

Looking for Bubbles Part One: A Statistical Approach

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Looking for Bubbles Part Two: A Sentimental Approach

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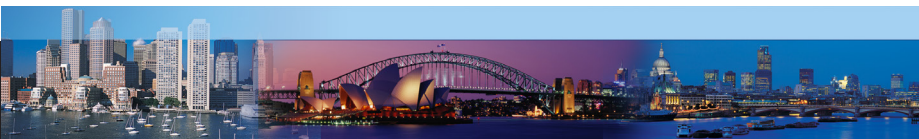


In Defense of Risk Aversion

Ben Inker

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Looking for Bubbles Part One: A Statistical Approach

Jeremy Grantham



Lots of \$58 million dogs around.

It is a sensible expectation that reasonable long-term value investors will endure pain in a bubble. It is almost a rule. The pain will be psychological and will come from looking like an old fuddy-duddy... looking as if you have lost your way in the new golden era where some important things, which you have obviously missed, are different this time. For professionals this psychological pain will also come from loss of client respect, which always hurts, and loss of peer group respect, which can be irritating.

In truth there is nothing much that we can do about this problem. Value investors must, as always, invest exclusively on long-term values and long-term risks. We must always build our portfolios from the best mix of these two characteristics. Therefore there is simply no alternative to standing our ground and taking it on the chin when crazy markets get even crazier. Our consolation will be in knowing that we will win in the end whereas if we start jumping around on other non-value considerations, who knows what might happen?

On the other hand, it is perhaps useful to be familiar with the various aspects of bubbles that may arrive to trouble us. It is in this spirit that this quarterly letter is written: to better prepare prudent investors for the probable future pain so that they can more easily process it and be less likely to do something foolish.

Edward Chancellor, my friend and colleague, who is an expert on bubbles and manias (and who foolishly is leaving GMO to write a book on Chinese troubles that I can't wait to read) has contributed the twin piece to mine, which concentrates on the less quantitative aspects of this and typical bubbles.

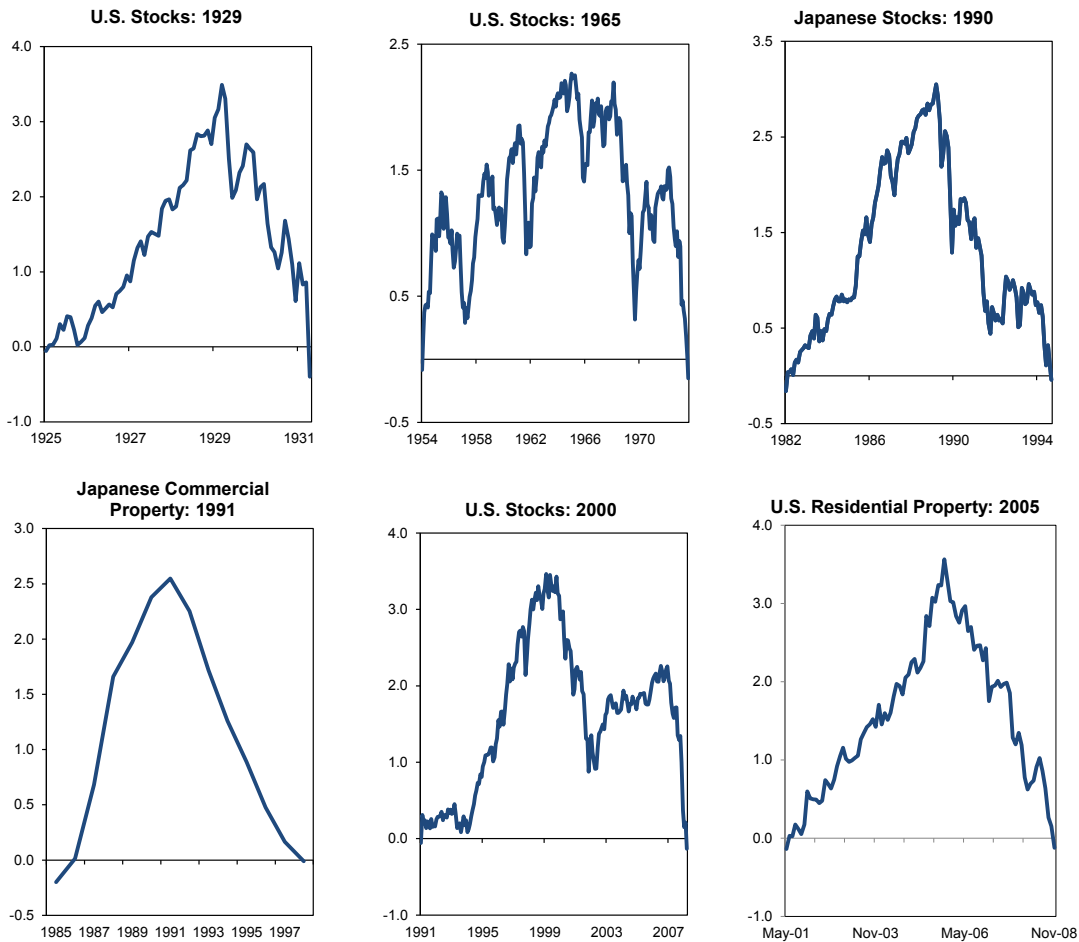
What is a bubble? Seventeen years ago in 1997, when GMO was already fighting what was to become the biggest equity bubble in U.S. history, we realized that we needed to define bubbles. By mid-1997 the price earnings ratio on the S&P 500 was drawing level to the peaks of 1929 and 1965 – around 21 times earnings – and we had the difficult task of trying to persuade institutional investors that times were pretty dangerous. We wanted to prove that most bubbles had ended badly. In 1997, the data we had seemed to show that all bubbles, major bubbles anyway, had ended very badly: all 28 major bubbles we identified had eventually retreated all the way back to the original trend that had existed prior to each bubble, a very tough standard indeed.

Having plenty of trained quants back then, it was no time before it was suggested that a two-standard-deviation (or 2-sigma) event might be a useful boundary definition for a bubble. In a normally distributed world, a 2-sigma event would occur every 44 years.

GMO has spent a lot of time during the last 17 years making a considerable review of minor bubbles as well as the 28 major ones that we covered originally in 1997. One thing was clear from the 330 examples we had studied: 2-sigma events in our real world have tended to occur not every 44 years, but about every 31 years. This was quite a bit closer to the 44 years of a random world than we originally would have guessed given that the world is fat-tailed but, frankly, it is convenient: once every 31 years, which would be a longish career in investing, feels like it perfectly fits the title of “bubble.”

In my opinion, time has been kind to this definition in the intervening 17 years. A 2-sigma event now seems to me to be perfectly reasonable even if I have to admit it is completely arbitrary. Having a useful and practical definition of a bubble is important for I have come to believe that the forming and bursting of the great investment bubbles are by far the most important things that happen in investing. So, how do the great events of the past score on this 2-sigma definition? The six most important asset bubbles in modern times (in my opinion) are shown in Exhibit 1 and, as you can see, each of them qualifies on the 2-sigma definition, although the 1965-72 peak, known in the trade then as the “Nifty-Fifty” event, did so by a modest margin. This event fell short in providing the usual good examples of extreme investment craziness. Perhaps, though, the very definition of the Nifty Fifty as “one decision stocks” may have qualified it, with one extremely crazy theme substituting for many smaller ones, for “one decision stocks” were so named because you only had to make one decision: to buy. These stocks were generally believed then to be so superior that once bought they would be held for life. (Most, like Coca-Cola and Merck, stood the test of time well enough, but unfortunately several then unchallengeable examples like Eastman Kodak and Polaroid went the way of all flesh, or all film.)

