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WEALTH MANAGEMENT

Forecasting the Improbable

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"Sea levels could go up as much as three-quarters of a meter in this century, but there is a reasonable probability it could be much higher than that."

Steven Chu, 1948-, American physicist and Secretary of Energy.

When creating a list of potential return outcomes based on events for an investment portfolio over a given time horizon, the practitioner typically assigns a probability value for each one of the "discrete" outcomes. The Gaussian "bell-curve" shaped distribution is just a more refined version of the same thing with the difference being that the outcomes are continuous rather than discrete. The "tail" ends of the curve represent the more extreme return outcomes that tend to have a very low probability of occurrence. Such things as war, bubbles and natural disasters can trigger a financial meltdown, which can produce extremely negative returns. They do occur, but with much lower frequency than the less extreme returns that are assigned a much higher probability of occurrence.

Typically, when thinking up extreme events, the practitioner draws from past experience or historical events that have had a material impact on financial markets. The subprime led crisis and the dot com bubble are but two examples of this. Things become more complicated when the event in question has never occurred in the past or occurred such a long time ago that there is little material to recollect its impact. Another issue with assessing the financial impact of events that took place a very long time ago is that we need to adjust for all the economic and financial progress that occurred between the past and the present.

A Mega Black Swan…

To illustrate this point we look at the probability of occurrence of a solar megastorm over the next decade as an example. A solar megastorm is a very large version of a solar flare, which is a sudden brightening, observed over the sun's surface. Solar megastorms generate auroras, which are visual expression of electromagnetic radiation hitting the Earth's atmosphere, and, given enough power, are known to knock out electrical systems. The largest observed solar megastorm ever occurred on September 1st, 1859 and was named the "Carrington Event" after the British astronomer who discovered it. According to newspapers of the time, auroras where observed across the globe and caused significant damage to electrical systems.

A recent paper published in "Space Weather", an international journal of research, puts the probability of a solar megastorm occurring over the next decade at a significant 12%. Taking into consideration the technological progress over the last 150 years and the degree to which our modern economy has become dependent on electronics, it doesn't take much to realize the potential havoc that such an event would cause. Auroras are known to damage electrical power grids and may contribute to the erosion of oil and gas pipelines. They can disrupt GPS satellites and disturb or even completely black out radio communication on Earth. The National Research Council, the working arm of the U.S. National Academies in its 2008 report puts an estimate of between 1 and 2 trillion dollars in terms of collateral damage in the U.S. for a Carrington-style solar storm.

Financial Armageddon…

If the outage were to last over the longer term, it could lead to a disruption of transportation, communication, banking and finance systems, access to water and lead to a spread of diseases through the lack of refrigeration.

In summary, such an event would have catastrophic consequences on our financial system of an unprecedented nature, both in the short and longer term but even more worrying is the one in eight probability of it occurring within the next ten years. This is huge and if true, you may be wondering why it's not in the front pages of the news. One reason may have to do with the fact that such an event is so outlandish, (it last occurred 150 years ago, damages were very limited so it is erased from our collective memories), that we prefer to ignore it. This form of "hindsight bias" is a well known feature of behavioral finance whereby we tend to put more

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emphasis or weight on past experiences. Whatever the reason for not taking it into account, the truth of the matter is that the most damaging form of disaster tends to be the one that is not accounted for, which means that a practitioner should always keep a very open mind when assessing potential risks.

And Where Do We Go From Here?

The so-called "haircut" offer on Greek sovereign debt was accepted by a majority of bondholders but nevertheless constituted a default, triggering credit default swap payments. The risk of contagion is very limited considering that the total outstanding amount is known and issuers have taken opposite positions that cancel out at least a portion of the payout amount. The more worrying aspect concerns Greek banks that were heavily exposed to Greek sovereign debt, which means that they will need to be recapitalized to maintain solvency. The bottom line to this is that Greek debt should remain relatively stable; the difference is in who owns that debt.

The ECB's accommodation to banks, offering a 3 year borrowing window has gone a long way towards stabilizing markets. This is readily observable in the almost universal drop in sovereign debt yields, starting in November last year, right around when the announcement was made. A serious contagion has been averted as mainly peripheral banks were having growing difficulty in raising capital to refinance expiring debt. Banks can now borrow directly from the ECB, which means that the risk is being transferred from private to the public domain, a situation that is similar to the Fed's purchase of troubled assets. The ECB may lose some credibility as the composition of its balance sheets changes, but also because its exposure to Greek sovereign debt will not be subject to the same haircut as everyone else.

Despite steps to foster greater stability, the Euro-zone still remains in a serious quagmire, plagued by a combination of a banking crisis, a sovereign debt crisis and substantially weakened growth. The challenge is to improve on all fronts, which is tricky and won't really happen unless some sort of political union is forged. This can only realistically be done if countries cede part of their sovereignty, a long shot for a region of the world with a turbulent past and where strong nationalistic sentiment still abounds. Austerity measures are already showing their limits through rising social unrest across the continent.

According to the latest economic releases, U.S. expansion for this year should be at a trend growth rate of around 2.5%, higher than what is expected for the Euro-zone, but also too weak to cut the unemployment rate any further. This means that although we may see improvements in the budget deficit, it won't be sufficient to create any dents on the soaring debt level. The presidential elections for later in the year make it an almost virtual certainty that no truly effective policy will be enacted any time soon or at least until sometime next year. The U.S. is therefore currently benefitting from both improvements in its macroeconomic picture but also from the fact that investors perceive greater short-term risk in Europe. This situation has helped keep the yield curve at unusually low levels, providing the government with access to very cheap borrowing rates. It has also put pressure on investors to take on greater risk in their investment, as treasury yields have continued to falter.

Emerging markets will continue to lead the pack in terms of growth rates, but there will be substantial discrepancies between countries, resulting from macroeconomic differences in debt levels, the current account and fiscal budgets. These differences will become even more pronounced in the event of a commodity price shock, as it will have a very different effect on whether a country is a net importer or exporter of commodities. After maintaining the lid on inflation, a growing number of emerging markets and most notably China have embarked on monetary and fiscal stimulus. Unlike the U.S. that has exhausted its means of propping the economy in a significant way, a large number of emerging market countries still have substantial reserves in terms of stimulus firepower at their disposal. This should help weather turbulent times ahead, but may not be enough to maintain growth over the longer term, especially if this growth continues to falter in developed markets, as it will further weaken exports.

Markets are signaling a greater appetite for risk taking which reflects the effect of a combination of factors that are pointing towards greater stability over the shorter term. These include economic figures, especially in the U.S. that are encouraging for the future and additional agreements by Euro-zone leaders to boost the size of the rescue fund and therefore increase the safety net from the risks of contagion. Because the recovery remains delicate, especially in Europe and the U.S., a strong enough external shock which could come in the form of a sharp rise in oil prices, would suffice to derail this recovery, plunging the world economy into another recession.

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