

Very Preliminary
Partial Book Draft
Please do not quote

Bubble Logic
Or, How to Learn to Stop Worrying and Love the Bull

Clifford Asness^{1,2}
AQR Capital Management, LLC
Comments welcome: cliff.asness@aqrcapital.com

Summary

A bull market, and the incentives of those who make their living from bull markets, can create its own form of logic. This book explores some of the stories that encourage the purchase or retention of stocks or mutual funds and the logic behind these stories. Some of these stories are honest attempts to explain new phenomenon, and may or may not prove true going forward. Some seem to be unintended falsehoods that come from an incomplete or lazy application of economic reasoning. Finally, some seem less well intended. The stories, and the logical analyses behind them, generally originate with Wall Street (both sell side and buy side), sometimes riding the coattails of academia, and are often readily absorbed by investors engaged in wishful thinking. Such wishful thinking has led to a stock market, and the growth/tech sector of the market in particular, that is priced so expensively that even very long-term investors will probably end up disappointed.

¹ I would like to thank Mark Anson, Rob Arnott, Brad Asness, Jonathan Beinner, Peter Bernstein, William Bernstein, Barton Biggs, Chris Campisano, Mark Carhart, Anne Casscells, Kent Clark, Roger Clarke, Tom Dunn, David Dykstra, Ken French, Deepak Gurnani, Ron Gutfleish, Brian Hurst, Antti Ilmanen, Ronen Israel, David Kabiller, Larry Kohn, Robert Krail, Oktay Kurbanov, Josef Lakonishok, John Liew, Mani Mahjouri, George Main, Todd McElroy, Jeff Mora, Peter Muller, George de Nemeskeri-Kiss, Tom Philips, Paul Samuelson, Salim Shariff, Robert Shiller, Meir Statman, Ross Stevens, and Steven Thorley for helpful suggestions and comments.

² Disclaimer: Please note that the views expressed in this book are purely the opinion of the author. Furthermore, The information set forth herein has been obtained or derived from sources believed by the author to be reliable. However, the author does not make any representation or warranty, express or implied, as to the information's accuracy or completeness, nor does the author recommend that the attached information serve as the basis of any investment decision. This document has been provided to you solely for information purposes and does not constitute an offer or solicitation of an offer, or any advice or recommendation, to purchase any securities or other financial instruments, and may not be construed as such. This document is intended exclusively for the use of the person to whom it has been delivered by the author and it is not to be reproduced or redistributed to any other person. All calculations performed by the author contained herein are subject to error. This document is subject to further review and revision.

Contents

I.	Introduction.....	page 3
II.	Long-term Equity Investing.....	page 5
III.	Creative Defenses for the Price of Stocks Today.....	page 26
IV.	Growth vs. Value Investing.....	page 41
V.	Miscellaneous Examples of Bubble Logic.....	page 45
VI.	Conclusion.....	page 49
Appendix I - Internal Rate of Return (IRR).....		page 51

I. Introduction

First, full disclosure. I am a Principal of a boutique investment manager with a value orientation. Thus, for about two years now with only brief interruption, we have had our assets handed to us. I believe that before a person rants and raves they should fully disclose that they may be typing with a jaundiced keyboard. Part of this book's thesis is that self-serving incentives often color what passes for independent analysis and research of financial markets, and since I am not immune to this bias, it would be particularly hypocritical of me not to declare my stance at the outset.

That said, my goal is to tick through many of the bromides about investing that currently are conventional wisdom on Wall Street and Main Street. Some of these popular wisdoms are explanations for new phenomenon that may or may not be true but must be critically examined. While some are correct, but misinterpreted, some are just dead wrong. While some are just benign silliness, many can prove harmful. Like in most businesses, these bromides exist largely to sell a product, in this case to sell equities. Of course, wishful thinking and the human desire for a free lunch, makes the consumer/investor very susceptible to this sales pitch. A basic theme is that although Wall Street research is made to look like independent science, and the financial media is made to look like neutral journalism, they are biased towards keeping you buying or holding common stocks. There is nothing wrong with that. That is their business. However, the investor needs to keep his eyes open. Furthermore, it is distinctly possible, and in my opinion likely, that the acceptance of these "wisdoms" has led to a stock market, and the growth/tech sector in particular, that is so expensively priced as to probably disappoint even very long-term investors.³

This book is meant to stimulate thought and debate, and should be taken that way. It certainly contains facts, but it also contains a healthy dose of my opinions (occasionally intentionally provocative), and I try my best to distinguish between the two. Some of the areas I address are very topical, while some apply to any era. I certainly do not claim to have all the answers. It is a lot easier to point out the fallacies in others' arguments than to figure out the answers. Still, when fallacies rule the land, somebody has to point at the naked emperor.

The book is divided into six parts. Part I is this introduction. Part II examines the properties of a long-term investment in equities, and the implication of today's high prices for this investment going forward. It is the most mathematical/technical part of the book, but is essential for examining today's stock market. Part III is lighter in tone and rigor, examining some creative ways sometimes used (and abused) to defend today's high stock prices. Part IV briefly examines growth vs. value investing. Part V encompasses several miscellaneous topics that might not fit anywhere perfectly, but clearly fit the

³ A piece by Shawn Tulley in the January 24th, 2000 issue of Fortune actually covers some similar ground (with a similar viewpoint). As his came first, my work owes a clear debt to Mr. Tulley's article. Also, after writing most of this book, a letter to clients (*specific attribution forthcoming*) by Cambridge Associates entitled "Do the Math" was pointed out to me. This letter parallels many of the arguments of this book (including repeated exhortations to "do the math"), and some of the quotes I use are taken from this piece. I think this piece is excellent and recommend it if you can get your hands on one (and not just because of the similarity in content to my work). However, mine is funnier.

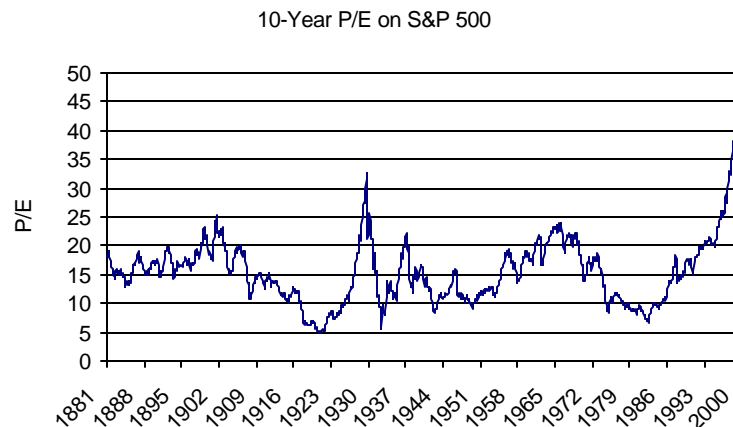
theme of bubble logic (the impact of new trading technologies, the effect of stock splits, the selectiveness of mutual fund advertising, and finally, the notion that it is “different this time”). Finally part VI concludes.

Each main part contains sub-sections that begin with a paraphrased quotation summing up the popular wisdom I am about to critically examine. Admittedly, this book is a mix of some hardcore valuation analysis, and a lighter anecdotal survey of the market. While perhaps an awkward mix at times, I argue that both are necessary to understand today’s stock market. In general, the most theoretical issues are relegated to the extensive footnotes, which the interested reader can peruse to their taste. Finally, if any readers are more annoyed than amused by some of the sarcastic humor herein (especially in the second half of this book after the heavy lifting topics are done) then I do apologize. Have pity on a partially gored bear.

II. Long-term Equity Investing

“Equities Always Win Over the Long-term”

One of the most prominent ideas behind the bull market is that over any long-term horizon (let us identify 20 years as the long-term horizon) an investor cannot lose in the stock market. This belief is clearly held by many investors today. There are many sources for this belief, but perhaps the most recently influential is Jeremy Siegel’s book, Stocks for the Long Run, documenting that over long periods the equity market’s premium over inflation and over alternative assets like nominally risk-free cash, has been very large and consistent. Siegel’s data is rock solid and correct.⁴ However, let us look at a graph of some alternative data. This one comes from Robert Shiller (author of the book Irrational Exuberance) and shows the price-to-earnings ratio (P/E) of the S&P 500 for over 100 years. Note, the E in this case is the 10-year average of trailing S&P 500 real earnings, not last year’s trailing earnings.⁵



⁴ Siegel does not say that stocks will always win over any 20-year period. He only points out how consistently well stocks have done, but gives no silly assurances going forward.

⁵ Before discussing the implications of this graph, I feel a need to defend Shiller for a moment. He has been criticized by some for using a 10-year average of real earnings as the E in P/E. The logic of this attack is that since earnings on average go up, a 10-year average of past real earnings will on average understate current earnings, and thus arrive at a larger P/E than just using last year’s earnings for E. This is true. But, Shiller makes very little hay about the fact that his version of P/E is currently in the 40s while the trailing P/E over one year (for the S&P 500) is currently in the low 30s. That is not his point. His point is that comparing his series (using 10-year real earnings) to itself over time is an absolutely legitimate exercise. In fact it is a necessary one. Especially over long periods that include some true earnings depressions, short-term earnings can be very misleading (e.g., in the early 1930s there were some very distressed times when 1-year earnings dropped precipitously thus raising P/E, but in fact these were times better described by a low P/E). By using 10-year real earnings, Shiller simply restates P/E in a more stable meaningful fashion. The fact that P/Es tend to be higher in this method is immaterial. Now, the gap between Shiller’s 10-year P/E and the more conventional 1-year P/E is indeed recently larger than normal (though examining the 1-year P/E graph also shows startlingly high recent prices). Again, the 10-year P/E will generally be under the 1-year P/E because earnings grow over time, and thus a 10-year average is usually below current earnings. Because the last ten year’s real earnings growth has been somewhat stronger than average, this gap between the 10-year and 1-year P/E is greater than average. This does not mean Shiller’s series is misleading. If one believes that this recent strong earnings growth will continue then this is a legitimate reason to argue that today’s high P/E might be partly justified, but it does not make Shiller’s version of the P/E any less a correct indicator of price (also, note that this view would have been exactly wrong in 1990 following 10 years of below average earnings growth).

First, it is exceedingly important to note that there is nothing magic about the long-term that makes equities pay-off so consistently, it is just math.⁶ As with any volatile asset the longer the observation period, the more noise tends to cancel out and the more accurately we observe the true average return (the long-run expected or required return of equities). The long-run average equity market return vs. inflation (the real equity return), and the average equity return vs. cash or bonds (the risk premium), should be positive since investors should require a positive expected return for investing in risky or riskier assets. Thus, the twin observations, (1) that average equity returns are positive, and (2) that we become more certain of realizing a positive return over long periods, are not exciting findings, they are what we expect to find. The exciting finding has been exactly how positive these returns have been and, to a lesser extent, that deviations around the average over long periods have been somewhat smaller than we would expect. Siegel finds that the real return on U.S. equities has been about 7% over the long-term, and this is higher than most theories say it should be.⁷ The gross compound return of the S&P 500 has beaten inflation in 100% of the 20-year periods from 1926-2000 (measured at overlapping monthly intervals), and has beaten U.S. T-bills in 96% of these same periods. Clearly, equities have been strong and consistent long-term performers.

Over any period, including the long-term, the return on an equity investment will be a function of the price you pay for it (let us deal with price in terms of P/E), the price at which you ultimately sell it, the dividends it throws off in between, and the earnings growth over the period.⁸ The data underlying the “long-term argument for equities” rests on a period when P/Es (defined as above) averaged about 15, peaked at around 30 (not counting the latest bull market run), and examined on this same scale are now residing in the low- to mid-40s. Other versions of P/E, and in fact just about any other credible valuation measure, tells a similar story.⁹ Equities historically always returned a reasonable amount (or even a superb amount) over the long-term. One reason is that they were almost always priced reasonably. To assume that this long-term consistency will now exist independent of pricing is simply to believe in voodoo. It will happen, because it has always happened is not a strong argument. Equities have gone up more than inflation (i.e., a positive real return) in all 20-year periods, and beaten cash (i.e., a

⁶ Some will say indeed there is magic in long-run equity returns, namely a tendency to “mean revert.” The argument states that after good (bad) periods equities tend to offer less (more) attractive expected returns, and this induces a less volatile long-term return to equities than if the stock market truly followed a random walk (with drift). However, mean reversion is not the main explanation for equities consistency over the last 125 or so years. First, there is only modest statistical evidence that such long-term mean reversion exists. Second, over the last 125 years, the high average returns of equities are far more responsible for the stock markets long-term consistency than any contribution from mean reversion. The mean reversion that does exist may be responsible for equities’ 20-year variance around their high average real returns being lower than we would otherwise forecast, but this is a second order effect. The high level of the average real returns is first order. For more on this topic, please see a soon to be available paper “It’s the Mean, Not the Reversion” Asness (2000). Finally, while perhaps an attractive long-term property, anyone long equities right now should pray that there is not a lot of mean reversion in stock returns.

⁷ See Brad Cornell’s book The Equity Risk Premium for an excellent readable review of these theories.

⁸ The reinvestment income on the dividends also matters. For an excellent detailed decomposition of what drives equity returns, see Bogle “The 1990s at the Halfway Mark” (Journal of Portfolio Management, Summer 1995).

⁹ Some examples of other valuation measures are the market’s dividend yield, price-to-book ratio, and Tobin’s Q. For a nice overview of Tobin’s Q in particular, and a bearish view who’s vehemence might just exceed my own, see the recent book by Andrew Smithers and Stephen Wright, Valuing Wall Street. Their book also does an excellent job of pointing out that the stock market (even over the more reasonably priced past) is not immune to periods of negative performance that, for all practical matters, would greatly impact investors with real world investing habits and time horizons (i.e., a 20-year buy-and-hold horizon is probably too long).

positive risk premium) in almost all of these periods, not because of magic, but largely because throughout the period we study they were generally priced reasonably, or even cheaply, vs. their earnings and dividends prospects. That is not necessarily the case anymore.

In an interesting recent paper (working paper, June 2000), Professors Fama and French take on the problem of estimating the market's risk premium (which they define as the expected return of the broad stock market over commercial paper). Among their other results, they find that because of high stock prices today, the expected risk premium of stocks over high quality commercial paper is now approximately 1½% (the range accounting for reasonable degrees of optimism or pessimism about earnings and dividend growth going forward). This compares to an average historical risk premium of about 6% from 1872-1999.

I am addressing here the simple question of whether equities will always win (beat inflation and/or short-term cash) over the long-term.¹⁰ Fama and French's estimated equity premium of 1½% is an expected value. Real life always varies from expectations, and Fama and French's estimate can be thought of as the center of our future expectations, or put differently, our best guess based on current prices and growth estimates of how the future will turn out (i.e., there is a 50% chance things work out better, and a 50% chance things work out worse).¹¹ Put simply, the very low current expectation for equities compared to history means there is very little "cushion". If things work out slightly worse than expected, equity returns can now easily be less than commercial paper over the long-term and can even be less than inflation (i.e., negative real returns). When equities were priced for much higher expected returns they had a very large cushion against negative returns. This cushion is largely gone now.

Now, to be balanced, there might be reasons to justify today's very high prices. Long-term (not highly transitory) large increases in real earnings growth, perhaps driven by productivity growth, and the ability to ultimately turn this earnings growth into free cash flow to investors, could justify higher prices (I examine this more later). Some also argue that today's low inflation environment justifies a higher P/E.¹² However, when

¹⁰ This focus on positive returns is somewhat arbitrary. If over 20 years you make just a bit more than zero you are positive, but not economically much better off than making a bit under zero. However, the market has focused great attention on the question/assertion of equities' long-term infallibility as defined in this section.

¹¹ For technical sticklers, we are ignoring differences between means and medians, and some compounding issues. However, the intuition works fine. For excellent discussion of related mathematical issues see two books by Kritzman, Puzzles of Finance (2000) and The Portable Financial Analyst (1995).

