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IS U.S. TECHNOLOGY SECTOR IN A BUBBLE?

Abstract

The paper is examines the issue if the U.S. technology sector is in the bubble. Our analysis is based on the study of relative indicators, especially on price-to-earnings ratio. We studied the last two historic bubbles and analyzed the current state on the U.S. stock market. We find that U.S. stock market is heavily overvalued, which can be argued with high values of the relative indicators compared to the historical average. Some of them indicate that market was valued higher only during the Great Depression in 1929 and during the technological bubble in 2000. Remarkably high values are the result of low interest rates and quantitative easing. The current expansive monetary policy is encouraging risky businesses and increasing margin debt. With potential abatement of tax rates and other measures of expansive fiscal politics, stock markets could reach even higher values.

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Key words:

Bubble, technology sector, Price-to-earnings ratio.

JEL: W32, G01, G12.

Introduction

A stock market bubble is an investment phenomenon, which is very difficult to clearly define, as it is connected to the psychological factors and behavior finance. The closest definition would be that bubble is a situation where the price of an asset exceeds its fundamental value by a large margin due to investors buying behavior and the disregard of the internal or fundamental value. Exaggerated optimism and speculation can raise stock markets to the heights, but such a situation is not sustainable in the long run and sooner rather than later, the stock market collapse.

At present, the technology sector is, by market capitalization, the leading sector in the U.S. The technology sector gained importance with the development of the Internet in the mid-1990s. Technology makes progress and innovation, so almost every sector depends on technology and consequently from technology companies. Due to the importance and different characteristics of the companies in the technology sector, technological shares are often the ones that cause euphoria and drag the whole stock market upwards. The best example is the year 2000, when technological shares were the cause for formation of the bubble, and consequently, a stock market collapse. U.S. economy has suffered few asset bubbles in their history and recent history includes two of the most consequential ones. First was the dot.com bubble and second was the housing bubble in 2007-2008. Both have emerged in a fairly close history and in economic conditions, which are at least a bit similar to the actual trends. In the present, some similar samples from both bubbles appear, so these two bubbles will be a good comparison for analyzing the current state of the market and finding out if the technology sector is in a bubble.

The paper is organized as follows. After introduction we present in section 2 literature review and theoretical backgrounds. Section 3 examines relative indicators in a bubble. Section 4 concludes.

Literature review and theoretical background

The issue of stock market bubble is one of the most discussed economic phenomenon in recent economic literature. Shiller (2005) defines a speculative bubble as: »an unsustainable increase in prices brought by investors buying behavior rather than by genuine, fundamental information about value«.

A stock market bubble appears in the time of optimism on the stock exchange and is the result of a herd instinct where investors are recklessly buying and generating high demand. Kindleberger (2005) defines bubble as increase in asset prices in the mania phase of the cycle. He claims that bubble involves the purchase of an asset, usually security or real estate, not because of the rate of return on the investment but in anticipation that the security or asset can be sold to someone else at an even higher price. The term 'the greater fool' has been used to suggest the last buyer was always counting on finding someone else to whom the security, real estate, or the baseball cards could be sold.

Statistically, the bubble can be defined as a 100 percent increase over a two-year period and a crash can be defined as a 40 percent decline in a two-year period. Since 1928 in the US, there were 40 episodes which have increased over 100 percent in the previous two years and in 21 of them the crash did occur in the next two years. After the first identification of the bubble the average return till the peak price is 30 percent, which confirms that it is hard to bet against the bubble, even if it can be identified correctly. This definition of the bubbles and crashes also proves that there is predictability of a bubble, since sharp price run-ups do predict a heightened likelihood of a crash. The probability of a crash after a 100 percent increase in the previous two years is 53 percent (Greenwood et al., 2017).

Hypothesis of an Efficient Market is one of the most important tools when investigating bubbles. Two main definitions in this theory are rational markets and unbeatable markets. Rational markets theory asserts that prices always reflect intrinsic values. Unbeatable markets theory assumes that in the longer term it is not possible to do above average returns assuming that investors know all the information at the time of their investment. The efficient capital market theory asserts that all available information is already included in the prices of securities. Therefore, the current price of the asset in the market always reflects the correct value of the asset, at all times. In capitalism, an effective capital market

plays a key role, where prices are accurate signals for capital allocation. Therefore, efficient capital market provides a fair price for all market participants (Fama, 1976).

