

**VALUATION OF INTERNET COMPANIES – TODAY’S PRICES
VERSUS THE SITUATION DURING THE DOTCOM BUBBLE.**

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ABSTRACT

In the two-year period from early 1998 through February 2000, the Internet sector earned over 1000 percent returns on its public equity. However, by the end of the year, those returns were all gone. Today, that phenomenon is known as the “dotcom” bubble. This research tries to identify what the underlying factors that led to the dotcom bubble were, and whether or not these factors still exist in today’s valuation of internet firms. In an effort to answer those questions, existing literature review concerning the dotcom bubble is reviewed. Further, in order to analyze whether or not a similar situation is present today, 97 internet firms from the QNET index is analyzed and provides the basis for which the present day situation. The study concludes that the present day situation is very different from that of the dotcom bubble period. Although there are some similarities, key factors such as overly optimistic investors, short sales constraint and a disregard from traditional valuation metrics are currently not significant in the same way as they were during the bubble period. The study does recognize however, that the valuation of internet firms relies heavily on growth rates and if for any reason these growth rates should drastically decline, then the present day situation could quickly turn around.

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Chapter 1

Introduction

CHAPTER 1 – INTRODUCTION

1.1 SIGNIFICANCE OF THE STUDY

In the two-year period from early 1998 through February 2000, the Internet sector earned over 1000 percent returns on its public equity (Ofek & Richardson, 2002). However, by the end of the year, those returns were all gone. Today, that phenomenon is known as the “dotcom” bubble. Many economists have since tried to identify how the bubble initially came to be, and what eventually caused the bubble to burst.

Today, some economists are noticing some similar warning signs from that time. Janet Yellen, the head of the Federal Reserve, is one of those and she have ushered concerns regarding the valuation of social-media firms, but has been largely ignored. Could there be another buildup of a bubble in the internet sector today? By analyzing the various factors that contributed to the buildup of the dotcom bubble and comparing those with today’s situation, this study will try to answer that question.

The results of this study could be of interest to anyone looking to perhaps invest in the internet sector today, or to anyone who wish to get a better understanding of what it is that drives a bubble, and how market forces sometimes fail to bring overvalued share prices down to fundamental values.

1.2 RESEARCH QUESTION AND OBJECTIVE

The research question for this paper has been stated as follows:

Are we witnessing the buildup of another internet bubble?

The main objectives of this research are:

1. To identify factors that contributed to the significant rise of Internet company share prices from the beginning of 1998 up until the subsequent market crash of 2000.
2. To analyze whether or not technology companies today are subject to the same factors

1.3 SCOPE AND LIMITATIONS OF THE STUDY

In order to perform an analysis of the current situation of internet companies, data has been collected from the NASDAQ QNET index, which consists of 97 internet related firms. As such, these firms are not representative of the internet sector as a whole, but we believe that this index provides a good indicator as to how internet firms are being valued at present date.

The conclusions drawn in this report is therefore based upon the authors subjective impression and analysis of the current market situation for the internet firms listed on the QNET index should be treated as such.

1.4 BENEFITS OF THE STUDY

The results of this research will benefit as follows:

- Provide an understanding of how investor rationality can influences market prices.
- Provide information with regards to similarities and discrepancies from today's market situation compared to that of the pre-crash dotcom situation.

1.5 STRUCTURE OF THE STUDY

Chapter one provides information with regards to the significance of study, research question and objectives and the structure of the study.

Chapter two discusses the literature review which this study is based upon. The literature review looks at standard valuation metrics, and further looks at factors that contributed to the buildup of the dotcom bubble and discusses different theoretical opinions on what eventually caused the bubble to burst. It explains theoretical viewpoints of a rational market - in particular with regards to retail investors versus institutional investors, limitations to arbitrage and more.

Chapter three discusses the methodology used in this study.

Chapter four provides an analysis of the current situation of internet firms, based upon the QNET index, and compares these findings with the market situation during the dotcom bubble period.

Chapter five concludes.

Chapter 2

Literature Review

CHAPTER 2 – LITERATURE REVIEW

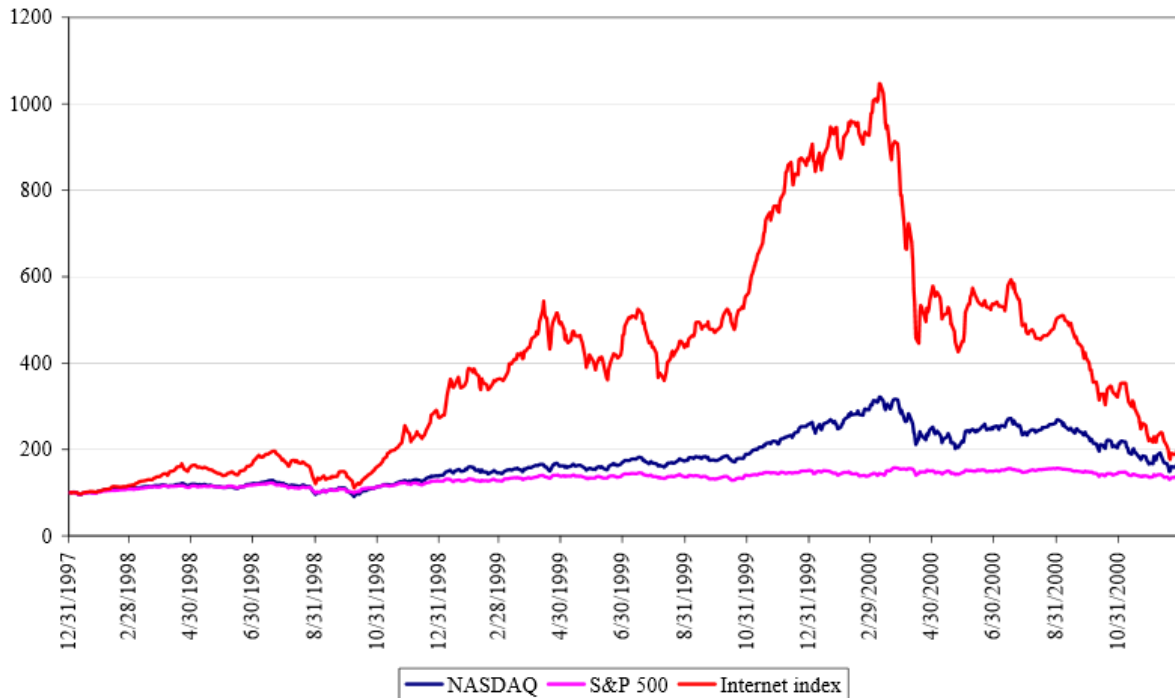
2.1 WHAT IS A “BUBBLE”?

In finance, a “bubble” is a financial situation in which an asset is priced far above their fundamental value and when the prices begin to fall sharply, the “bubble bursts”. Standard neoclassical theory precludes the existence of bubbles, and the efficient markets hypothesis also implies the absence of bubbles (Abreu & Brunnheimer, 2001). The efficient market hypothesis states that it is impossible to “beat the market” because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information and thus if a stock is overvalued, rational investors will, in theory, bring the price down to fundamental levels by selling or short-selling the overvalued stock.

However, bubbles have occurred numerous times through the years. Some of the more notable ones are the “tulip and bulb craze” in Holland from 1634 – 1637, and the “south sea bubble” in the United Kingdom in 1711. A more recent bubble and subsequent crash took place in the 1920s. In the period from 1921 to 1929 the Dow Jones index increased from 60 to 400. On October 28th 1929 a drop in share prices started, dropping to 145 in November and went all the way to 25 in 1932. This led to a major depression in the US economy.

The dotcom bubble and subsequent crash is illustrated in the below figure, as presented by Ofek and Richardson. It shows the value of the internet shares increased their value with approximately 1000% in the period from October 1998 until March 2000, and how the value dropped by end of 2000 to a value almost as low as in October 1998. The internet shares are here represented by an index defined by Morgan Stanley. The figure also shows how the Standard & Poor index (S&P 500) and the NASDAQ indexes developed during the same time. Note the S&P 500 represents a wide variety of sectors in the US market, whereas the NASDAQ index is an index mainly for companies classified as technology companies. Note that also the NASDAQ index appeared as a bubble, although not as spectacular as for the internet companies, and the rise and fall of the NASDAQ index was to a large extent driven by the Internet companies.

Figure 1 – Illustration of the dotcom bubble



Source: (Ofek, E., & Richardson, M. (2002) the valuation and market rationality of internet stock prices).

It is sometimes discussed what is a bubble bursting and what is a "correction". Various finance literature suggest that a correction should not exceed a 20% loss of value in the market. With this definition in mind, bubbles crashing are quite common - however, the dotcom bubble is still spectacular in its magnitude.

2.2 VALUATION METRICS

2.2.1 Price to Earnings (P/E) and Price to Sales (P/S)

When it comes to valuing stocks, the price/earnings ratio is one of the oldest and most frequently used metrics. It is calculated by taking the market value per share and dividing it by the earnings per share.

$$\text{P/E Ratio} = \frac{\text{Market Value per Share}}{\text{Earnings per Share}}$$

Shiller (2000) defines the P/E ratio as *a measure of how expensive the market is relative to an objective measure of the ability of corporations to earn profits.*

Market value per share is a reflection of what investors think a company will be worth and future growth possibilities are incorporated in this price. As such, one way of interpreting the P/E ratio is that it is a reflection of the market's optimism concerning a company's growth prospects. If a company has a P/E higher than the industry average, investors are expecting the company to grow more than the industry average. At some point, that company will have to increase its earnings or the share price will go down in value, thus bringing the P/E value down.

When determining whether or not a company has a high/low P/E ratio, it is important to take into account two main factors:

1. Company growth rates
2. Industry

It is important to look at growth rates when analyzing a company's P/E ratio. If a company has shown little growth in the past, but still has a very high P/E value, it could be a sign that the stock is overvalued.

Also, when comparing different companies P/E ratios, it makes little sense to compare companies that are in different industries. Some industries like utilities typically have low P/E ratios, because they are not expected to have high growth. Conversely, technology companies are often associated with high growth rates, and this should be considered when making a P/E evaluation.

It is important to note that if a company has negative earnings, it has no P/E ratio.

Now, what is a "normal" P/E value?

Let us first look at some historical values, as presented by Shiller (2000).

Figure 2: Price-earnings ratio S&P composite Stock Price Index



Source: Shiller, R. J. (2000). *Irrational exuberance*. p.8

The figure shows the P/E ratio of S&P index from the 1880s and up to year 2000. We recognize the 1929 bubble, and the dotcom bubble. Also we see that there were bubbles from 1901 and 1966. For the dotcom bubble, the P/E ratios went higher than ever, up to 44.3 by January 2000.