Exhibit 1: The Six Most Important Asset Bubbles in Modern Times

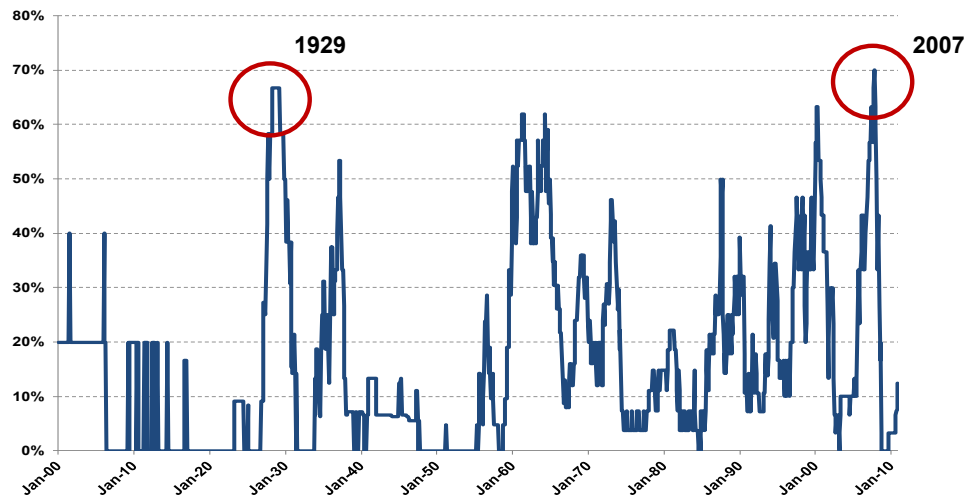


Source: GMO, Global Financial Data

There is one very important event that influenced our lives, financial and otherwise: 2008. The U.S. housing market leaped past 2-sigma all the way to 3.5-sigma (a 1 in 5,000-year event!). The U.S. equity market, though, was overshadowed by the then recent record bubble of 2000, although it still made it to a 2-sigma event on some definitions. But what was unique about 2008 was the near universality of its asset class overpricing: every equity market, almost all real estate markets (Japan and Germany abstained), and, of course, a fully-fledged bubble in oil and many other commodities. The GMO Quarterly of April 2007 (“It’s Everywhere, in Everything: The First Truly Global Bubble”) started out: “From Indian antiquities to Chinese modern art; from land in Panama to Mayfair; from forestry, infrastructure, and the junkiest bonds to mundane blue chips; it’s bubble time.” But it took until last month for the penny to drop about how to make the point statistically. Using just the 40 countries for whom we have the best long-term equity data, we asked how many of these markets have been over one standard deviation at any given time together and Exhibit 2 provides the answer: that in 2008 a higher percentage of the 40 equity markets were over that hurdle (a 1-sigma is the kind of event that occurs about once every six years in a random world) than ever before in our data, which starts in 1925. Interestingly, 1929 came

the closest. I must say I had not at all expected that. I have been carrying the quite false impression for almost 50 years that 1929 was overwhelmingly a U.S. market event, although I knew the crash was more universal. However, 2008 in contrast is unique in other ways too – in 1929, the housing market was more or less normal and the commodity markets were curiously very depressed.

Exhibit 2: Percentage of Global Stock Markets >1 Sigma

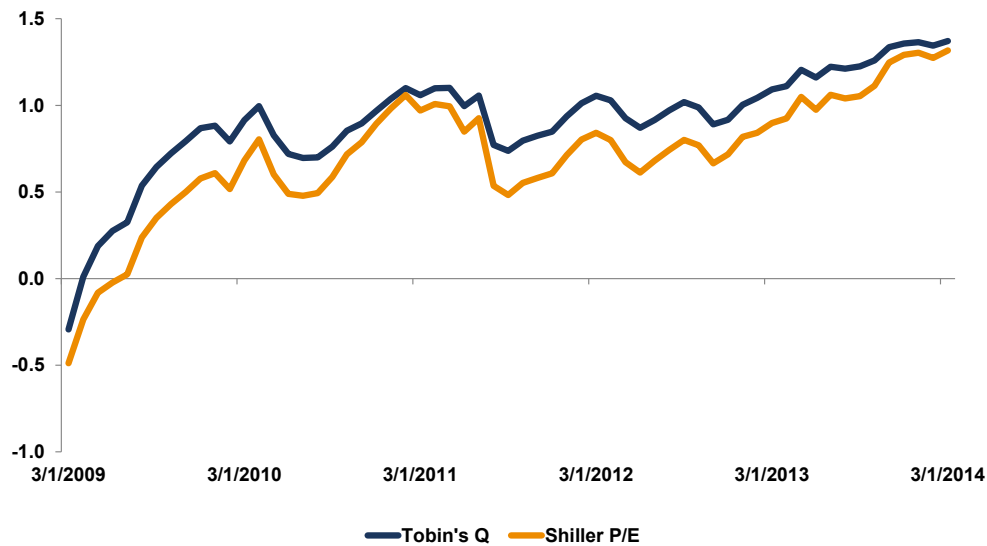


Source: GMO

So 2008, particularly if you can imagine adding real estate and commodities, was indeed a true global asset bubble, being the most extreme collective outlier in not just 30 years, but in at least the 88 years of our data and probably forever, given the much lower correlations of earlier times.

Thus, all the earlier major bubbles passed our 2-sigma test with flying colors. So now, to get to the nub, what about today? Well, statistically, Exhibit 3 reveals that we are far off the pace still on both of the two most reliable indicators of value: Tobin’s Q (price to replacement cost) and Shiller P/E (current price to the last 10 years of inflation-adjusted earnings). Both were only about a 1.4-sigma event at the end of March. (This is admittedly because the hurdle has been increased by the recent remarkable Greenspan bubbles of 2000 and a generally overpriced last 16 years.) To get to 2-sigma in our current congenitally overstimulated world would take a move in the S&P 500 to 2,250. And you can guess the next question we should look at: how likely is such a level this time? And this in turn brings me once again to take a look at the driving force behind the recent clutch of bubbles: the Greenspan Put, perhaps better described these days as the “Greenspan-Bernanke-Yellen Put,” because they have all three rowed the same boat so happily and enthusiastically for so many years.

Exhibit 3: U.S. Stocks – Standard Deviations from Normal

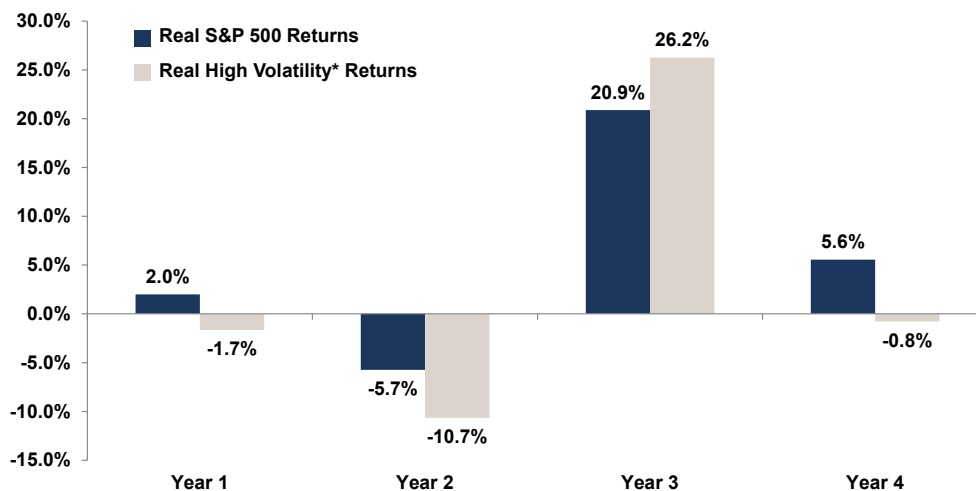


Source: GMO, Global Financial Data

The Greenspan Put (and the Presidential Cycle, of Course!)

The power of the Fed to move equity markets in particular is best demonstrated by the Presidential Cycle. Exhibit 4 shows the average of the four years since 1964 for the S&P 500 and the quarter of the market cap that is the most volatile. Admittedly, you've seen it before, but it is remarkable. Exhibit 5 shows the results since 1964 of just holding from the start of the third year (on October 1) and selling at the end of April. In 7 months you make almost all the return of the 48-month cycle! And in case you think this is only a U.S. effect, take a look at Exhibit 6, which shows the effect on overseas markets. Again you have seen this before, but really! That the U.K. market moves more on the Fed cycle than we do! Never underestimate the influence of the Fed. Even in Japan!

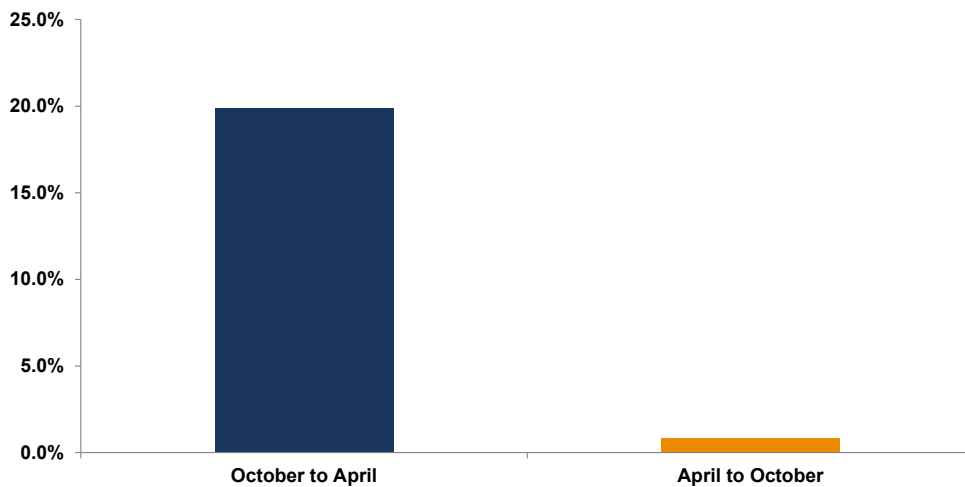
Exhibit 4: The Struggle For Year 3 – Exogenous Shocks vs. Ben Bernanke (Presidential Cycle 1964-2013)



* Returns to a cap-weighted portfolio of the quartile of U.S. equities with the highest trailing 60-day daily volatility.