The Hypothesis of an Irrational Bubble says that prices raise greedy expectations. Purchases and sales of investments are subject to psychological factors and irrational behavior, while the basic valuation rules are irrelevant to investors. Theory emphasizes that markets are ineffective, as reactions to given information are exaggerated, and the participants do not have all possible information. Prices on the market are primarily driven by investors who are optimistic and have no knowledge. As a result, there are fluctuations in the market and speculative bubbles. Non-Rational bubbles are associated with financial crises. Keynesian model says that the phase of euphoria and the recession phase are strongly linked. The seeds of the financial crisis should be planted just at the time of the euphoric phase of the stock market. The main role in the Keynesian model is played by uncertainty and limited information. Precariousness prevents the determination of precise internal values. In particularly uncertain times, when confidence in the economy is fragile, people rely on general opinion. They mimic others who may be better informed than themselves. The harsh instincts and psychology of the masses cause significant price changes. Because people realize that their expectations are built on dangerous, foreign foundations, the agreements are quite volatile and unstable (Baddeley, McCombie 2001).

Many of the experts have studied their perceptions of the stock market bubbles and they argue that the irrational behavior of investors is repeated periodically through the history of stock markets. In his work Manias, Panics and Crashes of 1978, Kindleberger defines a speculative balloon as a situation in which the relationship between the market and the internal value of the asset is broken as a result of over-inflated trading and unrealistic estimation. He says that the condition for the emergence of this situation is a novelty. As an example, the development of new technology or a sudden change in the political climate suggests great potential for profit generation. Skilled players enter the market, and with purchases raise the price of securities. But it's too little to develop the balloon. Their investments must be supported by purchases of other, less educated investors. Low interest rates that make cheap lending money for investment are the next necessary condition. If all the conditions are met, it follows the stock market boom, and speculation extends over the crowd, which usually do not appear on the market. New entrants have little experience and just greedy shopping. Rising prices are attracting new and new investors who inflate the balloon until demand is exhausted (Smith 2004).

One of the answers how the bubble can sustain itself is The Greater Fool Theory. As Cassidy (2002) explains, The Greater Fool Theory is when investors buy securities, even if they know that they are risky, because they believe that there will always be a greater fool, ready to buy their securities.

The Hypothesis of Rational Bubble says that investors are fully aware of an asset's fundamental value. Therefore, rational bubble arises when investors knowingly raise prices above their internal value and persist in their positions, as they estimate that due to the positive effects that made them willing to raise prices. This can happen if expectations of future price appreciation are large enough to satisfy the rational investor's required rate of return. The stock price must grow faster than cash flow in perpetuity, to sustain a rational bubble (Lansing 2007).

The hypothesis of a rational bubble states that when the price deviates from the principles of fundamental valuation, a speculative bubble is created. For example, in the case of a share, sum of all dividend cash flows converted to the present value represents the internal value. There are some deviations and they should take place in the world of strong, homogeneous, rational expectations of some economic operators. There are predictions about subjective expectations, which on average coincide in some kind of objective probability distribution. So there is likelihood that a certain expectation will come true. The chance of the bubble remaining (probability π) or bursting (probability 1-π) is in the glass time period. Some investors play on this card, that they will keep the shares, because the likelihood that the bubble will not burst is greater than zero, over time, the price is again approaching the valuations. There are several factors which can determine the probability that the bubble ends, including the distance from the baseline valuation and the duration of the bubble. Blanchard and Watson allow the possibility that the bubble has an impact on the prices of other assets, but in general, the viewpoint of rational expectations ignores the complex connections that are present in real economies (Baddeley, McCombie, 2001).

Rational bubbles must always be positive, as the stock price must always exceed its fundamental value. In the real world this simply can not be correct or the definitions must be correct on average, because if rational investors expected the stock price to depreciate below its fundamental value, then they would not be willing to overpay for the stock in the first place, therefore, the bubble would never get started. Moreover, there must be an infinite number of rational investors. Otherwise, the market would eventually run out of rational investors who are willing to overpay now for an asset, to sell it in the future to another rational investor at a higher price. Some economists argue that conditions like these rule out the existence of rational bubbles (Lansing, 2007).