¹² The argument states that low inflation and interest rates makes the earnings yield (the inverse of P/E) of equities more attractive vis a vis bonds. This is a difficult argument to make as it ignores the fact that presumably expected nominal growth moves with inflation. In particular, Modigliani and Cohn (Financial Analysts Journal, March/April 1979) argue that investors mistakenly make this comparison of equity yields to nominal bond yields. Furthermore, they argue that in the high inflation environment of the late 1970s this mistake (and related issues involving depreciation and liabilities) led investors to systematically undervalue the equity market (they estimated by about 50% at the time). In other words, Modigliani and Cohn rejected the idea that high nominal interest rates meant equity yields must be high (and P/Es low), and correctly forecasted the ensuing bull market. Applying their logic now obviously leads to the possibility of investors overvaluing equities today in our low interest rate, low inflation environment. Finally, Asness (Financial Analysts Journal, March/April 2000) looks at the issue empirically and finds that in fact low interest rates do support a higher than normal P/E on stocks, but only for the short-term. For long-term investors a high P/E is still very

equity prices (P/Es) are 3x their historical average and far above their prior historical maximum, the burden of proof in the debate is on those who claim they are still a low risk (or no risk) long-term investment. It is not enough to say “they always have been and thus will always be.” None of what I say is a proof that equities will do poorly over the next 20 years. All I argue against here is the idea that the stock market must do well, and that the price you pay does not matter to the probability of this occurrence.¹³ If equities are priced to offer considerably lower expected returns compared to history, then they are far more susceptible to negative shocks that can leave even their 20-year returns lower than short-term cash or even inflation. Returns over shorter time horizons, e.g. 10 years, that might be relevant to many or most investors, are even more threatened. Again, the cushion is substantially reduced (as is the reward even in the expected case).

Finally, let us step back for a moment. Does it fit intuition that as the world has bought into the “stocks cannot lose over the long-term” argument, investors have become price insensitive (why care about price if you cannot lose?), and thus bid up prices to the point where equities suddenly can lose over any term? It sure fits my intuition.¹⁴ Countless times we see researchers find patterns in the stock market that have existed for a long time and then continued to work for a short time after discovery. But then, they go away as victims of their own success. That is, too much money chases the effect. The current price of the stock market seems a prime candidate to be just such a case.

“But, My Estimates of Expected Stock Returns Are Based On Solid Long-term Data”

Fama and French (and many others) find that expected stock returns going forward are lower than stock returns have been in the past. However, when making asset allocation decisions, many investors still estimate expected future returns by using a long-term average of historical returns (the most common period employed is 1926 to the present). On first examination this seems eminently reasonable. However, this suffers from an important paradox. The bull run of the last 5 years (taking us from a P/E around 20 to over 40), and even more so the last 20 years, non-trivially raises the long-term average realized return of stocks, and hence the estimate some use going forward of the expected return. However, this more than doubling in P/Es in 5 years almost assuredly reduces the expected return of stocks going forward. That is, just as users of this method are estimating a higher expected return for stocks, it is in fact lower, and lower for the precise reason they are raising their estimates!¹⁵

bad news. In other words Asness finds that in the short-term investors mistakenly act like stock yields should move with nominal interest rates, but in the long-term discover that they should not.

¹³ A related abuse of the long-term argument for equities is when people apply it to individual equities. For example, “xyz.com might be massively overvalued but if I hold on long enough I will be fine.” Siegel’s work does not even begin to apply to these situations. Invest in a massively overvalued single stock and you may get lucky, but the odds are stacked against you, and having a long time horizon will not save you.

¹⁴ For more on this issue, I would refer the interested reader to a very readable article by Jane Bryant Quinn “Wave the Bubble Goodbye.” in the April 24, 2000 issue of Newsweek, and to another article by Ms. Quinn entitled “It’s not Dumb to Own Bonds” subtitled “Stocks are risky even if you hold for the long term. Investors also need something safe.” in the June 19, 2000 Newsweek.

¹⁵ I will not dwell on the technical details here, but one of the main contributions of the Fama and French article cited earlier was developing a methodology to estimate expected stock returns relatively free of this bias.

Going to extremes can make this issue even clearer. Imagine all stock prices went up 100x tomorrow with no change in fundamentals.¹⁶ Hopefully, we would all agree that paying about a 3000-4000 P/E for the S&P 500 right now would make a very poor long-term investment (wow, a P/E that even the author's of Dow 36,000 would not love). However, the historical average return on stocks would skyrocket once this 10,000% return was added. Obviously, in this case it would make little sense to use the historical average to forecast the long-term future. The historic average would be incredibly high, and the future would look incredibly poor. While far less extreme, the real-life situation today is analogous. Finally, this issue is very clear when applied to bonds. Few would think a bond's expected return has gone up if its yield falls, yet when its yield falls its price and thus historical average return rises. Stocks are really no different, but all the dust kicked up in equity analysis can obscure this highly analogous relation.

“It is Silly to Compare Today’s P/Es to Those Before the Great Depression”

Some question the very act of examining a figure like the earlier long-term P/E chart. They argue that comparing today’s P/E to historical averages is misleading, or more prosaically put “driving through the rearview mirror”, as times are different now. Today’s S&P 500 P/E (using the Shiller data) is about 44, while the historical average P/E from 1872-1999 is about 15. Critics say that it is naïve to assume that we will return to about a 15, as life is better now. As one example, the July 18th, 2000 Wall Street Journal had an interesting and thoughtful article on this topic. Quoting Jeremy Siegel from that article, “When we look back over the past century and say the average price-earnings ratio was 14 we’re talking about a period that includes the Great Depression, two world wars, and the double digit inflation of the 1970s. Saying we’ll go back to a 14 P/E means saying we have learned nothing about how to better manage the economy.” Well, there certainly may be some truth to this observation, but let us dig a little deeper. These are the average P/Es over different periods:

Average P/Es Over Different Periods

Period	Average 10-Year P/E	Average 1-year P/E
1891-Present	15.5	14.5
1946-Present	16.6	14.9
1970-Present	16.6	15.4
1980-Present	18.5	17.0
June 2000	43.9	32.2

For balance, I show both the Shiller 10-year P/Es (that correct for significant biases in the 1-year trailing P/E), and the more traditional 1-year trailing P/E (which is also calculated from the Shiller data). Comparing recent P/Es to the longest-term average P/E is startling (43.9 vs. 15.5, and 32.2 vs. 14.5). However, this is not an artifact of including very old data. Looking at the 1946-present averages (no World Wars, no Great Depression) the

¹⁶ If it helps to visualize this, just imagine Abby Cohen raises her recommended allocation to stocks by 5%.

comparison is hardly any different. Even looking 1980-present does not change the story much (and the current euphoric period is getting more and more weight in this shorter-term average). While memory of these cataclysmic events might have depressed P/Es even after they ended, it is certainly not the case that one needs World Wars and a Great Depression to get reasonable stock valuations. Rather, even compared to other modern times, it is today's high P/Es that are the exception not the rule.

Interestingly, in this same article, Jeremy Siegel was quoted as saying he thought reasonable P/Es for the S&P 500 might be in the range of 20-25.¹⁷ This can be (and actually was) interpreted as bullish because 20-25 is not 15, and thus Siegel is agreeing (correctly) that it is naïve to say that we must return to the historical average. However, falling from today's 32.2 to 25.0 is a -22% return (I assume Siegel's using 1-year P/Es), and falling from 32.2 to 20.0 is a -38% return. I will examine this more later, but a fall of this magnitude for the broad market, and in all likelihood a much harsher fall in the growth/tech sector, in most circles would be labeled bearish. While I think Professor Siegel's observation is accurate (that there is no real reason we must return to historical average P/Es) and certainly interesting, it is somewhat amazing that this can be interpreted as the bullish case!

Essentially, it is true that nobody should point at the historical average and say we must get back there. That is as naïve as observing that equities have historically done well and assuming they must do well going forward. However, to summarize, two points are important. One, you do not need to include the Great Depression or a World War, to get low average P/Es. Today's high P/Es are about 2x to 3x (depending on which P/Es you use) the average P/Es measured only over the modern era (1946-present). Second, as Siegel's quote supports, today's P/Es are still dangerously above reasonable levels (not just vs. history, but from actually examining the math behind expected returns – more on how to do this later).

Finally, I would like to discuss the relevance of the Great Depression. Revisiting Siegel's quote, "Saying we'll go back to a 14 P/E means saying we have learned nothing about how to better manage the economy." Again, perhaps a 14 P/E is an extreme prediction, but it is also precarious to rest too hard on how much we have learned about the economy. Students of the Great Depression uncover tremendous parallels to today, including a belief then that we had learned a lot about managing the economy (I know this talk of ominous parallels makes me sound a bit like Hal Lindsey, but bear with me). The quotes below are all (except for the last one) from a New York Times article by Floyd Norris called "Looking Back at the Crash of 1929." The first quote is Norris describing a Times editorial from October 1929 that blasts speculators, but then assures us that the Fed will protect us from the consequences of our own folly:

¹⁷ Siegel also mentions that perhaps the fact that we are now on the high side of this range (actually well past the high side) can be explained by the relatively good times we are experiencing, perhaps due to technological advances. However, Professor Siegel himself, in his aptly titled piece "The Shrinking Equity Premium" (Journal of Portfolio Management, Fall 1999), points out that returns to technological progress historically have gone more to workers in the form of higher real wages than to the value of companies. Quoting from his article, "Optimists frequently cite higher growth of real output and enhanced productivity, enabled by the technological and communications revolution, as the source of this higher growth. Yet the long-run relationship between the growth of real output and *per share* earnings growth is quite weak on both theoretical and empirical grounds."

... it may be useful to recall an editorial published in The New York Times in the midst of the 1929 crash, on Oct. 26. It heaped scorn on those who had participated in the “orgy of speculation” that had sent prices so high amid talk of a new era and permanently high stock prices. “We shall hear considerably less in the future of those newly invented conceptions of finance which revised the principles of political economy with a view solely to fitting the stock market's vagaries.”

But after blasting the speculators, The Times took a much more sanguine view of the economy's future. The Federal Reserve had “insured the soundness of the business situation when the speculative markets went on the rocks.”

Sounds a lot like the current view that we have a “Greenspan Put” where the Fed will save us from a crash so we can safely trade/invest like a crash cannot happen. On the impact of technology (in the 1929 case it was radio):

Then, as now, there was talk that an exciting new technology had rendered the old economic laws irrelevant. Then, as now, stock connected to that technology zoomed skyward, but even companies that had nothing to do with the technology saw their stock prices benefit.

Norris's list of parallels continues. Like today, pre-1929 dissenting voices were laughed at, the country was obsessed with stocks, and “dumb money” crushed “smart money”:

By 1929, such cautionary voices had been discredited, and the stock market had become a force unto itself, propelled by dreams -- and the reality -- of quick wealth. “Playing the stock market has become a major American pastime,” reported The Times in a magazine article published on March 24, 1929. The article noted that the number of brokerage accounts had doubled in the past two years, and added, “It is quite true that the people who know the least about the stock market have made the most money out of it in the last few months. Fools who rushed in where wise men feared to tread ran up high gains.”

Then as now, Wall Street came to the defense of stock prices. The following discusses bankers' reaction to a severe “dip” in early 1929, and the subsequent recovery from this dip that signaled to many that all was well again with the bull market (the parallels to the spring/summer of 2000 NASDAQ recovery make me start looking over my shoulder for four horsemen).

“Responsible bankers agree,” The Times quoted an unnamed broker as saying that day, after the recovery began, “that stocks should now be supported, having reached a level that makes them attractive.” The responsible banker in question, it turned out, was Charles Mitchell, the president of National City Bank, a predecessor of today's Citibank. He defied the Fed, and lent out all the money the speculators wanted. Soon prices were back on their upward course. By the August peak, the Dow was 35 percent above the low reached during the March sell-off.

Responsible bankers agreed, and choosy moms chose Jif, but we all know what happened next (a tremendous crash and bear market, The Great Depression, and a full 20 years of effectively zero real return on stocks).

Finally, I must add one other quote that makes clear the parallel between today and 1929 both in abandoning traditional valuation methodology, and in assuming the Fed will bail us out of any crisis with easy money:

Once stock prices reach the point at which it is hard to value them by any logical methodology, stocks will be bought as they were in the late 1920s – not for investment, but to be unloaded at a still higher price. The ensuing break could be disastrous because panic psychology cannot be summarily altered or reversed by easy-money policies.

Note the author's cynicism regarding whether a central bank can actually save us from an overvalued and declining market. The quote is from 1959, by Alan Greenspan.¹⁸

While the parallels are interesting, there are of course some things that are very different. However, this is not necessarily good news. If somebody asked me the riddle, "what's the single biggest difference between June 2000 and September 1929", I might be compelled to answer "the price." Measured using the Shiller 10-year scale today's P/E is about 43.9 vs. 32.5 in September of 1929, and measured using 1-year P/Es today's value is 32.2 vs. 20.4 in September of 1929.¹⁹ Furthermore, at the end of September 1929, CPI inflation stood near zero, and 10-year bond yields hovered around 4%, so these crutches sometimes used to defend today's high stock prices were even lower back then. Finally, recent real earnings growth (circa early 2000) has been strong. 1-year compound growth has been about 12% (vs. a 3.5% historical average), 5-year annualized compound growth has been about 4.0% vs. a 1.9% historical average, and 10-year annualized compound growth has been 4.5% vs. a 1.5% historical average (the historical average compound growth falls with time-horizon due to the effects of volatility on compound growth). In other words, recent real earnings growth has been strong. However, in September of 1929, the relevant numbers were 18.3% for 1-year growth, 10.2% for 5-year growth, and 5.4% for 10-year growth, all better or much stronger than today. Apparently, then as now, investors were looking at recent growth, and pricing stocks as if this growth would go on forever. Only then, the growth was even stronger, and the price was not as high.

On many qualitative issues (rampant speculation, total faith in the Fed, extreme belief in new technology, Wall Street trying to jawbone a stock recovery, etc.) today seems very much like 1929. On other fronts the comparison is more favorable for today (we

¹⁸ This quote was taken from the Cambridge Associates piece cited earlier. Their piece also contains many other quotes and parallels for the reader who is interested in more. In particular, my favorite involves the prevalence of books in the mid and late 1920s bearing a positively eerie similarity to Siegel's Stocks for the Long Run. One, by Edgar Laurence Smith, entitled Stocks as Long Term Investments "proved" that it was close to impossible for the stock market to lose over any 15-year period. Well, I guess every bubble has its Boswell (though in fairness to Siegel he did publish the first draft of his book in 1994, a time of financial distress not a bull market, and he has recently written articles, some of which I quote here, documenting that expected equity market returns are now lower going forward).

¹⁹ Someone really paying attention might note that the gap between the 10-year and the 1-year P/E was even larger in 1929 than today. Meaning, if Professor Shiller did his analysis in 1929, the screams that he was being unfairly bearish by using the 10-year measure would have been even louder than they are today, and of course tragically wrong.

probably live in a safer world, security regulation protects us better from outright fraud, etc.). Finally, on the pretty important issue of price, today seems significantly worse than 1929. Now, comparisons to other times are dangerous as things can and do change. I do not want to fall into the “representativeness bias” documented by students of behavioral science where one over-relies on perceived similarities. To this end, most of the rest of this work focuses on forward looking estimates of stock market returns, not simple historical comparisons. However, while slavish devotion to history makes little sense, and similarities can be overstated, it is perhaps at least as dangerous to completely ignore the lessons of the past.

“Stock Prices are High as Investors are Willing to Accept a Lower Risk-Premium Today”

Many reasonable analysts looking at today’s equity prices reach the almost unavoidable conclusion (as did Fama and French in the work cited earlier) that the equity market’s current prospective expected return is quite low compared to history. However, rather than forecast a severe drop in stock prices (or a long period of price stagnation) that would restore the expected market return to more normal levels, some argue that the lower expected returns are in fact here to stay. The idea is that investors now recognize that stocks are less risky vs. other assets than previously believed, and thus should offer a lower return premium going forward, and thus have higher prices today (remember, a higher price today leads directly to lower expected returns going forward). Actually, this explanation is theoretically reasonable. It might be true, and could explain the very high valuation levels we see today. However, there are at least two giant holes in this argument.

