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INVESTMENTS

# Managing Expectations Drawdown Scenarios and Swan DRS Performance Analysis

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March 2018

# NAVIGATING TURBULENT WATERS

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## How the Defined Risk Strategy Has Performed through Market Drawdowns

In the midst of a bull market, investors tend to forget that markets can and do sell off. The longer markets go up, the more surprised investors are when markets eventually go down. Swan Global Investments believes that it is essential to understand and accept that market downturns are a natural part of investing. Moreover, Swan's Defined Risk Strategy (DRS) was designed so that elements of it could protect and potentially even profit during market downturns. If markets never sold off, there would be no reason to hold the Defined Risk Strategy.

### Executive Summary

This paper will explore the different variables that impact the DRS's performance during sell-offs. In addition, historical examples will be provided of both favorable and unfavorable sell-offs over the last 20 years. Certain "special situations" will be discussed when a combination of variables create favorable or unfavorable conditions. Finally, the paper takes a closer look at how the volatility of markets tends to trade in "regimes." The paper discusses the implications for the DRS within regimes and as markets switch from one volatility regime to another.

No two sell-offs are exactly the same. Over the last twenty years we've seen the two largest bear markets since World War II as well as numerous shorter, smaller corrections. While each is a unique event, there are three primary variables that we use to differentiate the downturns. They are:

1. The speed of the sell-off,
2. The magnitude of the sell-off, and
3. The duration of the sell-off.

Differences in these variables will determine how the DRS will perform. While there might be additional "X-factors" that would help or hinder the DRS during a sell-off, the speed, magnitude, and duration of a downturn will be the primary drivers of the DRS's performance.

But before we discuss how the DRS might possibly respond to various downturns, let's quickly review the major components of the Defined Risk Strategy.

### Review of the DRS

The DRS was designed as a complete market cycle solution with different components doing well in up, down, or flat markets. Those three components are:

1. A buy-and-hold long position in an equity market,
2. A long-term hedge on that equity market position, and
3. Short-term harvesting of option premium.

The buy-and-hold position in an equity market is fairly straight-forward. The hedging is done via the use of long-term put options and is meant to change the risk profile of the equity holdings. An unhedged investment in a passively managed index fund will track its market quite closely, both on the upside and the downside. By applying the hedge, the DRS seeks to change the up-market/down-market dynamic.

The hedged equity profile is designed to go up in up markets; although, it will not participate in all of the up market move. Conversely, the more the market goes down, the greater the level of protection in the hedged equity.