Relative indicators in a bubble

Many studies have documented that excess returns (investment returns from a security or portfolio that exceed the riskless rate on a security generally perceived to be risk free) on financial market move in cycles. Researches on the interactions between different types of cycles have produced a number of important policy lessons. Economic theory moved toward the study of economic fluctuations rather than cycles, and the term «business cycle» lost its original meaning. Starting with Fisher (1933), a number of researches emphasize the importance of financial cycles for the real economy. Communale and Hessel (2014) find that financial cycle explains domestic demand movements better than business cycle and that crisis countries experienced surprisingly similar divergences of financial factors, thus suggesting their importance. This finding is implicitly found also in Borio (2012). Studies (Forest et al., 2014) trying to asses the current position in the cycles through the prism of historical combinations of the business financial and monetary cycles suggest that, while business and monetary cycles move in tandem most of the time, financial cycles appear to follow their own path. They also find that business cycle expansion is clearly beneficial for risky bonds, while the re-leveraging and house price increases that take place during the financial cycle expansion tend to lower the returns on corporate bonds. Finally, the utmost priority, after synthesizing the changes in business, financial, and monetary cycles, is still to correctly measure the probabilities of the cycles moving into the contraction or expansion phase.

According to Moshinsky (2017), there are two important cycles to pay attention to: short-term debt cycle and the debt super cycle (or long-term debt cycle). A debt super cycle is defined by the period since the Second World War in which debt levels have inched persistently higher. This trend has been driven by the use of monetary policy in the wake of shocks. The policy's response ended in unsustainable levels of first private and now public debt. Lo and Rogoff (2015) argue that the financial crisis/debt supercycle view provides much more accurate and useful framework for understanding what has transpired and what is likely to come next. The symptoms of excessive debt are exhibiting themselves in the form of continued low economic growth and excessive volatility. As of 2017, we are eight years into the expansion phase of the business/short-term debt cycle, which lasts about eight to 10 years – and near the end of the expansion phase of long-term cycle, which typically lasts 50–75 years.

In this moment (June 2017), we believe that the developed markets are in an extremely dangerous situation. While record high stock and bond prices have become more detached from economic reality than ever before, some central bankers have encouraged debt level to surge to a record as well. Massive debt and leverage have simply shifted from primarily a private sector problem to an

even larger public sector problem. Observers (Pento, 2017) find that, with major indices and stock indicators continuing to set record highs, there is further evidence that Wall Street is becoming more complacent with the growing dichotomy between equity and bonds prices (both moving higher) and the underlying strength of the US economy. The same picture is seen in European markets. Comparing total market cap to GDP, it becomes strikingly clear that economic growth has not at all kept pace with booming stock and bond prices in the past five years. The huge debt has been busted from new debt issuance, and debt compulsion which is the result of QE and zero interest rate policy.

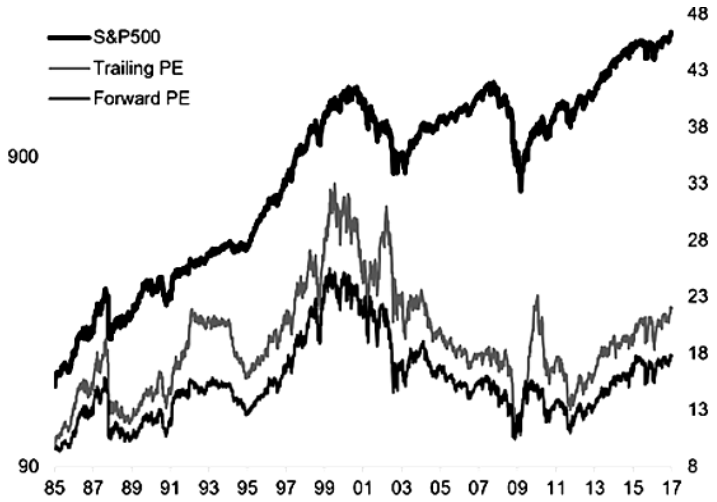
There are different views about the danger of recent bubble: the Warren Buffet view is that the market isn't expensive, the American economy is doing well and long term investor should always be engaged; the same position hold Morgan Stanley strategists: they do not believe that the current forward P/E is excessive in light of exceptionally low interest rate environment. They find conceptually invalid to compare P/E ratio today to, say, ratio in the early 1980's when interest rates were in double digits. However, there is a growing number of financial experts that expect an upcoming financial crisis. Especially US markets are experiencing level of risk that is the highest since the 2008 financial crisis. The potential causes of crash scenario on Wall Street are building. Downsize risks stem from several potential factors. Let us review some indicators that represent serious warning signals:

S&P 500 is considered as representative of the market because it includes a significant portion of the total value of the market. S&P 500 is overvalued in 18 of 20 standard valuation metrics. Stocks only trade cheap on free cash flow yield and relative to bonds. P/E multiples, which are probably the most widely used relative metrics, are showing that S&P 500 is overvalued in each one of them. Currently, TTM P/E ratio is 24, 58 compared to the past 40 years mean value of around 19. Last two times that TTM P/E hit above 25 was in the late 1920s and late 1990s. Also, forward P/E ratio of the S&P 500 has risen by more than 80% since 2011, and is now slightly below 19 compared with the past 40 years mean value of 15,2. Moreover, CAPE stands at more than 30 right now, which is the highest value in last 15 years and approaching to its peak level in 1929. This is more than 80 percent higher than the historical mean. All these measures indicate that the stock market is overvalued.

