Jeff Speakes
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In early 2007, before the financial crisis hit, author Naseem Taleb published his best-selling book “The Black Swan” in which he argued that extreme events occur more frequently than most of us are trained to expect. We are trained to think in terms of the “normal” distribution, or bell-shaped curve, in which events more than three or four standard deviations from the mean are wildly unlikely. Yet, every few years in the financial markets we observe a six or ten (or, in the case of the stock market crash in October 1987, a twenty) standard deviation event. These repeating occurrences should have completely disabused us of the notion that normal probability rules apply to financial markets. But it does not that appear that this is the case.

Taleb’s contribution in the Black Swan was to offer an explanation for why extreme events occur more frequently than we expect and a suggestion for what we should do about it. He distinguished between what he called “Mediocrastan” – the world in which the normal curve works – and “Extremistan” – the world in which it does not. He showed that in this latter work, probabilities are driven by so-called “power laws.” A simple example of a power law is the famous 80/20 rule, invented by French economist Pareto to describe land ownership in France in the late 19th century (20% of the families owned 80% of the land, and 20% of the 20% owned 80% of the 80%, etc.).

Taleb argues that the effects of winner-take-all technologies and globalization mean that more and more phenomena are falling into the Extremistan world. In order to survive and thrive in this world, you must on the lookout for negative Black Swans (that is, extreme events that are harmful to you) and seek to minimize exposure to them. Also, you should be on the lookout for positive Black Swans (extreme events that improve your position) and seek to increase exposure to them.

As mentioned above, Taleb described these ideas before onset of the financial crisis. It would have been highly beneficial for market participants, for example mortgage investors, to have applied these ideas. A negative Black Swan for mortgage investors is a huge drop in housing prices. One way to mitigate exposure to this event would have been to purchase protection in the form of mortgage credit derivatives, or to sell mortgage exposure. As described in Michael Lewis’ entertaining book “The Big Short,” a few investors did precisely that, but not many.

In his latest book “Antifragility,”[1] Taleb pushes these ideas forward by distinguishing between phenomena that are hurt by disorder from those that are benefited by disorder. You are fragile if you are impaired by an increase in volatility. You are “anti-fragile” if you are benefited by an increase in volatility. A great example of anti-fragility is evolution. The process of natural selection is enhanced by greater variation in genetic characteristics. Other examples of antifragility include bottom up decision making, local governments, and trial and error experimentation.

Examples of fragile systems include large corporations, central governments, top down planning, large indebtedness and conventional risk management. Taleb predicts that fragile systems will eventually blow up and fail.

How can you tell if a system is fragile or not? Taleb, who began his career as an options trader, argues that it comes down to whether you are “long options” (you own them) or are “short options” (you have sold them). Recall that an option is the right but not the obligation to buy or sell a commodity at a specified price. The payoff to a long option positive is positive or zero. The payoff to a short option position is negative or zero. The option seller receives cash up front and is benefited by little or no movement in the price of the underlying commodity. The option buyer pays cash up front and is benefited by greater movement in the underlying price.

In financial markets, options prices can be bid up to very high levels, so that it appears to be more attractive to sell them than to buy them. Thus, many investors and financial companies actively manage positions in which they sell (what they think are) overpriced options. Taleb believes these types of positions are inherently fragile and will eventually blow up. He prefers to own what he calls “barbell” positions which are made up of combinations of unlike positions, like 90% cash and 10% long out-of-the-money options. The typical performance of this type of position will be a modest or even small negative return, but periodically there will be a very large positive return.

To measure fragility, Taleb proposes that you estimate the performance of your strategy or position across an array of shocks to the underlying value drivers. If you plot these outcomes and the shape is like a frown (big losses with large shocks), then you are fragile. If the shape is like a smile (bigger gains with larger shocks), then you are anti-fragile.

Application: Personal Financial Planning

Suppose we define a financial plan as a lifetime path of consumption such that its discounted present value is less than or equal to the discounted present value of resources including future income and current wealth. To prepare such a plan includes making a monumental set of assumptions about future wages, rates of return on investment, retirement timetable and other factors. Naturally, those forecasts are going to turn out to be incorrect, perhaps wildly incorrect. Periodically, those projections will have to be updated. A fragile financial plan is one in which the original consumption plan turns out to be infeasible under the revised projections. On the other hand, a sustainable (non-fragile) plan is one which has sufficient cushion such that revised projections do not jeopardize the path of consumption.

Characteristics of a fragile plan

- Low savings rate
- High assumed future investment returns
- High assumed growth in real wages
- Big debt levels
- Low amounts of insurance (health, life, property)

Characteristics of a sustainable plan

- High savings rates
- Modest assumed future investment returns
- Modest assumed wage growth
- Modest debt levels
- Sizeable amounts of insurance

It is clearly desirable to put into place a sustainable plan, so that the chance of wrenching downward adjustment in the future is minimized. The way to accomplish this is pretty simple – make conservative assumptions. But, people have a hard time doing this. Impatience leads to greater immediate consumption and lower savings. Over-confidence leads to aggressive assumptions about future wage growth and investment returns. The combination results in a fragile plan.

[1] Naseem Taleb, Antifragility, Wiley, 2012.