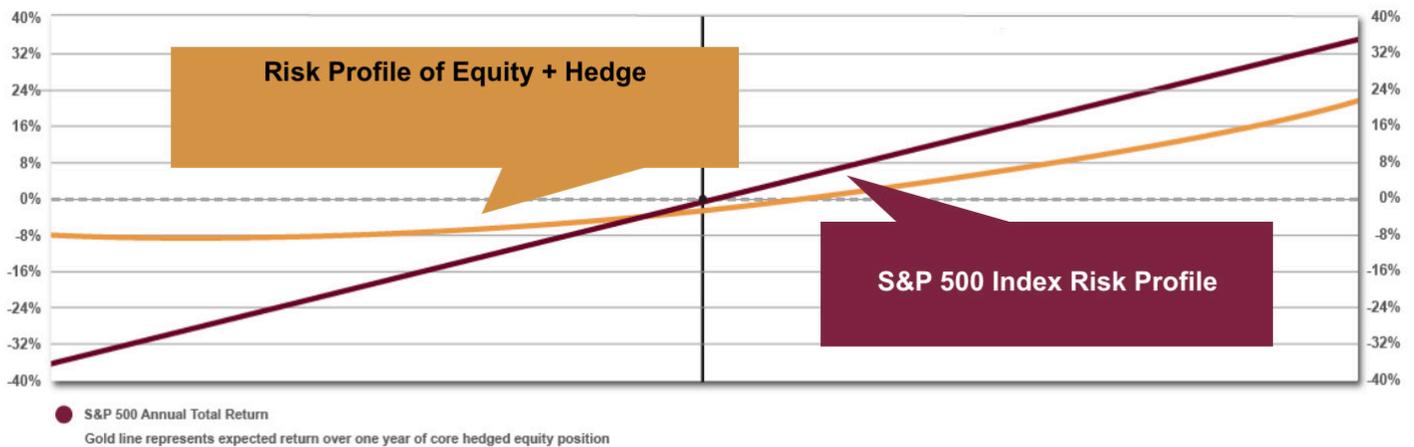


Chart 1. Source: Swan Global Investments; hypothetical representation. The S&P 500 Index is an unmanaged index, and cannot be invested into directly. DRS returns are from the Select Composite, net of all fees. NOTE – this chart is for illustration purposes, not a guarantee of future performance. The charts and graphs contained herein should not serve as the sole determining factor for making investment decisions.

The harvesting of option premium trades is the third driver of returns. These are meant to subsidize the carrying cost of the hedge in flat markets, increase up capture during up markets, and profit from heightened volatility in down markets. They are short-term in nature and are initially set up to be market neutral. The primary income trade is the

simultaneous writing of both an out-of-the-money call and put option. The DRS collects a premium from the selling of both options. This is known as a short strangle trade. If the market stays within the pre-defined range, the trade can be closed out at a profit and the whole process is repeated.

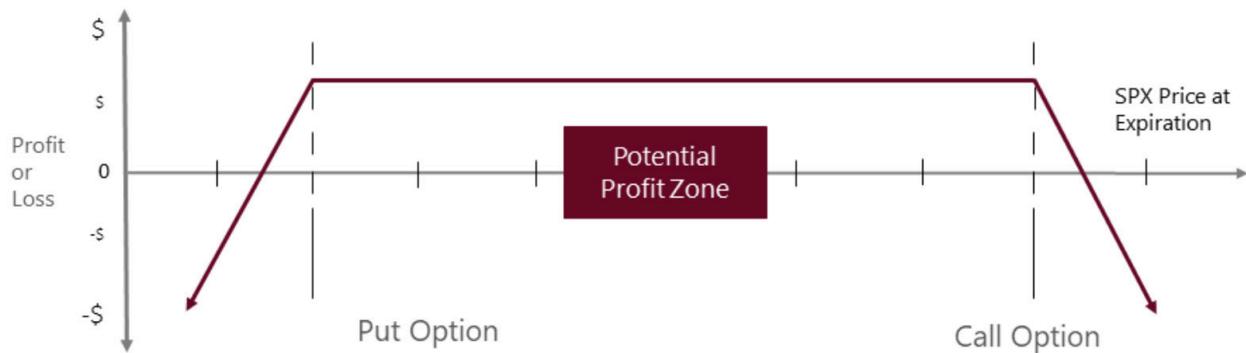


Chart 2. Source: Swan Global Investments; hypothetical representation

These trades work best when the markets stay within a predefined range. If the market moves too closely to one of the bands, there is a danger of the options going in the money. Seeking to avoid that, Swan’s active management is designed to make adjustment trades. These adjustment trades are intended to take advantage of the heightened option premium that exists following an increase in volatility. The adjustment trades can potentially claw back losses on the original trade and tend

to be more highly rewarded following a volatility spike.

**Entering a Downturn**

Generally speaking, when markets enter a downturn the DRS is expected to have performance roughly like the sketch below. The blue line represents the hypothetical DRS performance and the black line is the market.

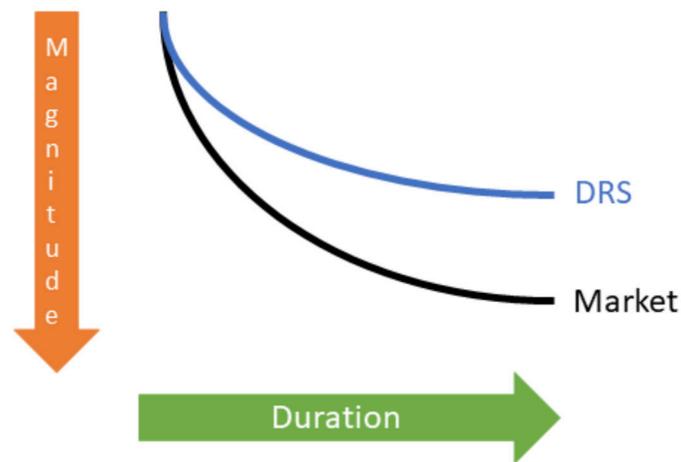


Chart 3. Source: Swan Global Investments; hypothetical representation

At the very beginning of a market sell-off, the DRS will likely participate in more of the initial downward move. In certain circumstances, the initial losses might match the market. Under extreme scenarios, it is conceivable that the DRS could even lose more than the market in a very short period of time.