Hole #1: Investors show no signs of accepting lower stock returns going forward. Investor surveys all point to their expected future returns being higher, not lower, than historical experience. It is hard to reconcile equity investors being happy with bond like expected returns, with the countless ads for on-line brokers implicitly promising you a private island if you will only trade with them. When compounding at $1\frac{1}{2}\%$ over commercial paper it takes a long time to pay off the mortgages on those islands. In addition, the existence of inflation-protected government bonds offering about a 4% guaranteed real return, high quality municipal bonds whose tax equivalent nominal yields currently approach 10%, and very high yields on equity-like low grade bonds, makes it even more unlikely that investors would now be consciously willing to accept very low prospective returns on stocks. Apparently, it is not general risk-aversion that is low, but only risk-aversion when it comes to buying equities. Quoting Jeremy Siegel (Journal of Portfolio Management, Fall 1999), “This divergence between increased historical returns and lower future returns could set the stage for some significant investor disappointment, as survey evidence suggests that many investors expect future returns to be higher, not lower, than in the past.”

Hole #2: As mentioned earlier, a large part of the long-term consistency of stock returns comes from the fact that they have historically had a high average return. If that average (or expected) return goes way down then stocks are going to have some long periods of

negative performance as their cushion is gone (see the discussion of Fama and French's findings earlier). Then, if equities can lose, they become risky again, and the circular argument that they should be priced super expensively because they have no long-term risk disappears completely.²⁰

It is rational to observe that the historical equity risk premium in the U.S. has been high, and maybe conclude it has been too high.²¹ And maybe, just maybe, part of the gigantic bull market we have seen is a permanent rational lowering of this risk premium. However, it strains credulity to explain the majority of this bull market as coming from equity investors now being perfectly happy to make nothing or just a bit over bonds going forward.

‘Earnings Growth = Stock Return’

This section examines the long-term returns of companies that are growing fast, and expected to continue this pace for quite a while. I provide examples that demonstrate that the long-term expected return from investing in these companies is not even close to equal to their expected growth rate. This counters what seems to be a widely held (though thankfully not universal) view that if a company's earnings grow at 30% per year, by investing in it, you will make about 30% a year. More generally, there appears to be a strong belief held by many that to make money investing, one must invest “where the growth is.” This is not true. While our general prosperity is certainly linked to the overall economies' ability to grow, this does not mean that investing in specific fast growth companies, or indices of these companies, is automatically a good idea. In fact, it should be immediately clear that any prediction of return that ignores the price you pay has to be wrong. Furthermore, if the confused belief that earnings growth = stock return is responsible for all or some of investors' current exuberance over stocks, then this misconception may be responsible for the low level of expected stock returns going forward.

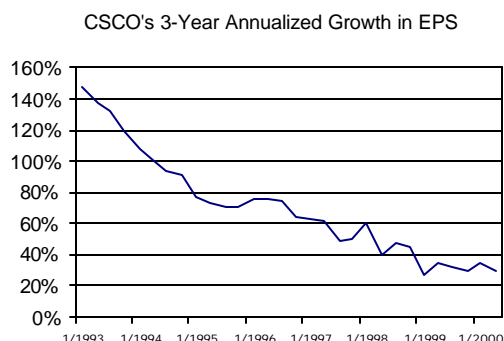
Let us use an example of a specific fast growing stock. I will pick on Cisco, probably the poster child for high tech blue chips and try to determine what an investor today in Cisco can realistically (or even optimistically) expect as a long-term return.²² As of June 2000, Cisco is trading at about a 140 P/E vs. 1-year trailing earnings. Wall Street analysts are currently forecasting (using the median IBES estimate) Cisco to grow earnings-per-share (EPS) at 30% per year for the next five years. The following graph is the actual

²⁰ Paul Krugman makes a similar point in a piece called “A Self-Defeating Prophecy.”

²¹ Even this is debatable. Some authors argue that looking at only the success of the U.S. market over the long-term biases us towards thinking the true equity premium is higher than it really is as ex post the U.S. has been the world's most successful market, and one of the few markets in continuous uninterrupted long-term existence. In fact, that the U.S. would survive at all was by no means a certainty, and probably upwardly biases historically based estimates of the expected return on U.S. equities. The technical term for this is survivorship bias. See Goetzmann and Jorion (Journal of Finance, June 1999). It is also another reason why the historical average might be a poor predictor of future stock returns.

²² While I only pick Cisco as a very recognizable example of a general phenomenon, it should be mentioned that as of June 2000 I am short this company both personally and professionally.

annualized 3-year compound EPS growth Cisco has achieved over the last ten years or so (a 3-year period is used to smooth short-term fluctuations).²³



Cisco is obviously a phenomenal company considering the spectacular growth rates it has generated for so long, and people who have faith in Cisco the company (not Cisco the price) are perhaps correct. However, there is a clear trend down in their EPS growth, and all economic intuition says this should occur. As a company gets bigger, and competitors gear up (both happening here in spades) it is natural for any company to slow its growth. Now, Wall Street analysts are not known for their restraint, and considering the trend above, their forecast of 30% growth going forward for another five years may be optimistic. But, for now, let us assume it is a good forecast²⁴. Of course, that assumption does not mean you will earn a 30% return on your investment in Cisco. To estimate long-term expected return more assumptions are needed. I will assume that Cisco continues to outgrow the market for another 5 years after its first 5 years of 30% EPS growth, as its growth linearly declines to normal market growth rates thereafter. I assume normal growth is 6% nominal EPS growth or about 3% real growth assuming inflation stays at 3%. In other words, growth in years 6-10 is linearly declining from 30% to normal growth of 6%, and it is steady at 6% from year's 11 onward. To be clear, under these assumptions nominal growth each year is as follows (scenario (1) in the following table):

Scenario	Cisco's Growth over Different Years																		Year 20	IRR	20-Year Annualized Compound Growth	Multiple of GDP in 20 Years
	Year 1-5	6	7	8	9	10	11	12	13	14	15	16	17	18	19							
(1)	30%	26%	22%	18%	14%	10%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	7.5%	14.5%	4.6
(2)	54%	46%	38%	30%	22%	14%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	10.0%	22.4%	17.3
(3)	30%	29%	27%	26%	24%	23%	21%	20%	18%	17%	15%	14%	12%	11%	9%	7%	7%	7%	7%	9.0%	20.8%	13.3

Combined, these assumptions mean Cisco has above normal earnings growth for the next ten years. Over the full next 20 years, these assumptions lead to compound annual growth of 14.5% for Cisco, and real total EPS growth that is roughly 5x that of real GDP (assuming real GDP grows at a compound rate of 3% per year). Even for a great

²³ For our purposes, we ignore some of the issues that people valuing a company like Cisco like to fight about (e.g., the dilutive effects of options issued, the impact of the choice of accounting methodology for mergers, etc.) though these issues are probably relevant. The source for the EPS data on Cisco is COMPUSTAT.

²⁴ A recent study by Chan, Karceski, and Lakonishok (2000) with the working title "The Persistence in Operating Performance Growth" shows that Wall Street analysts have some power to forecast the next two years earnings growth, but even over this short period you still want to discount their optimistic forecasts as they tend to overdo it. Even worse, out further than two years, the analysts have almost no forecasting power. This is a far cry from the optimistic assumption used here that analysts are 100% correct for five full years, and even after five years are still directionally correct.

company, it is optimistic to assume such powerful long-term growth given the sea of competition. I also assume that when Cisco's growth slows they start paying dividends (or buying back shares) in line with the historic behavior of firms with comparable growth rates (and eventually settling to a 50% payout ratio, which is about the average for the S&P 500 from 1950-1999).²⁵ With these assumptions, and using today's price, I discount back the cash flow to investors and find a current internal rate of return (IRR) on an investment in Cisco of 7.5% (please see appendix I for a discussion of the mechanics and meaning behind discounting cash flows and calculating IRRs).²⁶ If all my assumptions pan out then this is the return a long-term investor should expect on their Cisco investment buying in at today's price.

Of course, while still assuming my optimistic earnings growth assumptions come true, the next question is whether a 7.5% long-term return is enough. The answer seems to be a strong no. First, for perspective, note that this IRR is not that far above today's cash and government bond yields, and probably a similar expected real return (with a lot more risk) than inflation-protected government bonds. Now, most investors would probably expect and demand a higher return on Cisco than on the broad stock market as Cisco is more volatile. Say investors demand a 3% risk premium for the market over cash (itself far lower than history, but a bit higher than the Fama-French current estimate) and 1/3 above that for Cisco. So investors should require about 4% above cash to own Cisco, or a long-term return of about 10% today. If the above assumptions are right, Cisco's IRR has to go up 2.5%. Unfortunately, if the price moved down to get us there today, Cisco would have to immediately fall about 72%.

Now, getting more aggressively optimistic on my earnings growth assumptions will make the situation better, but the assumptions have to be truly heroic to get to a 10% IRR at today's price. For instance, in scenario (2) I assume Cisco grows EPS at 54% for the next five years and then slows to normal market growth linearly by year eleven. Now, the IRR does get to 10%. However, instead of growing 5x faster than real GDP for 20 years, Cisco's real EPS now grows about 17x more than real GDP grows for 20 years.²⁷ Of course, besides leading to 20-year growth of mythological proportions, 54% per year

²⁵ To estimate each year's dividends I estimate a payout ratio and multiply by that year's earnings. The payout ratio I assume is based on the following function: $\text{payout}(t) = 10\% + 84\% * \text{payout}(t-1) - 38\% * \text{earnings growth}(t)$. Payouts above 100% or below 0% are set to that respective boundary. This function is empirically estimated based on the annual payout ratios and growth rates of the S&P 500 through time. It captures that payout ratios are slowly mean reverting, and that payout ratios are lower (often zero) for high growth companies. The function settles to a steady state long-term payout ratio of 50% at 6% nominal growth. The results of this paper are not very sensitive to this specification.

²⁶ Note, there are complicated issues about uncertainty that we do not address here. I assume that Cisco's earnings evolve steadily and deterministically, and I discount the cash flow to investors from these earnings at the constant IRR that equates the present value of this cash flow to the current price. I also assume that when analysts forecast 30% annual earnings growth for Cisco, they are forecasting that Cisco's earnings in 5 years will be 1.30^5 times their earnings today (it is not fully clear what analysts' are actually forecasting). This is a different, and more aggressive, earnings growth assumption than assuming that the average growth each year is 30% (which would lead to lower future earnings as variance in per year earnings growth lowers total compound growth).

²⁷ Of course, optimists can also just assume that real GDP grows faster than 3% for the next 20 years. However, even assuming more aggressive growth in real GDP, the required earnings growth for Cisco is still shocking. For instance, if real GDP grows at 5% for the next 20 years, instead of 17x faster, Cisco only has to grow 12x faster than GDP to reach a 10% IRR at today's prices. We will retain the assumption of long-term 3% real GDP growth through this book, though relaxing this assumption has a minimal impact at reasonable levels. At unreasonable levels, long-term phenomenal real GDP growth can perhaps save the day (and perhaps this is what is being assumed by the market).

is also well above their growth of the last 3 years, is way above the usually optimistic Wall Street estimates, and must be sustained for five full years going forward starting from today's huge base. Instead of assuming larger than 30% EPS growth over the next five years, I can get more optimistic by assuming that Cisco's above normal growth lasts longer. For instance, in scenario (3), instead of linearly declining to normal market EPS growth by year 11, instead I assume this decline occurs more slowly lasting until year 20. In this case, Cisco's IRR goes to 9.0% (still below the required amount), and I am now effectively assuming that Cisco grows real earnings for 20 years at a compound rate 13x real GDP growth.²⁸

In fact, my entire analysis may be way too kind to Cisco. Ignoring for a moment that 10% is probably an unrealistically high estimate, what if you actually told their investors that they should expect a 10% long-term return? If they believed you, I think many (perhaps most) would bolt for the door as they expect, require, and in fact demand, the 30-100% annual returns they have been receiving. It is a real paradox that many Cisco investors would laugh at you if you told them they were only going to make 10% per year going forward, yet you need exceptionally optimistic assumptions just to get to a 10% long-term expected return. Eventually, something has to give, as "long and strong" gives way to "long and wrong" ("long and strong" is one of the deeper pieces of analysis you will often find on Internet chat rooms devoted to growth stocks).

Bottom line, while rational people can disagree, I think the case against Cisco as a long-term investment is reasonably strong given today's prices. However, it is not nearly as strong as the case against the entire NASDAQ 100. The entire NASDAQ 100 looks very much like a slightly less extreme version of Cisco, and while this analysis can certainly be wrong for one company (though unlikely, Cisco could surprise us with sustained 54% growth or even more), it gets much less plausible to assume this type of long-term growth for an entire index of 100 large companies. Can it happen? Of course, anything can. Perhaps the CEOs of these 100 companies are all children of Lake Woebegone? But, we must ask whether it is rational for an entire market to be priced with this as the base case.

Let us contrast the analysis of Cisco, with analysis of an "old economy" stock like the Ford Motor Company (Ford is far from the only example, and like Cisco, is only meant as an example). Ford is assumed by Wall Street analysts to have 5-year earnings growth going forward of only 8.2%. Pretty anemic huh. However, they are also selling for a P/E vs. trailing earnings of about 8 (i.e., you pay 8x last year's earnings for Ford vs. 140x last years earnings for Cisco), and they have a current dividend yield of 4.3% (vs. a zero yield on Cisco). I make the same assumptions for Ford as for Cisco (i.e., they match Wall Street's growth expectations for 5 years, and then slow from 8.2% to 6% growth over

²⁸ I experimented with an alternative methodology. At the end of 20 years assume Cisco is selling for a 15 P/E and calculate the IRR over this period assuming you sell your stake then (i.e., no more infinite horizon). This methodology is much less stable, and more arbitrary, than that employed above. For instance, in our base case scenario (1) (10 year abnormal growth, 30% growth in the first 5 years) the IRR under this new method was 3.4% (vs. 7.5% in the full analysis), when assuming 54% growth for 5 years in scenario (2) the IRR was 10.5% (vs. 10.0% in the full analysis), and when assuming abnormal growth lasts for 20 years in scenario (3) the IRR was 8.5% (vs. 9.0% in the full analysis).

years 6-10, ultimately then growing at 6% in perpetuity along with the overall economy). This is scenario (1) in the following table:

Scenario	Ford's Growth over Different Years																IRR	20-Year Annualized Compound Growth	Multiple of GDP in 20 Years
	Year 1-5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Year 20			
(1)	8%	8%	7%	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	12.7%	6.8%	1.1
(2)	6%	6%	5%	5%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	10.5%	4.1%	0.7

Instead of the 7.4% IRR I estimated for Cisco, Ford's IRR is 12.7% in the base case scenario. Remember above when I tried to find how optimistic I had to get about Cisco's earnings to get to a 10% IRR, well for Ford the question is how pessimistic I need to be to get to 10%. In scenario (2) I assume Wall Street is wrong, and instead of 8.2% Ford only grows earnings at a nominal 6% for the next 5 years, linearly slows down from 6% to 3% during years 6 to 10, and then grows at a nominal 3% from year 11 onward. These assumptions mean Ford is matching real GDP growth for 5 years, slowly declining for years 6-10 to zero real growth (or 3% nominal growth), and then staying at zero real growth forever in a presumably growing economy. Well, at these assumptions, far more pessimistic than Wall Street's assumptions, Ford's IRR is 10.5%. In other words, to get Cisco (or similarly the entire NASDAQ 100) up to an IRR of 10% I have to be far more optimistic than Wall Street, and far more optimistic than seems economically reasonable. To get Ford down to near an IRR of 10%, I have to be far more pessimistic than Wall Street. Note, I am not favoring old economy Ford over new economy Cisco based only on price while ignoring growth. I give Cisco tremendous credit for amazing growth going forward, and penalized Ford harshly for sluggish growth going forward. By doing so, I acknowledged that in a real sense Cisco is the "future" and Ford is the "past." This analysis favors Ford (by an obscene margin) over Cisco not because of a myopic focus on price, but because of simple recognition that price matters, and the right amount to pay for growth is not unbounded. In other words, at these prices, Cisco might be the "future" when it comes to earnings growth, but in all likelihood, Ford is the "future" if one cares about long-term stock returns. Again, I only use Ford and Cisco as examples of a more general market phenomenon. Any one company or even industry segment, can possibly grow more (or less for Ford) than necessary to justify today's prices, but it is much more difficult for broad indices to achieve this.

