

**THE DOT-COM BOOM... AND BUST**  
IDENTIFYING THE CAUSES AND CHARACTERISTICS  
OF THE 21<sup>ST</sup> CENTURY'S FIRST SPECULATIVE BUBBLE

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## EXECUTIVE SUMMARY

In his 2000 masterpiece *Irrational Exuberance*, Robert Shiller made the claim that stock markets were displaying “the classic features of a speculative bubble: a situation in which temporarily high prices are sustained largely by investor’s enthusiasm rather than by consistent estimation of real value.”<sup>i</sup> Shiller’s book appeared on store shelves in March 2000, the very peak of what would later be known as the Dot-com Bubble. During the 31 months that followed, the NASDAQ lost nearly 80% of its value, going from an intraday high of 5132.52 on March 10, 2000 to a low of 1114.11 on October 9, 2002.<sup>ii</sup> Over \$7 trillion in market value and the savings of millions of Americans were wiped out.<sup>iii</sup>

How had Shiller managed to time the release of his book (about speculative bubbles) at the very peak of the 21<sup>st</sup> century’s first speculative bubble? Had he experienced an incident similar to Bernard Baruch’s in 1929, when a shoeshine boy offered him stock tips and thereby revealed the extent of the market’s excess?<sup>iv</sup> Not exactly. Shiller wrote his book and identified the Dot-com Bubble by way of specific criteria and evidence. This paper will discuss a number of these criteria and examine the evidence about speculative bubbles in general. Why do bubbles appear as such only after the fact? Is it possible to identify them in real time? Was anyone else able to identify the Dot-com Bubble in real time? These are the questions we hope to address in the pages that follow.

## I. BUBBLES: CAUSES AND CHARACTERISTICS

Economists use the term “speculative bubble” to describe a situation where asset prices rise above levels justified by economic fundamentals. Fundamental value levels for assets can be measured in multiple ways. Often they are measured in terms of the discounted future cash flows an asset may accrue.<sup>v</sup> However the fundamental valuation is computed, one thing is certain: assets prices rise during bubbles, and do so to the point of being “over-priced.” The prices then continue to rise further and further, far out-stripping any reality-based valuation. This goes on until some event stymies the buying, and then a steep price decline ensues.

Economists and scholars from various disciplines have for years speculated about the causes of such run-ups in asset prices. These causes include but are not limited to: government regulation/de-regulation, supportive monetary policy, new technologies, cultural changes favoring business, demographic changes, expansion of media reporting of business news, over-optimistic analyst forecasts, the growth of investment vehicles (like mutual funds), the perceived decline of inflation, the expansion of trading volume via retail trading, and the popularization of gambling. These factors combine with other amplification mechanisms like herd behavior, over-confidence, and general irrational exuberance about the future to induce and support asset price run-ups.<sup>vi</sup>

Throughout these run-ups, feedback mechanisms are at work. For example, investors are influenced by their own winnings and by tales of other investors’ winnings. Stories of windfall profits spread through the market and enthusiasm increases. As Stephen Greenspan puts it in his book *Annals of Gullibility*, the fact that “so many people are participating in the scheme makes it appear safe at the same time that the perception that others are getting rich makes it appear too good to pass up.”<sup>vii</sup> These perceptions encourage new, less sophisticated

investors to enter the market and bid up prices even further, creating a self-fulfilling prophecy of price rises. Soon the whole market becomes convinced that the old fundamentals of valuation no longer apply and that the world has entered a “new era.” The future is conceived of as something fundamentally different from (and better than) the past. Over-confidence tightens its grip on investors and blinds them to any semblance of realism. Prices, the investors claim (and *believe*), will never go down again!<sup>viii</sup> At this point, the feedback mechanism kicks in with even more thrust and the media begins broadcasting “new era” claims in an attempt to explain and justify the excessive price movements. Shiller compares this phenomenon to a Ouija board, where “players are encouraged to interpret the meaning of movements in their hands and to distill forecasts from them” while they themselves move the very Ouija pointer they’re interpreting.<sup>ix</sup>

In other words, during speculative bubbles, investors explain price increases (something they themselves cause) according to some objective, outside cause (something they don’t cause): i.e. the new era. The investors then make forecasts based upon that outside cause (the new era), and proceed to buy more assets in reaction to the forecasts. This perpetuates the price rises—the very phenomenon they were trying to explain in the first place— and offers proof for the objective, outside cause (the new era) which, in fact, they have caused. This then gives rise to further optimistic forecasts, and the price spiral continues upward.