Another interesting observation is that every time the P/E ratio has risen to levels above 20, the market has seen a big correction or crash in the subsequent time periods. It also indicates that a "normal" P/E ratio will be somewhere between 10 and 20.

While these P/E values represents the entire S&P composite index, it is even more revealing to look at what the P/E ratios for internet-companies were during the buildup of the dotcom bubble.

In their research paper, Ofek & Richardson uses Morgan Stanley's breakdown of various internet sectors which in total provided them with a sample of 400 internet companies from 1999. A challenge is however, that very many of the internet companies did have negative earnings during the dotcom bubble, and as mentioned earlier, companies that have negative earnings have no P/E ratio. In order to still be able to roughly indicate what P/E ratio those share prices would imply, they assumed that those companies which had negative earnings would have a profit margin equal to their "Old-Economy" counterparts in order to calculate a "target"-P/E based on their target-earnings. The calculation was done by grouping the 400 companies into 11 groups, and show a target P/E ranging from 91 to 6703 - i.e. extremely high values. The aggregate target P/E for the industry as a whole was calculated to be 605, also extremely high.

Table 1: Aggregate Financial Information and Target P/E (1999)

Industry Code	Aggregate Market Cap	Aggregate Sales	Aggregate EBITDA	Aggregate Net Income	Industry Margins	Target Earnings	Target P/E
All	942967	27429	-5750	-9888	0,0568	1557	605
1	284565	6090	404	-1181	0,0452	275	1035
2	100910	2172	23	13	0,0474	103	980
3	139442	3354	-1562	-2846	0,1169	392	356
4	95617	1219	-328	-457	0,0436	53	1804
5	72675	4459	-3037	-3565	0,0190	85	855
6	62697	3038	-123	-501	0,0436	132	475
7	30968	3658	270	-57	0,0927	339	91
8	53620	192	-126	394	0,0436	8	6703
9	43264	2267	-871	-1054	0,0558	127	341
10	31278	590	-289	-390	0,0436	26	1203
11	27931	390	-110	-244	0,0436	17	1643

Source: Ofek, E., & Richardson, M. (2002).

Ofek and Richardson further calculated that in order to justify the target P/E values, the required growth rates are between 50 and 100 percent higher than the highest 2 percent of existing firms.

In light of the historic P/E, the pricing of these companies seems irrational. However, it must be also be said, that the above information was not available for the investors at that time in this structured manner.

Price to Sales (P/S)

Another widely used valuation metric is the price-to-sales ratio. This ratio is useful for comparing the valuation of early-stage companies that have revenues but are not yet profitable. It is calculated by taking the market capitalization of a company and dividing that by the company's sales over a 12-month period.

$$\text{P/S Ratio} = \frac{\text{Market Capitalization}}{\text{Total Sales}}$$

As with the P/E ratio, the P/S ratio is most relevant when comparing companies within the same industry or sector. A high P/S ratio compared to the industry average may indicate that a company is overvalued, and a low ratio may indicate that a company is undervalued.

Information about P/S ratios for 7887 US companies is collected by A. Damodaran and published on www.stern.nyu.edu, updated as per January 5th 2015. The companies included are found within several sectors. The median value is 1.65. The sector with the highest value is Drugs/Biotechnology with a factor of 10.38. The lowest is Retail (grocery and food) with 0.36. The "software (internet)" sector has P/S ratio of 6.34.

Using the figures from table 1, as presented by Ofek and Richardson, we can calculate what the P/S ratio for these companies as a whole was during the dotcom bubble. With a market cap of \$942,967 and total sales of \$27,429, we can calculate the average P/S of the companies on the internet index:

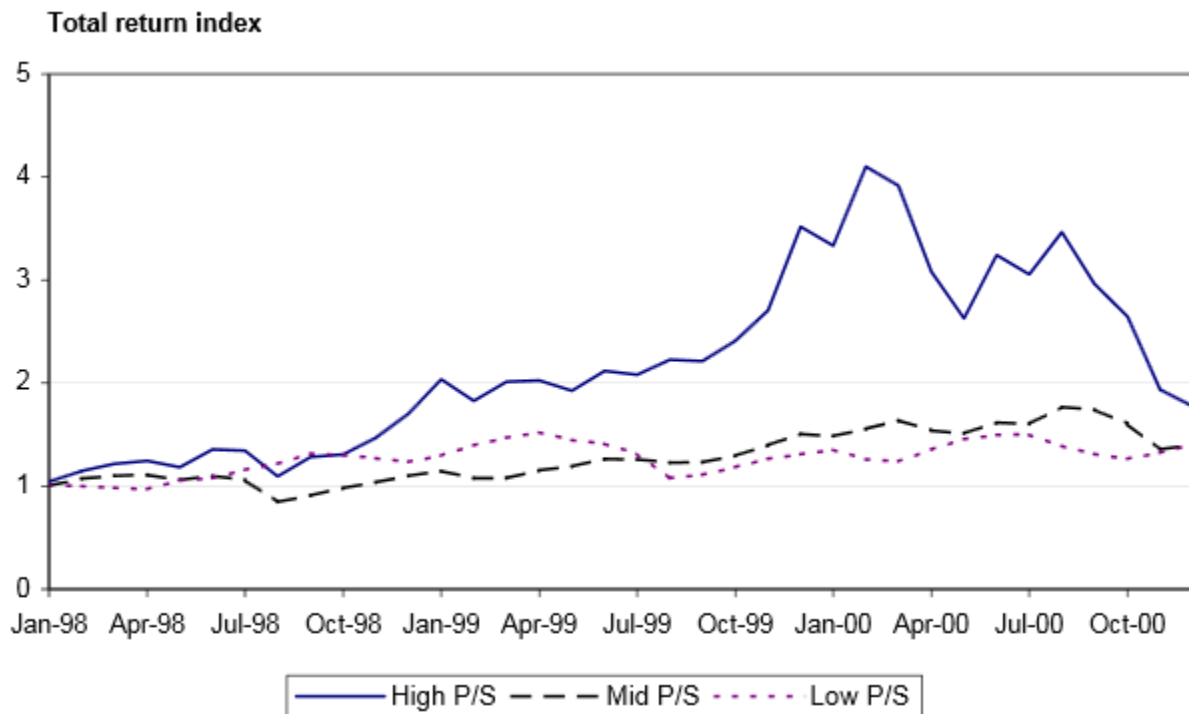
$$PS \text{ Ratio} = \frac{\$942,967}{\$27,429} = 34.4$$

Again, the standard valuation metric indicates the extreme overvaluation of the share prices during the dotcom bubble.

Brunnermeier and Nagel (2002) have studied how the P/S ratio developed during the dotcom period. These studies are for the total NASDAQ index, and not just the internet sector. They

have categorized companies with different P/S ratios from 1998 to 2000 into three different groups; High P/S, Mid P/S, and Low P/S and analyzed the returns from each of these categories.

Figure 3: Value-weighted return indexes of NASDAQ stocks with different P/S ratios 1998 – 2000.



Source: Brunnermeier, M. K., & Nagel, S. (2002).

They document that the value of high P/S stock quadrupled over a two year period, but more than half of those gains were gone by the end of 2000. These findings are consistent with Ofek & Richardson sample for internet stocks that documented price increases of a 1000 percent in the same time period.

2.3 POSSIBLE REASONS FOR THE DOTCOM BUBBLE

In the previous section we have seen that the standard valuation metrics strongly indicated that internet stock prices were overvalued. In hindsight it is difficult to understand why investors did not act on this. In this section we will look at different literature that provides different theories on why the market moved as it did.

2.3.1 Market Rationality and Different Types of Investors

One theory for why prices skyrocketed is that they were driven by unprofessional (irrational) investors, who based their investment of feeling and beliefs rather than on underlying economic values.

Finance literature generally categorizes investors into two different groups, i.e. "retail investors" and "institutional investors". Retail investors are individual investors who buy and sell shares on their personal account. These investors are often viewed as less sophisticated in comparison with institutional investors. Retail investors are therefore said to be more likely to trade irrationally, that is, buying shares which might be priced far higher than what might be reasonable from a viewpoint of fundamental values.

Institutional investors are investors who have a significant amount of capital; generally these consist of banks, insurance companies, mutual funds, hedge funds etc. Institutional investors are viewed as sophisticated traders, and as such they also face fewer protective regulations because it is assumed that they are more knowledgeable and therefore better able to protect themselves.

Ofek and Richardson has provided indications that the internet sector had a higher share of retail investors than the general share market in US, and the this could explain some of the irrationality.

Also, Shiller argues the price increase was driven by irrational euphoria among individual investors (see also section 2.3.5).

However, other studies question if this is a good explanation. Griffin, Harris et. al (2011) describes three different paths between investor interactions in bubble literature.

The first path is related to classical finance theory and the rational markets view, which says that some investors may trade irrationally, but that such behavior will have little to no effect on

market prices because sophisticated traders (arbitrageurs) will quickly trade against this to eliminate deviations from economic values. The second path is based on a theory that says that sophisticated traders will not be able to correct deviations from economic values caused by irrational trading because of frictions such as short-sale constraints, in which case prices are driven by retail investors. The third path is the most unconventional path, and it describes a situation in which rational traders may actually drive a bubble. Arbitrageurs, who know the market is overvalued, maximize their profits by riding the bubble, knowing that the prices are likely to increase even more as a result (Abreu and Brunnermeier 2002).

These theories represent different ways in how investors interact and how they may or may not influence the buildup of a bubble. With respect to the first path, that says that bubbles should not exist, has been proven not to be true in practice. In order to explore the second and third path, it is interesting to analyze how the institutional (“rational”) investors behaved during the buildup period of the bubble.

2.3.2 Trading patterns of Hedge Funds during the bubble period

Brunnermeier and Nagel (2002) have looked at the behavior and trading patterns of hedge funds during the bubble period. They argue that among institutional investors, hedge funds are amongst the most sophisticated investors, and that they come closest to the ideal of “rational arbitrageurs”. According to classical finance theory, these investors should trade against what they view as irrational trading, but was this actually the case? The results from Brunnermeier and Nagel are very interesting, as they reveal that hedge funds did *not* act as a correcting force on inflated price levels. In fact, their results show that hedge funds were actually “riding the bubble”!

The methodology used by Brunnermeier and Nagel to reach at this conclusion, was the data that these hedge funds had to report to SEC (Securities and Exchange Commission). Although the data reported was not categorized per individual hedge fund, by using the name of the hedge fund manager they were able to document how the major players, such as Soros Fund Management, Tiger Management, Omega Advisors, Husic Capital Management, et cetera, were playing their cards.

