

Endogenous Abnormality

Happy New Year! ... Well, not really. Gosh, 2008 was great... until they reopened the markets on January 2nd. Since then it seems like the stock market has been going down almost non-stop! What did we do to deserve this poor start to our new year? Was there some important fundamental development that we missed?

The short answers to these questions are; we didn't do anything, and not much has changed since December. The markets are just being irrational and volatile. I repeat, our current stock market is behaving emotionally and irrationally, making it impossible to truly determine causes and effects.

We can see why most large market moves are internal to the system (endogenous) versus external factors imposed on the market (exogenous). Our estimate is 80 percent of the market's largest moves in the past 60 years are attributable to endogenous activity.¹

This fascinating (though densely worded) assertion is found in the most recent essay by Michael Mauboussin of Legg Mason Capital Management (here is the [link](#) to the full essay.) Put simply, what he is saying is that 80% of all large moves (both up and down) in the stock market are irrational and self-inflicted! Forty years ago all my Finance professors at the Wharton School taught me that the market was efficient and fully rational. By this methodology, the 'efficient market hypothesis', all large market moves were caused by distinct rational outside (exogenous) forces. According to Mauboussin, I was misled and I should probably ask for a tuition refund.

Let's take a longer look at this essay. Mauboussin titled it, Fat Tails and Nonlinearity. This is a direct attack on the established theory that the stock market is 'normal'. Forty years ago, financial theorists posited that the stock market's movements could be modeled using 'normal' statistical distribution: the commonly-described 'bell curve'. This was a terrific



finding for academics because a 'normal distribution' meant that they could use all sorts of arcane mathematics to describe the past movements of the markets. Nothing advances ones career in academic finance faster than a published paper that contains lots of Greek letter symbols within indecipherable formulae. When your financial advisor uses terms like alpha, beta or standard deviation, you are being exposed to the efficient and 'normal' market hypothesis that is still taught by Finance professors today. Fortunately, there are growing numbers of non-academic investment professionals, who question the supposed efficiency and rationality of our markets.

Mauboussin's title alludes to the assertion that the market is not 'normal' because it has 'fat tails'. Graphing a normal distribution of outcomes creates a bell curve, (think of a distribution of peoples' heights) with very few outcomes at the extremes (the thin 'tails'). How many people do you know that are over seven feet tall? Or, under five feet? The stock market, keeps defying this supposed 'normal' shape with days of extreme outcomes that do not fit the academics' bell curved model. Twenty years ago, on October 19th, 1987, the stock market declined more than 22 percent in one day. A movement of this magnitude wasn't ever supposed to happen in a 'normal' market! And, since 1987, there have been plenty of additional non-normal outcomes, both up and down, further demonstrating that the stock market has 'fat tails'.

The other half of Mauboussin's title is nonlinearity. To illustrate nonlinearity, he references an example from Nassim Taleb's recently published book, [The Black Swan](#).

Taleb relates the story of a turkey that is fed 1,000 days in a row. The feedings reinforce the turkey's sense of security and well-being, until one day before Thanksgiving an unexpected and uninvited bad event occurs. All of the turkey's experience and feedback is positive until fortune takes a turn for the worse.ⁱⁱ

The turkey's 'model' for predicting the future fell apart rather quickly! This example of nonlinearity, speaks to the current mess in the mortgage-backed securities markets. No one defaulted on his or her subprime mortgage for '1,000 days' because the value of their real estate kept rising. But, suddenly and without any particular news, home prices stopped going up and the buyers disappeared. Forty years of academic finance and the efficient market hypothesis caused Wall Street's financial alchemists to assume that the subprime mortgage market would always be rational and liquid. But, as we all now know, we are



suffering a 'nonlinear' outcome. If you own a subprime mortgage-backed security, it is very difficult to value and, quite possibly, impossible to sell at any price.

One of the key assumptions of an 'efficient' market is diversity. It is assumed that there is enough diversity of opinion so that for every seller there is a potential buyer. Thus, in this efficient market, you always have a linear outcome where prices and volumes are continuous. But, Mauboussin explains that the markets are more complicated than this simple assumption,

[R]ising asset prices provide investors confirming evidence that their strategy is good and everything is fine. This induction problem lulls investors into a sense of confidence, and sets the stage for the shock when events turn down.ⁱⁱⁱ

The stock market is not 'normal' because it is populated by individuals who are less and less 'diverse' as a trend plays out. As the market rises, we become more uniform in the belief that we shouldn't sell because all is well. However, when we reach the tipping point, we all want to sell at yesterday's prices. Unfortunately, because this market has lost 'diversity' due to rising prices, when prices start to decline, there aren't many buyers to be found. Momentum investing, the product of our emotional nature, begets non-diverse peaks and troughs in our 'abnormal' market.

Now that we understand that the markets have fat tails and are nonlinear, what can we do to become better investors? Mauboussin offers us three pieces of advice. First, "Avoid the problem of induction"^{iv}. Induction (as opposed to deduction) is the forming of a conclusion based upon limited information. Taleb's turkey was a victim of induction. We need to question ourselves continuously about the basis for our belief/faith in a particular investment. Does a rising price necessarily prove that we have acted wisely in owning a certain stock? As Mauboussin writes, "prosperity can breed an unhealthy sense of security"^v. My restatement of this advice is to be constructively and continuously skeptical.

Second, "Be mindful of diversity breakdowns."^{vi} If everyone seems to agree on the direction of an investment or a strategy, try hard to think independently. Using the benefits of hindsight, the Internet bubble of the late 1990's was the ultimate diversity breakdown. Everyone threw common sense out the window in order to embrace the 'new, new thing' of the Internet. I would be willing to wager that today's diversity breakdown is that we are all



way too cynical about the ability of people to make their mortgage payments. Sure, there are problems out there. However, there are way too many unsubstantiated assertions about the magnitude of these problems. My restatement of this advice is, again, to be constructively and continuously skeptical.

Third, "Watch for the nonlinear reaction."^{vii} Don't expect the markets to act rationally. Expect the unexpected. I'm hard-pressed to explain to you how to anticipate the unexpected. The only value-added advice that comes to mind is to always hold enough cash reserves so that you can laugh at the ups and downs of the market. Maybe the best restatement of this advice is to be skeptical of anyone or any model that suggests it can accurately measure or predict all risks.

Right now, I think that we are having a diversity breakdown as almost everyone seems to be accentuating the negative. I am eagerly awaiting a non-linear reaction to some piece of good news. So, in spite of the early market returns, Happy New Year!

Endnotes:

ⁱ Mauboussin, Michael. "Fat Tails and Non-Linearity: Diversity Breakdowns and Invisible Vulnerability" *Legg Mason Capital Management*, December 20, 2007 <http://www.lmcm.com/pdf/FatTailsandNonlinearity.pdf> 2

ⁱⁱ Ibid., 2

ⁱⁱⁱ Ibid., 2

^{iv} Ibid., 6

^v Ibid., 6

^{vi} Ibid., 6

^{vii} Ibid., 6

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