It is easy to imagine a relatively new investor getting caught up in the exuberance of buying these stocks thinking that buying companies with great current earnings growth automatically means making a lot of money. Frankly, to various degrees, investors are often explicitly or implicitly told this by Wall Street and the financial media. Criticizing this new investor would probably be too harsh. However, one can certainly criticize the legion of "licensed" strategists/analysts out there who simply ignore the math. I do not think any of the bullish strategists and analysts would remain publicly bullish on the NASDAQ 100 while simultaneously predicting substantially below 10% long-term returns. On the other hand, I do not know many who would be willing to publicly predict that the earnings of Cisco, or far more unlikely the entire NASDAQ 100, will grow at 17x real GDP over the next 20 years, or that real GDP will grow at enormous rates for an extended period of time.²⁹ However, with only some small wiggle room on assumptions,

²⁹ To put this in perspective, currently, Cisco's trailing earnings are currently about 0.04% of nominal GDP, Microsoft's are about 0.09%, and GE's are about 0.11%. At 17x real GDP growth, with real GDP growing at 3% per

that is the mathematical choice. Yet, Cisco is on almost every “must own” recommended list I see. Go figure.

Let me remind the reader again that all of the above analysis of Cisco assumed (at least) that Wall Streets’ exceptionally optimistic earnings growth forecasts for the next five years do come to pass (and I added to the optimism by assuming the tremendous growth only slows gradually after year five). Even with these assumptions I still derive unacceptably low long-term expected returns. In other words, high earnings growth does not necessarily equal high long-term investment returns, and depending on the price paid, can certainly accompany low or negative returns. Let us now be more sober for a moment. What if things are not as optimistic as Wall Street forecasts? What if over the next 20 years Cisco, or the entire NASDAQ 100, posts growth rates below my very optimistic assumptions. In fact, history says this is the very likely outcome. Historically, studies have shown that the earnings of both fast and slow growing companies on average “regress to the mean” quicker than what is priced into the market, and as I mentioned earlier, Wall Street’s growth forecasts tend to be optimistic, and have little historical power for forecasting horizons past one or two years. Quoting Barton Biggs of Morgan Stanley in a recent missive (June 2000),

The big-cap, sacred-cow tech stocks in the U.S. and Europe have been nicked but not ravaged, and no one wants to take the risk of being out of them. The multiples of EBITDA, earnings and sales are so elevated on these marvelous companies that they have to be discounting compound earnings growth at 20–30% a year for at least the next five years. This would be a feat never before accomplished by companies of this size. In fact, Bernstein's studies show that, based on the history of the last 40 years, there is only one chance in about seven that a "recognized" high-growth tech stock can sustain that exalted status for five years, and only one chance in 14 for 10. "Dwell on the past and you will lose an eye. Ignore the past and you will lose both of them."

Though I am highly sympathetic to this more realistic outlook, I will not replace my optimistic assumptions with more realistic assumptions, as the IRRs I find with the optimistic assumptions are depressing enough. Suffice it to say that if growth is less than my very optimistic forecasts, given today’s prices for these companies, it will be very very bad. If the world turns out wonderfully and my optimistic forecasts are attained, it is merely very bad. Finally, if one is a super optimist, perhaps it is only bad.

I do not want to shout fire in a crowded NASDAQ market, but please make sure your smoke detector is working (and check where someone might be blowing this smoke).

year, Cisco’s earnings will be about 0.70% of GDP in 20 years. In other words, in percentage terms, Cisco’s earnings will be about 3x the current importance to the economy of Cisco, Microsoft, and GE combined.

“But I am A Really Long-term Investor”

It is instructive to examine my analysis³⁰ of Cisco further. I actually projected Cisco’s growth, and valued that growth over an infinite horizon. Under my assumptions, by buying at today’s price, you get an unacceptably low return over this period (I think we can all agree infinity is long-term). Often it is said that companies will “grow into their valuations” over the long-term. This is misguided. There is no concept of growing into it. Alternatively, an investor might say, “sure I see your valuation argument, but I’m young and have a long time horizon, so naturally I want growth stocks”. Well, unless they are Ponce De Leon, their time horizon is less than infinity. If the price is way too high relative to the long-term prospects (even if those prospects are great) then a long-term horizon does not save you. In a very real sense, at today’s prices, the world has it backward thinking that stocks are only safe if held for the long-term. If my analysis is correct, then a short-term investor may still do well (or poorly) as nobody knows what will happen in the short-term. However, if my analysis is correct, a long-term investor is in big trouble with a high probability, because in the long-term, irrational valuation loses.

“The Long-term Will Be O.K. As We Have Entered An Era of Sustained Spectacular Earnings Growth”

Unless long-term, non-transitory earnings growth is much stronger than historical experience, investors are currently faced with a difficult choice. Either they must believe that going forward the expected return on the stock market is far lower than history because market participants are generally content with this low return, or they must believe that we are going to have a significant drop in price (perhaps a quick crash, perhaps a protracted bear market) that will return prices to where expected returns are again attractive. Rather than face this uncomfortable choice there is another option, a loophole if you will. They can believe that long-term real earnings growth will be truly spectacular going forward, and thus stocks have an acceptable long-term expected return even at today’s prices. In this section I examine how realistic this hope is for the S&P 500, for which we have 125+ years of data, and what it means for long-term returns. Although lack of data does not permit a similar study the situation appears even grimmer for the growth/tech sector.

The trailing 1-year P/E of the S&P 500 is now approximately 30, and the IBES median forecast of the next five years nominal earnings growth for the S&P 500 is about 17% per annum (capitalization weighting the individual median forecasts³¹). Let us assume this

³⁰ When I say “my analysis” I must clarify. I carry out the analysis here, but internal rates of return and discounted cash flow analysis were hardly invented by me. On the other hand, I did invent the Internet.

³¹ This methodology is not perfect as capitalization weighting is not perfectly accurate for this task, but it will suffice. In fact, if all earnings were positive, I believe the right way to do this would be to weight the earnings growth rates by dollars of earnings not market capitalization. Because higher P/E firms are probably faster growers, weighting by market capitalization probably overstates the earnings growth of the entire index, and is another potential source of optimism in our approach. Unfortunately, when you hear the expected earnings growth of the market quoted by the financial media and Wall Street, while it is not clear exactly what they are doing, it is highly probably that they are using the biased high forecast. In fact, when they quote the trailing growth of the index, they most probably combine

growth occurs. Next, as in my earlier analysis of Cisco, let us assume that over the next 5 years (i.e., years 6-10) earnings growth linearly slows to ultimately reach an assumed long-term rate of 6% per year in year 11 and beyond (or about 3% real at today's approximately 3% inflation rate). Scenario (1) in the following table sums up these growth assumptions:

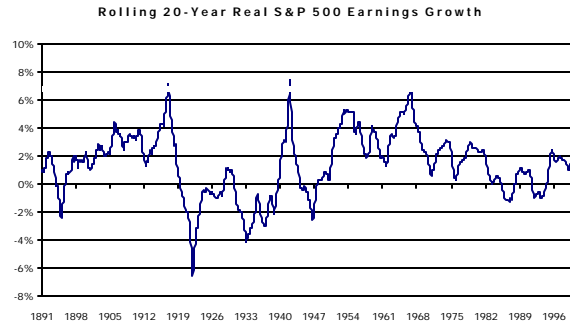
Scenario	S&P 500's Growth over Different Years																			IRR	20-Year Annualized Compound Growth	Multiple of GDP in 20 Years
	Year 1-5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Year 20						
(1)	17%	15%	13%	12%	10%	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	9.1%	10.0%	2.1
(2)	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	6.3%	4.5%	0.7
(3)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	7.7%	6.0%	1.0

These optimistic assumptions³² imply about a 10% nominal or 6.8% real compound per annum growth in S&P 500 earnings over the next 20 years. In turn, if this occurs, my model would estimate an IRR for the S&P 500 of just about 9%, or if inflation stays around 3%, a long-term real return of just about 6%. While a bit less than long-term historical experience, and perhaps less than investors today really expect and demand, this would still be a healthy long-term return. The next task is to see how reasonable this earnings forecast seems versus history. First, let us look at the history of real earnings growth for the S&P 500 using data from 1871-2000. The following figure plots the rolling prior 20-year compound per annum real earnings growth of the S&P 500 (the thick gray horizontal line represents 6.8% 20-year real earnings growth)³³:

this bias with that described in a later footnote (the substitution bias where they quote the trailing growth of firms in the index today, perhaps added specifically because of recent strong earnings growth, not the firms actually in the index over the period in question). In other words, there is a large chance that the headline growth numbers we hear for the market are perilously close to gibberish (though again, it is hard to know for certain how the quoted numbers are really calculated).

³² These assumptions are optimistic for many reasons. As mentioned earlier, historically analysts are overly optimistic with their five year growth forecasts. In addition, there is some statistical evidence that 5 year earnings growth is actually negatively autocorrelated, meaning that if earnings grow faster than trend for 5 years, all else equal we would guess slower than trend for the next five years. Thus, clearly my assumptions that the first five years match Wall Street's huge forecasts and that years 6-10 are still above normal are again, very optimistic. Other optimistic assumptions are explained in the text and other footnotes.

³³ This data series comes from Professor Robert Shiller's website. It is important to note that this data series represents the real earnings of the current S&P 500 firms each year. The 20-year growth of this series, is not the 20-year growth of the firms you would have bought at the start of each 20-year period. Since the S&P 500 replaces unsuccessful firms with successful firms, this is likely to bias the compound growth rates we calculated here to be higher than the growth rate of the actual firms in the S&P 500 at the start of each 20-year period. For instance, the July 5th Wall Street Journal (page C2) reported that last year's earnings growth for firms currently in the S&P 500 is expected to be 17% this quarter, but only 12% for the firms that comprised the S&P 500 one year ago. I do not know the extent of this bias through time, but it is yet another reason why this analysis, and in fact most public reports of the market's historical earnings growth, probably err on the side of being optimistically bullish. I should note that I am still looking into how S&P reports this data, and there is a small chance they somehow remove this potential bias in the historical data.

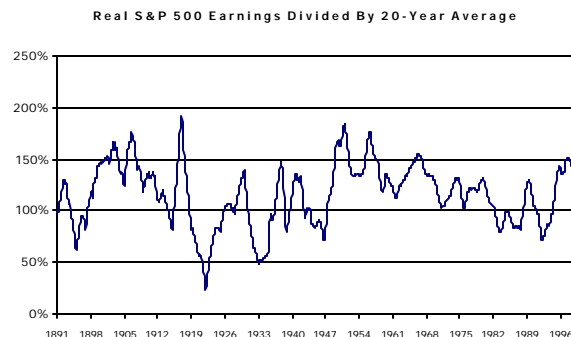


The average, maximum, and minimum, compound per annum growth rates for real S&P 500 earnings over the 1891-2000 and 1946-2000 periods are as follows:

Statistics for 20-year Growth of Real S&P 500 Earnings

1891-2000	
Compound Real Earnings Growth	1.4% ³⁴
Maximum Real 20-year Earnings Growth	7.5%
Minimum Real 20-year Earnings Growth	-6.6%
1946-2000	
Compound Real Earnings Growth	1.5%
Maximum Real 20-year Earnings Growth	6.8%
Minimum Real 20-year Earnings Growth	-1.3%

Going forward, the 20-year real compound growth rate implied by the prior assumptions was 6.8% per annum (the thick gray horizontal line in the graph). This means that if these assumptions pan out, the next 20 years (2001-2020) will about match the very best 20-year growth rates ever achieved. Now, what are the chances this actually occurs? Well, let us look at some more data. The following figure shows each year's real earnings divided by the average real earnings over the last 20 years:



³⁴ The numbers here are smaller than the numbers more commonly used as estimates of average annual real earnings growth for the stock market, since I report the average long-term compound growth not the arithmetic average growth. Variance in annual growth will cause the compound growth to be below the arithmetic average growth. For comparison, arithmetic average annual growth is around 3% over this period.

This figure can be interpreted as a measure of whether very recent earnings are strong or weak vs. the last 20 years (i.e., are we near a local high, low, or neither?). The average for this figure is 116% from 1891-2000, the maximum is 192% and the minimum is 24% (from 1946 on these figures are 123%, 184%, and 72% respectively). While not at a maximum, we can see that today's figure of 149% is impressive by historical standards. In other words, current earnings are well above their 20-year average as we have been experiencing relatively good times.

While strong current earnings growth certainly has been a good thing, it might be the case that extremely strong growth over the next 20 years is more difficult when starting from a high base, and far easier starting from depressed times. I test this hypothesis. The next table repeats the earlier table, but also includes these same statistics looking only at 20-year periods that began with earnings above the trailing 20-year average by at least 116%, and then by at least 149%. In other words, columns 3 and 4 examine only 20-year periods that started with current earnings above 20-year trend by at least an average amount (116%) and a large amount equal to today's value (149%):

Statistics for 20-year Real S&P 500 Earnings Growth

	All Periods	Starting at >116%	Starting at >149%
1891-2000			
Compound Real Earnings Growth	1.4%	0.5%	-0.6%
Maximum Real 20-year Earnings Growth	7.5%	4.0%	2.7%
Minimum Real 20-year Earnings Growth	-6.6%	-6.6%	-6.0%
1946-2000			
Compound Real Earnings Growth	1.5%	1.3%	0.9%
Maximum Real 20-year Earnings Growth	6.8%	4.0%	2.7%
Minimum Real 20-year Earnings Growth	-1.3%	-1.3%	-1.3%

The data shows that when earnings are starting from a very high base, it is much more difficult to achieve exceptional 20-year growth going forward.³⁵ Over the full period the maximum 20-year growth for real S&P 500 earnings was 7.5%, and 6.8% over the post-war period. Excluding the periods that started at below average earnings vs. 20-year trend (i.e., only including those 20-year periods starting with current earnings above 116% of 20-year average earnings), the average 20-year growth falls slightly, but the maximum achieved falls from 7.5% to 4.0%. This 4.0% figure is far below the 6.8% real growth on the S&P 500 we need going forward. In fact, going further and looking at column 4 on the far right, we see that when starting from as high a base as today (which occurs for about 20% of the 20-year periods historically) average real earnings growth is actually negative over the next 20 years (and only averages 0.9% post-war), and has never been greater than a maximum of 2.7%. Summarizing, achieving a 6.8% compound

³⁵ This result is not driven by large transitory components (real or measurement error) in one year earnings that bias that year up, and thus the next 20-year growth down. First, I lagged the earnings divided by 20-year average calculation by one year (in other words, I used one year old data on earnings divided by 20-year average earnings to decide if the current period was a high or low period) and the results were essentially unchanged. Next, I redefined this variable as the 3-year average of real earnings divided by the 20-year average, and again, results were very similar.

real growth rate going forward would match the best post-war 20-year period ever, and come very close to the best 20-year period in about 125 years. However, when starting from such a high base as today, the best 20-year real S&P 500 compound earnings growth rate for over 125 years has been only 2.7% per annum. All considered, when compared to history, compound real earnings growth over the next 20-years of 6.8% seems very unlikely. And remember, in the historically unlikely event it does occur, we only get to an IRR of just about 9% on the S&P 500.

It is worth dwelling on this a bit. Matching the best growth in history, a feat never close to attained when starting from good times, only gets you to mediocre long-term returns, almost assuredly below the inflated expectations of most investors today.