The problem this can create is that some investors extrapolate the first few days of a drawdown to the performance of the DRS over an entire cycle. An investor might look at a week when the S&P 500 is down 5% and the DRS down 4%, and incorrectly assume that if the market drops 50% the DRS will lose 40%. In reality, the first “hit” to the DRS is usually the worst while follow-up losses are less. The DRS is constructed so that if the market continues downwards and the sell-off extends from days to weeks to potentially months, the more the DRS’s performance tends to level off. The DRS tends to catch less and less of a downturn the longer and further the market falls.

The reason for this is two-fold. First, the value of the hedge accelerates the more the market goes down. During the initial down move, the hedge adds some value, but it takes a while for the protection to fully “ramp up.” Once the hedge goes in-the-money, and then potentially deep-in-the-money, the more insulated the DRS becomes to market movements.

The second reason has to do with the harvesting

of option premium trades. Remember, these tend to be most profitable if the market stays within pre-defined trading bands over shorter periods of time. If the market moves too close to those bands, the trades will become unprofitable and will likely be shut down for a loss. However, if markets continue to sell off and volatility remains at elevated levels, the subsequent premium collection trades tend to be more profitable.

Again, the chart above is a generalized, theoretical case. Now, let’s move on to the three primary variables stated earlier and show how they impact performance, citing historical examples of each.

### Speed of the Sell-Off

One of the primary drivers of performance during downturns is the speed of the sell-off. Markets selling off by 10% in a single trading session is an entirely different scenario from markets gradually selling off 10% over the span of a month or two.

**The DRS typically performs better during gradual sell-offs rather than instantaneous drops in the market.**

The impact of the speed of a downturn is primarily borne by the harvesting of option premium trades. The equity portion and the hedge portion of the portfolios are little impacted by how quickly the markets sell off. If markets do sell-off quickly and Swan is forced to close out the short put positions, it might be done under unfavorable pricing.

Alternatively, if markets are slowly “bleeding out,” it gives Swan the time to make orderly exits from the short positions.

Moreover, the whole process of writing short-term

options is based upon their rapid time decay as they get closer to expiration. In a gradual market sell-off, the short options are losing value over time anyway.

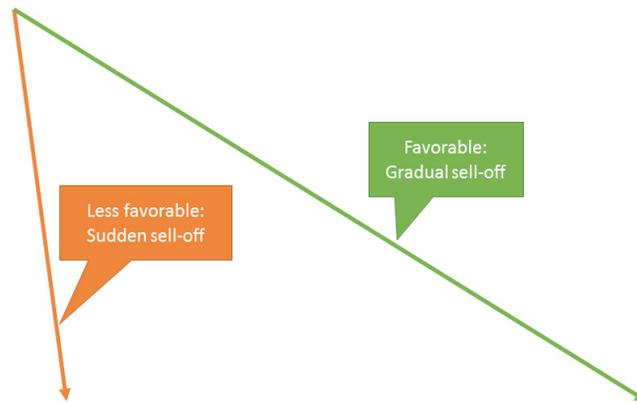


Chart 4. Source: Swan Global Investments; hypothetical representation

In both cases, the elevated volatility levels that tend to follow a market sell-off usually make future premium collection trades more profitable. This is discussed further when we talk about the duration of the sell-off. But during the initial point when markets tip-over, a gradual sell-off is preferable to a sudden crash.

*Less favorable example:* In late August 2015 markets sold off very violently. In the span of just one week, markets entered correction territory, losing over 10%. August 18th and 19th were modest loss days, but over the next four trading days markets dropped like a stone. The nadir of the sell-off was Monday, August 24th when the Dow dropped 1,000 points and the S&P 500 almost 100 points at opening. Although the markets recovered nearly half of their initial losses by midday on August 24th, Swan's strict adherence to its risk-control rules forced the DRS to close out the short option position at a sizeable loss.