## II. THE DOT-COM BUBBLE

Looking back at the Dot-com Bubble, we see many of the above causes at work. The run-up in equity prices during the second half of the 1990s culminated in the one-year doubling of the NASDAQ between March 1999 and March 2000. This entire period was underscored by a seemingly worldwide obsession with the coming onset of the new millennium. Y2K, as it was known, was not just a computer bug to be neutralized. It was also a date that seduced many investors into the belief that a “new era” was upon them.<sup>x</sup> Of course, this belief would likely

never have taken hold were it not for the unprecedented advances in communication taking place via the nascent World Wide Web.

As early as 1998, the NASDAQ was already replete with start-up internet firms, founded by entrepreneurs, funded by venture capitalists, and brought to market as IPOs by investment bankers. The huge commercial potential that internet technology represented reinforced the period's "new era" themes. Internet-enabled technologies, it was said, would rapidly change the structure of the stock market, the corporate landscape, and the entire way business was done. This meant that enormous opportunities awaited the companies that could create new innovative ways to solve consumer problems and provide novel products and services via the internet.<sup>xi</sup> Shiller describes the unprecedented nature of the new internet technology:

[The internet] is comparable in importance to the personal computer or, before that, the television. In fact, the impression it conveys of a changed future is even more vivid than that produced when televisions or personal computers entered the home. Using the internet gives people a sense of mastery of the world. They can electronically roam the world and accomplish tasks that would have been impossible before. They can even put up a website and become a factor in the world economy themselves in previously unimaginable ways... Because of the vivid and immediate personal impression the internet makes, people find it plausible to assume that it also has great economic importance.<sup>xii</sup>

The rising economic importance of the internet, beginning in 1994, just happened to correspond chronologically with a dramatic increase in US corporate profits from that year on. S&P Composite real earnings were up 36%, 8% and 10% in 1994, '95 and '96, respectively. These increases obviously had nothing to do with the advent of the internet, but as the decade went on, correlation began to be mistaken for causation and the linking of higher profits with the internet and the "new era" became ever more deeply entrenched in investor minds.<sup>xiii</sup>

By early 2000, equity prices had spiraled out of control. Price-to-earnings ratios were higher than they'd ever been (and these ratios were for the companies that were actually profitable!). Many companies that had never made a dime in profits were selling at unheard of valuations. Alfred M. King, chairman of the board at Valuation Research Corp., wrote at the time:

The new dot-com companies have no history, very low sales, and virtually no profits--yet they captured \$900 billion in market capitalization. Skeptics have

been predicting for years that the bubble will burst, but, so far, it hasn't. Perhaps investor psychology will change, and they won't use the rationale that "this firm could be the next Microsoft." Internet stocks would then be valued on a basis comparable to Ford, Texaco, and Sears--all great companies with a long history of sales and profits. But for the time being, investing in a basket of e-business companies may be sound.<sup>xiv</sup>

For the time being, perhaps, but growth without profitability could not be sustained in the end, and in the spring of 2000 markets capitulated. A sudden wave of selling sent markets spiraling downward long enough and far enough to wipe out all investor optimism for the internet sector, and for most other sectors too. The bubble that had been inflating for the past six years suddenly popped. The aftermath was not pretty.<sup>xv</sup> The nearby Figure 1 illustrates the 39% fall in the NASDAQ Composite Index during 2000 along with the continuing declines through 2003. Figure 2 traces the stock prices of five web portals of the period, showing the dramatic collapse in prices between March 2000 and January 2002.