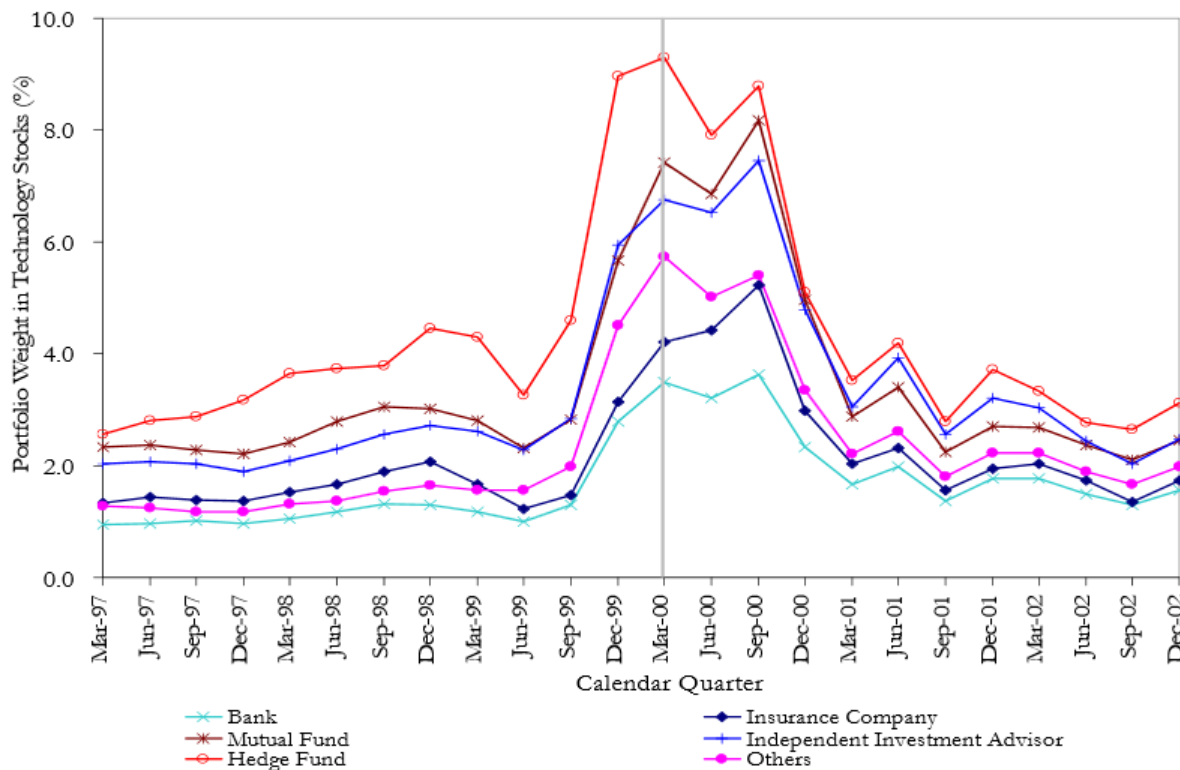
Interestingly, in the first quarter of 1999, hedge funds drastically decreased their holdings in the technology sector, and Stanley Druckenmiller of Soros Fund Management later said that they were too early in calling the bursting of the internet bubble (Brunnermeier and Nagel 2002).

After having decreased their portfolio weights in technology stocks, most hedge funds subsequently invested aggressively into technology stocks during the second half of 1999 (Griffin, Harris et. al (2011)). This happened at a time when Professor Richard Thaler at University of Chicago had conducted a survey of professional investors, asking for their opinion on the share value for five internet companies (America Online, Amazon.co, eBay, Priceline.com and Yahoo), and the median reply he got was the they were 100% overvalued (Brunnermeier and Nagel (2002)). In spite of this, large investments were made in these companies.

The hedge funds eventually lowered their portfolio weights during March 2000, just prior to the crash. Brunnermeier and Nagel's analysis demonstrate that hedge funds in general held long positions of technology stocks, but as the bubble burst, they were able to sell their positions of technology stocks at the time when the share prices were at a peak.

This view is also supported by Griffin et al, who has provided the below graph, indicating how hedge fund and others increased and reduced their portfolio in technology (and presumably internet) stocks. During 1999 they reduced their investments, but shortly thereafter invested heavily during second half of 1999. The graph also shows how the hedge funds were able to pull out quickly when the share prices dropped early in 2000.

Figure 4 - Portfolio weights in technology stocks:



Source: Griffin, Harris et. al (2011) – Who Drove and Burst the Tech Bubble?

The findings of Brunnermeier and Nagel gives goes against the classical finance theory that says that it's optimal for rational arbitrageurs to “attack” a bubble. In fact, it provides support for the third theory, that rational arbitrageurs will maximize their profits by riding the bubble.

Their findings also contradict the work of Ofek and Richardson (2002) who argues that short sale constraints are the primary reason to why rational arbitrageurs didn't attack the bubble (see further discussion on short sales below). According to Brunnermeier and Nagel, a limitation to short sale is not a sufficient explanation to why rational investors did not actively trade against the rising share prices. The fact that hedge funds held long positions contradicts this claim. However, short sales constraints in itself is a limitation to arbitrage, which in itself is a possible explanation to why prices did not correct themselves, and it is therefore highly relevant to have a close look at how short sales constraint affected price levels during the bubble period.

One aspect that should be kept in mind when considering the actions of the hedge funds, is the fact that although some hedge funds were highly profiled, their total volume of equity was very small compared to aggregate equity (according to Brunnermeier and Nagel, only 0.3%). Thus, in order to “attack a bubble”, individual hedge funds may be too small, and coordinated efforts between several funds required. According to Abreu and Brunnermeier such coordination is difficult to achieve, as there may be different views with regards to timing.

2.3.3 Short-Sales Restrictions

Ofek & Richardson presents short-sales restrictions as a possible explanation to why rocketing stock prices was not corrected.

Short-sale is one of the key mechanisms to how an investor can make profit if he or she believes that a stock is overvalued. Short-sales have the effect of implementing the view of pessimistic investors into the share price, thereby bringing the share price closer to fundamental values. A short sale transaction is when an investor borrows shares and immediately resells it to the market in anticipation that the price will go down in the future. The investor then has to buy back the share, and “return” it to the original owner.

The risk associated with short sales is, however, very high. If the investor is wrong in his anticipation of a drop in the share price, his risk exposure is unlimited; e.g. if the share triples in value, the loss for the short investor will be three times the price of the share (in comparison, if an investor buys (long) shares, his maximum loss will be the value of the share). Because of this, short sale is considered to be a tool only for the sophisticated investor, e.g. the hedge fund manager. Traditionally, mutual funds generally stay away from buying shares short.

In a short-sale transaction, the person or entity that wishes to borrow stock has to put up cash collateral to borrow that stock. For this amount of cash, the borrower is paid an interest known as the rebate rate. When there is an ample supply of shares to sell short, the rebate closely reflects the prevailing interest rate. However, when the supply is tight, the rebate rate will be lower. This lower rate represents compensation to the lender of the stock (Ofek & Richardson 2002).

Ofek and Richardson has documented that at the time of the dotcom buildup, the rebate rates were significantly lower for internet stocks compared to non-internet stocks, thus making internet stocks more expensive to sell short.

Another factor that limited the ability of investors to short stocks is that there were a limited number of shares available for short sales due to lockup agreements. A lockup agreement is normally applicable to a share in a time period after an Initial Public Offering (IPO). In general, when a company goes public, the underwriter, typically an investment bank, will insist upon that only 15 to 20 percent of the shares are issued to the public and that the remaining 80-85 percent is restricted from sales for a certain period of time without the written consent of the underwriter (Ofek & Richardson 2002). This period is known as the lockup period (typically 180 days).

During the dotcom period, the number of IPO offerings was extremely high. From second quarter of 1999 to first quarter of 2000, there were a total number of 400 IPOs out of which 280 were related to the internet sector. Thus, because of the lockup periods associated with IPOs, a relatively high volume of shares were not available for being shorted.

There could also be other limiting factors to short sales during the dotcom bubble.

Shleifer and Vishny have made studies concluding that if the market is volatile, because of the increased risk associated with volatility; this is a reason for arbitrageurs to stay away. Ofek and Richardson has documented that the internet sector during the dotcom bubble was very volatile, as an example, the daily high-low for internet stocks was 9.9 percent.

Bradford de Long has studied "noise trader" risk in financial markets, and claims that a high degree of noise trading may scare arbitrageurs away. A noise trader is an investor who makes decisions regarding buying and selling transactions without use of fundamental data. These investors generally have poor timing, follow trends, and overreact to good or bad news. Retail investors are often considered as noise traders.

Ofek and Richardson further believe that the large quantity of lockup's that expired simultaneously was the main trigger that caused the market to collapse. They argue that this event had the same effect as removing the short sale constraint, and thus the beliefs or the pessimistic

investors were immediately incorporated in the share price (not just the optimistic ones) which led to a sharp drop in prices, i.e. the bubble burst.

Ofek and Richardson's studies are consistent with Brunnermeier and Nagel in that they both agree that rational arbitrageurs did not have a correcting effect on share prices, although their views are different with regards to why. In both cases they have looked at institutional investors not being able to correct share prices in deviating from fundamental price caused by retail (irrational) trading behavior. Does this necessarily mean that it was the retail investors who caused the run-up in price levels? Griffin and Harris et. al (2011) refer to news articles that it was individual investors, not the sophisticated or smart money that drove the share prices of technology stocks.

In the next section we will look into who bought technology shares.

2.3.4 Who bought technology shares?

Griffin and Harris et. al (2011) have done an extensive study with regards to who bought and sold technology shares during the dotcom run-up. They define the run-up period from January 2, 1997 to March 27, 2000. During the run-up period they show that institutions made 64.6 percent of active technology purchases, while individual investors bought the remainder (19.4% percent via mutual funds and 17 percent directly) (Griffin and Harris et. al (2011)). Consistent with Brunnermeier and Nagel, they find hedge funds the most aggressive investors amongst institutional investors.

Thus, with institutional investors being the larger party in buying internet shares, it can hardly be said that it was the retail investors alone who drove the run-up of the dotcom bubble.

Another interesting aspect of their analysis is that institutional investors began pulling capital out of the internet sector during mid-march 2000, while at the same time, individuals accelerated their purchases.

They also conclude that the retail investors continued to buy shares also after the shares were peaking, thus supporting the view of the retail investor as being "irrational", or at least, unable to time the market.

The findings of Griffin and Harris et. al are inconsistent with the view that it was irrational behavior among retail investors that drove technology stock prices. However there are other economists that still believe this was the case. Shiller (2000) is one of those economists who argue that stock prices were driven by irrational euphoria among individual investors. In order to understand why there was such a strong belief in technology shares, it is useful to look at what the overall market situation looked like in The United States prior to the run-up period.