Market's valuation must be looked within the context of other investment opportunities. The stock market prices by themselves are high but earnings are reasonable as there is good earnings growth. Later, differences in opportunities of stocks vs. bonds must also be taken into account. People usually put their funds in three places: cash, stocks and bonds. Despite recent run-up in prices, the best return is still in stocks. The 10-year Treasury note is yielding 2.3 percent, or 0.4 percent inflation is accounted, compared to 3.5 percent after-inflation returns historically for long-term bonds. Even if you took a 20 P/E ratio on the S&P 500 that gives you a 5 percent earnings yield on stocks compared to 0.4 percent in real bond yield. So stocks are much cheaper compared to their history, than bonds are (Schwartz 2017).

Figure 1

S&P 500 vs. P/E Ratios from 1985 to 2017



Source: (Topdown Charts 2016)

Shiller explained that even if the CAPE ratio is very high, model still predicts a positive return in the stock market. It seems that today's situation is qualitatively different and a stock market could be in a reasonable range, as long-term interest rates are low. But on the long term, the rates should increase (Shiller 2015). Interest rates are basically almost at zero and have been around that level for some time. When borrowers are paying close to zero interest on loans, that means money is cheap to get. Investors with money generally have a choice: they can save it in interest-paying, risk-free bank accounts or invest it in riskier assets, which may pay more money over time. At zero interest rate, virtually any other kind of investment is likely to pay more because the risk-free alternative generates so low returns. That is how investment asset bubbles get created. Demand will increase for stocks, and other investment assets, and the price tend to go up (Edwards 2014).

Greenwell (2017) believes that due to low inflation and low interest rates, stocks are allowed to carry higher valuations, particularly when more than 40 percent of the companies within the S&P 500 have yields above the 10-year Treasury and payouts are increasing. Investors are struggling with low alternative yields and for the first time in four years are seeing earnings rise due to a marginal uptick in GDP, a slightly improved foreign earnings outlook, and a modestly

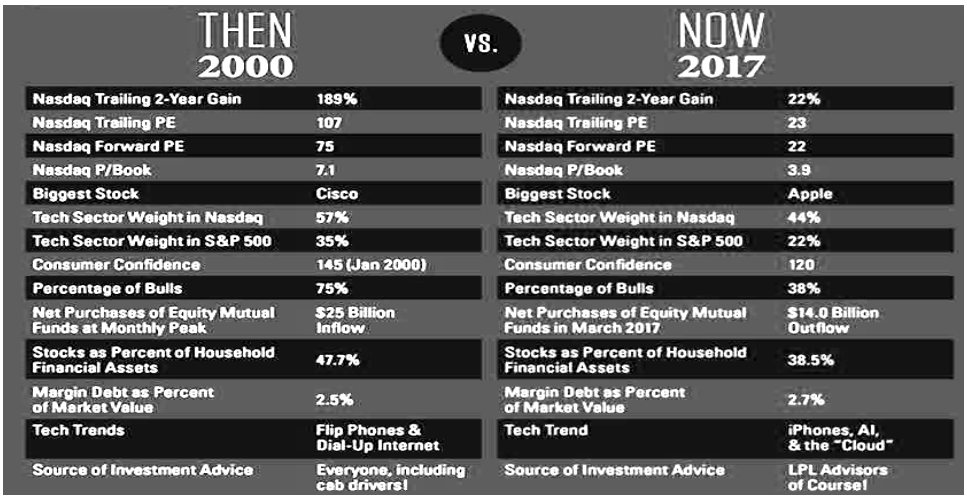
weaker dollar. P/S ratio is trading around 2.3 which are extremely high and by this ratio market is looking much more overvalued than by P/E. Total market cap compared to relative GDP is Warren Buffet's favorite metric. It currently stands at 130 percent which is 129 percent increase since 2009. The Wilshire 5000 variant illustrate that today's market is valued extremely high and is similar to the bubble peak in 2007, even though it fell from it's interim high in the first quarter of 2015. From 1970 to 2017, only in 2002 the ratio was higher than it is now (Garret, 2017).