Source: Global Financial Data, GMO, as of 12/31/13

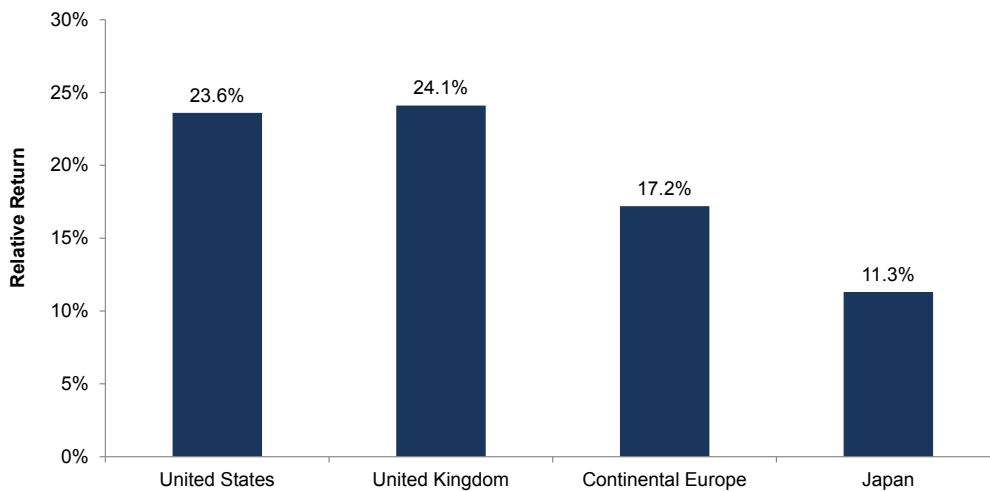
Exhibit 5: Average Year 3 Real S&P 500 Return by Season – October to April, April to October



Source: Global Financial Data, 1932-2013

Exhibit 6: World Wide Reverberations of U.S. Presidential Cycle

Third year of local markets relative to their average: 1964-2010



Source: Global Financial Data, as of 9/30/10

Yet, my colleague Nick Nanda and I could never really find the murder weapon. Interest rates and measures of money supply did move in the expected way, but by such tiny amounts it seemed preposterous that such modest moves could affect anything. So what does cause this extraordinary stock market effect? The data and logic strongly suggest that it is moral hazard. Enough professionals hear and understand the subtext of the Fed's message: if you speculate in year one and two and something goes wrong, you are on your own. But in years three and four, and especially three, we at the Fed will do whatever we can to bail you out in a crisis. And long before Greenspan – that ultimate Pied Piper who appeared to lead not the rats but perhaps the pigs – astute

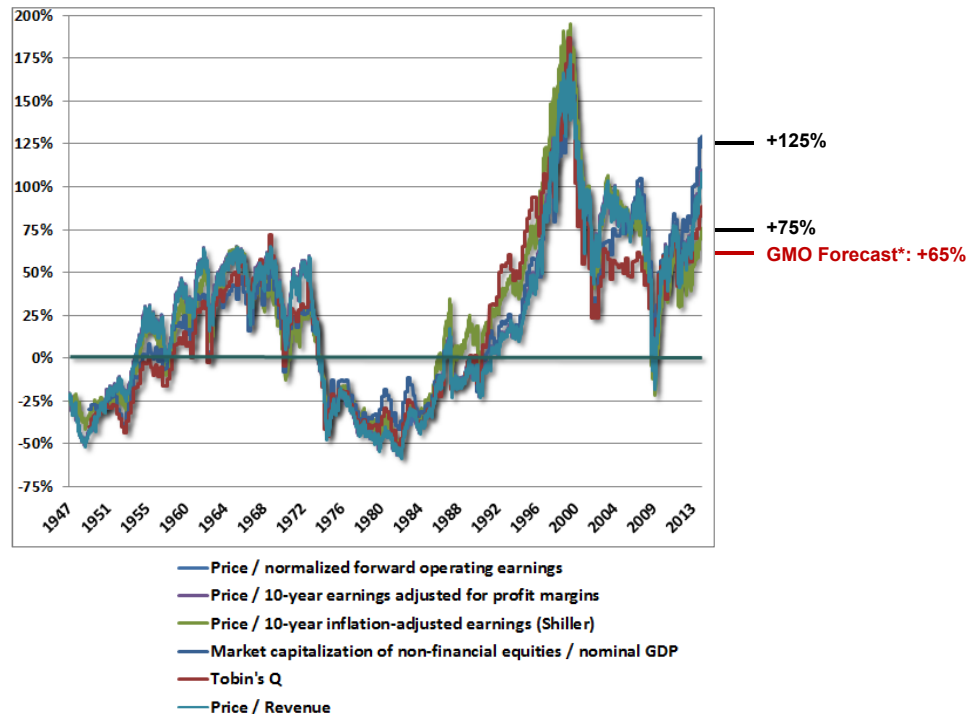
market players heard the message. So how much more they must have listened as the piping got louder and louder and the promises were more and more often delivered on in the Greenspan era. Thus, the bond market was resuscitated after it stumbled in 1994 and then the Asian crisis and the LTCM crisis, the latter of which might well have brought down one or two Goldman Sachs if the market had been left to its own devices. By then Greenspan was spelling out what the Put really amounted to clearly and unashamedly: he would not interfere with bubbles but he would try to reduce the pain of bubbles breaking – to protect speculators who had rolled the dice too enthusiastically and lost. This promise was to be repeated more and more clearly until Bernanke was even bragging of his influence on pushing up asset prices. But Greenspan, back in LTCM days, was just getting warmed up. He threw lots of money at the Y2K scare, just in case, and, most critically, as the great Tech Bubble broke he led the cavalry to the rescue and stopped the U.S. market from even hitting its trend line. Previous equity bubbles, despite being smaller than 2000, had each crossed below trend and stayed there for years. This time, in 2002 the market merely reached a low that was still 10% over trend before doubling once again. By now aggressive and astute investors were openly discussing the remarkable gift – to speculators – of the Fed’s asymmetric promises. Not surprisingly, many of these speculators became increasingly willing to roll the dice more often each time. And the tour de force was still waiting: the bailout of the great housing and commodity-induced economic collapse, aka The Global Financial Crisis, and its twin, The Great Bailout. Despite the painful and unexpectedly slow economic recovery that followed, investors have still been rewarded with a 150% rally in the five years off the low. Surely most investors must be believers in the Fed Put by now?

To be sure, purist value managers may try to block out the siren call because they don’t wish to be tempted, and some may hear it and do nothing because the gains are never certain and the lack of prudence is painfully obvious in the end. Yet long-term value managers are outnumbered by momentum managers – always were and probably always will be – and momentum managers have no such qualms. Why this time, then, would they not play the game with even more enthusiasm, at least enough to drive the market to its 2-sigma level of 2,250 and perhaps a fair bit beyond? And although nothing is certain in the market, this is exactly what I believe will happen.

The Other Side of the Argument

Out there in the wilds of the internet along with our free quarterly letter, which always feels like a long painful delivery, there is an equally free letter from John Hussman, who turns out to have the same work ethic as Alexey Stakhanov, that hero of the Soviet Union known for his massive and routine production over quota. Hussman, can you believe, produces a long and well-researched quarterly letter each week! Deplorable. Surely (he says enviously), he must be a workaholic and obviously unlike some of us less industrious types can have no life at all. But I will say this: he grinds some good data. He therefore makes a good representative of the analytical group, all value diehards who believe the market’s demise is imminent. And the data is comprehensive enough that I admit it worries me. Clearly he and the others may be right. Exhibit 7 reproduces – with his kind permission – his version of all of the value measures he deems important. They indicate an overpricing for the U.S. markets that ranges from 75% overpriced to 125% at the end of March. All of the measures have a history of being predictive – much more so than, say, Yellen’s reprehensible choice of current price as a multiple of next year’s estimated earnings. (Either she’s painfully ill-informed or, most implausibly, not too smart, in which case sooner or later we’re scr*w*d, or she knows this measure is a third-rate prediction of true value and is cynically using it to tout the market, in which case we’re doubly scr*w*d! But at least that latter reason would be an ideal proof of her buying into her predecessors’ Put, in case we had any doubt.)