What happens if we bow to the evidence and relax these very optimistic growth assumptions? All of the analysis so far gives tremendous credence to analysts' 5 year forecasts of earnings growth, and then goes on to assume this above normal growth only slowly moves down to normal over years 6-10 (and even my assumption of what is normal is a high estimate vs. history). This is highly tenuous. For instance, Fama and French examine this issue in their work cited earlier and conclude that earnings and dividend growth are best approximated by a random walk, and thus the best guess of future growth in any year is simply long-term average growth. Similarly, Bogle (Journal of Portfolio Management, Summer 1995) advocates using the simple average earnings growth rate over the last thirty years to forecast the future. What happens if these authors are right? In other words, what happens if earnings growth going forward is not spectacular? Well, it is not pretty. Scenario (2) assumes a 1.5% percent compound real earnings growth rate (the historical average) for all future years and the IRR on the S&P 500 drops to 6.3%. Note, while it might seem pessimistic, real 20-year growth of 1.5% is above the post-war average growth rate of 0.9%, and way above the full-period average growth rate of -0.6%, when starting from very good times like today. The IRR in this scenario is below commercial paper, and below the real return available on inflation-protected government bonds. Going back to the more optimistic 3% growth rate ad infinitum in scenario (3), the IRR recovers to an anemic 7.7%. In other words, if Fama and French, and Bogle, and my historical analysis of earnings growth, have any validity, reasonably optimistic estimates of the current long-term expected return of the S&P 500 might fall between 6.3% and 7.7%. Compared to inflation-protected government bonds the risk-premium is negative or just a hair above zero. Note, I am still avoiding the more pessimistic, but historically reasonable, case that starting from such a high base as today the next 20-years will see below average earnings growth.

None of this is a proof that tremendous real earnings growth (6.8% per annum or higher) will not occur over the next 20 years. Furthermore, the evidence above has to be considered more anecdotal than statistical as we do not get to observe enough 20-year periods to make solid statistical assertions. One can certainly argue that despite the historical evidence, times are now so different that massive long-term earnings growth is possible. While this cannot be disproved, I would just mention two caveats. One, we, like everyone throughout history, have the hubris to think that the present is radically different than the past. The last 125 years have seen an incredibly impressive array of

technological advances, and all that is contained in the data above. Two, it is often difficult to remember how much things can change in 20 years. 20 years ago was 1980, high inflation and a deep recession made optimism a four letter word. 10 years ago we were just waking up to our false belief that Japan had found the answer and was going to rule the world (and own every Monet in existence). To think that because things feel (and are) very good now, we can forecast extreme unprecedented earnings growth for a full 20 years going forward, strikes me as very dicey. To make it the base case for pricing the entire stock market (and not even an exceptionally attractive base case), strikes me as very scary.

III. Creative Defenses for the Price of Stocks Today

“Fine, I See the Math, But I am Bullish Anyway Because Of ...”

What is the solution for the bullish analyst/strategist? They face a formidable dilemma. I first found that tremendously optimistic forecasts of long-term spectacular earnings growth are necessary to justify current stock prices (either that, or one must believe that investors are now perfectly happy with bond like returns on their equity investments). I then examined this possibility, and found that this spectacular sustained long-term real growth is highly unlikely going forward. This work was done on the broad market. The growth/tech sector is currently priced to even lower long-term returns despite using today’s super optimistic earnings forecasts (remember the Cisco analysis). For the growth/tech sector, Wall Street’s gigantic forecasts must actually be substantially exceeded before long-term returns become remotely acceptable. What is a bull supposed to do in the face of such mathematical torture?

Well, ignore the math of course! Just go ahead and set a high “price target” for one of a host of reasons. It is the paradox of this bull market that there is incredible focus on the short-term, all under the banner of long-term investing. Be bullish because the economy is currently great, because the Internet is the future (along with the children), because this quarter’s earnings are rising fast, because the Fed has to stop ruining the fun soon, because we are “oversold”, because earnings season will soon be upon us (or behind us), because summer’s here and the rallying is easy, because prices have recently dipped, because despite the jump in standard CPI the core rate is still benign (switch core and standard CPI as needed), because we are in a Goldilocks economy³⁶, because someone somewhere just “reiterated” a strong buy, because all the bad news we ever hear is “company specific”, because the earnings slowdown you heard about was only because parts and labor were not available not because sales are suffering³⁷, because the market is ready to put this Microsoft break-up stuff behind it, because we have reached a technical bottom, because this is a presidential election year, or, just because we are all having a good hair decade. But for God’s sake stay away from the math.³⁸

While it might seem more complicated than the above reasoning, the math boils down to evaluating stocks as you would the purchase of any private business. What is this

³⁶ In my version of the story the Goldilocks economy gets eaten by the bears.

³⁷ While probably better than having no customers, a shortage of parts and labor is a very big deal. Bottlenecks like these are part of the reason why extreme high earnings growth is very difficult to sustain over long periods, and thus these events should not be dismissed as a mere abundance of riches.

³⁸ Some analysts do claim to have valuation models that justify, say, a 100 P/E for a stock growing at 20% per year in a low inflation environment. The only way I can see this occurring is if you assume the 20% growth goes on for a really really long time (and far longer than I am willing to assume). Frankly, I just do not see how these strategists come up with assumptions that justify >100 P/Es on any stock other than one with a tiny market capitalization going through an exponential growth period or a distressed stock with temporarily near zero earnings. Other ways analysts try to analytically justify prices is through certain heuristic measures, for example the much discussed PEG ratio (the ratio of P/E to assumed growth – the lower the better). All of these measures are distorted ad hoc attempts to simplify IRR and discounted cash flow analysis. The PEG ratio suffers seriously from ambiguities in how long growth goes on, in whether a ratio is the right functional form to make this comparison, and in our lack of a benchmark for what constitutes a high or low number. As a quick one-stop measure perhaps the PEG ratio has use in relative value, but when it disagrees with thoughtful full analysis, it must be cast aside.

business worth in terms of the cash flow it will pay me over a long-horizon going forward? How does the value of this future cash flow compare to the price I must pay today? How does this compare with other alternative assets in terms of both expected return and risk? Note, this approach is not about what I can sell it for tomorrow, or next month, or next year.

Obviously, I am setting up a straw man as not all analyst/strategists brazenly ignore the math. Frankly, if an analyst does the math, but genuinely forecasts absolutely huge earnings growth, like the NASDAQ 100 growing 17x faster than real GDP growth for 20 years (and hence, eventually, hopefully, having dramatic growth in cash flow to shareholders) then I strongly disagree with them, but must respect their integrity and methodology. On the other hand, a bullish analyst who tells a story, but refuses to do the math, well, that is another thing entirely. This type of analyst is just focusing on the short-term (like those stories listed above) in order to avoid the uncomfortable unpopular conclusion that comes from the math. Personally, I wish this type of analyst would just come out and say, “I think earnings announcements and the Fed holding off are going to take this mania up a notch, so hop on board the momentum train”, as it would be more honest. But, of course, they cannot do that (obviously this would pose some problems as they all claim to be long-term focused). Instead, they go on TV or write a report, extol how great things are and what wonderful times we live in, list many of the reasons above, and never, ever, ever, touch the math. Why, because the math says that although things are wonderful, they are not in the ballpark of wonderful enough, and buying into a mania is not a good long-term decision.

I will leave it to the reader to form their own opinion about whether most bullish analysts truly have done the math and are willing to make the long-term forecasts needed to justify today’s prices, or are just spinning a short-term profitable yarn. As usual, I think my own opinion is obvious. However, please, when you watch a strategist talk bullish while presenting only short-term stories and vague references to how wonderful things are, and definitely not doing the math, at the very least be extremely cynical.

“We Recommend Stable Tech Stocks With Earnings, Not Speculative Internet Stuff”

Decrying the Internet bubble, while simultaneously advocating a flight to “safe” solid tech stocks with large and growing earnings is currently a very popular way to sound prudent and rational (i.e., avoid those stocks with no earnings) and aggressive (i.e., own lots of tech) at the same time. It is somewhat of the “in” opinion to have among strategists. Protect your reputation by being prudent, but do not prick the bubble your firm so depends upon. Neat trick. No need to give up the dream, just stick with the boys, and the groupthink, that got you there. Tech is the place to be, the driving force of the economy, you have to participate. Again, just do not do the math.

None of the analysis I have conducted in this book, or the stories I have been examining, have focused on Internet stocks. Often the Internet is mistaken for the entire stock market bubble (for those willing to call it a bubble). However, Internet stocks have little

to do with my ugly prognostications, or alternatively the extremely unlikely assumptions I find necessary to forecast good times for stocks going forward. Internet stocks provide a convenient scapegoat behind which to hide for those who want to avoid the math but still seem to prudently worry about valuation. In other words, if you want to look attractive, stand next to the truly ghastly. Again, given different and more aggressive assumptions, someone can disagree with my assertions about valuation. A strategist who recommends established big cap tech while eschewing the Internet, because he did the math and truly believes in phenomenal long-term earnings going forward for these companies, must be respected if not agreed with. However, do not let anyone avoid the math with this Internet trick.

Finally, in fairness I must say that a bearish strategist is in a real bind. A few years is not that long for a mania to last, but it can be career limiting or ending for a bearish strategist even if they are ultimately right. Thus, the pressure to appear bullish, by hook or by crook, in a mania must be acute. Steering your clients away from the most speculative, most dangerous stocks (i.e., perhaps the Internet), and maintaining your job, might appear to be the best course among difficult alternatives.

“The Days of Outsized Returns Are Over, Going Forward The Stock Market Will Return More Like the 10-12% It Has Throughout History”

Another version of this is simply saying that after years of outsized gains, the market is now “fairly valued”, leaving the impression of historically reasonable expected returns going forward but judiciously avoiding an explicit forecast. These comments are close cousins in spirit to decrying the Internet bubble while recommending big cap tech stocks. They sound prudent and sober, but are obviously still very bullish. Well, not to be a broken record, but please do the math! For the S&P 500 I found about a 9% long-term IRR using very very optimistic assumptions. When compared to the last 125 years I find that these assumptions have to be deemed unrealistic. Using more reasonable assumptions I find IRRs in the 6.3% to 7.7% range (effectively a negative or near zero risk-premium). In either case, this is not 10-12%. Looking at Cisco, and also extrapolating to the similarly priced NASDAQ 100, I find IRRs in the mid 7% range, based again on Wall Street’s very optimistic forecasts. Any less aggressively optimistic analysis would find expected returns on these growth stocks to be well below bonds and cash.

It sounds prudent to tell people to calm down, and not expect the heady gains of the past few years to continue (and in fact, this comment alone is prudent). Calling something “fairly valued” seems utterly reasonable (obviously those nuts screaming cheap or expensive are not reasonable). However, it is only the appearance of prudence and the absence of mathematics that explicitly or implicitly combines this sentiment with forecasts like a 10-12% return on the stock market going forward. Again, if a strategist wants to make this forecast, then please also include an incredibly optimistic forecast of sustained long-term earnings growth and an explanation of why it will occur. It is not

unreasonable to be an optimist, even an extreme one. However, it is unreasonable to skip the math in an effort to appear to be a prudent bull.

“We Have Just Lived Through A Bear Market”

Wall Street and the financial media would have us believe that having lived through the first half of 2000 we are all scarred grizzled veterans of a bear market. Implicitly, this means that stocks are beaten down, there are bargains everywhere, and the bubble has popped. That is, it is safe to go back in the water.

First, the analysis in this book has been done largely on prices holding near the end of this period. No convenient choosing of say, March 27th 2000 (the NASDAQ peak), was done here. If the very optimistic assumptions I have made earlier in the book are right, stocks are still priced way too high after the “bear market.”

Second, speaking of conveniently choosing March 27th 2000, it is the Knights of Bull who would have us focus on the drop from the peak. Focusing on peak to trough drops is certainly the most dramatic way to examine the market, and conveys the strongest impression of low prices and hence bargains. However it is not the most useful way to examine the market. Suffice it to say that stocks are approximately unchanged in price for the first six months of 2000, and way up in price over any reasonably longer period. This does not constitute a bear market, by any acceptable definition, no matter what even sillier heights they might have hit in-between.

With the exception of some pure Internet stocks, there has so far been no correction in broad market stock prices, rather there has been volatility, and a pause in the market's advance.³⁹ The fact that so many are so easily convinced that they have lived through major trauma, is perhaps one of the scarier indicators of how spoiled and unrealistic investors have become. But, like any feel good Freudian, Wall Street and the financial media are more than willing to put investors on the couch, tell them it is not their fault, and counsel them on dealing with their “pain.” Well, I certainly may be wrong about the valuation of the market today, but I am not wrong that the broad indices are about where they were six months ago⁴⁰, and much higher than any time further back.⁴¹ No pain, just a lot of volatility, whining (admittedly, half of it from me), and noise, ultimately, signifying nothing.

³⁹ I will focus on this more later, but there has also been little or no correction in stocks' relative pricing. While the Internet has come way down, for the first six months of 2000 the S&P/BARRA Growth index has still beaten the S&P/BARRA Value index.

⁴⁰ Specifically, the total return from 12/31/99 to 6/30/00 of the S&P 500 is -0.4% and of the NASDAQ 100 is +1.5% (source Bloomberg).

⁴¹ I do have to admit though, not everything is unchanged from six months ago. The Fed has sharply raised short-term interest rates, inflation seems to be stirring, and the economy seems to be slowing. However, we will see soon that the economy slowing is really good news.

“Tech Stocks Are Immune To Higher Interest Rates”

One of the main opponents of this expensive stock market has been rising interest rates. In defending the prices of technology stocks, many argue that interest rates really do not affect these stocks. This argument says that interest rates really only effect firms who finance themselves with bonds, or who’s business depends on the price of money (like a bank). Well, this is not true.

There are two main reasons why interest rates can affect stock prices. One reason is because a rise in real rates makes future cash flows worth less. A second reason is because a rise in real rates presumably can slow the economy, and firms’ earnings with it. Technology stocks should be immune to neither of these effects. Furthermore, they might in fact be very sensitive to both. One, because much of their growth is in the future, a rise in real discount rates should acutely affect their present value. Two, given how reliant their current pricing is on mammoth future earnings growth, any potential slowing of that growth should impact today’s stock prices, probably seriously. With valuations so excessive these stocks do not have much room for even a small slowdown. The term often used, but perhaps too mild, is “priced for perfection.” Simply put, tech stocks should be far from immune to the negative effects of higher interest rates.

A more difficult question is whether technology stocks are more or less sensitive to interest rates than so called “old economy” stocks. I have no definite answers here. Technology stocks are clearly more sensitive to the discount rate effect (longer dated cash flows), but perhaps (as many argue) less prone to an earnings slowdown as demand for their products is so strong. But again, given their valuations, any slowdown no matter how small might severely affect their stock prices. Also, one could certainly see much greater price pressure on tech companies in a slower economy (i.e., customers shopping around more). Frankly, I do not know how these opposing forces shake out.

One point I will address is the often heard idea that old economy stocks are more sensitive to interest rates since they finance themselves with bonds as opposed to the more equity biased technology stocks. The reasoning is that if rates rise, these firms will have to pay more in interest charges, and thus earnings will go down (note, as a side issue, this ignores that the firms can alter their capital structure – as one can presume tech companies have altered theirs towards equity as their cost of equity capital is so low). However, another effect is ignored. If you own a bond, and interest rates rise, you lose money, right? Well, if a firm has financed themselves with bonds, when interest rates rise, they should make money, right? The answer is yes, as they have shorted a bond. Think of a firm as a valuable set of assets (tangible and intangible). These assets are owned, literally divided up, by the stock and bond owners. Say interest rates rise, but for now, assume the assets maintain their value. Well, if the bonds go down in value, the equity has to go up! Simply put, they are short bonds, a declining asset.