One of the signs that market is in a danger zone is margin debt, which is a measure of speculation and refers to the money that is borrowed by investors to buy stocks. Margin debt hit at all time high of 549.86 billion in July and has more than doubled from 2010. Figure shows us relationship between S&P 500 and margin debt, the percentage growth of each data series from the year 1995, based on inflation-adjusted data. Margin debt grew at the pretty much the same rate as the market from 1995 to late summer of 2000. Leverage surged significantly in late 1999 and peaked in March 2000, the same month that the S&P 500 hit all-time daily high. A similar surge began in 2006, peaking in July 2007, three months before the market peaked. After the market low of 2009, margin debt surged again until the contraction in 2010. In August 2010, Chairman Bernanke hinted of more quantitative easing. Fed periodically increased the easing and the appetite for margin instantly returned. With the QE now history, the latest peak is perhaps a response to the latest market rallies, as the S&P 500 had over twenty record closes since the presidential election (Mislinski 2017).

Actually, there is a big issue among researchers between Nasdaq metrics in 2000 compared to Nasdaq metrics in 2017. Nasdaq Composite Index is showing signs of overheating as the P/E ratio of the Nasdaq is increasing faster than that of the S&P 500. This could show that the market is overvalued, even if those P/E numbers are far from the numbers from early 2000s where P/E ratios were around 100 (Rusli, 2017). The TTM P/E ratio for the Nasdaq Composite Index is 23 today compared to the 107 in March 2000. Using forward earnings, the P/E is standing at 22 compared to the 75 back in March 2000. The cash flow multiples also tell the same story: around 100 then compared with around 25 now. The price-to-book ratio as of April 28, 2017 was 3.9 compared with 7 at the peak in March 2000. Valuation measures, based on book value, reveal that Nasdaq was much more expensive in 2000 than it is now. The lack of assets supporting valuations during the dot.com bubble was a big problem and those assets today generate a lot more revenues and profits (LPL Financial 2017).

Figure 2

Comparison between Nasdaq in 2000 and Nasdaq in 2017



Source: (LPL Financial 2017)

Currently, the tech bubble is not only in the publicly listed companies but also among Unicorns or start-ups with private valuations bigger than $1 billion. Valuations of these companies are larger than GDP of many countries (Rusli, 2017). Every year some of the unicorns go public. This could cause a big problem when the Uber and other top valuated private companies go public with little revenue and negative earnings. When moreover, most unicorns are from U.S. which means that U.S. stock markets could become more overvalued or on the other side, unicorns' values could fall as investments dry up. Most of the unicorns are not yet profitable. Uber, despite its high valuation, is still not profitable after eight years of operation. Uber said that they will become profitable soon and that they will go public in the next few years. Another hot private company is Spotify, a music streaming company. They announced that they are set to make a direct listing on NYSE in 2018. Despite the rising revenue, they still do not generate profits, as losses have risen to €173 million. When these unicorns will go public, the pressure will come to innovate, and unicorns will then have to prove their value to investors. For example, Snap Inc., this year's hottest IPO, couldn't create value and released disappointing first financial statements since going public. Share prices fell well below its IPO level of $17 to $14 (Rusli, 2017). The vast majority of new entrants to unicorn list come from either the U.S. or China. So far

this year, there were 13 new unicorns from the U.S. and 8 from China. There are 121 unicorns in the U.S. and 66 in China, out of total 231 (TechCrunch, 2017).

