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Timely thoughts & musings on the financial markets

## A REGIME SHIFT: NEUROPLASTICITY AND THE GLOBAL OPTIMIZATION UNWIND

By Jordi Visser, President & CIO

*"Neuroscience has confirmed that your brain changes throughout your life, a concept known as neuroplasticity. Neuroplasticity is an umbrella term for a sequence of processes taking place in your brain over time in response to incoming stimuli. Your experiences, behaviors, thoughts, and emotions physically change the form and function of your brain. In other words, your life shapes your brain."*
*-Debbie Hampton*

*"Neuroplasticity is the property of the brain that enables it to change its own structure and functioning in response to activity and mental experience."*
*-Norman Doidge author of The Brain that Changes Itself*

William James is considered by many to be the Father of American Psychology. He wrote a book titled The Principles of Psychology and one of the most important elements of it was the theory of brain plasticity. Simply put, neuroplasticity is the ability of the brain to change. A great example of this can be seen in the extreme case of Jill Bolte Taylor who spoke in one of the most watched TED Talks of all time. Within the talk she spoke about how neuroplasticity could help to increase your

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own intelligence. The quotes above on neuroplasticity made me think about how I could express my current views given what has occurred in the market over the last few weeks and how I perceive the implications for the rest of the year.We have seen a violent adjustment in volatility. As I wrote in my 2018 Outlook paper in early January, I thought something like this was possible in this year but I did not expect it to happen so fast and most importantly in such an extreme manner. Now that it has happened the question most people are asking is, is it over and are we going back to the quiet environment we saw in 2017? This is where neuroplasticity enters my thoughts in this paper.

Last year, one of our investors, knowing my interest in psychology, sent me an email with a cognitive bias codex. I liked it so much, I ordered a poster-size copy and it's hanging in my office at work. It has 188 cognitive biases categorized into four quadrants 1) meaning or reasoning 2) the need to act fast 3) information overload and 4) what we choose to remember. After abrupt changes to an environment or a significant event, it is normal for people to want to believe that nothing has changed. We resist change and choose to believe the most recent past will continue. This is because the brain has been changed into its current thinking and has biases from the recent experiences. For investors, the recency bias includes buy the dip, consistency of returns, tax cuts mean better GDP & higher profits, and the last nine years of good times. These recent experiences have brought back signs of speculation and a state of greed as investors become complacent. Not wanting to believe something has changed creates an anchoring to these views which is difficult to break. This is due to the fact that a lot of time has been put into the fundamental work for the positioning, and when you get off to a start like we did in January, confirmation bias sets in, which further clouds your judgment. It leads to people believing the event was just a technical event without a fundamental "reason". Humans need a reason for why the market falls or goes up.The thought that it could actually be random is scary. All of these psychological factors lead me to feel that a follow-up outlook paper right now is necessary to the new information.

In my original outlook, there was no mention of price targets. The main point was to alert people that after 9 years of positive gains, 22 of the last 23 months in the SPX total return being positive, high Sharpe ratios for assets, and expectations of

stronger growth, it was “obvious” to be positive on 2018. Nothing should scare people more in the art of predicting where the market will be than the words ‘consensus’ and ‘obvious’. I believe this past month is likely to impact markets for the rest of the year as we shift to a new higher volatility regime and with it less stability in asset correlations. Normally people think of higher volatility periods as recessions or crises because of years like 2008 but I view all these volatility events as cleansing periods to 1) reduce consensus expectations and exuberance, and 2) cleanse the system of those with excess leverage. Assuming we have left the low volatility period of last year and entered a new higher volatility regime, I think the recent experience is a warning sign and that it would be prudent for investors to be prepared for more episodes like this in the coming months. For the rest of the paper, I will try and give you a scenario that makes me think this could be a memorable year before it is done.

To be a memorable year, it has to leave a mark so let’s start with what conditions could make that a possibility. Since my days in emerging markets in the 1990s, where things shifted in a similar way to the last few weeks, I have incorporated a simple four quadrant matrix model to think about markets. The X axis would be fundamentals, good and bad, and the Y axis would be bullish and bearish sentiment. The quadrant that always worried me the most while in EM was good fundamentals and bullish sentiment. To many, that may not make much sense but the reality is for a memorable event to occur, by definition you cannot expect it and when people go into a year able to lay out a clear fundamental argument with already bullish sentiment, that has proven in my experience to be dangerous. It gets even more dangerous when the sentiment shows up in retail, and that is what we saw at the end of January with record equity inflows and retail brokers talking about historic low cash levels at the same time.

To be memorable there also has to be a ‘villain’. In 2016 it was oil, in 2008 it was housing, in 2000 it was the internet bubble, in 1998 it was emerging markets and LTCM, and in 1987 it was portfolio insurance. This year, I do not think volatility or volatility targeting strategies will be remembered as the villain in the same way that Bear Stearns was not the villain in 2008. This recent volatility explosion is the cause for the new higher volatility regime. I think the villain in this year will most

likely be covariance matrices. That may sound like a wonky villain but behind it, as always, are humans making assumptions that the recent history will continue.This was the focus of my two papers in 2017 arguing for the value of the brain over “AI.” Before I get emails from the artificial intelligence zealots again, I do not mean deep learning but anything that uses back tests to predict the future. Optimization is the problem to me as allocators have moved too much money from higher fee discretionary managers to lower fee optimized strategies. Here is a snip from an AQR document on the many pitfalls with optimization.