On the other hand, there is a reason that old economy stocks may be more sensitive to interest rate hikes than technology (“new economy”) stocks. By issuing more bonds, the equity of old economy stocks becomes a more levered claim on their assets. Thus, if the

assets fall the same amount for technology stocks and old economy stocks, while ameliorated by the value of their bonds going down (as discussed above), we expect the value of the old economy stocks to fall more as they are a more levered claim on the falling assets. Of course, we would expect this effect for any change in asset value, and the fact that old economy stocks are generally less volatile than new economy stocks might make us doubt this theory.

Bottom line, I do not know which type of stock is more interest rate sensitive. However, I do believe that all theory, and empirical fact, says that both old and new economy stocks should generally (all-else-equal) fall as real rates rise. Sometimes this happens, but recently we have often seen a “rotation” from old to new economy as rates rise, that actually causes the new economy stocks to go up. The story is often that investors are “fleeing to the less interest rate sensitive technology stocks.” Amazingly, they rise in price as their fundamental value is almost undoubtedly falling. This is almost certainly the result of a host of forces that favor a “rotation” from one stock into another, rather than the selling of stocks for bonds and cash. For instance, equity mutual funds are loathe to own cash or bonds (ask Jeff Vinik) as they focus on “benchmark return/risk” not actual return/risk, individual investors do not want to give up the stock dream for boring cash or bonds, and Wall Street would much rather have you “rotate” than leave. To summarize, new or old economy stocks should (on average, and barring other news) go down as real interest rates rise. Which type should go down more, I do not know.⁴²

“The Market, and Tech in Particular, Will Rally As Soon As The Fed Stops Hiking”

I included this in my earlier list of short-term reasons to be bullish despite the math, but it is really worthy of its own section.

It is somewhat ironic that as I write this (June 2000) the stock market, and the growth/technology sector in particular, is rallying sharply on the prospects of slower economic growth, and thus a greater chance the Fed will stay their hand. Many strategists and forecasters are jumping on the bandwagon, predicting better times ahead as soon as the Fed stops. The stock market rally of 1995-1999 is often pointed to as example, as it commenced once the Fed stopped its rate hikes begun in February of 1994. Of course, this argument follows on the heels of many bulls telling us that tech stocks are not affected by interest rates (discussed above). Apparently, having failed at this immunity argument, we are now to believe that the natural state of the market is continuous massive rally, only briefly interrupted by a nasty man named Alan. I see several problems with assuming that the rally recommences as soon as the Fed stops.

First, the reason to fear Fed rate hikes is largely that they may succeed in slowing the economy and raise discount rates on future cash flows. If the Fed stops raising rates it is because they believe they have slowed the economy enough. We should not fear Fed

⁴² My favorite ridiculous comment of 1999 was when several analysts commented that Internet stocks should go up if rates rise, as they were sitting on a ton of cash whose yields would rise. I will not go through the math, but suffice it to say that whoever said this should be embarrassed. Well, at least these companies do not seem to have the problem of excess cash any more.

hikes as a cartoon monster or superstition, but for the real effects these hikes can cause. Thus, the current cheer resembles the old joke, “the operation was a success, but the patient died.” It is only long-term spectacular real earnings growth that can come close to justifying current stock prices, and that is not going to occur without very strong economic growth. Perhaps the hope is that the slowdown is short lived enough to stay the Fed’s hand, but not so much to really slow earnings, but then earnings will not pick up enough to stir up the Fed again, but somehow long-term earnings will still be huge enough to justify today’s prices. Then the porridge will be just right. Watching the bullish cheer an economic slow down at these price levels does feel like we have entered a different dimension of sight, sound, and mind.

Second, the comparison to 1994 is exceptionally dicey (as of course is any reasoning by singular historical example, including my earlier analogy to 1929). At the start of 1995 the P/E (using the Shiller data which I extended for a few months as his data ends in early 2000) of the S&P 500 was about 20, and now at the end of June of 2000 it is about 44. I do not know what else to say that could make it clearer that the analogy to 1994-95 is faulty beyond this approximately 120% increase in valuation. Again, there is nothing wrong with asserting that the market today is fairly valued or attractive. However, at the risk of boring even myself with repetition, it must be based on the math, long-term forecasts of earnings, dividends, and discount rates. To come to a bullish conclusion an analyst must be wildly optimistic in these forecasts. It seems clear that rising real rates and a slowing economy would reduce not enhance this optimism.

Wall Street, the financial media, etc., have all obscured the issue of whether the market, and growth/tech stocks in particular, are wildly overvalued, with the short-term issue (circa June 2000) of when or how much more the Fed will raise rates, how much the market will rally when they stop, and which stocks it will affect the most. I guess these stories are more fun to discuss than the math, both because they are simpler, and because they can lead to a bullish conclusion. Furthermore, these stories might or might not have short-term validity (the stories might be self-fulfilling or self-defeating in the short-term, who knows?). However, they are close to irrelevant to the long-term investor.

“Surely You’d Admit That All The Mergers & Acquisition Activity is Bullish?”

First, I admit nothing. However, the logic here is almost compelling. The idea is that merger mania might be a sign that companies find it more attractive to buy than build, meaning they think other companies are undervalued. Perhaps managers, closer to the ground, betting their own companies’ money, have a better perspective than any of us, and perhaps this all adds up to a very bullish verdict. As an example, many think the M&A boom in the 1980s was a response to equity values that by the early 1980s had gotten quite attractive vs. alternatives (like building something yourself). They believe the subsequent M&A boom was tied in with the 1980s bull market, and they may very well be right.

However, it seems that most of the mergers we hear about these days are stock for stock swaps. Now, I have not done a statistical study if this is true, and I do not know for certain if today differs markedly from the past. However, anecdotally, when you see a big merger, particularly in tech/telecom/Internet, it always seems to be one company swapping their stock for another's.

There is a time-honored idea in economics expressed as "Gresham's Law." The short way to describe it is "bad money drives out good." A classic example is a government on a precious metal standard, who then issues some coins with a lower mix of the precious metal, but still the same face value (i.e., a debased currency). While the government naively thinks consumers and companies will use the old and new coins interchangeably, what happens is that the old money (the good stuff) goes into mattresses, and the new money (the bad stuff) is the only thing used in circulation. So, the bad money drives out the good.

Now, imagine a company who knows their shares are tremendously overvalued, but so are their targets. What would an acquirer use for a merger? Well they would not use cash (good money) to buy something overvalued, rather they would use their stock (bad money). Just like consumers owning good money (the company's cash) and debased currency (the company's stock) the companies hoard the good money and spend the bad. Gresham's Law in action. In fact, for some companies, their very high assumed growth is actually intimately related to their assumed ability to grow by merger, buying up super expensive small competitors with their own super expensive stock. Neat idea. However, while I cannot prove it will fail, historically this type of strategy has been a bust since the firm of Ponzi merged with Scheme.

Why then are they doing these mergers if the assets they are buying are not undervalued? Well, many possible reasons. First, perhaps they really believe in the synergies the merger will bring. That is, the two companies are such a good fit that the combination will be worth more than the sum of the parts. Historically, it strikes me as the biggest real synergy in most mergers is laying off people and combining overlapping operations, and that does not seem to be the main driving force today. Rather, the synergies today are supposed to be about things like "networking effects" where hitting critical mass, bringing together diverse media, etc., all add in a non-linear way. Of course, the networking effects today may be real, and perhaps synergies are more important now than ever. On the other hand, historically the search for non-downsizing synergies through mergers has been only a bit more successful than the 1000+ year search for a way to turn lead into gold. However, rather than actually turning lead into gold, historically a far more successful endeavor has been convincing the market that years down the road you will do it. Finally, for the cynics out there (and in here), the funny-money merger boom might be at least partially driven by ego, empire building, the fact that mergers allow all kinds of creative accounting (how many firms now report superb earnings before merger costs?), and last but not least, the fat fees Wall Street makes on this activity.

While not directly on topic, I want to mention a few related corporate finance instances of bubble logic. How many firms have we seen planning to do an IPO, only to pull it when the market goes down? These firms never say, “we are waiting to sell until we get massively overvalued again”, but rather the answer is always that they are pulling the IPO because of “too much volatility”, as if they would have pulled it if the volatility were upward. Also, how many spin-offs do we see of high tech areas (e.g., wireless, Internet, media, etc.). The reasons given range from making it easier for Wall Street to value the company’s separate parts compared to the difficulty of valuing the whole (while they are at it, perhaps they could use smaller words and bigger type in their annual reports), and being able to compensate the people in these divisions better. My favorite explanation was an executive (unnamed) who said in a statement that his company is exploring a tracking stock or spin-off of portions of its phone operations to “allow more efficient management and focus on business customers.” Why on earth does this not apply to their divisions that are not so richly priced? I guess for these divisions inefficient management and a lack of focus on customers is fine. Of course, if the areas being spun-off are undervalued vs. the enormous growth opportunities (as the companies would undoubtedly tell you), the firms could just retain the divisions and implicitly reap the benefits of this undervaluation, as opposed to giving it away to investors. Again, a cynic might say that these firms know the stuff they are spinning off is massively overvalued, and are just getting out of Dodge (at least for the portion they sell).

Obviously, I have a fairly cynical view, but rather than bullish, much of the recent corporate finance activity strikes me as yet another indication we are in a mania.

“Valuation Schmaluation, If You Had Worried About Microsoft’s Valuation 15-Years Ago You Would Have Missed Making A Fortune”

The idea here is simple. If you care at all about valuation (I am not talking full fledged distressed value investing, but just caring about what you are paying for a stock) then you would have missed investing in Microsoft (and some others). Thus, it is silly to worry too much about valuation! Now, this logic is precisely the same as pointing to the winner of a lottery and declaring that lotteries are a good investment. Everyone remembers the lottery player who won, and the super expensive growth stock that was really worth the price (or much more). On the other hand, a host of losers (lotteries and expensive stocks) fade from memory. A large litany of academic work shows that systematic high P/E investing is not a great long-term idea. Common sense knows that lotteries are usually not positive expected return investments. You can invest in them either for entertainment, or desperation, but be prepared to lose. Arguing by singular example (or a small handful of them) based on what has happened ex post, is very dangerous. The success of Microsoft no more proves that valuation does not matter, than it proves dropping out of Harvard is always a great idea.⁴³

⁴³ Being from the University of Chicago I might just have to rethink this one.

“Do Not Try and Time the Market”

Well, one way to get people to ignore the current high price of the market is to explicitly tell them it is a sin to actively change their exposure to stocks. In fact, this is probably the most commonly heard piece of conventional wisdom on Wall Street. Avoid market timing! First, let me say that 99/100 times this is actually a very good piece of advice, and Wall Street probably does the investing community a service by popularizing it. The transactions costs, tax effects, and general unpredictability of the market, all make timing a dicey proposition for the individual and the professional. All else equal if I had to chose between giving a friend the above advice, or the opposite advice of “actively and often try and time the market” it is a no brainer, keep your hands off the portfolio.

However, let us put our cynical hats on for a moment. Wall Street (buy and sell side) is in the business of selling you stocks, and they do not want you leaving the market. Let us rephrase the advice “Do not Try and Time the Market” another way. How about, “Ignore the Price of What I am Selling You and Buy No Matter What.” If you think about it, it is the same advice. If your salesman told you to ignore the price of any other purchase than common stocks because “it will all work out over the very long-run”, you would run clutching your wallet. While perhaps usually good advice, “do not try to time the market” cannot mean ignore price entirely, as in the extreme this is obviously silly. However, making great long-term returns without any imposition of effort or vigilance (i.e., having to watch prices for opportunities or bubbles) is obviously a seductive siren’s call. If being price sensitive means timing the market, and timing the market is a cardinal sin⁴⁴, then prices have no anchor to reality. If one is looking for possible causes of a financial bubble, then the “ban” on market timing must be a prime candidate.

In fact, the most common reasons Wall Street gives us for avoiding market timing are quite silly (the good reasons are listed above). Even if they lead to good outcomes, silly reasons should not be tolerated (we should not have to fool ourselves into doing what is right). Let us talk about two of the more common anti-market timing rationales.

Reason #1: If you timed the market and managed to only miss the few best days for the market, you give back all the positive returns of stocks while retaining most of the risk. This argument is found everywhere (mutual fund ads, stories in the media, advice from financial planners, etc.). It seems every firm has their own version of this parable.⁴⁵ The numbers are supposed to shock you, and on the face of it they do. You do not have to miss many of the best days to lose a lot of the return from being invested in stocks. However, this is really a very silly argument. First, it postulates a very wacky, extreme market timing strategy. Even those people who do try and time the market probably do not do it by going to all cash from 100% equities for just a few select single days. After postulating this ridiculous strategy, those who advance this line of reasoning against market timing then make the minor assumption that one then gets this timing pathologically wrong by choosing amongst the thousands of possible days, the literally

⁴⁴ Remember, the first step towards quitting market timing, is admitting you have a problem. Seeking help from a higher power also does not hurt (I do not mean Alan Greenspan).

⁴⁵ In particular, sometimes months are used instead of days.

worst possible ones to be out of the market. The analyst doing this exercise is then shocked, shocked to discover that pursuing this crazy extreme market timing strategy, and getting it astoundingly wrong, appears to seriously hurt returns (and is also shocked, shocked to discover gambling is going on in the market). Interestingly if one carries out these calculations assuming one only avoids the worst days for the market (the opposite of the normal calculation), long-term returns are increased by a similarly dramatic amount. This is not shocking, and fair. If one pursues an extreme strategy the consequences are high but relatively symmetric. Essentially, this argument against timing constitutes some very silly and intentionally selective mathematics, paradoxically supporting some good advice.

Reason #2: Even if you have perfectly terrible market timing, that is, investing your savings for the year on the worst possible day each year (i.e., the high day for the market that year), if you keep investing over a long horizon you still do much better than someone who might have much better market timing (i.e., investing on the low day for the year) but was in the market for a shorter time than you. Thus, the refrain is, “it is not the market timing, but time in the market that counts.” This argument is more mathematical trickery. Where reason #1 used a market timing strategy that is way too extreme, reason #2 uses one that is way too tame. Assuming terrible market timing (investing on the worst day of the year) sounds pretty bad, but the only market timing going on here is on the new investment. The main portfolio (i.e., the compounded value of all old investments) is still invested in the market for the long-term, and very quickly the returns on this main portfolio come to dominate the timing done on the relatively small annual investments. I do not think that stocks must win over any long-term, but they certainly have done great over the period these tests are run over. Thus even with terrible market timing (on the relatively tiny additional investment each year) the person in the market longer generally won. Essentially, we are comparing someone in the market for a longer period but doing a tiny amount of terrible market timing, to someone in the market shorter doing a tiny amount of great market timing. Because the market itself was so strong over this period, and because the amount of true market timing was so tiny, the effect of being in the market for longer dominates. This is not really a test of market timing at all, but a restatement of how wonderful it has been to be invested in this bull market. Earlier, I talked about the long-run argument for stocks, and this is a subject for legitimate debate. However, adding literally a smidgen of market timing to this long-run argument, and discovering it does not matter much, is not exciting news, and is again, misleading mathematics.

What is really amusing is when you realize that reason #1 and reason #2 are the exact opposite in spirit and are often mentioned together or at least by the same firm! #1 says do not time the market because the consequences to a misstep are so severe, and #2 says do not bother because the consequences are so miniscule.

What do I think about market timing? Well first, it is generally a bad idea because it is very hard to forecast short-term market movements, and transactions costs and taxes (for taxable investors) will kill you. Second, I think it is very important to distinguish the short-term from the long-term. Perhaps some have effective systems for short-term

timing, perhaps not. I am reasonably cynical about the prospects, and thus, without substantial evidence to the contrary, would generally avoid short-term timing. However, over longer term horizons, I do think making conscious portfolio shifts based on the relative attractiveness of different asset classes can make sense, and especially so when extremes are reached. Note, Wall Street, home of “Do Not Try and Time the Market”, implicitly agrees as their strategists are all running around with their changing recommendations for how much stocks, bonds, and cash to own. Looking ahead now, I have no idea what will happen over the short-term. However, over the longer term, it seems pretty clear that either (a) the risk-premium on stocks has permanently come way down, or (b) people are in for a very rude awakening when they realize they do not like holding stocks with very low expected returns, and prices then will sharply fall. Furthermore, I think this analysis applies particularly harshly to the growth/tech sector of the market. I do not know when it will happen, and nobody should ever be certain they are right over any horizon, but either way it looks like a pretty good bet to lighten up on equities now (this does not mean sell them all or go short). That is long-term market timing, and I think done occasionally in moderation it can make sense.⁴⁶

“Dips Are Not to Be Feared, But Are A Buying Opportunity”

Ah, to buy on the dips, one of the most hallowed activities of the last few years. First, I had to put this one after “Do not Try and Time the Market” as often the same firm, and sometimes the same person at that firm, will give you both pieces of advice. That seems pretty contradictory to me, as buying on the dips is pure short-term market timing at its finest.