Figure 1

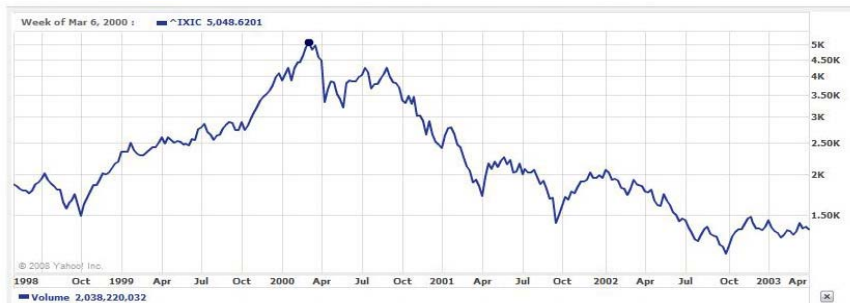
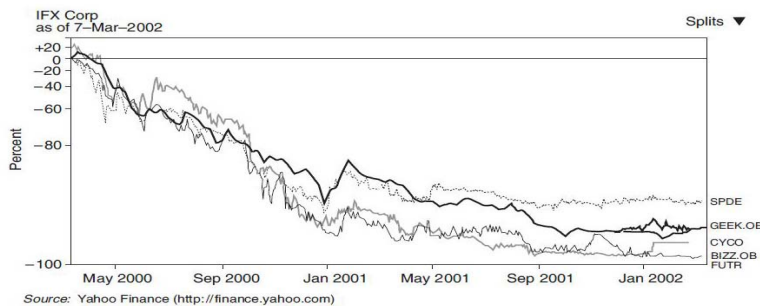


Figure 2



Web portal's market performance March 2000-January 2002.

Source: Yahoo! Finance

As further evidence for the severity of the situation, consider the fate of Pets.com. The online pet supply company managed to raise \$82.5 million in February 2000, and then failed to make it to the end of the year— even with the support of Amazon.com, one of the few companies robust enough to withstand the crash. eToys.com was another such casualty. Its shares went from a high of \$84 in October 1999 to a low of just 9 cents in February 2001.<sup>xvi</sup>

### III. IDENTIFYING BUBBLES IN REAL TIME

Hindsight is 20/20. It's easy to look back at speculative bubbles and affirm them as such *ex post*. Looking backward, we see both the features we were blinded to during the bubble, and the events that inevitably followed the burst. For example, looking back on the Dot-com Bubble, we cannot help but notice the numerous corporate scandals that surfaced afterward in 2001-2003. Historically, asset bubbles have tended to generate corruption, and the Dot-com Bubble was no different. Management at companies like Enron, Tyco, WorldCom, Adelphia, and Parmalat used the bubble to pursue their own interests by inflating company share prices. Looking back over the period, many investors convince themselves that they must have known about the corruption all along. But identifying the characteristics of speculative bubbles in real time is harder than it seems once one is looking back in hindsight. There are, nevertheless, methods for doing so.

The most obvious method for identifying an asset bubble in real time is to compare the current prices to both historical prices and average historical prices. For example, if a buyer of tulips during the Dutch Tulip Mania Bubble of the 1630s had stepped back and compared the prices of bulbs in 1637 to the prices just three years earlier, he would have noticed a more than 100x increase in the prices of some bulbs.<sup>xvii</sup> Such a multiple could be interpreted as a sign of speculation. Again, this is easy to say in hindsight. In the moment at hand, the speculator is likely thinking that a hundredfold increase in bulb prices in the recent past adumbrates a similar

increase in the near future. It thus proves extremely difficult when a bubble is underway to sell or stop buying at the right time.