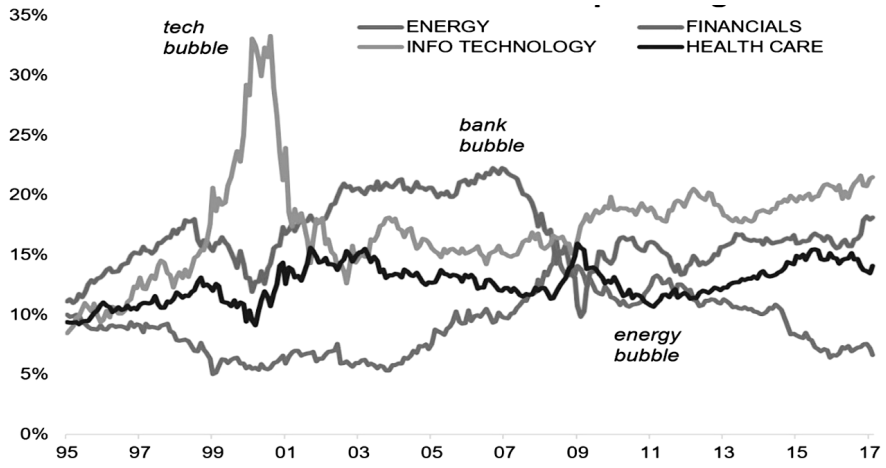
Enthusiasm for technology stocks took the sector's weighting in broad indexes, especially S&P 500 and Nasdaq Composite Index, well above where it had been. Technology sector represents around 22 percent of the S&P 500 Index and 44 percent of the Nasdaq Composite Index. At the peak in March 2000, the technology sector represented about 34 percent of the S&P 500 Index, compared with just 5 percent in the early 1990s. The Nasdaq had a 57 percent technology weighting at the peak of the bubble (LPL Financial, 2017).

The main reason to look at sector weights when trying to find sector bubbles is that it can be one of many potential signs of things getting out of hand at a market top. The experience has been that for things to really get out of hand, there usually is some sort of «story», a mega trend or structural shift. In 2000 it was the the internet and new economy but at present there is yet to be a real story to inspire and give the bull market its final rush (Thomas, 2017).

The tech sector is by far the most dramatic standout, spiking to extreme highs at the peak of the dot.com mania. The next interesting one is the financial sector which went from around 10% to over 20%. Energy was likewise interesting, going from around 5% to 15% at its peak. Health care is included on the figure because it had similar trend as IT and financial sector in recent year (Thomas 2017).

Figure 3

S&P500 Sectors Market Cap % Weight



Source: (Topdown Charts 2017)

FAAMG is synonym for Facebook, Amazon, Apple, Microsoft and Google (Alphabet). They are the biggest five companies by market capitalization, with a market capitalization around $ 3 trillion. They have been the key drivers of both the Nasdaq and S&P 500 returns in 2017. By June 7, FAAMG stocks have created more than $660 billion in market value. They represent 13 percent of the S&P 500 but they are responsible for 40 percent of YTD performance of the S&P 500. Also, FAAMG represent 42 percent of the Nasdaq Composite index, but are responsible for 55 percent of the YTD performance of Nasdaq. Comparison between FAAMG stocks at the peak in 2000 and FAAMG stocks now shows that stocks were much more overvalued in Q1 2000. Profitability was the only advantage of the tech bubble, which is normal after all, as these stocks are now more mature.

Figure 4

Tech Bubble vs. Now

		Size		Valuation	Cash Balances		Cash Flow		Profitability	
		SPX Weight	Market Cap ($ bn)	P/E (FY2)	Cash + ST Inv.	Cash / EV	FCF Margin	FCF Yield	GP / TA	ROIC
Tech Bubble (as of 1Q00)										
Microsoft	MSFT	4.5%	581	55.1	21,205	4%	34%	1.6%	46%	22%
Cisco Systems	CSCO	4.2%	543	116.8	4,653	1%	31%	1.6%	54%	17%
Intel	INTC	3.6%	465	39.3	11,216	2%	27%	2.8%	43%	21%
Oracle	ORCL	1.9%	245	103.6	2,768	1%	22%	2.2%	95%	43%
Lucent	LU	1.6%	206	35.9	1,709	1%	-2%	-0.5%	47%	12%
Tech Bubble Aggregated		**15.8%**	**2040**	**58.3**	**45,157**	**2%**	**19%**	**1.6%**	**45%**	**16%**
FAAMG (as of 1Q17)										
Apple	AAPL	3.9%	815	14.9	67,101	9%	24%	8.7%	26%	18%
Alphabet	GOOGL	2.8%	587	25.0	92,439	18%	29%	5.1%	35%	15%
Microsoft	MSFT	2.7%	559	21.8	126,018	27%	33%	6.2%	25%	11%
Amazon	AMZN	1.9%	400	89.0	22,392	5%	7%	2.5%	67%	10%
Facebook	FB	1.7%	361	25.2	32,306	8%	43%	3.6%	42%	21%
FAAMG Aggregated		**13.0%**	**2723**	**22.7**	**340,256**	**13%**	**23%**	**5.6%**	**32%**	**15%**
Advantage		**Bubble**	**FAAMG**	**FAAMG**	**FAAMG**	**FAAMG**	**FAAMG**	**FAAMG**	**Bubble**	**Bubble**

Source: (ZeroHedge 2017)

FAAMG group is displaying lower volatility than the much of the market this year. Investors who want low volatility strategy are moving into these stocks. If some events cause rise in the volatility, these passive investors could sell these stocks and exacerbate downside volatility (Boroujerdi 2017). Current bull-run by FAAMG group could be ended with new money flowing into stocks or bar-

ring a significant jump in valuations, an event like Apple hitting a market cap of $1 trillion, or a major merger could be a sign that enthusiasm for tech stock has peaked (Emanuel 2017).