Exhibit 7: Hussman's Value Measures



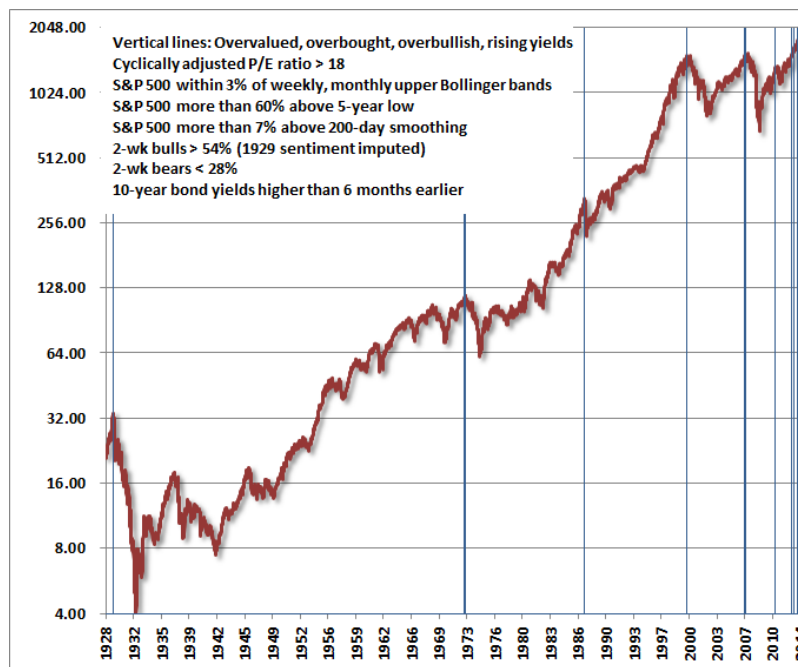
Source: Hussman Funds, as of March 10, 2014

Note: The forecast above is not for any GMO fund or strategy. These forecasts are forward-looking statements based upon the reasonable beliefs of GMO and are not a guarantee of future performance. Forward-looking statements speak only as of the date they are made, and GMO assumes no duty to and does not undertake to update forward-looking statements. Forward-looking statements are subject to numerous assumptions, risks, and uncertainties, which change over time. Actual results may differ materially from the forecasts above.

But back to value and Hussman. Not surprisingly, GMO very much agrees with the spirit of this data, but our preferred measure for our 7-Year Forecast has the market slightly less overvalued at 65%. (Although, interestingly, at 2,250 – our 2-sigma target – it would be about 100% overpriced.) Our estimate allows for a very modest improvement in trend line profitability and an even more modest allowance for a slightly higher P/E as a response to probable lower equilibrium interest rates. Still our estimate of overpricing is pretty close to his.

Exhibit 8 shows an equally disturbing Hussman exhibit in which he has collated very bad things that happen to markets. His exhibit suggests that whenever this large collection of troublesome predictions line up like they have recently there has been a very serious and fairly immediate market decline. While I have no quarrel with the eventual outcome and recognize that possibly the bear market's time may have come, particularly in light of recent market declines (April 13, 2014), I still think it's less likely than my suggestion of a substantial and quite lengthy last hurrah.

Exhibit 8: The Sum of Bad Things (from Hussman)



Source: Hussman Funds, as of March 10, 2014

The January Rule

Unlike my main thesis this quarter, I do have some support for the bears in the so-called January Rule: that the move in January predicts whether the balance of the year will be strong or weak.

The logic for the January Rule has always been that individuals have an unusual flow of investable funds at the end of the year from tax loss selling and from Christmas bonuses, and also at the end of the year ask themselves what lies ahead and act on that in early January and apparently get it moderately more right than wrong. In any case, the Rule seems to work. By a curious set of events, it turned out that our very first institutional account in late 1978 – a midwestern pension fund – was the only account we ever had that used this approach. It had three components: the Presidential Cycle, the January Rule, and a measure of monetary stimulus. It worked okay for two years, but just as soon as a new pension officer appeared, he fired us for having an approach that to him looked simple-minded and because we were busy doing traditional value stock picking by then, that that was the end of it. I offer this history to make the point that both the Presidential Cycle and the January Rule had excellent records then – 35 years ago – in simply predicting the outcome of each individual year. So when we review the 35 years that followed I find it more of a real-time experiment than data mining. What we found 35 years ago was that the first 5 trading days of each year had a good record of predicting a similar trend for the balance of the year. The same applied to the performance for the whole month of January. Although this rule was old even then, as was the Presidential Cycle, and could be regularly found updated in the annual “Stock Traders’ Almanac,” what I found that was slightly new was that when the 5 days contradicted the January results, the following 11 months were close to a wash. Our interest, therefore, was in those cases in which the two pieces of data confirmed each other: what I thought of as “up ups” and “down downs.” Since 1932 there have been 22 “up up” years. The average gain from February to December those years was 11.6%. Most remarkably, since my birth in 1938, only 1 of the 22 occurrences was below average and that was 1987, a year that spent the first

9 months going up 35%, one of the strongest 9 months ever, before hitting the technical collapse caused, we believe, by the over-enthusiastic use of portfolio insurance.

Almost as remarkable have been the results of the 14 “down downs” since 1932, for which the average balance of the year is a dismal -6.6% with only 1982 showing a pretty big upside move. Remember, too, that even that year went down steadily through August until it hit seven times earnings and staged a late-year rally. It should be mentioned here that 2014 is a year in which both the first five days and the month of January were down – i.e., a “down down” year. It is also, until October 1, the weakest year of the Presidential Cycle, “a year two.” (Although the Greenspan gang has had a hard time not stimulating every year, so that 1998 and 2006 were two of the few year twos that had respectable performance as the Fed and the markets got carried away.)

A very interesting question is why these two rules keep on working. Well, for one thing, to arbitrage the difference between a -6% year (“down down”) and a +10% year (“up up”) would take a lot of money. But more to the point, investors are very reluctant to take these two factors seriously. In fact, the factors are not respectable at all! They felt hokey and insubstantial 35 years ago and another very good 35 years of performance has not changed that. Managers seem embarrassed to talk about these factors and clients (based on our sample) are reluctant to consider them. And this of course is the point: they carry the career risk for professionals as being seen to be trivial, data mined, and just too simple to be true. Individuals, in contrast, probably find these outperformance tendencies to be too mild for their taste. The net effect is that no one (really, including GMO) acts on them and this is precisely why they have continued to work.

In the interest of full disclosure, I must confess that even as I studied these rules for decades I hardly used them at all, even personally, for reasons similar to those described. Today, older and wealthier and not exposed to career risk with my own money, I tilt a minimal amount away from “down down” years and toward year 3. Fortunately, I don’t have to worry about anyone else (even GMO) following these two apparently useful rules. Ever.

Best Guesses for the Next Two Years

With the repeated caveat that prudent investors should invest exclusively or nearly exclusively on a multi-year value forecast, my guesses are:

- 1) That this year should continue to be difficult with the February 1 to October 1 period being just as likely to be down as up, perhaps a little more so.
- 2) But after October 1, the market is likely to be strong, especially through April and by then or in the following 18 months up to the next election (or, horrible possibility, even longer) will have rallied past 2,250, perhaps by a decent margin.
- 3) And then around the election or soon after, the market bubble will burst, as bubbles always do, and will revert to its trend value, around half of its peak or worse, depending on what new ammunition the Fed can dig up.

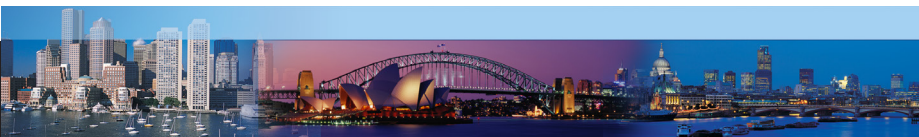
Conclusion and Summary

The bull market may come to an end any time, indeed as I write it may already have happened. It could be derailed by disappointing global growth, profits sagging as deficits are cut, a Russian miscalculation, or, perhaps most dangerous and likely, an extreme Chinese slowdown. But I believe it probably (i.e., over 50%) will not end for at least a year or two and probably not before it reaches a level in excess of 2,250 on the S&P 500. Prudent long-term value investors will of course treat all of the above as attempted entertainment (although I believe all statistically accurate) and be prepared once again to prove their discipline and man-hoods (people-hoods) by taking it on the chin.

I am not saying that this time is different (attention Edward Chancellor). I am sure it will end badly. But given this regime of the Federal Reserve and given the levels of excess at other market peaks, I think it would be different to end this bull market just yet.