2.3.5 Structural Factors in the United States Prior to the Bubble run-up

As previously stated, Shiller (2000) points to what he calls irrational exuberance amongst investors during the dotcom run-up period, as a reason for the overvaluation of internet stock prices. He also sheds some light on other factors that might have played a role on influencing investor's psychology in the mid-1990s. Investors clearly had a very optimistic view on technology stocks, and Shiller points out that there were probably many factors that contributed to this optimism other than technology stocks by itself.

During the early nineties, U.S. companies saw very high earnings growth, with 36 percent in 1994, 8 percent in 1995 and 10 percent in 1996. Tax reductions took place in 1997 (top capital gains tax rate cut from 28 to 20%), further reductions was expected but was vetoed by President Clinton (Shiller 2000).

On this basis, investors would presumably be receptive for thinking that a high growth was to continue, or even increase now with the revolutionary internet giving easy access to global markets, with the United States in the lead of the technology development.

Also, in the beginning of the 1990s, the global development had been advantageous for the U.S., with the old Soviet Union broken up, and China adopting western style of doing business, there was a feeling that Capitalism, or the United States, had "won".

Another element which, according to Shiller (2000), could have had an impact on stock prices is the fact that trading with shares had become more common for ordinary people (more "retail investors"). Some examples: In 1982 there were 6.2 million equity mutual fund shareholder accounts. In 1998, this figure had grown to 119.8 million. The share turnover rate (the total shares sold in a year divided by the total number of shares) for New York Stock Exchange was

41% in 1982, and 78% in 1999. For NASDAQ, the figures were 88% in 1990 and 221 in 1999). Also the number of online accounts (for buying and selling shares) increased, from 3.7 million in 1997, to 9.7 million in 1999.

Furthermore, the availability of the internet made a lot of share information more available for the public; thus it is likely that this would have an effect as advertisement for share trading.

Another aspect which according to Shiller could contribute towards a more risk taking culture, was the liberalizations in laws pertinent to gambling.

A further element that it is quite easy to intuitively see had a strong impact, was that firms changed the compensation packages for management away from fixed salaries and towards stock options. By 1998, employee stock options had reached 6.2 percent of the outstanding shares in a sample of 144 of the largest S&P 500 firms (Shiller 2000). Such stock options can become quite lucrative for the management if the share price increases to levels higher than the option exercise price. This provided a strong incentive for management to focus on how they could increase the firms share value. Many managers were looking at ways to how they could redefine their company as an internet firm, because in many cases, firms who were able to tie their business with internet related activities saw an immediate positive effect on the share price.

As Ofek and Richardson discuss in their research article, when one considers corporate events that should have little effect on the financials of a company, a name change should be high on the list (Ofek and Richardson 2002). Prior to the dotcom period, existing literature was supportive of this view. However, in a study done by Cooper et. al (2001), they investigated stock price movements of firms that changed their name to an internet related name, and found a name change had a significant impact on the share price. One good example is Zapata, a company founded in 1953 by the former US president George Bush, as an example of this. Zapata was an oil and gas company, by which management in April 1998 announced that it was going to form a new company and move into internet related business. Initially this process stalled as Zapata failed to acquire Excite, as their bid was reject on the basis of a “complete lack of synergy”. However, in December 1998 it announced that it was going to form a subsidiary, Zap.com, and on this news, shares rose 98 percent in New York Stock-Exchange (NYSE) composite trading (Ofek and Richardson 2002).

Shiller argues that this rush to achieve dot-com status may have influenced many managers to take on costly internet-related investments without properly analyzed the long term consequences of these investments.

Shiller also mentions that during the late 1980s and the beginning of the 1990s, many US corporations were downsizing, and as a result, this encouraged workers to become less dependent on their employer and try to become financially sound on their own. This is somewhat consistent with the results from a questionnaire survey done by Roper-Starch that was done in 1975 and 1994. In that questionnaire, American citizens were asked “when you think of the good life – the life you’d like to have, which on the things on this list, if any, are part of that good life, as far as you are personally concerned”? In 1975, 38 percent picked “a lot of money”, while 64 percent did in 1994(Shiller 2000).

Thus, Shiller paints an interesting picture in which outside factors as mentioned above might have played a pivotal role in affecting the psychology of investors, especially retail investors. The technology sector emerged at a time, in which people were more accustomed to risk, seeking to become economically independent from their employers, and the economy was strong.

2.3.6 The Role of Financial Analysts

How did the professional analyst advice the general public during the bubble? Shiller quotes data from Zacks Investment Research about analysts' recommendation on some 6000 companies. In late 1999, only 1 percent of the recommendations were "sell", while 69.5 percent were "buy" and 29.9 percent were "hold". So clearly, if the retail investors did drive the bubble, they certainly received a helping hand from the professionals.

Also Jansen and Perotti (2001) concluded in their studies that the financial analysts actually stimulated the overvaluation of the internet stocks, by being too optimistic in their forecasting of earnings.

2.4 BRIEF SUMMARY OF THE LITERATURE REVIEW

We have seen in the previous sections that during the dotcom bubble, the standard valuation metrics had high numbers which should have made alarm bells sound. With regards to why they did not, several theories have been looked at; e.g. too many retail (noise) investors, frictions to short sale, institutions and hedge funds riding the bubble, too much optimism. It is likely that all these different theories are relevant to some extent.

Chapter 3

Research Methodology

CHAPTER 3 – RESEARCH METHODOLOGY

3.1 Research Method

This study uses qualitative method by analyzing secondary data, primarily in the form of research papers, explaining events leading up to the dotcom bubble. Key factors connected to that event are then identified and analyzed and compared with the current situation of a sample of internet firms.

3.2 Research Design

This study uses a descriptive design.

3.3 Data Collection

This study is based on secondary data collected from research articles, news articles and financial information gathered from Yahoo Finance, Wikinvest and Marketwatch. Moreover, we use the QNET index which consists of 97 internet firms for the basis of our analysis of the present day situation of internet firms.

3.4 Methodology

The study seeks to describe and explain the differences and similarities between the current market situations of internet companies with that of the dotcom bubble period. As such, this study is mainly based upon qualitative research. In order to acquire a good understanding and knowledge about the dotcom period, numerous research papers have been studied, from which the analysis and conclusions drawn, are discussed and analysis further.

In order to analyze the current situation of internet firms, it has been assumed that the QNET index is a good representation of the overall situation of today's internet companies. The QNET index consists of 97 internet companies. The index includes major players such as Google, Facebook, eBay, Amazon, Twitter etc.

The key data collected from this index was collected from the QNET index from 26th – 27th of June. This data has then been organized and analyzed in an excel spreadsheet (See appendix 1 and 2).

The analysis has been concentrated around the ten largest companies on this index, whose market capitalization represents approximately 83 percent of the total market capitalization of the index.

Also, some additional information has been gathered from other financial reporting websites such as Wikinvest in order to get a better understanding of individual company performance.

The findings from the analysis have then been compared with the situation of the dotcom bubble.

Chapter 4

Analysis

CHAPTER 4 – ANALYSIS

4.1 STRUCTURE OF ANALYSIS

The analysis is based on data from the QNET index, which consists of 97 internet firms. The data gathered from this index used in this analysis is summarized in appendix A.

The first part of the analysis presents general observations with respect to the index as a whole. However, the ten biggest firms on this index represent roughly 83 percent of the total market value of all the companies on the index. For this reason, in the second part of the analysis, a detailed analysis of these ten firms is done.

4.1.1 General Analysis of the QNET index

4.1.2 Price to Earnings Ratio Analysis

In this part of the analysis, we begin by taking a closer look at the standard valuation metrics, beginning with the P/E ratio. Out of the 97 companies on the QNET index, only 48 report a P/E ratio. This is because out of the 97 companies listed on the index, 49 of those companies have negative earnings and thus no P/E value.

The reported P/E ratios range from 5 to 424. The median P/E value is 36. In order to calculate a P/E ratio for the index as a whole, the following is relevant:

- Market cap – presented for each company
- Earnings – calculated by multiplying the given revenue with the given margin for each company

The P/E ratio for the index as a whole is thereby calculated by summing up the individual market capitalization values for each company, divided by the summed up earnings for each of the 97 companies:

$$PE\ ratio = \frac{Total\ Market\ Capitalization}{Sum\ of\ earnings} = \frac{\$1,374,055}{\$33,378} = 41$$

A P/E ratio for the index as a whole at 41 is certainly high, however internet companies are often associated with high growth and it is expected that the P/E ratio of sectors associated with high

growth will be higher. With reference to the literature review, Shiller pointed out that the P/E ratio of the S&P in January of 2000, hit 44.3. Currently, the S&P has a P/E ratio of 20.2 (www.multpl.com).

The P/E ratio of 41 is significantly lower than the peak values seen during the dotcom bubble. Ofek and Richardson calculated a “target P/E” of 605 for the internet companies used in their sample as defined on the Morgan Stanley internet index. The “target P/E” was made under the assumption that companies that had negative earnings had an industry average profit, i.e. the value of 605 in reality was too low. Thus, the overall P/E value of the QNET index as calculated above is nowhere near the high values during the dotcom bubble.

Another key difference from the dotcom bubble period is that although not all companies on the QNET index have positive profit margins, on aggregate, the index has positive earnings. The sum of earnings is representing approximately 10.7% of the total revenue. In the sample used by Ofek and Richardson, on aggregate, the internet index had negative earnings during the dotcom period.