It should be noted that the hedge component did

do well during this period in August. It started the correction slightly out-of-the-money, but the hedge did perform its intended role as the markets sold off. Moreover, in subsequent months the DRS was able to “claw back” some of its initial losses. This phenomenon is explored in the duration section.

*Favorable example:* In early 2016, markets gradually sold off over the first six weeks of the year as investors worried about a slowing global economy. Markets bottomed on February 11th after losing 10.27%. In this case, it took over five weeks to officially become a correction. During that stretch there wasn't a single day where the market lost more than 2.5%. In this environment, the DRS performed quite well and was down roughly a third as much as the index<sup>1</sup>.

The chart below compares the speed of the August 2015 sell-off to the early 2016 correction.

<sup>1</sup> Notes to early 2016: The DRS also benefitted from the fact that it had just re-hedged the portfolio at the end of 2015, so its hedges went in-the-money as soon as the markets opened up down in 2016.

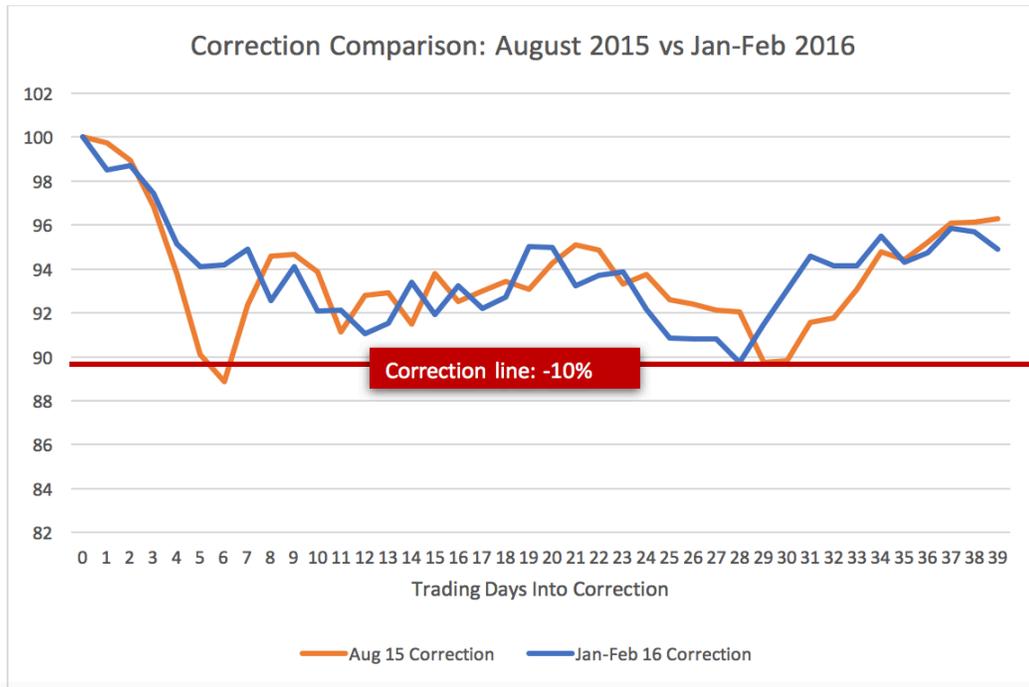


Chart 5. Source: Morningstar Direct, Bloomberg

### Magnitude of the Sell-Off

The magnitude of a market downturn primarily impacts the value of the hedging component of the DRS. The more the market moves down, the more valuable the hedges become. Furthermore,

the value of the put options accelerates as they go deep-in-the-money. **The larger the magnitude of the sell-off, the better the performance of the DRS's hedge.**



Chart 6. Source: Swan Global Investments; hypothetical representation

This relationship is displayed in the graph previously. If the hedge is out-of-the-money, the DRS will likely move more in-line with the market. This is true for both upwards and downwards moves at this point in the curve. If the hedge is at-

or near-the-money, it will be partially sensitive to market moves. However, if the hedge is deep in-the-money, losses in the market are offset dollar-for-dollar by increases in the value of the hedge.