Perhaps a better method for identifying an asset bubble in real time is to watch for gross discrepancies between the utility of the asset itself and the utility of what it can purchase at its current price. For example, one “Viceroy” tulip in 1637 sold for the equivalent of \$2 billion today:

[During the height of the Tulip Mania,] the 2,500 guilders (currency) paid for a single bulb would have bought twenty-seven tons of wheat, fifty tons of rye, four fat oxen, eight fat pigs, twelve fat sheep, two hogsheads of wine, four tons of beer, two tons of butter, three tons of cheese, a bed with linen, a wardrobe of clothes, and a silver beaker.<sup>xviii xix</sup>

That’s a lot of assets for a 3-inch flower bulb! Couldn’t the owners or potential buyers of such bulbs see in real time the discrepancy between the bulb’s utility and the utility of all that grain and livestock? Again, this is easier said than done— especially when one considers that a bulb worth \$2 billion today might be worth \$3 billion next week, and thus buy 50% more grain and livestock than it can buy today.

It turns out that both of the above conditions (historically exorbitant prices and limited relative utility) were at play during the Dot-com Bubble. For example, when one compares equity prices during the bubble to historical equity prices, a major discrepancy becomes apparent. During the 105-year period between 1900 and 2005, the average P/E ratio<sup>1</sup> for companies in the S&P 500 index registers somewhere in mid teens.<sup>xx</sup> In March 2000, at the peak of the Dot-com Bubble, that average increased to an all-time intraday high of 47.2, nearly three times the historical average. P/E’s at that level had not been seen since September 1929, when the ratio hit 32.6.<sup>xxi</sup> Equities were clearly expensive by historical standards and any investor could have known this in real time. They also could have seen that the market capitalization of many internet stocks were high enough to purchase fortunes in commodities, real estate, and other real assets. For example, online grocer WebVan.com, a company that

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<sup>1</sup> The best way to compare prices of equities over time is to use the price-to-earnings (P/E) ratio, which measures how expensive a company’s stock is relative to the company’s capacity to earn profits. The ratio can be computed several ways, but the ten-year average is appropriate for us because it tends to “smooth out” the temporary bursts and busts in earnings caused by anomalous events.

never turned a profit, had a market cap of \$1.2 billion at the height of the Dot-com Bubble. That capital could have purchased blocks of real estate in almost any American suburb, or shiploads of copper or oil. Less than a year after its peak, WebVan.com was worth nothing. It ceased trading in July 2001, making its 2,000 employees redundant.<sup>xxii</sup>

#### IV. SUCCESS STORIES IN IDENTIFYING THE BUBBLE

The question remains: who was actually able to identify the Dot-com Bubble in real time? There were certainly verbal warnings coming from the highest echelons of the business world. For example, in September 1999, six months before the peak of the bubble, Steve Ballmer of Microsoft played the modern-day Cassandra at the Society of American Business Editors and Writers Conference on Technology in Seattle. He told reporters that “there's such an overvaluation of tech stocks, it's absurd,” and then added “and I'd put our company's stock in that category.”<sup>xxiii</sup> Ballmer's warnings obviously went unheeded. The market readjusted only slightly in reaction to his comments, and then resumed the charge upward. Investors continued to pour their savings into tech stocks.

By March 2000, an article in the Wall Street Journal was acknowledging that investors were finding it difficult to justify the valuations of their tech stocks using traditional metrics. The article title referred to a “new market order.”<sup>xxiv</sup> Investment guru Warren Buffett commented at the time that he could not recognize any “truly durable competitive advantage” the Dot-com companies held.<sup>xxv</sup> It is thus not surprising that Buffett refused to participate in the popular trend of betting on multiple internet companies in hopes of picking one that would eventually manifest a competitive advantage.<sup>xxvi</sup> In any case, despite his accurate identification of the nature of the Dot-com Bubble, Buffett did not profit significantly from either the expansion or bursting of the bubble. In fact, he apologized to his shareholders in 2000 for his company's modest stock market performance relative to the rising Dot-com stars.<sup>xxvii</sup> Berkshire Hathaway did, however, outperform the NASDAQ in the period between 1996 and 2005 with a geometric annual return of 10.8% compared to the NASDAQ's 7.7% over the period.<sup>xxviii</sup>