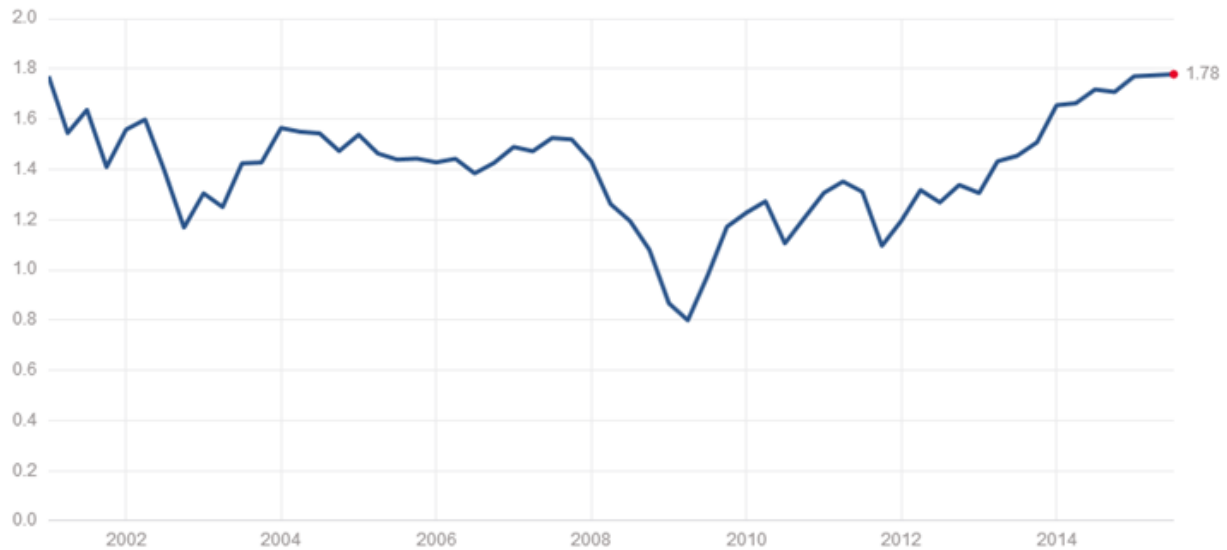
4.1.3 Price to Sales Ratio Analysis

For the companies listed on the QNET index, total sales are equal to \$310,028M, and the total market capitalization of the firms are \$1,366,555M. This gives a P/S ratio of:

$$PS\ Ratio = \frac{\$1,366,555}{\$310,028} = 4.4$$

In general, finance literature considers a P/S ratio between 1 and 2 as good, and ratios below 1 are considered excellent. As such, a P/S ratio of 4.4 represents an unfavorable and high figure. Figure 5 illustrates how the P/S ratio for the S&P 500 index has varied for the past 13-14 years:

Figure 5: S&P 500 Price to Sales Ratio:



Source: Standards & Poor's

Again, the S&P 500 index represents ten different sectors, and some sectors will be associated with higher P/S ratios than others. Currently, information technology, the sector closest related to the internet sector, equals approximately 19.6 percent of the S&P 500 index.

Based upon the data collected by Ofek and Richardson, the P/S ratio was calculated to be 34.4 for the internet firms used in their sample.

Compared with that figure, a current P/S ratio of 4.4, although not ideal, is quite low in comparison. Also, bearing in mind that this value is normally 1-2 (see section 2.3.1), 4.4 is high, however, not unreasonably so.

4.2 ANALYSIS OF THE TEN LARGEST COMPANIES ON THE QNET INDEX

In the following section we take a closer look at the ten companies with the largest market capitalization on the QNET index.

Together, these ten companies represent 83 percent of the market value of all the companies on the index, and 78 percent of the revenue. Thus, these companies will to a large extent determine whether the pricing of the internet sector represents a possible bubble.

4.2.1 Google Inc. (Ticker GOOG)

Google is a company specializing in internet related services and products, with “Google-search” probably known to all readers. Their revenue streams are mainly from online advertising.

Google is by far the largest company on the QNET index, with a market capitalization of \$355,840 million, representing 26 percent of the index. Their revenue represents 22 percent of the index.

Google’s IPO took place Sept. 1st 2004. Since then, the stock has grown on average about 30 percent each year, which place the share among the most profitable share ever in the United States – see curve of share price development below.

Google currently has P/E ratio and P/S ratio of 24.7 and 5.4 respectively. These are high values, but considering that their profit margin was 21 percent and the revenue growth rate in 2014 was 19 percent (21 percent in 2013), the high ratio values seem to have a reasonable foundation.

Figure 6 - Google Share-Price Development:



Source: Marketwatch

QNET quotes the institutional ownership for Google to be 31.9 percent, which is low compared to the other nine largest companies on the QNET index.

The share of stock being shorted is 0.4 percent, i.e. very low.

All aspects considered, the Google share price does not seem to be overvalued.

4.2.2 Facebook (Ticker FB)

Facebook is an online social networking service. As of Q1 2015, it had 1.44 billion active users (user's active minimum once per month). Facebook's income is from advertisement. A special thing about Facebook is that it collects personal information about their users. This information is then sold, so that advertisement can be tailored against the consumer group assumed to be most receptive.

Facebook's market capitalization is \$240,490 million, representing 18 percent of the overall index. The revenue of Facebook is at \$13,510 million, which only represents 4 percent of the index.

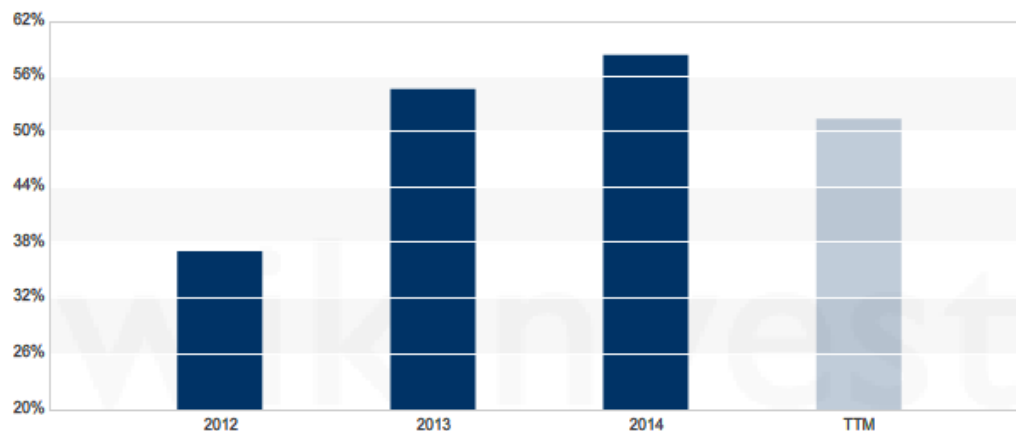
Facebook's IPO took place on May 18th, 2012. After one year with a share price lower than the original IPO offering, the share price increased approximately 300 percent from mid-2013, until present day (see figure 7 below).

In terms of standard valuation metrics, the share price is very high. Facebook currently has P/E ratio and P/S ratio of 83.0 and 18.3 respectively.

Facebook is, however, highly profitable, with a profit margin of 21 percent. The high P/E is therefore, unlike most of the internet companies with high P/E, not due to low earnings. The P/S ratio of 18.3 is extremely high, as mentioned earlier; the average P/S ratio for the index is 4.4.

One possible explanation for the high share price of Facebook is the high annual growth of Facebook's revenue:

Figure 7 – Facebook Revenue Growth:



Source: Wikinvest

The growth rate was “only” 37 percent in 2012, which could be part of the explanation why the share price went down after the IPO. However, with the stronger growth figures from 2013 and onwards, the share price increased strongly (close to 250 percent) until Q3 of 2014.

An important question is for how long this strong growth can continue? As a percentage, it must be expected to be reduced, but a lower percentage may still represent a large volume growth.

Analysts generally recommend buying this share (out of 49 analysts, no one has a sell recommendation). The percentage of the shares sold short is only 1.2, which is low, and an indication that most investors are not expecting this share to decrease in value (consistent with analysts' recommendations).

On the ownership side, 65.9 percent of the shares are held by institutions, i.e. by professional investors.

In conclusion, Facebook has a very high price according to the standard valuation metrics. However, we believe this is largely related to the fact that Facebook is very profitable and has a high growth rate, and thus we do not believe this share price is overvalued.

Figure 8 – Facebook Share-Price Development:



Source: Yahoo Finance

4.2.3 Amazon (Ticker AMZN)

Amazon is the leading online retailer of books. Since opening for business as “Earth’s Biggest Bookstore” in July 1995, the Amazon.com bookstore has quickly become one of the most widely known, used and cited commerce sites on the Web.

Amazon’s market capitalization is \$200,180 million, representing 15 percent of the index. Their revenue the last 12 months was \$91,960 million, representing 29.7 percent of the index. However, Amazon is having a negative profit margin of minus 0.44 percent.

Amazon’s IPO took place in 1997, and the company survived the dotcom bubble, but the company had a very low share value until 2007. Since then, the share price has increased by approximately 1000 percent. With negative earnings, no P/E ratio is quoted. However, if we assign Amazon with a “reasonable” profit margin of 5 percent, by using the same approach as Ofek and Richardson, we can calculate “target earnings” and thus a “target P/E”. This method provides Amazon with a P/E ratio of 43.5, which is well below the targeted P/E values as calculated by Ofek and Richardson during the dotcom bubble.

Amazon has a P/S ratio of 2.2, which is more normal, and lower than most companies on the QNET index.

The percentage of shares sold short is 1.4, also suggesting that not many investors are expecting this share price to decrease in value. Institutional ownership is at 67.7 percent.

Of the 43 analysts quoted on the QNET index, 30 recommend buying, and the remaining 13 to hold. No analysts are recommending selling.

Based on the “target P/E” value, and taking into consideration that Amazon is in fact losing money currently, we believe that although analysts are mostly recommending investors to buy this share, we question this recommendation. The teachings from the dotcom bubble were to pay close attention to standard valuation metrics – not recommendations from analysts.

Figure 9 – Amazon Share-Price Development:



Source: Yahoo Finance

4.2.4 eBay (Ticker eBay Inc.)

eBay is providing consumer to consumer as well as business to consumer sales via Internet. The company receives their revenues from transaction fees paid by sellers and buyers.

The market capitalization of eBay is approximately \$72,120 million, representing 5 percent of the index. Revenue last 12 months was \$18,090 million, representing 6 percent of the index.

E-bay went public in 1998, at an initial share price of \$18, and came through the dotcom bubble with only minor scars. The share had a peak in 2004 at \$58, but dropped down to approximately \$12 in 2009. Since then the share price has grown to approximately \$60 (see figure 9 below).

In terms of standard valuation metrics, eBay currently has a P/E- and P/S ratio of 24.8 and 4.1 respectively.

The profit margin was 17 percent for last 12 months. The annual growth rate has been stable at about 14 percent over the last couple of years. However, lately, it has declined to 8 percent in Q4

2014 and only 4.3 percent in Q1 2015. These are strong figures supporting the high valuation of the company, although with a little caveat for the lower growth rate recently.

Institutional ownership for eBay is high (84.7 percent) and the percentage of shares sold short is low (1.5 percent).

The opinions of the 42 analysts quoted are 21 buy, 18 hold, 3 underperform and 0 sell.

Based on the information listed above, we believe that eBay share price is not overvalued.

Figure 10 – eBay Share-Price Development:



Source: Yahoo Finance

4.2.5 Baidu (Ticker BIDU)

Baidu is a Chinese web services company. Baidu offers a wide variety of services, including a Chinese language search engine for websites, audio files and images. Baidu also offers a number of other search and community services including an online, collaboratively-built encyclopedia and a searchable, keyword-based discussion forum. Baidu's revenue comes from advertisements and receives most of their revenue from the Chinese market.