Disclaimer: The views expressed are the views of Jeremy Grantham through the period ending April 30, 2014, and are subject to change at any time based on market and other conditions. This is not an offer or solicitation for the purchase or sale of any security and should not be construed as such. References to specific securities and issuers are for illustrative purposes only and are not intended to be, and should not be interpreted as, recommendations to purchase or sell such securities.

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Looking for Bubbles Part Two: A Sentimental Approach

Edward Chancellor



“It is important for the Fed, as hard as it is, to try to detect asset bubbles when they are forming,” Janet Yellen, the Fed’s prospective new boss, told the Senate Banking Committee last November. At the time, and later when she reappeared before the same committee in late February, Yellen did not see speculative “excesses [as] having developed at this point.” To justify this claim, Yellen suggested back in November that U.S. stocks weren’t particularly expensive relative to analysts’ estimates of future earnings – a notoriously unreliable measure of market value.

Perhaps because they are new to the game – researchers at the U.S. central bank were not allowed to discuss the “b-word” during Greenspan’s tenure – the Fed appears to have trouble identifying bubbles, *ex ante*. Typically, at GMO we call a bubble when an asset has moved two standard deviations from its long-term real price trend. This approach would have identified the 1929 bubble, the Nifty Fifty boom of the 1960s, and the Dotcom mania in the late 1990s.

The purpose of this essay, however, is to take a non-valuation approach to bubbles. I outline the typical features of asset bubbles, as they have appeared over the ages, and look at a number of measures of market sentiment. I conclude that most of the conditions under which earlier bubbles have appeared are present in the U.S. markets today. Furthermore, many of the traditional measures of market sentiment, such as the soaring performance of IPOs, appear to be indicating excess. This all bodes ill for long-term investors in U.S. stocks.

Typical Characteristics of a Stock Market Mania

1. This-time-is-different mentality. Throughout history, successive market manias have been rationalized with the argument that history is no longer a reliable guide to the future. Both the “new era” of the 1920s and “new paradigm” of the 1990s were marked by a “this-time-is-different” mentality. The same mode of thinking is evident again today. U.S. profit margins are currently at peak levels and the profit share of GDP in the United States is more than two standard deviations above its long-term mean (based on data going back to the 1920s). The U.S. profits dataset is the most reliably mean-reverting financial series available, claims Andrew Smithers of Smithers & Co. Most commentary, however, assumes that U.S. profits have reached, in Irving Fisher’s immortal phrase, a “permanently high plateau.” As John Hussman of Hussman Funds comments, “Believing that historical tendencies have evolved into a new paradigm will likely have the same results as playing leapfrog with a unicorn.” Painful.
2. Moral hazard. Speculative bubbles tend to form when market participants believe that financial risk has been underwritten by the authorities. The “Greenspan Put” appeared in the late 1990s after it became clear that the Fed was prepared to support falling markets but wasn’t going to act against the bubble in technology stocks. Fed policy hasn’t significantly changed since then. Monetary policy in the aftermath of the financial crisis has

aimed to put a floor under asset prices, encouraging investors to take on more risk. As a consequence, U.S. household wealth – comprising largely of home equity and stocks – has rebounded to a near-record level of 472% of GDP, nearly 100% above its long-term mean. Whenever a cloud appears over Wall Street, market participants have come to expect more quantitative easing and guarantees of perpetually low interest rates. The personnel may change at the Fed, but the Greenspan Put remains in place.

3. Easy money. Great speculative bubbles have generally been accompanied by periods of low interest rates. Greenspan's easy money policies in the last decade inflated the U.S. housing bubble, along with numerous other bubbles around the world. Bernanke's cure for the economy in the wake of the financial crisis has been more of the same. For more than five years, U.S. real interest rates have been maintained at negative levels. An avowed aim of the Fed's quantitative easing has been to push down long-term interest rates in order to boost both the stock market and home prices. In particular, lowering the long-term discount rate has boosted the valuation of growth stocks.
4. Overblown growth stories. Another common feature of a bubble is the overblown growth story. We witnessed this during the Dotcom bubble, ad nauseam. In the late 1990s we were told that tech stocks were experiencing "S-curve" growth (which posits very rapid growth in the near term); investors were also encouraged to value the "real options" of Internet stocks from future income streams yet to be conceived. Many of today's high profile growth stocks – operating in fields such as social networking, electric cars, biotechnology, and, of course, the Internet – have been boosted by similar wishful thinking. Just as there were serial railway bubbles over the course of the 19th century, Internet stocks in the age of Dotcom 2.0 appear to be experiencing what my colleague James Montier has termed a "bubble echo."
5. No valuation anchor. The most speculative markets – from the 17th century Dutch tulip mania onwards – have been marked by the absence of any valuation anchor; when there's no income to tether the speculator's imagination, asset prices can become unbounded. Our electronic age has even come up with a digital version of the Semper Augustus tulip. The fact that Bitcoin – the best known among the dozens of competing crypto-currencies – soared by 5,500% during the course of 2013 is testimony to the strength of the recent speculative tempo.

Needless to say, most of the recent stock market darlings – Netflix, Facebook, Tesla, and Twitter – have little or nothing in the way of profits. Internet retailer Amazon.com, whose margins have deteriorated in recent years yet whose stock soared nearly 60% in 2013, is the poster child for a market that is more obsessed with growth than profitability.

6. Conspicuous consumption. Asset price bubbles are associated with quick fortunes, rising inequality, and luxury spending booms. Since the spring of 2009, not only has the Fed engineered a strong rebound in the level of household wealth, but the richest part of the population has enjoyed the greatest share of the gains. Luxury spending has surged globally since the crisis.

The art market provides an excellent barometer of the speculative mood, given art prices depend entirely upon what other people are prepared to pay. A bubble in modern and contemporary art, which was evident before the financial crisis, has returned. Last November, a sculpture by Jeff Koons – Balloon Dog (Orange) – fetched \$58 million at auction, a record sum for a work by a living artist. The contemporary collector apparently isn't fazed by the fact that this dog was one of five "unique" versions or that Koons himself didn't produce the work by his own hand but had it made in a factory. The same month, a painting by Francis Bacon sold for \$142 million, the highest price ever paid for any work at auction.

7. Ponzi finance. Manic markets are often marked by a decline in credit standards. In the last decade, subprime debt inflated the U.S. real estate bubble. The financial crisis may have had many unpleasant after-effects, but it hasn't diminished the appetite for low quality U.S. credit. In fact, we have recently witnessed the lowest yields for junk bonds in history. The quality of debt issuance has been deteriorating. Last year, nearly two out of three corporate bond issues carried a junk rating. Last year, total issuance of high yield and leveraged loans exceeded \$1 trillion. More than half of the 2013 vintage leveraged loans came without the traditional covenants to protect investors. The decline in the quality of credit has attracted the attention of Jeremy Stein, one of the more market-savvy Fed governors.¹ Stein's boss, Janet Yellen, has also expressed concern about the manic leveraged loan market.
8. Irrational exuberance. Valuation is the truest measure of speculative mood. There are other ways to take the market's pulse, however. Most conventional measures of market sentiment have become very elevated over the past year. The IPO market in 2013 and into the first quarter of 2014 has become particularly speculative. New IPOs in 2013 rose on average by 20% on their first day's trading (Twitter rose 74% on the day it came to the market last November). Nearly three-quarters of the IPOs, which were launched in the six months to March, produced no profits.² A good portion of these profitless IPOs, in particular those of the biotech variety, hadn't even got around to generating anything by way of revenue. They are story stocks, pure and simple.

Other sentiment measures have been telling the same story. The trading activity of corporate insiders is a reasonably good indicator of managements' view on the intrinsic value of their companies. Recently, the ratio of insider sales to purchases has climbed to near record levels. Equity mutual fund flows – another commonly cited sentiment indicator – have also picked up lately, while household cash balances (as a share of total assets) have declined. Margin debt as a share of GDP is close to its peak level. Market volatility has been trending downwards, while the daily correlation of stocks – another useful gauge of the market's fear level – has also come down.

Measuring Market Sentiment

To put all of this together, we have made our own sentiment model at GMO based on some 20 traditional sentiment measures.³ The measures we have selected can be divided into several categories: insider selling (e.g., IPO issuance and returns), animal spirits (e.g., investment newsletters' bullish/bearishness), leverage (e.g., margin debt as a share of GDP), volatility, and momentum.

Our finding, which comes as no great surprise, is that sentiment has reached an extreme level, fast approaching two standard deviations above its long-run average, which goes back to 1950. In fact, the current score on our composite measure has only been exceeded in 1968 (during the "Go-Go Years," also known as the "Great Garbage Market"), and between 1998 and 2000 (during the TMT bubble).

