Looking for Bubbles Part One: A Statistical Approach

May 2, 2014

by Jeremy Grantham
of GMO

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; its 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 Sachses 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.)

Avery 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.