The company was founded in 2000, and the IPO took place in August 2005. Baidu's market capitalization is approximately \$70,420 million, representing 5 percent of the QNET index. Baidu's revenue the last 12 months was \$8,420, representing 3 percent of the index.

The standard valuation metrics show a high price for the share, with a P/E ratio of 34 and a P/S ratio of 8.5.

Baidu's profit margin is 25 percent and the company has a high growth rate (34 percent in Q1 2015), but declining from Q1 in 2014, when it was 59.1 percent (Source: Techcrunch).

Institutional ownership is high (84.3 percent). The number of stocks being sold short is not made available.

Of the 29 analyst quoted on the index, 24 recommend "buy" while the remaining analysts recommend "hold".

The current share price is 198, down approximately 20 percent from the peak in late 2014.

The share price is high, however, not irrational. The dependency on the Chinese market however, adds a significant element of uncertainty.

Figure 11 – Baidu Share-Price Development



Source: Yahoo Finance.

4.2.6 The Priceline Group Inc. (Ticker PCLN)

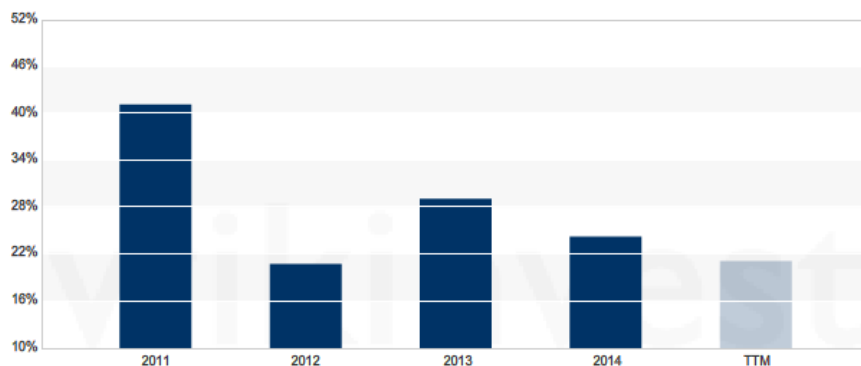
The Priceline Group Inc. provides online travel- and travel related reservation and search services. The company operates Booking.com, which provides online accommodation reservation services; and priceline.com that offers hotel, rental car, and airline ticket reservations services, as well as vacation packages. Their revenue is from transaction fees and from advertisement on their web pages.

The first IPO took place in March 1999, during the dotcom bubble. The share peaked at very high values, but came down and the company had a low market value for a long while until the share price started to grow in 2007. Since 2007 and until Q3 in 2014 the value of the share increased with a factor of approximately 10. From Q3 to today the share price has declined about 10 percent.

The market cap of PCLN is approximately \$57,420 million, representing 4 percent of the index. Their revenue is \$8,640 million which represents about 3 percent of the aggregate revenue of QNET.

The Priceline Group Inc. currently has a P/E ratio of 24.2, and a P/S ratio of 6.8. Their profit margin was at 28 percent during the past 12 months, and the company had the following growth rates for the past 4 years:

Figure 12 – The Priceline Group Revenue Growth



Source: Wikinvest

Of the 27 analysts quoted, 21 recommend buy and 6 recommend hold.

Again we see the share-price being quite high; however the company is also very profitable and has a high growth rate, which suggest that the company is priced reasonably.

Figure 13 – The Priceline Group Share-Price Development:



Source: Yahoo Finance

4.2.7 JD.com Inc. (Ticker JD)

JD.com Inc. operates as an online direct sales company, operating in China. It primarily offers electronics and home appliances products, general merchandise products, including audio and video products as well as books. It also provides an online marketplace for third-party sellers to sell products to customers through its Website. Their revenue is mainly from transaction fees.

The market capitalization is approximately \$44,440 million, which represents approximately 3 percent of the QNET index. Their revenue was \$20,760, which represents about 7 percent of the total revenue from the index. Their profit margin was slightly negative at minus 1.5 percent.

With negative earnings, no P/E value is announced. The P/S ratio however is 2.2.

We see that this company has similarities with Amazon; they operate in the same market segment, currently not profitable but focus on growth, and the investors seem to think that profitability will eventually come. The company report very high growth figures with their annual report for 2014 reporting gross revenue of Q4 119% higher than that of Q3 2013. Their quarterly report of Q1 2015 reports gross revenue 62% higher than that of Q1 in 2014.

The institutional ownership percentage is not made available, and neither is the percentage of shares sold short.

Of the 26 analyst quoted, as usual, mostly agree: 18 recommendations to buy, 8 to hold.

The basis for the share price thus seems to be rational, but as with Baidu, the dependency on the Chinese market, adds an element of uncertainty.

Figure 14 – JD.com Inc. Share-Price Development:



Source: Yahoo Finance

4.2.8 Netflix, Inc. (Ticker NFLX).

Netflix, Inc., is an Internet television network, engages in the Internet delivery of TV shows and movies directly on TVs, computers, and mobile devices in the United States and internationally. The company has approximately 57 million customers in approximately 50 countries. Income is from subscription based fees.

Netflix, Inc. was founded in 1997 and is headquartered in Los Gatos, California. The IPO took place on May 22nd, 2002. As can be seen from figure 14 below, the stock had a low value for many years, until it started to grow in 2010, had a peak of 270 in May 2011, dropped to 54 in sept 2012, and has since then grown to 658. As late as December 1st 2014 it was valued at 341.

The current market capitalization is approximately \$39,140 million, which is about 3 percent of the total index. Revenue last 12 months was \$5,810 million, approximately 2 percent of the index.

Netflix reported a profit margin of 4.1 percent.

In terms of the standard valuation metrics, Netflix has extremely high values; with the P/E ratio at 168, and the P/S ratio at 6.8.

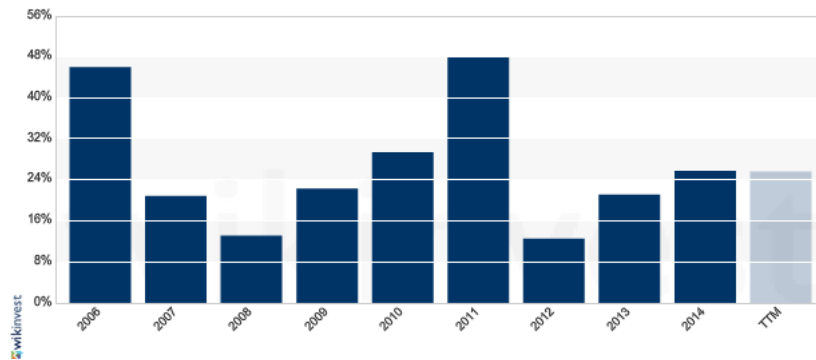
88.2 percent of the shares are held by institutions, and a total of 9 percent of the shares are sold short. The number of shares sold short is considerably higher compared with the other companies that dominate the index, which could be a sign that quite a few investors believe that this share is overvalued. A P/E ratio of 168, certainly indicate this could be the case.

Still, out of 42 analysts making their opinion available on the QNET, 26 is recommending to buy, 13 recommends hold, only 2 is recommending to sell the share (and one believes the share will "underperform", i.e. do worse than market, but still does not recommend to sell).

So what is the reason for this remarkable growth in share price?

Again the reason is revenue growth, the last two years, as shown in figure 13 below. Note the slowdown in 2012, which sent the share price down to a very low value.

Figure 15: Netflix Revenue growth:



Source: Wikinvest

A key performance indicator for Netflix is also the number of subscribers, which is also showing growth.

Still, all things considered, we believe that the Netflix share is overvalued. It is overvalued by standard metrics, very volatile historical share values, high number of shares sold short.

Figure 16: Netflix Share-Price Development:



Source: Yahoo Finance

4.2.9 Yahoo (Ticker YHOO)

Yahoo Inc. (styled as **Yahoo!**) is an American technology company, known for its web site and search engine Yahoo Search, and a number of related services, e.g. Yahoo Directory, Yahoo Mail, Yahoo News, Yahoo Finance, Yahoo Groups, and Yahoo Answers etc. Yahoo's revenues are mainly from advertisement on their web pages.

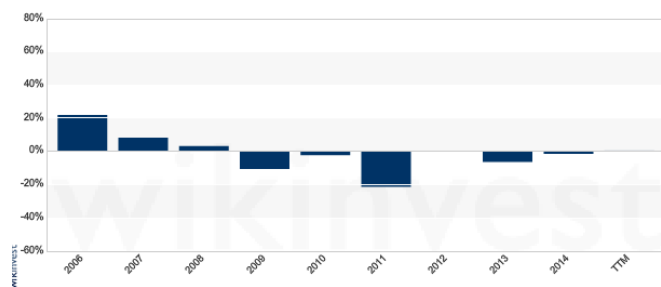
Yahoo initial IPO took place in 1996, thus they are one of the internet companies with the longest history. As seen from figure 16, Yahoo's share price has been very volatile over the years: Their share price peaked during the dotcom bubble, at a value of 108, but then dropped to approximately 5 by late 2002, peaked again at 40 in 2005, dropped again to 11.5 in 2008, had another peak of 51.7 in November 2014, and today, the share is at 39.4.

The current market capitalization is approximately \$36, 510 million, and revenues of \$4,710 million, representing 3 and 2 percent of the total index values respectively.

The P/E ratio reported on QNET is 5. However, this figure must be questioned, as QNET also reports a profit margin of 153%, which must be erroneous. In the annual report, the EDITDA margin for 2014 is reported as 31%. Using this figure, gives a P/E of 25

P/S is 8, which indicate the problem that Yahoo is having with reduction in their revenues, (possibly as a result of the financial crisis of 2007-2008) as shown in figure 15 below:

Figure 17 – Yahoo Revenue growth:



Source: Wikinvest

Not listed in this graph is the first quarter of 2015, where Yahoo has a positive growth of 8 percent, so Yahoo is showing signs of improvements.

Institutional ownership is 61.6 percent, and the percentage of shares sold short is 3.7 percent. Apparently, some investors believe the share price shall go down, but of the 40 analysts quoted on QNET, 24 recommends buy, and 16 hold.

We believe that although the share is expensive when comparing P/S ratio, we do not have strong evidence for the company being overvalued.

Figure 18 – Yahoo Share-Price Development:



Source: Yahoo Finance

4.2.10 Twitter Inc. (Ticker TWTR)

Twitter, Inc. operates as a global platform for public self-expression and conversation in real time. It offers various products and services for users, including Twitter, which is an online social networking service that enables users to send and read short messages ("tweets"). As of May 2015, Twitter has more than 500 million users, whereof 302 million are using it at least once a month. Twitter's income is from advertisement on their web pages.