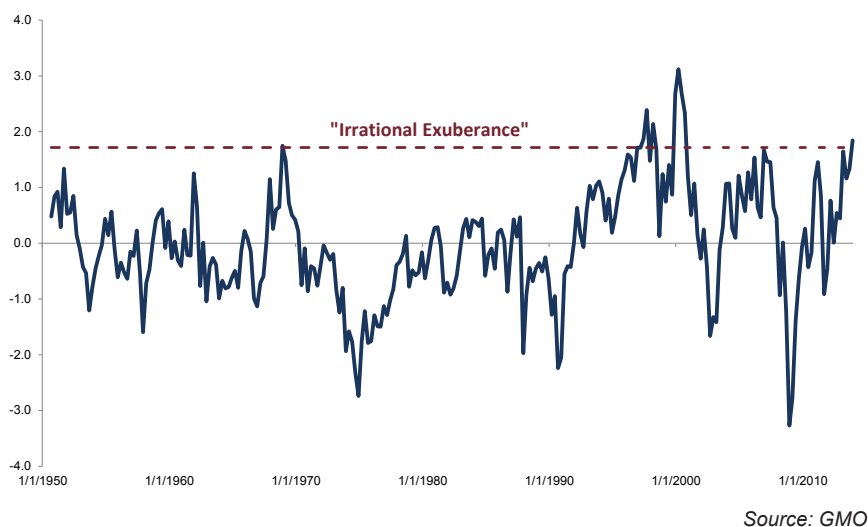
Clearly, the U.S. stock market is not as manic as it became during the late stages of the Dotcom bubble – IPO issuance and first-day returns and mutual fund flows are far below their record levels at the turn of the century. M&A activity is also less frantic. Still market sentiment going into this year was above the level of December 1996 when Alan Greenspan first noted (but did nothing about) the market's "irrational exuberance." (See Exhibit 1.)

¹ See Jeremy Stein, "Overheating in Credit Market," Federal Reserve Board, February 2013.

² This compares to a peak of loss-making IPOs of 80% in March 2000, and a long-term average of around 40%.

³ Our sentiment measure is comprised of the following measures: stock buybacks/issuance; IPO proceeds; IPO first-day pop; number of IPOs; insider buy/sell ratio; equity share of issuance; equity mutual fund net inflows; AAI bull-bear ratio; stock/bond relative performance; household % in cash; M&A activity; trailing S&P volatility; equity correlation; trailing small factor performance; closed-end fund discount; margin debt; high yield spread; high yield issuance share; new 52-week highs to lows; S&P distance from 200d moving average; trailing momentum factor performance.

Exhibit 1: Sentiment Indicator

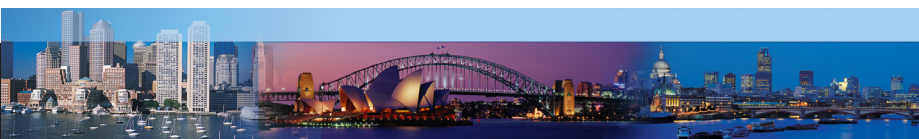


One condition, however, appears to be lacking for the development of a full-blown stock market bubble. Great bubbles tend to coincide with strong credit growth. Although the quality of credit has been deteriorating, private sector credit growth remains lackluster. The flattening of the yield curve has historically been the most reliable indicator that the credit cycle is about to turn down. At the moment, however, the U.S. yield curve remains bullishly steep. Given that the credit cycle is not close to a peak, it's quite possible that the Fed will allow a full-blown stock market bubble to form, Yellen's protestations notwithstanding.

The most speculative stocks put in a strong performance in the first quarter of this year, but have faltered over the past month. Elevated market sentiment, however, doesn't provide a sure-fire signal that the U.S. stock market is about to collapse. Serious investors, however, shouldn't take much comfort from this. Our composite sentiment measure does a useful job at forecasting future equity returns (admittedly it's not as accurate as our valuation-based models). Anyone who bought U.S. stocks in the past when sentiment was at today's elevated level has lost money, on average; that's to say, the S&P 500 has generated negative real returns over one-, three-, and seven-year periods.

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In Defense of Risk Aversion

Ben Inker



Last quarter, I wrote about why the bull market in 2013 is causing us to sell equities during the course of 2014, rather than selling when the move was taking place last year. But there was a piece of the process that I didn't really spend much time talking about, which is why we are selling equities in our multi-asset asset allocation portfolios in the first place. The simple answer as to why we are selling is that equities are more expensive than they were before their run-up, but that is actually too simple an answer. Because if you look at the equity portfolio we own today – largely a combination of U.S. quality stocks, European value stocks, and emerging market value stocks – it still has a significantly higher expected return on our forecasts than any of the non-equities that we are buying as we sell equities down.

In general, our clients are sufficiently used to our behavior that they don't give this kind of move much thought, but this isn't all that intuitive a response. By selling equities today, we are voluntarily reducing the expected returns of our portfolios on our own forecasts. Given that our clients have hired us to try to make them money and we were already running below the maximum level of equity weight we have told them to expect, it almost seems a little masochistic to do this. It would be one thing if we were running around arguing that the stock market was in immediate peril of a crash, but we are not. Neither our asset class forecasts nor most of the other indicators we look at are particularly screaming that the stock markets are about to fall, and as Jeremy states in his piece this quarter, we could easily see this bull market last for another year or three, dragging equity valuations up well beyond today's levels.

So why do we sell equities with an expected return of 3-4% real to buy TIPS and bonds with expected returns of around 1% real? The behavior follows from a belief we have about the markets and a belief we have about what we should be doing with our portfolios. These are beliefs that are not necessarily that widely shared in the investment world, and if you don't believe them, you almost certainly want to be much less aggressive moving your portfolio around than we are. The key belief we have about financial markets is that asset valuations tend to revert to long-term fair value, and the key belief about how we should manage our portfolios is that we want to minimize the expected shortfall against our real return target. We have written extensively on why we believe asset valuations mean revert, so I won't rehash those arguments here. Instead, I want to focus on how that belief impacts our portfolio construction. I don't want to give a false impression that we build our multi-asset portfolios quantitatively, but we try hard to learn the lessons that quantitative analysis can teach us, and our belief in mean reversion has a very large impact on how we think about putting portfolios together, in both obvious and some more subtle ways.

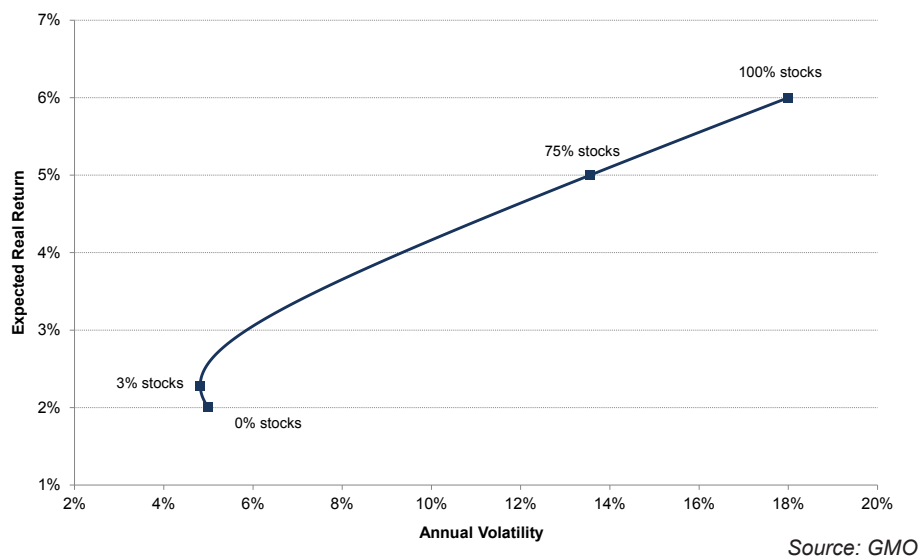
In an attempt to demonstrate that impact, in the rest of this paper I am going to be doing something that my colleague James Montier would like to bash me over the head repeatedly for – making the simplifying assumption that volatility and risk are synonymous. Volatility and risk are far from equivalent, and an important part of our portfolio construction

is about trying to understand what risks really matter and act accordingly. That being said, a lot of things can be learned through simplified models, and in the simplified model that follows, I'm pretending that volatility and risk are synonymous. I'm also assuming the world consists of only two assets and ceases to exist beyond the borders of the U.S. We're going to have enough of a slog from here on out through the piece without any additional pesky complications so I hope James and others will forgive me.