Some will argue that dip buying is not short-term market timing as they are simply looking when to enter a long-term investment. It is a common refrain to hear even bulls say they are rooting for the market to dip, “as they have cash to put to work.” However, one must ask them what they are doing with the cash until they get their dip to buy? Clearly they believe that the money should be in stocks long-term, and they always have the option of investing now. If they think it is a good idea to hold some money back waiting for a dip, then they are forecasting the stock market’s expected risk-adjusted return between now and the end of the dip to be below their alternative (presumably cash or bonds). It is 100% certain that there will be a dip eventually. But, in a long-term rising market (as every bull believes in) the dip might very well occur after the investor has suffered a large opportunity cost from sitting in cash waiting for it. In other words, in a long-term rising market, today’s prices might never be seen again, even after some future dip. Thus, someone holding cash waiting for a dip is forecasting that this will not happen to them, and that some time in the near future prices will be lower than they are today. In other words, they are forecasting the short-term attractiveness of the market. I could not think of a better definition of market timing.

⁴⁶ This might be a good time to mention that there is nothing necessarily wrong with being short-term. Short-term strategies, and short-term momentum strategies in particular, might have validity (see for instance Jegadeesh and Titman (Journal of Finance, March 1993) and Asness (AQR Capital Management working paper, 1999)). However, these strategies are probably not very applicable to the average investor, and tend to go away or become wildly unstable if too many try to follow them. Clearly the majority of us should be focused on the long-term.

Now, if you just look at the success of buying dips in isolation, you will find it works as buying in general has worked for a long while. However, to evaluate if there is any content to the idea of buying dips, as opposed to just buying, you must show that after dips it is a better time than normal to buy (i.e., that it is an effective type of short-term market timing). You must show that what you gain or lose from being on the sidelines waiting for a dip, is more than made up for by your extra returns after buying a dip. Otherwise, you are just arguing again to invest more in stocks (an interesting, but separate argument). Although buying the dips is a simple short-term market timing strategy, I have not seen it analyzed as such (i.e., fairly judging whether can you do better buying the dips than an equivalently risky strategy) and I would be interested in seeing such a study (it might even work).

In my opinion, too many dip buyers think they are in fact value players, only their valuation model is not based on P/Es or IRRs. Their valuation model consists of “if a stock or market has dipped below its all-time high, it is cheap!!” This “buy the dip” mentality may indeed have contributed to the stability of equities we have seen for a few years as any dip is quickly erased. If permanent, it could mean equities really are less risky going forward (and also that their expected returns really are permanently lower). On the other hand, if only temporary, much like an infection not quite killed by an antibiotic, every dip that comes roaring back might make things far worse in the end.

Finally, if I hear one more person refer to buying a 200 P/E stock, that is up 200% in the last year, but is down 5% from its closing high two days ago, as “bargain hunting”, I might have to start doing some hunting of my own.

“We Have Heard the Bears Wrongly Scream ‘Over-valued’ for So Long Now”

Finally, failing all else, we can forget arguing the merits and just laugh at the bearish for being wrong for so long. Well, as you might guess, there are several logical flaws with this plan (but, of course, it can still be pursued for pure entertainment purposes).

It has really not been that long. It was only in December of 1997 that P/Es (from my first figure) crossed their former high of September of 1929, and in fact only in January of 1995 when they crossed and remained above 20. While 3-5 years may seem like a very long time (it certainly does to me), it is not. In terms of markets, 3-5 years is a blip of time. One can certainly argue with the thesis that equities are overvalued, but a legitimate argument is not “you have been saying this for three years now.” If one believes that we are in a bubble, then that argument simply uses the mania to justify itself. Argue the merits of the case going forward, but not the recent returns, as over short periods, returns are basically random. Furthermore, once you admit the possibility that the stock market can become overvalued, it becomes very difficult to discuss what limits there are on this overvaluation (again, short-term market timing is difficult). Neither the bulls nor the bears, if things should turn their way for only a short period, should point to recent returns as an indication that they are right regarding valuation.

“OK, So If You’re So Smart, Why Doesn’t This Bubble Pop?”

This is a darn good question. The prior section made it clear that it is incorrect to justify current stock prices simply by deriding the bears as being wrong so far. However, this should not let a bear off the hook either. Turning it around, while the bulls should do the math to justify their beliefs, a bear who believes the market is priced irrationally high should have a theory about why such irrationality can persist for so long. Barring such a theory, it is probably prudent to assume the market knows more than you do, and that stock prices today are rational. Of course, not surprisingly, I do have such a theory.

Actually, I borrowed the theory. An article called “The Limits of Arbitrage” by Shleifer and Vishny (Journal of Financial Economics, 1995) sheds some light on why irrationality can last. The article is complex, but essentially the authors postulate a true arbitrage situation, one in which you are guaranteed to make a risk-free return. However, the authors also postulate some real world complications, namely mark-to-market and bankruptcy risk. Meaning, because of interim fluctuations, you will not necessarily be around to see your arbitrage through to a successful conclusion. The authors go on to make the point that in the real world, even a true arbitrage is not necessarily instantly eliminated because of these risks. Now, to apply this to our question, imagine for a moment that somehow you privately knew for certain that the real return of the stock market would be negative over the next 20 years. What would you do now?

Well, if you run a mutual fund you might very well stay fully invested. Imagine you sell stocks and raise a significant amount of cash and the bubble expands still further (obviously a very real possibility over short-horizons, even if you know the next 20 years will be poor for stocks). When this happens, the marketplace has been quick to punish the under-invested mutual fund manager. However, imagine you do not raise cash and the market declines sharply. Well, you are in the pack, and while your industry might suffer, you will not necessarily suffer relatively (and we all seem to care at least as much about relative as absolute suffering).

If you run an endowment or pension fund you also might not raise that much cash. Much like a mutual fund’s shareholders, an endowment’s board does not have a 20-year time horizon. You will be evaluated at a far shorter frequency. If you are right, and a crash ensues, clearly you will be rewarded. But, if the mania rolls on, in a year or two you will find yourself out of a job, and branded a “maverick” (there is an actual term called maverick-risk). If you are right in the short-term, you get a pat on the back and maybe a little something extra in your envelope, but if you are wrong, back to the career drawing board. It is easy to see how even if you possessed a 20-year crystal ball, it might be difficult to act upon this knowledge (of course, you could always hope the crash does not happen for 19 years and 364 days, and then act swiftly and confidently with 24 hours to go).

If you are a sell-side strategist, or worse, a broker, then the incentives to stay bullish are probably more acute. Is there anyone who truly thinks that even the certain knowledge that stocks are priced to offer poor 20-year returns would turn the brokerage crowd bearish? If so, you have more faith than I. This is not necessarily a knock on their morals, but a knock on the incentives and asymmetric loss functions (a geek term for punishing them more for being bearish and wrong, than for being bullish and wrong) we as a group provide them.

Even if you are an individual investor, amazingly, you might still do little with your funds. 20 years is a long time. The mania can certainly continue in the short- to medium-term, and perhaps you think you can time when to get out? Worse, if it does go on who wants to admit to their friends at cocktail parties that they are missing the party. While this sounds extreme, and probably is, by no means is it certain that individuals, even given this distant foreknowledge, would immediately shed their equities.

Now, let us make the example more realistic and acknowledge that nobody knows for certain what will happen over 20 years, just that the odds are now far worse for equities than normal. Also, add that there is a large cadre of the marketplace seduced by the many fallacies we describe who seem to continue buying no matter what happens. It is quite easy to see how the prospect of poor long-term equity returns could have little immediate effect. Given the strong belief that equities will underperform inflation for the long-term, the rational thing, and the only act of a prudent fiduciary, would be to at least lighten your equity exposure. However, if it were realistic to think that “career risk”, “maverick risk”, and “asymmetric loss functions” might stay your hand even in a certain world, they certainly can stop you cold in an uncertain one. Frankly, all considering, it is quite easy to see irrationality persisting (and on some days hard to see it ending). Unfortunately, it seems very possible that we are all just doing a “dance macabre”, gentlemen and fiduciaries all, waiting for the disaster we know is coming to strike, so we can all go down together.

Of course, the only bright spot is that the inability of many to act on long-term knowledge, even if relatively certain, only increases the long-term benefit to those who can act.

IV. Growth vs. Value Investing

“You Will Be O.K., Just Stick to Buying Great Companies”

This quote is related to the earnings growth = stock return fallacy I examined earlier, but because of its simplicity, is perhaps more widespread. A great company is clearly worth more than a crappy one (pardon the technical jargon). Recognizing a great company before the market does is clearly a way to get rich. However, buying a great company after the market knows about it is at best a wash if the market prices things rationally, and could be a negative if, as history (and academic study) seem to show, investors systematically overpay for perceived greatness. Looking at the long-term data (the longest data I have seen is for 1927-1999), and even including the last few years, value investing, or buying out of favor companies selling for cheap prices, actually outperforms buying expensive companies perceived to be “great.” For instance, looking at data from 1929 to 1997, Davis, Fama, and French (Journal of Finance, forthcoming 2000) found that firms selling for higher prices (they defined higher prices in terms of the price-to-book ratio) on average underperformed those firms selling for lower prices. Presumably the higher priced firms were perceived to be “greater” than the cheap firms at the time. Similarly, Lakonishok, Shleifer, and Vishny (Journal of Finance, December 1994) found that firms priced expensively, and firms whose sales have been growing relatively quickly, on average make poorer investments than those firms not priced for greatness, or growing as fast. These examples are a drop in the bucket as there is a great body of literature on this topic, most of which finds that investing in cheap, slow growing “not great” firms has generally beaten investing in expensive fast growing “great” firms over the long haul.⁴⁷

As always, any systematic strategy can have poor performance for periods of time (the last two years for instance has seen a great victory for investing in expensive firms). However, at the very least, the historical evidence is that you should not be able to beat the market simply by buying companies generally thought to be great. The simple lesson is that price matters! Please watch carefully as many investors and analysts love to discuss how “great” a company is, but again, do not want to do the math. This does not mean you should not pay up for growth or greatness, but it does mean you better be wary of the price you are paying and know that historically investors have probably paid up too much.

Finally, I have actually heard it said, by individuals and on occasion by recognized experts, that there are certain great companies you “have to own at any price.” Well,

⁴⁷ While the researchers generally agree that investments in “great” firms have lost out over the long haul to cheaper firms, they do argue over why. Some argue that investors in expensive firms are making a mistake and over-extrapolating recent success too far into the future, and thus pay too much for these firms. Others argue that investors might not actually be overpaying for perceived greatness, rather, they might be willing to accept a lower expected return on these companies as perhaps these companies are less risky than their “non-great” counterparts. See Fama and French (Journal of Finance, June 1992) and Lakonishok, Shleifer, and Vishny (cited above) for two sides of this debate. Finally, some argue that the entire result itself is an accident of the data, and will not necessarily hold up going forward. See Black (Journal of Portfolio Management, Fall 1993) for an example of this point of view. In my opinion, this last argument might be difficult to support now that researchers have found the same effect in many countries, and in previously unexamined U.S. data from 1927-1963.

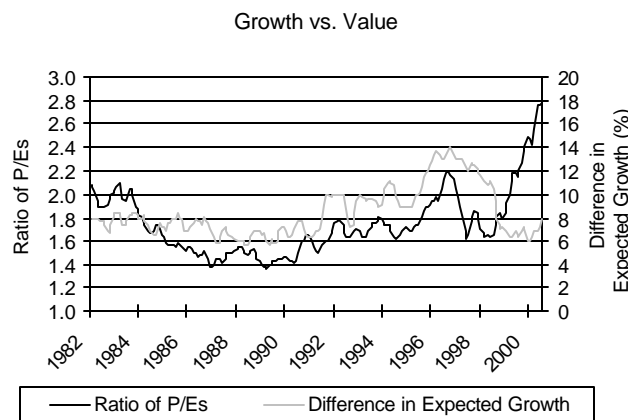
hopefully only once in this book will I dip from sarcasm to outright rudeness, but that is a dangerously foolish statement. If you hear someone say it, run screaming. Better yet, sell them something.

“Value Stocks Are Dinosaurs, I Would Steer Clear Of Them”

Alright, you got me. This quote is really the same as the prior one, just coming at it from the other side. However, it does give me a sneaky chance to examine this issue in more depth.

For several years now value stocks (cheap stocks perceived to have problems, poor growth opportunities, or exposure to some painful risk factor) have generally underperformed growth stocks (fast growing expensive stocks perceived to be “great” companies). Despite the long-term evidence that the opposite is true, many make the simple forecast that this trend will continue. Here I examine the medium-term prospects for value vs. growth using fundamentals, not simple extrapolation of what has been happening lately.⁴⁸

In a recent study, Asness, Friedman, Krail, and Liew⁴⁹ (Journal of Portfolio Management, Spring 2000) try to build a model to forecast the medium-term returns of value vs. growth stocks. I will follow a similar methodology. First, I form stocks into five groups based on how expensive they are, taking care to make sure each industry is relatively evenly represented in each fifth (so I am not just examining tech vs. everything else, but cheap vs. expensive stocks within each industry). Examining the top one fifth (the most expensive growth stocks) vs. the bottom one fifth (the cheapest value stocks) I produce the following figure (ending 6/30/2000)⁵⁰:



The dark line in the figure is the P/E of the median growth stock divided by the P/E of the median value stock. It is measured using the scale on the left, and obviously is always

⁴⁸ Also, see Laurence Siegel and John Alexander “The Future of Value Investing” (forthcoming in The Journal of Investing, 2000) for an excellent review of value’s history, and a study of the forward looking prospects.

⁴⁹ Hereafter my worthy co-authors will be obnoxiously referred to as “et al.”

⁵⁰ For presentation purposes, all numbers in this figure are quarterly moving averages.

greater than 1.0 (i.e., by construction growth stocks are always priced more expensively than value stocks). However, there is great variance in this number, and in particular note that recently it is at historical highs. In other words, growth is currently priced more expensively vs. value (by a large margin) than at any time over the last 20 years.

Now, the light line in the figure is the difference in expected (IBES median) 5-year earnings growth of the most expensive stocks (growth stocks) vs. the cheapest stocks (value stocks). Using the scale on the right we see that this differential is always positive, ranging from about 6% to as much as 14%. In other words, growth stocks are always expected to outgrow value stocks. Like the ratio of the P/Es, this number also varies through time. Sometimes growth stocks are expected to outgrow value by a large margin, and sometimes the expected margin is smaller. Now, if the reader will only cover up the last two years (oh, if only I could really do that) they will see that while not perfect, these two measures (the ratio of P/Es, and the differential in expected growth) do seem to move together. This is entirely rational. When the market is expecting growth stocks to outgrow value by more than usual, they have historically been priced more expensively than usual. What about the last two years? Well, lately the relationship seems to have broken down. Growth stocks are far more expensive than ever (for the 20 or so years I examine), but are not expected by Wall Street to outgrow value by more than usual.