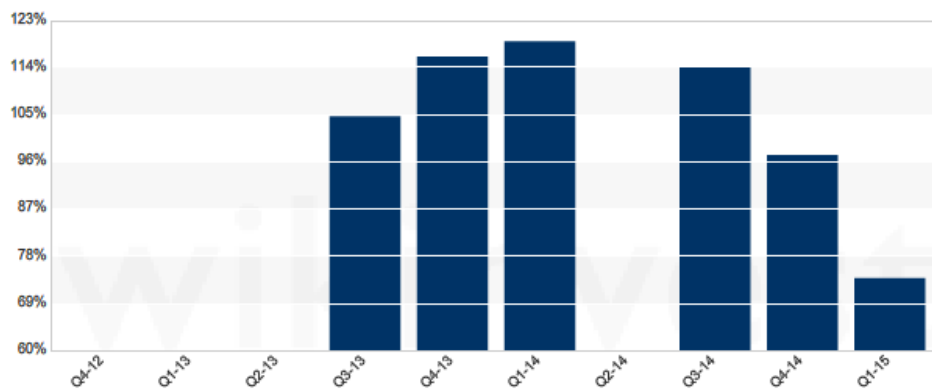
Twitter shares were offered to the public in November 2013, at a price of \$26. However, it immediately rose to \$45, and further climbed to a peak of \$70 in December 2013. However, in May 2014, it was down to \$30. After several ups and downs, the share is now at \$35.

An interesting aspect is that the lowest share price occurred approximately 6 months after the IPO date. Remember Ofek and Richardson claimed that bursting of the dotcom bubble was largely caused by the expiration of share lock-up periods, typically 180 days duration after IPO. Here we possibly see the same thing happening for the Twitter share.

Twitter has a negative margin of 38%. Accordingly no P/E value is reported. A "targeted" P/E based on assumed 5% positive margin, is calculated to 288 - i.e. the share would be extremely expensive even if it was making money.

The P/S ratio is 14.4, a very high value. However, as illustrated in figure 17, the growth rate is very high, which, presumably, is what keeps the share price high.

Figure 19 – Twitter Revenue Growth (Quarterly basis)



Source: wiki-invest

Institutional owners are reported to hold 51.5 percent of the shares, somewhat lower than average out of the ten largest firms on the index. 4.6 percent of shares are sold short, indicating that quite a few investors believe the share will drop in value.

Of the 39 analysts quoted on QNET, their recommendations are as follows: 15 buy, 23 hold, 1 underperform. None is recommending sale.

The value of the Twitter share since the IPO has shown considerable variation. The movement of the share price over the course of the first 6 months could be said to be a bubble that burst. Based on the historical values, large variations is also to be expected in the future.

Figure 20 – Twitter Share-Price Development:



Source: Yahoo Finance

4.2.11 Short Sales

The medial value of the percentage of shares sold short amongst the companies listed on QNET is 8.4 percent. Of the largest companies considered above, all have lower than the median values, with the exception of Netflix.

A few companies have a very high share of their stocks sold short. For example, Zillow Group has 43.7 percent of its free float of shares shorted, Lands' End Inc. has 40.9, and Benefitfocus has 30.9 percent of float sold short. This is understood as a high number of investors believe that these shares will drop in price.

This indicates that whereas Ofek and Richardson states that there was friction to short sales during the dotcom bubble, short sales are today actively used by investors.

This is further supported the daily short sale trading volumes, as found on www.shortvolume.com. This web page is operated by FINRA (Financial Industry Regulatory Authority, an "independent, not-for-profit organization authorized by Congress to protect America's investors by making sure the securities industry operates fairly and honestly").

This page show for example that on the 23rd of June, 72 percent of the Zillow Group shares traded on this date, were actually short sales. Also looking at a company with a low share of the overall share volume (float) shorted, like Facebook, with only 1.2 percent, the typical share of short sales on a daily basis was typically ranging from 30 – 50 percent during May and June.

Chapter 5

Conclusion

CHAPTER 5 – CONCLUSION

After our literature review and our analysis work, what are the main conclusions to be drawn?

The first conclusion is that we do not at all have a similar situation as during the dotcom bubble. Today, a high number of the companies have been around for quite a while, and the largest companies that are heavily influencing the QNET index are showing good earnings, and a strong volume growth.

The share prices are however high, considering normal metrics, but there seems to be a rationale for the high prices. A common factor seems to be the belief in a continued growth in the markets in which the companies operate. If this belief appears to be the actual case, there is little reason to believe a strong drop in the share prices.

Among the 10 largest companies, two of them are Chinese companies, mainly targeting the Chinese market, whereas the other companies are American, with a major part of their revenue from the US domestic market. These markets can develop differently. The Chinese stock market has strong signs of being a bubble which may burst. If so, the growth of the companies operating in the Chinese market may suffer. This represents a risk for a drop in share prices.

We have further seen that the institutional ownership is generally high for the biggest companies, and we have seen indications that short sale of shares takes place to a relative large extent, both of these elements is considered to contribute to avoid mispricing.

Of the financial analysts quoted on the QNET index, there is a general consensus amongst them that out of the 10 largest actors on the QNET index, most of them are good buys. However, one should keep in mind that financial analysts also had strong buy recommendations during the dotcom bubble, and investors should keep this in mind when considering making investments into this sector.

Although this study concludes that today's situation is generally different from the situation during the dotcom bubble, it must be noted that this study represents a limited amount of work compared to the difficult task of predicting the future development of the stock market, and the conclusions drawn are largely based on the authors subjective opinions and judgement.

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Appendix 1:

Appendix 1													
Top 10 largest companies on Qnet - key data													
Symbol	Name	Market Cap (\$M)	Market cap %	Revenue (\$M)	Revenue %	P/E	target P/E	P/S	Profit Margin	Profit (\$M) (calc)	Target earning	Held by Institutions	Short % of Float (Jun 15, 2015)
GOOG	Google Inc.	355 840	26	67 840	22	25		5,4	0,21	14 579		31,90 %	0,40 %
FB	Facebook, Inc.	240 490	18	13 510	4	83		18,3	0,21	2 810		65,90 %	1,20 %
AMZN	Amazon.com	200 180	15	91 960	30	N/A	22	2,2	0,00	-405	4 598	67,70 %	1,40 %
EBAY	eBay Inc.	72 120	5	18 090	6	25		4,1	0,17	2 998		84,70 %	1,50 %
BIDU	Baidu Inc.	70 420	5	8 420	3	34		8,5	0,25	2 110		84,30 %	N/A
PCLN	The Priceline Group Inc.	57 420	4	8 640	3	24		6,8	0,28	2 424		95,30 %	2,40 %
JD	JD.com, Inc.	44 440	3	20 760	7	N/A	21	2,2	-0,01	-307	1 038	N/A	N/A
NFLX	Netflix, Inc.	39 140	3	5 810	2	168		6,8	0,04	238		88,20 %	9,00 %
YHOO	Yahoo! Inc.	36 510	3	4 710	2	5		8,0	1,53	7 229		61,60 %	3,70 %
TWTR	Twitter, Inc.	22 980	2	1 590	1	N/A	144	14,4	-0,38	-608	80	51,50 %	4,60 %
Sum		1 139 540	83	241 330	78					31 067			

Appendix 2:

Appendix 2: Information summarized from NASDAQ Internet Index Qnet													
		Market	Revenue	P/E	P/S	P/B	PEG	Profit	Profit	% Held	% Held	Short %	
Symbol	Name	Cap (\$M)	(\$M)				(5 y)	Marg	(\$M)(calc)	by Insider	by Institution	of Float	
												(as of Jun	
												15, 2014)	
CRTO	Cortendo AB (publ)	7 500	0	N/A	8,0	275,6	1,5	N/A	0	N/A	N/A	N/A	
YHOO	Yahoo! Inc.	36 510	4 710	5	8,0	1,1	-3,8	1,53	7 229	13,38 %	61,60 %	3,70 %	
NTES	NetEase, Inc.	18 410	2 090	23	9,0	4,8	0,9	0,38	787	5,22 %	55,30 %	N/A	
VRSN	VeriSign, Inc.	7 150	1 020	24	7,2	N/A	1,8	0,34	349	11,90 %	106,90 %	26,10 %	
ATHM	Autohome Inc.	5 310	389	41	14,2	8,8	1,0	0,33	128	N/A	N/A	N/A	
YNDX	Yandex N.V.	4 800	1 680	9	3,0	2,7	1,3	0,32	530	2,31 %	76,20 %	1,10 %	
PCLN	The Priceline Group Inc	57 420	8 640	24	6,8	6,9	1,1	0,28	2 424	0,48 %	95,30 %	2,40 %	
YY	YY Inc.	3 640	670	23	5,6	10,2	0,8	0,27	178	21,74 %	41,10 %	N/A	
SINA	SINA Corporation	3	781	18	4,1	1,6	2,1	0,26	200	0,01 %	69,10 %	4,90 %	
BIDU	Baidu Inc.	70 420	8 420	34	8,5	8,1	1,1	0,25	2 110	0,13 %	84,30 %	N/A	
GOOG	Google Inc.	355 840	67 840	25	5,4	3,4	1,2	0,21	14 579	0,19 %	31,90 %	0,40 %	
FB	Facebook, Inc.	240 490	13 510	83	18,3	6,6	1,6	0,21	2 810	3,26 %	65,90 %	1,20 %	
JCOM	j2 Global, Inc.	3 260	626	28	5,4	4,1	1,2	0,19	118	11,44 %	102,60 %	7,20 %	
STMP	Stamps.com Inc.	1	158	41	7,6	5,5	1,3	0,18	29	9,80 %	85,00 %	4,20 %	
TRIP	TripAdvisor Inc.	12 310	1 330	57	9,6	10,8	1,7	0,17	221	14,55 %	93,40 %	12,00 %	
AKAM	Akamai Technologies	12 350	2 040	37	6,2	4,3	1,9	0,17	339	3,21 %	87,60 %	2,50 %	
EBAY	eBay Inc.	72 120	18 090	25	4,1	3,8	1,9	0,17	2 998	8,85 %	84,70 %	1,50 %	
QIHU	Qihoo 360 Technology	8 370	1 510	39	5,6	7,1	0,6	0,15	227	23,50 %	59,80 %	N/A	
EGOV	NIC Inc.	1 170	277	30	4,3	10,4	1,2	0,14	39	7,33 %	84,20 %	3,50 %	
OTEX	Open Text Corporation	4 900	1 860	19	2,7	2,8	3,9	0,14	253	0,00 %	91,20 %	2,10 %	
WBAI	500.com Limited	895	95	74	9,5	5,1	9,1	0,13	12	15,07 %	28,40 %	N/A	
IACI	IAC/InterActiveCorp	6 430	3 140	17	2,1	3,8	1,8	0,13	405	1,14 %	99,10 %	2,00 %	
PERI	Perion Network Ltd.	204	326	6	0,7	0,8	N/A	0,12	40	8,12 %	4,90 %	0,20 %	
DHX	DHI Group, Inc.	481	266	17	1,9	2,9	1,8	0,11	28	3,29 %	86,80 %	3,90 %	
SALE	RetailMeNot, Inc.	938	264	39	3,6	2,0	0,9	0,09	25	24,06 %	69,50 %	14,30 %	
WBMD	WebMD Health Corp.	1 620	590	40	2,8	18,8	3,6	0,08	46	5,13 %	81,80 %	16,00 %	
EXPE	Expedia Inc.	13 670	5 940	31	2,4	8,5	1,7	0,08	457	13,89 %	92,80 %	9,00 %	
PETS	PetMed Express, Inc.	347	229	20	1,6	4,7	7,3	0,08	17	4,59 %	69,70 %	24,90 %	
MELI	Mecradolibre, Inc.	6 230	589	144	11,1	19,7	2,1	0,07	44	43,87 %	71,70 %	14,20 %	
CMPR	Cimpress N.V.	2 770	1 450	29	2,0	12,3	1,0	0,07	97	N/A	N/A	15,60 %	
RAX	Rackspace Hosting, Inc	5 280	1 850	47	2,9	4,7	2,0	0,06	113	24,16 %	69,10 %	9,90 %	
SSTK	Shutterstock, Inc.	2 080	353	104	6,1	8,2	1,6	0,06	20	55,90 %	54,30 %	27,80 %	
PRFT	Perficient Inc.	679	453	26	1,6	2,1	35,1	0,05	24	3,64 %	66,20 %	2,00 %	
NTRI	Nutrisystem, Inc.	707	418	33	1,7	13,5	1,4	0,05	22	17,01 %	74,00 %	13,40 %	
CTCT	Constant Contact, Inc.	910	343	55	2,7	3,4	1,0	0,05	17	2,24 %	91,30 %	4,60 %	
CSGP	CoStar Group Inc.	6 530	616	219	10,8	4,4	6,0	0,05	29	3,23 %	87,70 %	3,20 %	
LE	Lands' End, Inc.	771	1 520	12	0,5	2,0	0,9	0,04	64	59,06 %	20,20 %	40,90 %	
NFLX	NetFlix, Inc.	39 140	5 810	168	6,8	20,7	21,4	0,04	238	1,92 %	88,20 %	9,00 %	
TTGT	TechTarget, Inc.	290	107	70	2,8	1,9	1,0	0,04	4	50,64 %	25,30 %	2,50 %	
ENV	Envestnet, Inc.	1 460	367	112	4,1	7,0	1,7	0,04	14	8,92 %	90,20 %	6,10 %	
FLWS	1-800-Flowers.com Inc	656	1 080	20	0,6	3,1	1,2	0,03	34	26,41 %	63,00 %	21,90 %	
LOGM	LogMeIn, Inc.	1 560	234	227	6,9	8,9	2,2	0,03	7	13,70 %	85,50 %	10,90 %	
NILE	Blue Nile Inc.	357	476	36	0,8	23,3	1,8	0,02	10	1,17 %	105,50 %	31,60 %	
UNTD	United Online, Inc.	232	212	55	1,1	2,3	1,0	0,02	4	2,96 %	88,70 %	0,90 %	
FTD	FTD Companies, Inc.	813	818	41	41,4	1,3	N/A	0,02	15	0,66 %	62,60 %	15,90 %	
AWAY	HomeAway Inc.	2 860	460	424	6,3	3,1	2,6	0,01	7	10,73 %	92,90 %	6,20 %	
ZU	zulily, Inc.	1 590	1 270	117	1,3	6,8	2,1	0,01	15	32,77 %	91,50 %	20,60 %	
RATE	Bankrate, Inc.	1 100	550	176	2,0	1,3	1,3	0,01	6	42,89 %	60,80 %	10,90 %	
OSTK	Overstock.com Inc.	535	1 550	71	0,4	4,2	-0,9	0,00	8	37,72 %	46,10 %	10,40 %	
CTRP	Ctrip.com International	9 940	1 300	N/A	7,9	6,7	3,0	0,00	0	13,92 %	91,40 %	N/A	
CCOI	Cogent Communications	1 550	384	N/A	4,0	28,3	8,4	0,00	-1	8,98 %	88,80 %	9,30 %	
SQI	SciQuest, Inc.	405	102	N/A	4,0	2,3	3,4	0,00	0	14,32 %	82,70 %	4,90 %	
AMZN	Amazon.com	200 180	91 960	N/A	2,2	18,8	31,6	0,00	-405	18,26 %	67,70 %	1,40 %	
Angi	Angie's List	358	326	N/A	1,1	N/A	1,5	-0,01	-4	36,49 %	78,60 %	26,40 %	
JD	JD.com, Inc.	44 440	20 760	N/A	2,2	7,7	36,0	-0,01	-307	N/A	N/A	N/A	
GRPN	Groupon, Inc.	3 420	3 210	N/A	1,1	4,6	1,2	-0,02	-49	24,47 %	73,00 %	18,70 %	
WWWV	Web.com Group, Inc.	1 210	543	N/A	2,3	7,5	0,7	-0,02	-11	3,18 %	100,40 %	10,30 %	
CNV	Cnova N.V.	2 410	4 050	N/A	0,6	4,5	-0,7	-0,02	-80	N/A	N/A	2,90 %	
FLY	Shutterstock, Inc.	1 780	944	N/A	1,9	2,6	-8,9	-0,02	-19	11,85 %	109,10 %	13,30 %	
LTRPA	Liberty TripAdvisor Holdings	2 480	1 410	N/A	1,8	2,9	N/A	-0,02	-34	N/A	N/A	2,00 %	
TRAK	Dealertrack Technologies	3 440	948	N/A	3,6	3,2	2,9	-0,03	-28	7,66 %	92,40 %	13,50 %	
EIGI	Endurance International	2 650	661	N/A	4,1	14,9	0,7	-0,03	-23	10,08 %	85,70 %	24,50 %	
LPSN	LivePerson Inc.	551	222	N/A	2,6	3,1	4,2	-0,04	-9	9,03 %	66,10 %	4,70 %	
SCOR	comScore, Inc.	2 130	340	N/A	5,5	11,0	-19,2	-0,05	-16	2,33 %	89,20 %	5,00 %	
ELNK	Earthlink Holdings Corp.	758	1 160	N/A	0,7	12,7	-5,0	-0,05	-57	1,49 %	83,80 %	5,20 %	
P	Pandora Media, Inc.	3 290	957	N/A	3,5	6,0	1,7	-0,05	-50	4,56 %	96,30 %	13,10 %	
WB	Weibo Corporation	4	363	N/A	10,1	6,4	1,5	-0,05	-19	N/A	N/A	N/A	
MMYT	MakeMyTrip Limited	832	300	N/A	2,8	5,3	4,4	-0,06	-18	17,35 %	53,00 %	7,20 %	
SOHU	Sohu.com Inc.	2 270	1 760	N/A	1,3	2,0	-1,5	-0,07	-119	21,27 %	72,80 %	4,00 %	
BCOR	Blucora Inc.	660	539	N/A	1,3	1,3	0,6	-0,07	-38	5,20 %	95,30 %	11,00 %	
EQIX	Equinix, Inc.	15 040	2 510	N/A	5,9	6,8	1,3	-0,09	-225	6,46 %	117,20 %	7,10 %	
VNET	21 Vianet Group, Inc.	1 650	507	N/A	3,4	3,9	3,6	-0,09	-47	10,08 %	70,30 %	N/A	
LQDT	Liquidity Services, Inc	296	473	N/A	0,7	1,2	-0,8	-0,10	-45	17,30 %	88,00 %	12,90 %	
CARB	Carbonite, Inc.	322	127	N/A	2,6	24,4	4,4	-0,12	-15	42,57 %	59,20 %	2,10 %	
BCOV	Brightcove Inc.	223	127	N/A	1,9	3,0	-6,9	-0,12	-15	4,61 %	69,70 %	3,50 %	
INAP	Internap Corporation	505	334	N/A	1,5	3,4	-1,6	-0,12	-39	22,47 %	62,10 %	7,00 %	
DWRE	Demandware, Inc.	2 580	178	N/A	15,2	9,1	27,1	-0,13	-24	16,39 %	79,30 %	13,30 %	
LLNW	Limelight Networks, Inc	384	163	N/A	2,5	1,9	-17,3	-0,14	-23	12,75 %	55,40 %	2,10 %	
XOOM	Xoom Corporation	805	168	N/A	5,2	3,4	2,4	-0,17	-28	3,44 %	92,40 %	18,60 %	
WIFI	Boingo Wireless, Inc.	300	122	N/A	2,6	2,7	-1,2	-0,18	-22	13,80 %	77,60 %	8,90 %	
BV	Bazaarvoice, Inc.	474	191	N/A	2,5	2,5	-4,1	-0,18	-34	8,23 %	74,00 %	8,40 %	
GOGO	Gogo Inc.	1 780	428	N/A	4,5	13,9	-0,9	-0,20	-88	73,58 %	42,70 %	29,20 %	
FUEL	Rocket Fuel Inc.	345	439	N/A	0,8	1,2	-0,1	-0,21	-90	47,71 %	34,00 %	20,00 %	
NQ	NQ Mobile Inc.	453	342	N/A	1,4	1,0	0,4	-0,21	-72	25,40 %	32,90 %	N/A	
TRUE	TrueCar, Inc.	978	221	N/A	4,6	4,1	1,3	-0,23	-50	27,64 %	1,70 %	17,00 %	
Z	Zillow Group, Inc.	5 080	387	N/A	13,2	1,9	-20,0	-0,25	-96	29,48 %	77,30 %	43,70 %	
CSOD	Cornerstone OnDemand	1 880	280	N/A	6,9	85,7	-5,9	-0,26	-72	16,31 %	82,20 %	13,90 %	
Acta	Actua Corporation	519	97	N/A	5,6	1,3	-2,2	-0,29	-28	N/A	N/A	4,50 %	
MRIN	Marin Software Incorporated	244	103	N/A	2,4	2,4	-0,6	-0,34	-35	31,34 %	45,00 %	5,50 %	
WIX	Wix.com Ltd.	899	158	N/A	5,9	103,2	2,8	-0,37	-58	N/A	N/A	3,60 %	
MKTO	Marketo, Inc.	1 160	164	N/A									