In the end, profiting from the upside or downside of a speculative bubble is extremely difficult because it calls for “market timing”—picking the exact moment when to buy at troughs and sell at peaks. The problem with market timing, as Buffet says, is that often “the clocks have no hands.”<sup>2</sup> Remarkably, there were some mutual funds that did exhibit significantly positive market-timing abilities during the Dot-com Bubble, especially those in the “aggressive,” “small-company,” and “growth” investment objective categories. However, the same studies which noticed the market timing abilities also showed that “equity-income funds exhibit negative market-timing abilities, and balanced funds exhibit no timing abilities.”<sup>xxix xxx</sup> Other studies have come to similar conclusions, indicating that “gains from market timing over the long run require forecast accuracies that are likely to be beyond the reach of most managers.”<sup>xxxi</sup>

Perhaps the most remarkable case of an investor identifying the Dot-com Bubble in real time was the case that began this paper in the Executive Summary. As mentioned above, Robert Shiller wrote his seminal work *Irrational Exuberance* in the year leading up to the Dot-com Bubble peak, and the book hit store shelves at the very month of the peak: March 2000. In the preface to the 2005 edition of the book, Shiller relates several interesting anecdotes about investors he met during the book tour that commenced at the tip of the March 2000 peak.

I remember appearing on a radio talk show and hearing a woman tell me that she just knew I was wrong: the stock market has a pronounced uptrend; it has to go up generally. The tremor in her voice made me wonder what accounted for her emotions. I also recall seeing a man who came to two of my book talks, each time sitting in the back and looking agitated. Why did he come back a second time, and what was upsetting him so?... But most of what I remember is people cheerfully and with apparent interest listening to my talk and then blithely telling me that they did not particularly believe me. Some kind of collective conclusion had been reached about the stock market—and it had a powerful hold on people’s minds.<sup>xxxii</sup>

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<sup>2</sup> “The line separating investment and speculation, which is never bright and clear, becomes blurred still further when most market participants have recently enjoyed triumphs. Nothing sedates rationality like large doses of effortless money. After a heady experience of that kind, normally sensible people drift into behavior akin to that of Cinderella at the ball. They know that overstaying the festivities—that is, continuing to speculate in companies that have gigantic valuations relative to the cash they are likely to generate in the future—will eventually bring on pumpkins and mice. But they nevertheless hate to miss a single minute of what is one helluva party. Therefore, the giddy participants all plan to leave just seconds before midnight. There’s a problem, though: They are dancing in a room in which the clocks have no hands.” Buffett, W.E.: “Letter to Shareholders (2001).”

Whatever the emotions of the investors Shiller encountered, Shiller himself seems to have succeeded at ignoring his emotions and noticing the writing on the wall. He observed that historically high price levels had been brought on by structural, cultural and psychological factors, including everything from new information technology to “new era” thinking to investor over-confidence and herd behavior.<sup>xxiii</sup> Shiller, of course, is an academic and not an investment advisor, so his investment activity during the period remains a mystery. But if he had put his money where his pen was, and shorted the market at the time of his book’s release, he surely would have made a handsome profit.

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<sup>i</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Preface: xx.

<sup>ii</sup> [http://en.wikipedia.org/wiki/Stock\\_market\\_downturn\\_of\\_2002](http://en.wikipedia.org/wiki/Stock_market_downturn_of_2002) (viewed: 11/27/09).

<sup>iii</sup> Gray, Kenneth R., Larry A. Frieder, and George W. Clark Jr. "Financial Bubbles and Business Scandals in History." *International Journal of Public Administration*. 30. (2007): 885. Print.

<sup>iv</sup> [http://money.cnn.com/magazines/fortune/fortune\\_archive/1996/04/15/211503/index.htm](http://money.cnn.com/magazines/fortune/fortune_archive/1996/04/15/211503/index.htm) (viewed: 11/26/09).

<sup>v</sup> Lansing, Kevin J. "Asset Price Bubbles." *FRBSF Economic Letter*. 2007.32 (2007): 1-3. Print.

<sup>vi</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Ch. 1.

<sup>vii</sup> Lansing, Kevin J. "Asset Price Bubbles." *FRBSF Economic Letter*. 2007.32 (2007): 1-3. Print.