Conclusions

The U.S. market is heavily overvalued, which can be argued with high values of the relative indicators compared to the historical average. Some standard valuation metrics as P/E, P/B and P/S show that market is overvalued by more than 20 percent. They also show that the market was valued higher only during the Great Depression of 1929 and during the technological bubble in 2000. History has shown that if assets are overvalued, the future returns will probably be low or close to zero. Currently, not only the publicly listed companies are overvalued but also Unicorns, where valuations of these companies are larger than GDP of many countries. Uber, which leads the «pack», is currently valued at more than $60 billion, despite making loss for the eighth straight year. These are patterns that have been seen in the past, but never at private companies and could have great consequences on the stock markets if they do not deliver results.

A comparison of valuation and sentiment measures, year 2000 versus now, reveals that the Nasdaq appears far from bubble territory and sentiment is far less euphoric today. Even at the price of 6,000, the Nasdaq stands on a much stronger foundation today than it did 17 years ago leading up to the dot.com crash. One of the main factors underpinning the dot.com bubble burst in 2000, was that investors were blindly buying the stocks of any internet company, including those without any revenue or even a working business model. In recent years, the top U.S. tech companies have shown healthy profits. They have also been piling up cash over the years, far more than is being safe. From our perspective, Nasdaq stocks are far from bubble territory by comparing various valuation and sentiment measures in today's market with those back in March 2000.

Bottom line, comparing valuation and sentiment measures today with levels during the dot.com bubble gives us comfort that stocks, particularly the technology and other growth stocks that make up the Nasdaq, should not be avoided. Even on an absolute basis, we find current valuation measures for growth stocks still reasonable, but investors should be wary of rising investment risk.

References

1. Baddeley, M., & McCombie, J. (2001). An historical perspective on speculative bubbles and financial crises: tulipmania and the South Sea bubble. In P. Arestis, M. Baddeley & J. McCombie (edit.), *What global economic crisis?* (p. 219-243). Basingstoke: Palgrave.
2. Borio, C. (2012). *The financial cycle and macroeconomics: what have we learnt*? BIS Working Papers, No. 395.
3. Boroujerdi, R. (2017). *Forget FANG: Goldman adopts a new acronym fort he most powerful tech stocks driving market.* Retrieved on 2. September 2017 from Business Insider: http://www.businessinsider.com/faamg-tech-stocks-market-goldman-2017-6
4. Cassidy, J. (2002). *Dot.con: the greatest story ever sold.* New York: Harper-Collins Publishers.
5. Comunale, M., & J. Hessel. (2014). *Current account imbalances in the euro area: Competitiveness of financial cycle*. DNB Working Paper No. 433.
6. Durden, T. (2017). FANG Stocks Slammed After Goldman Warns Of «Valuation Air-Pocket». Retrieved on 2. September 2017 from ZeroHedge: http://www.zerohedge.com/news/2017-06-09/big-5-tech-firms-account-55-nasdaq-gains-2017-goldman-warns-valuation-air-pocket
7. Edwards, J. (2014). *Here's The Evidence That The Tech Bubble Is About To Burst.* Retrieved on 23. August from Business Insider: http://www.businessinsider.com/evidence-that-tech-bubble-is-at-a-peak-2014-10
8. Emanuel, J. (2017). *FAAMG is powering the market – and that's not unusual.* Retrieved on 3. September 2017 from Yahoo Finance: https://finance.yahoo.com/news/5-big-tech-stocks-powering-market-thats-normal-144945468.html
9. Fama, E. F. (1976). *Foundations of finance: portfolio decisions and securities prices.* New York: Basic books.
10. Fischer, I. (1933). *The debt-deflation theory of great depression*. Econometrica.
11. Forest, N., T. Orpiszewski, A. Péters, & G. Kojo. (2014). *Riding the cycles: Understanding business, financial and monetary cycles in order to allocate fixed income*. White Paper. Candriam Investors Group. New York.
12. Garret, O. (2017). *5 Charts That Scream 'This Is It' – Here's What to Do.* Retrieved on 27. August 2017 from Forbes: https://www.forbes.com/sites/oliviergarret/2017/03/20/5-charts-that-scream-this-is-it-heres-what-to-do/#4ac84eea4f5a