Mean Variance and the Lambda Question

The standard tool that investors tend to use to determine their long-term portfolio mix is mean-variance optimization. A typical efficient frontier from a mean-variance optimization for stock/bond portfolios would look like Exhibit 1.¹

Exhibit 1: Stock Bond Efficient Frontier



Such efficient frontiers are fairly ubiquitous in consultant and manager presentations, and come from an optimization of a simple utility function. At the risk of boring one chunk of readers and confusing another chunk, I'm going to show the simple utility function² behind mean-variance optimization here:

$$U = w'r - \lambda w'\Sigma w$$

where $w'r$ is the expected return of the portfolio, $w'\Sigma w$ is the variance of the portfolio, U is the “utility” we are trying to maximize, and λ is a term that specifies how much an investor dislikes variance relative to how much he likes additional return. Why am I bothering to show the function? The reason is that the efficient frontier doesn't tell you which portfolio is the “right” one. The efficient frontier is a set of portfolios that are optimal for a variety of different values for λ . Investors pick where they want to be on the frontier, which corresponds to a particular λ , but in all likelihood they didn't directly pick the λ they liked best, but rather some feature about a particular point on the line. Let's imagine the investment committee of a foundation is looking at the efficient frontier in Exhibit 1. Where along the frontier might they choose to be? A natural place could be the

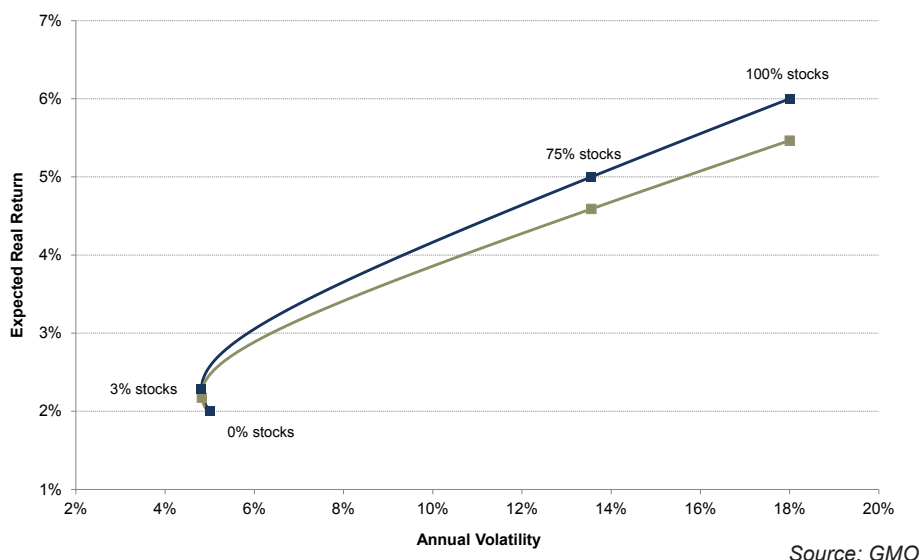
¹ The assumptions used in this one are that stocks return 6% real with a volatility of 18%, bonds return 2% real with a volatility of 5%, and the correlation between stocks and bonds is zero. I'm ignoring the difference between arithmetic and compound returns for this chart, which is mathematically wrong albeit not particularly importantly so in this case, so forgive me the oversimplification.

² Strictly speaking, I should have used $\lambda/2$ in the equation instead of λ , so for those that care, pretend that everywhere I use λ , I'm really saying $\lambda/2$.

75% stock/25% bond portfolio, which has an expected return of 5% real, an expected volatility of 13.5%, and corresponds to a λ of 0.84. The λ of 0.84 means that for every percent of additional variance a portfolio has, it needs to have an additional return of 0.84% to make the investor indifferent between the two portfolios.

In picking the 75%/25% portfolio, the investment committee could have been saying any of three things. First, they could have looked for the lowest volatility portfolio with an expected return of 5% real. Second, they could have looked for the highest expected return portfolio with a volatility of no more than 13.5%, or third, they could have decided that they had a λ of 0.84. Why does it matter which thought process they were using if they wind up with the same portfolio in any case? Let's imagine that the world changes and the expected return to equities is no longer 6% real, but 5.5% real. The new frontier is in Exhibit 2, in green.

Exhibit 2: Stock Bond Efficient Frontiers



The difference between the frontiers is a fairly subtle one, but it can have a significant impact on what the foundation will decide to do now. The investment committee had earlier decided to be at the 75%/25% point on the old frontier. Where would they choose to be on the new frontier? If they were picking the highest expected return portfolio with a volatility of no more than 13.5%, they would stick with 75% stocks/25% bonds. But if they actually want the lowest volatility portfolio with an expected return of 5%, they would want to move to a 86% stock/14% bond portfolio, and if they really have a λ of 0.84, they would move to a 66% stock/34% bond portfolio. The portfolios have the characteristics shown in Table 1.

Table 1

	Expected Return	Volatility
86%/14% Portfolio – lowest volatility with 5% return	5%	15.5%
75%/25% Portfolio – volatility less than 13.5%	4.6%	13.5%
66%/34% Portfolio – $\lambda = 0.84$	4.3%	12.0%

Source: GMO

So depending on what was driving their original preference for the 75%/25% portfolio, the investment committee could now have any of three quite different portfolios, differing by as much as 20% in their weight in stocks.

Which is the “right” portfolio? It’s hard to know. The efficient frontier can’t tell you, since all three points are optimal solutions to slightly different problems. In practice, we find that most investors tend to stick with the 75%/25% portfolio in this circumstance. That may seem odd at some level, because there is unlikely to be anything that special about the 13.5% volatility point they chose in the first place.³ The committee almost certainly picked the original portfolio on the grounds that it was the least risky portfolio that achieved 5% real. But from the “common sense” standpoint, it’s easy to see why the foundation would stay put. If equities have just gotten less attractive, it’s hard to see how the right thing to do is buy more of them, which is what the constant expected return portfolio does. But at the same time, equities still have a much higher expected return than bonds, so reducing the equity weight reduces the expected return of the portfolio at a time when it’s already harder to earn a decent return.

Going with the Lambda Flow

The way we run our portfolios at GMO is closest to the constant λ strategy, but just looking at the output of the optimization, it’s hard to particularly understand why. If 13.5% was an acceptable volatility when equities were priced to give 6% real, why is it suddenly not when they are priced to give 5.5%? If our clients were prepared to allow us to run 13.5% volatility, why not simply run the best portfolio we can at that level? The answer is that we aren’t simply trying to run the best portfolio we can for a given level of volatility, but a portfolio that cares about achieving 5% real and is most concerned about how far short of that return it might be over time. We also believe that asset prices mean revert, which means that our best estimate of the future efficient frontier is not simply whatever today’s is. If assets are priced to have returns below our long-term fair estimate, we believe it is likely that future returns will be better than today’s, and if assets are priced to have returns above the long-term fair level, we expect that future opportunities will be worse than today’s. This means that a single period problem like mean-variance optimization can’t tell us what the “right” portfolio is. To figure out what our λ should be – and whether it should be stable over time or shift – it is very helpful to have a specification of the problem we are trying to solve that recognizes what we are really trying to do. Expected shortfall (ESF) minimization, which Martin Tarlie and I discussed in “Investing for Retirement,”⁴ does the job nicely.

With this tool, we can directly ask the question “What is an appropriate trade-off to run between risk and return for a portfolio if it is trying to minimize shortfall against a 5% real target and stock and bond valuations tend to mean revert slowly over time?” Asking this question allows us to go beyond the “common sense” solution of picking a level of equity weight and sticking to it under most circumstances, and it confirms that the right solution to that problem is fairly close to picking a constant λ and letting the weight in stocks vary widely with their expected return.