*“Mean-variance optimization is a useful tool for portfolio construction but it has many pitfalls. Its use is particularly limited when we make top down portfolio decisions on characteristics beyond the mean-variance framework. For example, how much leverage and shorting to allow, or how much to allocate to illiquid investments, when an optimizer often keeps saying “more”? How should we weigh across diversifiers of traditional portfolios: alternative risk premia versus illiquid assets or versus manager-specific alpha?”*

If you read through the pitfalls you notice there are many discretionary choices referenced in the lines. The one that is the most important pitfall for this conversation though is “how much leverage?” Since the financial crisis, we have seen the growth in assets managed in this optimized manner to a level that I believe is overcrowded. During the period of March 2009 to November of 2016, we had a pegged fed fund rate except for one tightening in December 2015. Volatility declined, credit spreads tightened and equities rallied. During the last year, we have seen gross exposures move higher as asset volatility declined and asset correlations were high. If you look at the monthly returns last year, credit, developed market equities, emerging market equities, emerging market debt and currencies and bond funds were all positive with good Sharpe ratios. The volatility of a portfolio is dependent upon not only the volatility of the assets within the portfolio but also on the correlations of those assets. VaR models at some point inevitably hit the GIGO point or “garbage in – garbage out.” I think the real problem for 2018 will be the historical correlation assumptions and not what happened with the XIV and SVXY. Their collapse is the beginning of a larger, more important story which is the movement across assets and regions and the importance of these correlations to

overall portfolio construction. This is where the dangers of back testing are not only important for investment alpha but also for portfolio diversification and leverage assumptions. Being in Brazil in 1998 and witnessing the LTCM unwind, I very much remember the story behind the quote below from the book When Genius Failed.

*"If Wall Street is to learn just one lesson from the Long-Term debacle, it should be that. The next time a Merton proposes an elegant model to manage risks and foretell odds, the next time a computer with a perfect memory of the past is said to quantify risks in the future, investors should run—and quickly—the other way."*
*- When Genius Failed*

The simplest of the historical asset correlation relationships that has gotten a lot of press lately as a cause of the increased volatility is the correlation of stocks and bonds, with both of them falling together. Forbes recently had an article titled "How Trillions In Risk-Parity/Volatility Trades Could Sink The Market" and in the article was this quote:

*"The strategy, which involves investors switching between different assets based on changes in market volatility, has now grown so big that it threatens to sink the market."*

Although I do not believe the risk parity strategy in and of itself is likely to sink the market, I absolutely believe the importance of risk parity lies within the connection of the strategy to volatility targeting and the risk optimization of other investment strategies. Effectively there is a bubble in risk optimization with far more dollars managed in this manner than any time in history and many of them will suffer if the historical correlations amongst assets continue to remain far more unstable than they have in previous post crisis years. Outside of risk parity's returns in February, if you look at the returns for cross asset risk premia strategies and trend following indexes, you will see similar examples of large drops. All of these strategies employ some form of leverage as well as correlation assumptions. If these were small parts of the investment world of allocations, it would be less bothersome but as I have written about for close to a year now, there has been a large investment shift into these autonomous investment strategies, as well as quant strategies, since 2009.

Large, statistically significant losses in a place which has yet to be tested since these large inflows is a risk that in my opinion needs to be watched.

However, the largest worry for me is that I think people are not paying attention to the trends this year that are likely to directly impact these correlations. Technology and globalization have impacted both the performance of these portfolios as well as the recent historical correlations impacting the leverage and this year the world seems headed down a path to test relationships. The US tax plan and unsynchronized central bank policy moves have already had implications for the short end of the funding market with FRA/OIS widening during the month. If this continues, I fully expect the dollar to reverse course on the now consensus view that it will continue to weaken. On February 16th we continued down the path of trade tariffs on steel and aluminum. We are waiting on the decision as to how to proceed with the debate with China on Intellectual Property and Section 301. In May, we have the EU General Data Protection Regulation (GDPR) taking effect, which follows the tech backlash in Davos where the theme was "creating a shared future in a fractured world." We have already seen the volatility in the cryptocurrency markets. Finally, I think the apparent forced deleveraging of the large real estate focused Chinese conglomerates like HNA, Anbang, Fosun and Wanda has huge implications for an already weakened real estate market in some of the world’s major cities and will be a bigger global story as the year progresses. All of these globalization stories could impact asset correlations but also create uncertainty in what is currently a fairly certain future growth picture for 2018.

In the end, this is about an expected regime shift. So far in February, we have had seven days where the VIX made a daily close above 20.From March 2016 to January 2018 when the SPX total return was up 22 of 23 months, the VIX only closed above 20 on six days. To show how quickly and unexpected this move in volatility was relative to history, the VVIX (the VIX for the VIX or the volatility of volatility index) made its highest daily close in history this month. If you use your brain to forecast what would have happened just knowing the level of the VIX and the speed of its rise, you would have guessed credit spreads widened, bond yields fell, min vol strategies would outperform and CTAs would perform well. These expected relationships did not hold which is why I think there is a warning sign in

the correlations and assumptions that will impact the current portfolio construction through higher portfolio volatility. Higher portfolio volatility will lead to less leverage. August 2007, during the quant unwind and LTCM in 1998, were two of the periods I think of when I think about leverage events. Those lessons taught us many things about leverage. Leverage is a bet on future volatility. Leverage is a bet on future liquidity. Leverage is a bet on future correlations. And, leverage is a bet of future leverage. Unfortunately, autonomous portfolios are using assumptions based on the past and on a regime that may be changing. If this is a regime shift, they will be slow to adapt which could lead to the global optimization unwind that I think may play out this year. A popular catch phrase within the world of neuroplasticity and 'change your brain' books is "neurons that fire together, wire together." Remember, "your experiences, behaviors, thoughts, and emotions physically change the form and function of your brain." In the world of optimized portfolios the word that always scares me the most after losses is recalibration. Like in my argument for the brain over AI, I think neuroplasticity wins over 'recalibration'.

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