What is the bottom line? Asness et al. first find, like other researchers, that on average value (by their definition) has defeated growth over these 20 or so years. However, this victory was by no means uniform or consistent. They found the best time for value vs. growth was when growth was the most expensive (i.e., the dark line in the above figure was high) but not giving up too much expected earnings growth (i.e., the light line in the above figure was not high). Furthermore, they found that this model was surprisingly powerful for forecasting value vs. growth at horizons of one year. Of the two effects, the relative valuation levels (dark line) matters more, but both matter. As of now we have a situation where value is priced incredibly cheaply vs. growth by historical standards. However, the valuation differential is not being ameliorated by higher than normal growth expectations.⁵¹ Thus, the Asness et al. model forecasts that the expected return for value stocks is currently far greater than the expected return for growth stocks (and greater than anytime over the last 20 years). While recent value performance has been the worst of times, this model is now forecasting the best of times for the relative returns of value stocks going forward. Like most reasonable models, this forecast is made with far more confidence for medium-term time horizons (say 1-3 years) than for the short-term (say less than 1 year).

There are caveats of course. It is possible that the Asness et al. model is missing something that would justify the current relative price of growth vs. value stocks. Perhaps Wall Street analysts' 5-year forecasts, for some reason, do not express the

⁵¹ Chan, Karceski, and Lakonishok (Working paper, March 2000) look at this in an alternative (and interesting) way. While Asness et al. look at IBES forecasts of future earnings growth, Chan et al. look at actual past growth in operating performance. However, while the approach is different, the answer is the same. They find that past growth in operating performance cannot explain the recent performance of growth vs. value stocks. Furthermore, they conclude "...the assumptions about the sustainability of high growth needed to justify large growth stocks' relative valuations are quite bold."

analysts' true optimism regarding the future earnings of growth vs. value companies. Or, perhaps the analysts do not get it, and the market is correctly pricing far larger and longer excess earnings for growth vs. value compared to what the analysts think will occur. Perhaps neither value investors, nor Wall Street analysts understand today's economy, but the little guy does.

Well, here I will apply a version of Occam's Razor, the idea that the simplest explanation is often correct. Value historically beats growth on average (for at least the 75 years or so we can examine it). Currently, value (as Asness et al. define it) is cheaper than it has ever been, but is giving up far less expected earnings growth than you would normally expect to see at these price differentials. While we can, and should, explore all kinds of stories that might justify this pricing, perhaps the simplest explanation is that history, and the above model, is correct. Perhaps investing in value stocks right now just looks a heck of lot better than investing in growth stocks. Recent popular discourse has made many of the investing fallacies I study more common than ever (e.g., earnings growth = stock return, great companies necessarily make great investments, price does not matter if you are long-term, etc.). All of these fallacies favor the broad market, and growth stocks in particular. While by no means a certainty, the prevalence of these fallacies makes it easier to believe that growth stocks are currently extremely overpriced vs. value stocks. In summary, which of the following is a simpler explanation? First, that value, which wins on average, looks much cheaper than ever today, and using Wall Street's own earnings forecasts is not worse vs. growth than normal, is being rationally shunned by investors who have their own, deeper and better forecasts of long-term earnings. Or second, that investors are caught up in a momentum driven mania, or afraid of being trampled by it, making value currently a historic opportunity for someone with even a medium-term outlook. As usual, our opinion (mine and Occam's) is obvious.

V. Miscellaneous Examples of Bubble Logic

“Technological Advances Make the Market Safer Today”

I want to switch gears now and talk a bit about the mechanical workings of the market itself. It is a common refrain that the individual in the market is made safer today because of the speed at which he/she can gather information and trade. I think this is mostly a myth. I think the myth comes from the fact that many investors believe that in the event of a crisis they can get out. I think many, implicitly or explicitly, know that they own some very overvalued securities, but, they are comfortable because the immediacy of information gathering, and the ability to trade near instantaneously, makes many feel they can nimbly avoid the bad times. In other words, there is an illusion of control.

However, what is missed is that near everyone possesses this same technological “advantage”, and that getting out of the market before a crisis is a zero sum game. For anyone who gets out, someone has to get in. Put more graphically, in the aggregate, when the \$#@! hits the fan, nobody gets out alive. Hearing about bad news quickly on a financial news cable station, or being able to trade immediately in your Ameritrade account, might make you a winner if you are the first, but there is a loser on the other side. If the market is way overvalued in the aggregate the ability to get instantaneous information, and the ability to trade on it quickly, is irrelevant for everything but the distribution of who gets killed.

To be balanced, I have to say that one hypothesis I must give credence to is that technology has led to a more informed investing populace, and a more informed investing populace is a more educated investing populace is a more stable and less prone to panic investing populace. Now, I give credence to this because it sounds plausible and I cannot refute it. It is possible that people are just more patient investors now, partially because of technology, and that the market is safer for this reason (i.e., from a change in psychology and education levels brought about by technology, not the real safety effects of the technology itself). However, to play devil’s advocate, there really is no evidence for this, and what anecdotal evidence there is probably comes more from investors embracing the long-run argument for equities and a dip buying philosophy, than any technological edge. To be extreme, I defy anyone to spend any time on an Internet bulletin board related to stocks and then believe these people are making the market more rational (as a bear, the nicest thing I have been called on these boards is moron).

Finally, let us talk specifically about the on-line trading of one’s own account. I do not know if many of you readers have played video poker in Las Vegas (or anywhere). I have, and it is addicting. It is addicting despite the fact that you lose over any reasonable length period (i.e., sit more than an hour or two and 9/10 times you are walking away poorer). Now, imagine video poker where the odds were in your favor. That is, all the little bells and buttons and buzzers were still there providing the instant feedback and fun, but instead of losing you got richer. If Vegas was like this, you would have to pry people out of their seats with the jaws of life. People would bring bedpans so they did not have

to give up their seats. This form of video poker would laugh at crack cocaine as the ultimate addiction. In my view, this is precisely what on-line trading has become over the last several years (with perhaps some lessons taught only very recently, and not necessarily learned). This is just my opinion, but I think it is very plausible that these “crackhead” traders might be an important part of a multi-year bidding frenzy taking stock prices well past the rational (and I will not even dwell on the paradoxical fact that this bull market, carried on the back of the long-term argument for equities, has spawned a subculture of high turnover day traders). In sum, it is highly arguable whether technological advances have made the market safer, and it may well be that the opposite has occurred.⁵²

“Stock Splits Are A Great Buying Opportunity”

First, a joke. I am stealing this from somewhere (I do not remember where), but what is the best “pricing model” for an Internet stock? Well, at \$50 it is cheap, at \$100 it is fair value, but at \$200 it is cheap again as it is about to split 4:1.

I am not going to insult my readers, and myself, by explaining for too long that a stock split is a paper transaction that means next to nothing. I am not going to dwell on the fact that when I overhear conversations about stocks, often times what is generating excitement is that a split might occur, or has just occurred.⁵³ I will mention that the companies splitting their shares know that for some reason people care a lot about this event, and the cynical among us might notice stock splits of late corresponding to times the company is just aching for some good news (and for some reason manipulating reported earnings is more difficult than usual).

Finally, let us not dwell on the fact that some investors have beepers to alert them when a stock is splitting, as such knowledge can only make us into misanthropes.

“You Can Believe Our Advertising”

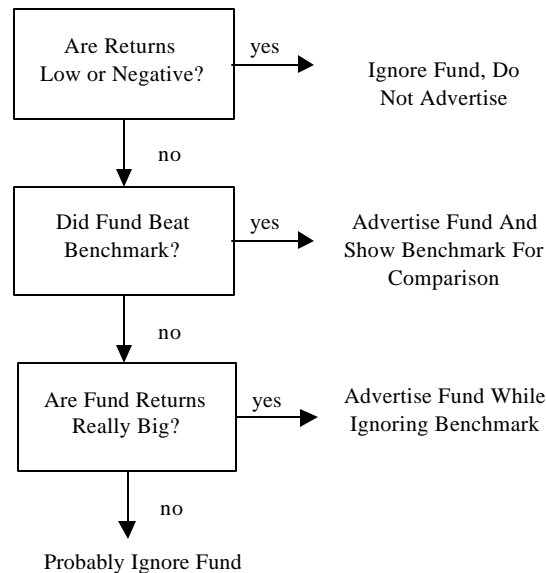
Another interesting characteristic of the bubble is how many mutual fund ads we have to read lately advertising triple digit returns. It is interesting to examine what mutual funds get advertised, and contrast that with the reasonably well established empirical fact that the average actively managed mutual fund underperforms the market.

I thought I might shed a little light on this subject by discussing my “formal” model for how a money manager decides which mutual funds to advertise (obviously, I am speaking in generalities as not all firms do this). Remember, mutual funds almost all

⁵² Robert Shiller advances related, and much more fleshed out, arguments in Irrational Exuberance (and since he came first, obviously my thoughts were greatly influenced by his work).

⁵³ There is some academic evidence that a strategy of buying after a split might have validity (it is difficult to disentangle these results from other momentum trading strategies). However, while some self-fulfilling success might occur, the tiny statistical excess returns documented in academic studies are clearly not what all the excitement is about.

have benchmarks (passively managed indices representing their style which the funds are supposed to beat) so companies have three options: (1) do not advertise the fund, (2) advertise the fund without mentioning the benchmark, or (3) advertise the fund and show performance vs. the benchmark. My model for how this decision is made is the following (with the time horizon being approximately the last year):



Step one is obvious, if the fund has done poorly do not advertise it. Step two, if the fund beat the benchmark and has done well in absolute terms, then definitely advertise it and show it vs. the benchmark. Step three, if the fund has failed vs. the benchmark, but is doing very well in absolute terms, advertise it and leave out the benchmark! This happens all the time, and it is a good bet when you see a fund advertised with a good track record, but no benchmark present, the fund underperformed their benchmark. That is especially prevalent now with so many growth funds posting excellent results, but many not beating growth and NASDAQ/technology benchmarks. Not too many ads for value funds these days are there (even if they beat the benchmark)?

Why should you care about this selective advertising? Well, several reasons. One, there is only a tiny amount of evidence that winning mutual funds continue to win.⁵⁴ Thus, the proposition of just investing in the funds that have done well recently is very dicey. Two, by only examining the ads you get a very skewed view of how active management does vs. passive management, and how the broad market has done in general. A pretty big decision for an individual is whether they should go with index funds or actively managed funds (or some combination), and while the weight of the evidence seems to be in favor of index funds, selective advertising can definitely push you the other way. Of course, all of this begs the question of why there is a cottage industry of magazines, web sites, and consultants, devoted to telling you which mutual funds are winning lately? I cannot explain that, but then again, I also cannot explain why the newspaper keeps publishing my horoscope.⁵⁵

⁵⁴ See Carhart (Journal of Finance, March 1997).

⁵⁵ Unfortunately so far, mine keeps saying “short more.”

Finally, I see nothing really wrong with the fund industry's advertising practices. There is hardly a business in the world that insists on pushing its ugly tough-to-sell products as hard as its attractive ones. Furthermore, if investors insist on shunning anything doing poorly recently, and buying only recent winners, it would be very unfair to blame only the fund companies for the selective advertising practices I discuss. They should not be required to tilt at windmills. My only point, and the implicit point of many of my observations, is that investors should know this practice occurs and use that knowledge when making their decisions.

"It is Different This Time"

Welcome to the Granddaddy of them all. It is different this time, and the old rules (e.g., valuation) do not apply. Oh yes, the cast of characters is indeed different this time. The Internet, the on-line investor, the 401K, and so on, are all relatively recent developments. Frankly, it is always different all the time. However, what is the same is far more important than what is different. Earnings and dividends still matter. All else equal, paying more for a stock or stock market must reduce your expected return. The forces of competition still exist making limitless profit growth an unlikely event. In essence, A is A, math still works.

Of all the differences this time, the one I keep thinking about is that on a host of scales, we have never, ever, seen broad market stock prices (or growth vs. value prices) near this high. We are in uncharted territory, and if there is the slightest slip, or even the slightest failure to excel in an unprecedented manner, the long-run will not save us. Yes, come to think of it, perhaps we should be careful what we wish for, as if it really is different this time, it might not be a good thing.

Instead of "It is different this time", I prefer the French *Plus ca change, plus c'est la meme chose*.⁵⁶

⁵⁶ Meaning, "The more things change, the more they remain the same." After holding out this long, the bubble has finally driven me to quote the French.

VI. Conclusion

Reading this book, one might conclude that I am anti-Wall Street. Nothing could be further from the truth. There is not one government regulation I would offer to fix any of the above. I believe in caveat emptor, and I believe Wall Street is, and should be allowed to be run as a business, selling a product. Furthermore, I strongly believe that we are all far better off with a free and unfettered Wall Street pursuing profits. In fact, it is one of our system's biggest advantages. Even if there are abuses (some of which I detail) I think the alternatives are uniformly worse. I simply believe it is very important for investors to recognize that Wall Street is not an independent source of academic research, rather they are a manufacturer with a huge vested interest in supporting their product. I also think it must be recognized that a host of financial media (e.g., financial T.V. networks, the latest personal finance magazine each week, etc.) are also much better off in an ongoing bull market, and perhaps act with a slant towards perpetuating this state.⁵⁷ We all act in our own interest and probably with a bias (intended or not) towards arguments that benefit us.⁵⁸ This book is no exception, and thus I do not condemn this activity, I simply point it out, and analyze some of the logic that flows from these observations. I come to the conclusion that these various forms of "bubble logic" have in all likelihood contributed to, or even led to, a situation where stocks are dangerously expensive.

The question of whether we are currently in the grip of a gigantic financial bubble, particularly in the growth/tech sector where I argue many investors have mistaken earnings growth for expected return and great companies for great investments, makes the issues I discuss of no small consequence to our collective prosperity. Put simply, there are really three possibilities for the broad market (with all three being more extreme for the growth/tech sector),

- 1) Investors understand and are now comfortable with a very low expected return on the stock market going forward.
- 2) We are in for an exceptionally long period of exceptionally high growth in real earnings that justifies today's market prices.
- 3) Most investors are not really thinking about either 1) or 2), but are engaged in wishful thinking, believing in hype and slogans, focused on irrelevant short-term stories, or forced to be in stocks by circumstance (e.g., many mutual fund managers), and all this is coming together causing a massive financial bubble. If true, this bubble can only end with a tremendous stock market crash, or a very long period of stagnation.

Earlier in this book I argued strongly that 1) and 2) are highly unlikely. Paraphrasing Sherlock Holmes, "when you eliminate the impossible, the improbable must be true." While "impossible" is far too strong a word, my rejection of 1) and 2) unfortunately leaves 3) as my favored candidate. In fact, while one is never able to prove an assertion

⁵⁷ One can imagine the chief of a financial news network telling a nay saying photographer not to worry, "you provide the pictures, I'll provide the bull market."

⁵⁸ Note, I think this bias occurs naturally and tacitly, I am not a conspiracy theorist. Alan Greenspan, Abby Cohen, and Colonel Sanders, are probably not meeting together in Geneva to plot the bubble's continued expansion over a bucket of extra crispy.

about the economy or the stock market as would a logician, when one does the math, the overvaluation of the market, and of the growth/tech sector in particular, is the closest thing to a proof we will probably ever see. Unless we see 20-year growth for the S&P far far in excess of anything ever seen for 125 years starting from similar good times, long-term S&P returns become quite ugly. If we do see such unprecedented growth, the long-term returns become merely acceptable. For growth/tech, if we do see future growth in-line with Wall Street's gigantic and unprecedented expectations, the long-term return to today's buy-and-hold investor is still exceptionally poor. If we go past perfection, and assume mythological growth for the entire growth/tech market, long-term returns might then achieve mediocrity. Yet, this math is still ignored, and short-term stories, greed, and ignorance still prevail.

I do think more voluntary intellectual honesty on many of the points of this book would benefit Wall Street's customers, and ultimately (perhaps not short-term, but long-term) Wall Street itself. Nevertheless, it is difficult for Wall Street to suddenly sound a siren call of warning when it is not what investors want to hear. It is far easier to focus on a bevy of distracting and ultimately irrelevant short-term phenomena (e.g., the Fed is stopping!, earnings this quarter are great!), rather than the math. However, the short-term matters little, and the long-term is too important a thing to be left to bubble logic.

Appendix I – Internal Rate of Return (IRR)

TBD