<sup>viii</sup> S. Greenspan, “Annals of Gullibility”, 1<sup>st</sup> edition, 2009, Ch. 8, pg. 133

<sup>ix</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Ch. 6.

<sup>x</sup> Guttman, Robert. "Asset Bubbles, Debt Deflation, and Global Imbalances." *International Journal of Political Economy*. 38.2 (2009): 54-55. Print.

<sup>xi</sup> Wheale, Peter Robert and Amin, Laura Heredia, “Bursting the Dot.com ‘Bubble’: A Case Study in Investor Behaviour,” *Technology Analysis & Strategic Management*, Vol. 15, No. 1, 2003.

<sup>xii</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Ch. 3.

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<sup>xiii</sup> *Ibid.*

<sup>xiv</sup> King, Alfred, "Valuing Red-Hot Internet Stocks," *Strategic Finance*, 81, 10, 2000, pp. 28–34.

<sup>xv</sup> Wheale, Peter Robert and Amin, Laura Heredia, "Bursting the Dot.com 'Bubble': A Case Study in Investor Behaviour," *Technology Analysis & Strategic Management*, Vol. 15, No. 1, 2003.

<sup>xvi</sup> <http://www.justsearching.co.uk/JustBlog/why-did-the-dotcom-bubble-burst.html> (viewed: 11/21/09).

<sup>xvii</sup> [http://en.wikipedia.org/wiki/Tulip\\_bubble](http://en.wikipedia.org/wiki/Tulip_bubble) (viewed: 11/27/09).

<sup>xviii</sup> <http://www.pbs.org/thebotanyofdesire/> (viewed: 11/15/09)

<sup>xix</sup> Chancellor, E., "Devil Take the Hindmost: A History of Financial Speculation" (First Plume, June 2000) Ch. 1.

<sup>xx</sup> [http://en.wikipedia.org/wiki/P/E\\_ratio](http://en.wikipedia.org/wiki/P/E_ratio)

<sup>xxi</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Ch. 1.

<sup>xxii</sup> <http://www.justsearching.co.uk/JustBlog/why-did-the-dotcom-bubble-burst.html> (viewed: 11/21/09).

<sup>xxiii</sup> McGee, Suzanne, "Share Prices Suffer Late-Day Slide After Warning About Tech Sector." *Wall Street Journal*, (Eastern edition), New York: Sep 24, 1999. p. C1.

<sup>xxiv</sup> Ip, Greg, *Wall Street Journal*, (Eastern edition). New York: Mar 13, 2000. p. C1.

<sup>xxv</sup> Buffett, W.E., "Letter to Shareholders," Berkshire Hathaway, March 1, 2000.

<sup>xxvi</sup> Skapinker, Michael, "A madness that ignores the known virtues: The dotcom boom is lacking in rational scientific process," *Financial Times*, London (UK): Mar 31, 2000. p. 05

<sup>xxvii</sup> Buffett, W.E., "Letter to Shareholders," Berkshire Hathaway, March 1, 2000.

<sup>xxviii</sup> <http://finance.yahoo.com/>

<sup>xxix</sup> Bello, Zakri Y. and Janjigian, Vahan, "A Reexamination of the Market-Timing and Security-Selection Performance of Mutual Funds," *Financial Analysts Journal*, Vol. 53, No. 5 (Sep /Oct 1997), pp. 24-30.

<sup>xxx</sup> Lee, Cheng-Few and Rahman, Shafiqur, "Market Timing, Selectivity, and Mutual Fund Performance: An Empirical Investigation," *The Journal of Business*, Vol. 63, No. 2 (Apr 1990), pp. 261-278.

<sup>xxxi</sup> Droms, William G., "Market Timing as an Investment Policy," *Financial Analysts Journal*, Vol. 45, No. 1 (Jan/Feb 1989), pp. 73-77.

<sup>xxxii</sup> Shiller, Robert, *Irrational Exuberance*, 2<sup>nd</sup> ed. (New York: Doubleday, 2005), Preface.

<sup>xxxiii</sup> *Ibid.*