13. Greenwell, P. (2017). *A Closer Look At Valuations: Is The Stock Market Overvalued?* Retrieved on 22. August 2017 from Forbes: https://www.forbes.com/sites/adamsarhan/2017/06/19/a-closer-look-at-valuations-is-the-stock-market-overvalued/#4d0e92f4ad01

14. Greenwood, R. & Shleifer, A. & You, Y. (2017). *Bubbles for Fama.* Cambridge: Harvard university.

15. Kindleberger, C. & Aliber, R. Z. (2005). *Manias, panics and crashes: a history of financial crises.* New York: Palgrave Macmillan.

16. Lansing, K. J. (2007). *Rational and Near-Rational Bubbles Without Drift.* Federal Reserve Bank of San Francisco Working Paper 2007-2010. Retrieved on 5. September 2017 from FRBSF: http://www.frbsf.org/ economic-research/files/wp07-10bk.pdf .

17. LPL Financial (2017). *Nasdaq 6,000 – Then And Now (INFOGRAPHIC).* Retrieved on 28. August 2017 from ValueWalk: https://www.valuewalk.com/ 2017/05/nasdaq-6000-now-infographic/

18. Mislinski, J. (2017). Market Cap to GDP: An Updated Look at the Buffett Valuation Indicator. Retrieved on 28. August 2017 from Advisor Perspectives: https://www.advisorperspectives.com/dshort/updates/2017/09/ 06/market-cap-to-gdp-an-updated-look-at-the-buffett-valution-indicator

19. Moshinsky, B. (2017). Ray Dalio: The 75-year debt super cycle is coming to an end. *Business Insider UK*, Jan 27.

20. Pento, M. (2017). Here's what the market could do for the 3rd time in 17 years. Retrieved from http://www.talkmarkets.com/content/bonds/heres-what-the-market-could-do-for-the-3rd-time-in-17-years?post=126432.

21. Rusli, S. (2017). *The tech bubble: how close is it to bursting?* Retrieved on 1. September 2017 from The Telegraph: http://www.telegraph.co.uk/technology/ 2017/06/22/tech-bubble-close-bursting/

22. Schwartz, J. (2017). *Is the U.S. Stock Market Headed Higher – or for a Crash?* Retrieved on 21. August 2017 from K@W: http://knowledge.wharton.upenn.edu/article/u-s-stock-market-headed-higher-crash/#

23. Shiller, R. (2015 a). *Is the U.S. Stock Market Overvalued?* Retrieved on 22. August from K@W: http://knowledge.wharton.upenn.edu/article/is-the-u-s-stock-market-overvalued/

24. Shiller R. J. (2005). *Irrational exuberance.* New Jersey: Princeton University press.

25. Shiller, R. (2015 b). *Robert Shiller: Beware The New Normal Bubble.* Retrieved on 22. August from Forbes: https://www.forbes.com/sites/investor/ 2015/06/29/robert-shiller-beware-the-new-normal-bubble/#44617c01a53f

26. Smith, B.M. (2004). *A history of the global stock market: from ancient Rome to Silicon Valley.* Chicago: University of Chicago.

27. Teare, G., Glasner, J. (2017). The state of the unicorn. Retrieved on 1. September 2017 from Tech Crunch: https://techcrunch.com/2017/06/02/the-state-of-the-unicorn/

28. Thomas, C. (2017). *S&P Sector Level Analysis: Where's The Bubble?* Retrieved on 6. September 2017 from SEE IT market: https://www.seeitmarket.com/sp-500-sector-level-analysis-wheres-the-bubble-investing-16664/

29. Topdown Charts (2016). *Weekly S&P 500 ChartStorm – 18 Sep 2016.* Retrieved on 21. August 2017 from Topdown Charts: https://www.topdowncharts.com/single-post/2016/09/18/Weekly-SP-500-ChartStorm---18-Sep-2016

30. Topdown Charts (2017). *Weekly Macro Themes – 10 Mar 2017.* Retrieved on 6. September 2017 from Topdown Charts: https://www.topdowncharts.com/ single-post/2017/03/12/Weekly-Macro-Themes---10-Mar-2017

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