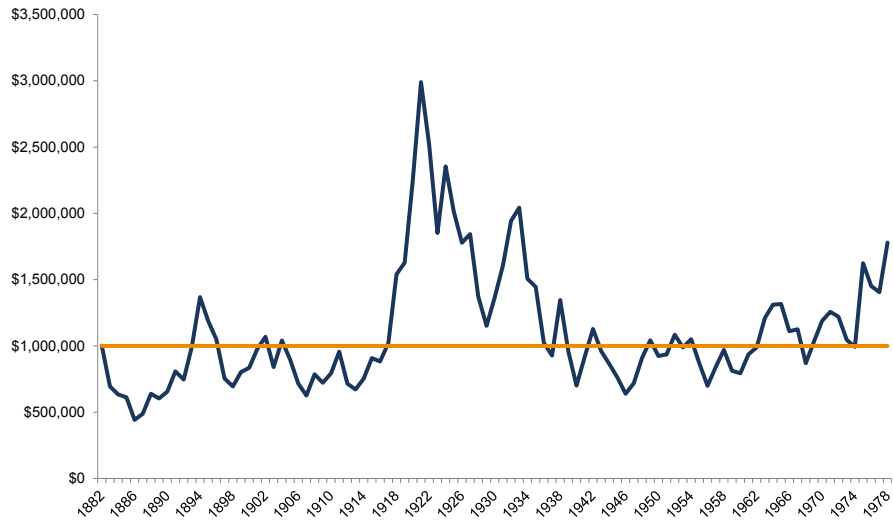
Let’s go back to our hypothetical foundation, which started with \$1 million and pays out 5% of its corpus every year. It invests in a portfolio consisting of 75% S&P 500 and 25% 10-year U.S. Treasury notes. Since 1882, a 75%/25% portfolio has achieved about 5% real, which means that at first blush this looks like a sustainable strategy. We can look at what the foundation would be worth after 35 years if it started in each of the years from 1882 to 1979 in Exhibit 3.⁵

³ The answer that 13.5% might be the average level of volatility of their peer group isn’t actually much of an excuse, because if they are really interested in managing their portfolio to control tracking error to their peer group, they have a different utility function and don’t actually want to solve the problem as written.

⁴ Ben Inker and Martin Tarlie, “Investing for Retirement: The Defined Contribution Challenge,” April 2014. This white paper is available at www.gmo.com.

⁵ There isn’t any particular magic to 35 years. Martin Tarlie built much of this apparatus for our work on retirement savings, which is a 70-year problem. We cut the time period in half for this one, because doing so gave us more data to use. The basic results hold true for a wide variety of measuring periods.

Exhibit 3: Real Wealth of 75%/25% Portfolio After 35 Years of Paying Out 5% Per Year

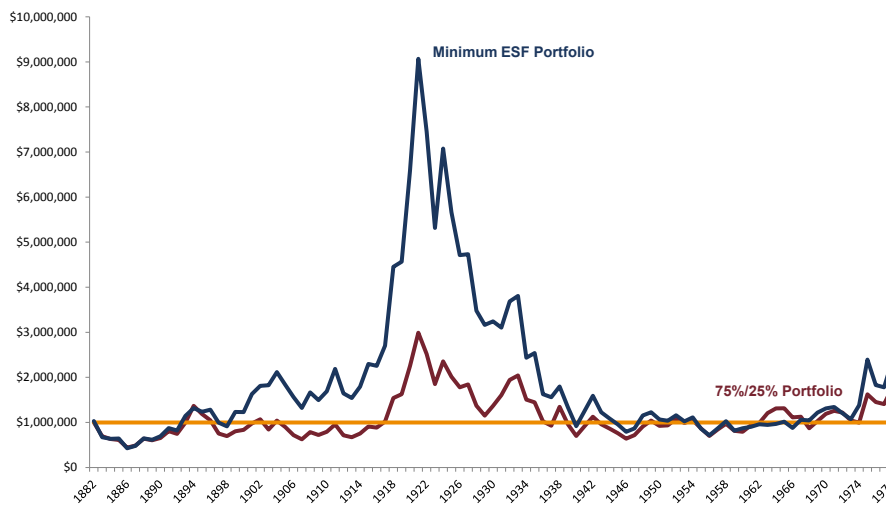


Source: Robert Shiller, GMO

The median result after 35 years is about \$989,000, just shy of maintaining the real value of the corpus. The average result is just over \$1.1 million, as a few of the really good starting points, such as the bottom of the 1921 bear market, give extremely good results of \$2 million or more. So 75%/25% may be a perfectly reasonable starting point for an investor interested in achieving 5% above inflation. But if you believe that asset prices are mean-reverting and your goal is minimizing the expected shortfall from earning the 5% real necessary to maintain the corpus, you can do better.

Exhibit 4 shows the 75%/25% portfolio along with a portfolio put together based on a simple mean reversion model (cyclically adjusted P/E for the stock market reverts to 17.5 and real bond yields revert to 2%) and a desire to minimize expected shortfall from \$1 million in constant dollars at any time in the future.

Exhibit 4: Real Wealth of Portfolio After 35 Years of Paying Out 5% Per Year



Source: Robert Shiller, GMO

Note: The Minimum ESF Portfolio is shown for illustrative purposes only. GMO does not manage any strategy that implements the Minimum ESF methodology shown above.

It's hard to graphically show the “at any time” nature of the shortfall calculation, so we are looking at the wealth level at the end of 35 years in the same fashion we did in Exhibit 3. Some of the relevant data is in Table 2.

Table 2

	Median Result	Average Result	Percent of Results Below \$1 Million
75%/25% Portfolio	\$988,915	\$1,106,525	54%
Minimum ESF Portfolio	\$1,282,704	\$1,907,213	27%

Source: Robert Shiller, *GMO*

Interestingly, even though the process doesn't directly care about the outcomes above \$1 million, the average result is still about 72% higher than the 75%/25% portfolio. The probability of winding up with less than \$1 million at the end of 35 years is half as high, and the median result is 30% higher. It does it with an average equity weight of just under 64%, about 11% lower than the static portfolio.

The point of this is not particularly to suggest that ESF minimization is the only way to put together a reasonable portfolio – the basic reason why the results were better is that U.S. markets since 1882 have exhibited reversion of valuations, and a process that respects valuation will outperform one that does not. Building a portfolio with a λ of 0.84 and the value-based expected returns we used would have given fairly similar results. But because it is so hard to have intuition about what a λ of 0.84 actually means, it is also hard to understand whether you should act as if you have one. The ESF minimization allows us to build that intuition.

The most interesting point to me is what happens if you remove the belief in reversion of valuations. Historically, reversion of valuations has been a good assumption in the U.S., and if you build a process that has worked well for U.S. stocks and bonds over the last 100 or so years, you will probably have wound up building a process that at least implicitly assumed valuations revert. If you believe valuations mean revert and the expected return to stocks drops from 6% to 5.5%, bringing your stock weight down from 75% to 66% makes a lot of sense. You are giving up 0.3% of return by reducing your equity weight by close to 10 percentage points, but the 1.5% reduction in volatility cuts down on the very worst possible outcomes from here, and because the expected return to stocks is likely to be better in the future, you will have other chances to take volatility when you are being better compensated for it. Minimizing expected shortfall in a mean-reverting world isn't quite the same as picking the right λ , but it isn't that far from it.

If, however, you don't believe that asset prices mean revert, having a constant λ turns out to be far from optimal in the sense of minimizing expected shortfall. The fact that tomorrow's opportunity set is likely to be no better than today's means there is little reason to wait for better times in the future. If asset valuations do not mean revert and the expected return to equities falls from 6% to 5.5%, the ESF minimizing portfolio only drops its equity weight by two percentage points, close to one-fifth the aggressiveness as in a mean-reverting world – i.e., the 10-percentage-point drop above – and a lot closer to the “common sense” rule of staying put.

It's worth pointing out that an investor who doesn't believe in reversion of valuations doesn't necessarily believe that valuations don't matter. It is perfectly logically consistent to say that equities give a return given by, say, their cyclically adjusted earnings yield, but not to take the further step that cyclically adjusted earnings yields revert. If you don't take that further step, the “optimal” response to changing valuations is quite muted, except

in extraordinary bubbles such as 2000 where that earnings yield dipped below the real bond yield. But if you do believe that the earnings yields do eventually revert to a reasonably constant fair value, it is appropriate to move aggressively in response to changing valuations. The changing opportunity set over time means you will do well by reducing risk significantly when faced with a less favorable set of expected returns and increasing risk when looking at a particularly favorable set of asset valuations.

Conclusion

Believing that value matters is not quite the same thing as believing that valuations mean revert. If you believe that value matters but valuations do not necessarily mean revert, you should move your portfolio of risky assets around pretty aggressively as valuations shift among the various risky assets. But you should keep a fairly constant allocation to risky assets over time except in the rare instances where valuations are so extreme that risky assets are actually priced to lose out to lower-risk assets. That strategy will outperform a naïve strategy over time, but if valuations do mean revert, it is substantially sub-optimal. If valuations mean revert, you can improve the risk/reward trade-offs of your portfolio substantially by adjusting how much risk you take through time, taking more risk when the return to risk is high, and less when it is low. Since we at GMO believe in reversion of valuations, we move our allocations to risky assets around fairly aggressively over time, reducing their allocations not just when risky assets have a worse expected return than lower-risk assets, but whenever the amount of extra return available is noticeably worse than normal. In our view, today's opportunity set for investors is decidedly sub-par, even if it is not as disastrously bad as 2000 or 2007, and we are reducing risk accordingly. And I warmly look forward to the day we feel the need to write a defense of why we are taking so much more risk than normal just when everything looks like it is going wrong and risk seems unacceptably high.

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