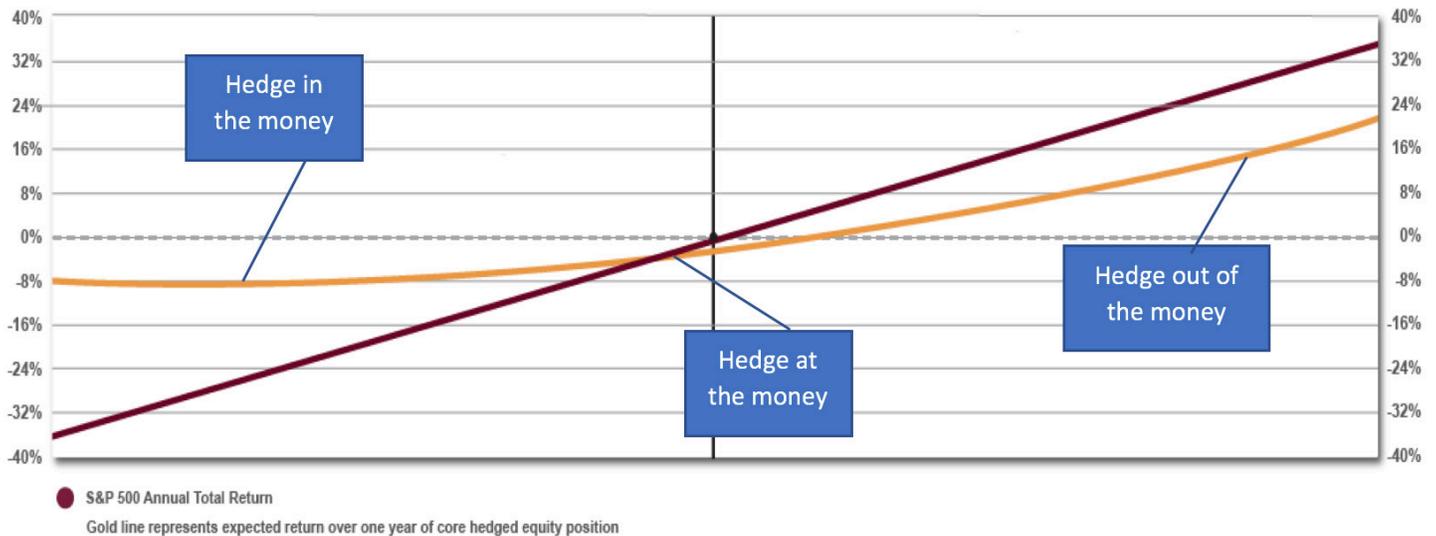


Chart 7. Source: Swan Global Investments; hypothetical representation. The S&P 500 Index is an unmanaged index, and cannot be invested into directly. DRS returns are from the Select Composite, net of all fees. NOTE – this chart is for illustration purposes, not a guarantee of future performance. The charts and graphs contained herein should not serve as the sole determining factor for making investment decisions.

Swan has always maintained that the Defined Risk Strategy was built to protect against bear markets not corrections. Bear markets are commonly defined as sell-offs of 20% or more and take months if not years from which to recover. Alternatively, corrections are sell-offs of 10% to 19%, might last a few weeks or at most a couple months. Bear markets are life-changing whereas corrections are quickly forgotten.

*Less favorable example:* August 1998, LTCM. During the summer of 1998 the Russian default triggered a crisis at the hedge fund Long Term Capital Management. The market had been up 23.3% up until that point. During the crisis, the peak-to-trough losses were 19.2% on the S&P 500. While certainly a major correction, the LTCM

crisis technically just missed the 20% breakpoint to be called a true bear market. In addition, the market also quickly recovered to new highs.

The bigger impact on the DRS, however, was due to the fact that the hedge did not go in-the-money. Essentially, the LTCM crisis had erased all of 1998's gains up until that point; by the time the market bottomed out, the market was more or less where it started the year. On the way down, the hedge did not offer a lot of protection since it was so far out-of-the-money. The hedge was near-the-money when the market bottomed, and its value would have accelerated had the market continued to drop. Instead, the market reversed itself and all of the losses associated with LTCM had been recovered by November 23rd, 1998<sup>2</sup>.

<sup>2</sup> Notes to August 1998: during the LTCM crisis, the harvesting of option premium trades also suffered. In this highly volatile environment, markets whipsawed up and down, a difficult scenario for market-neutral trades.

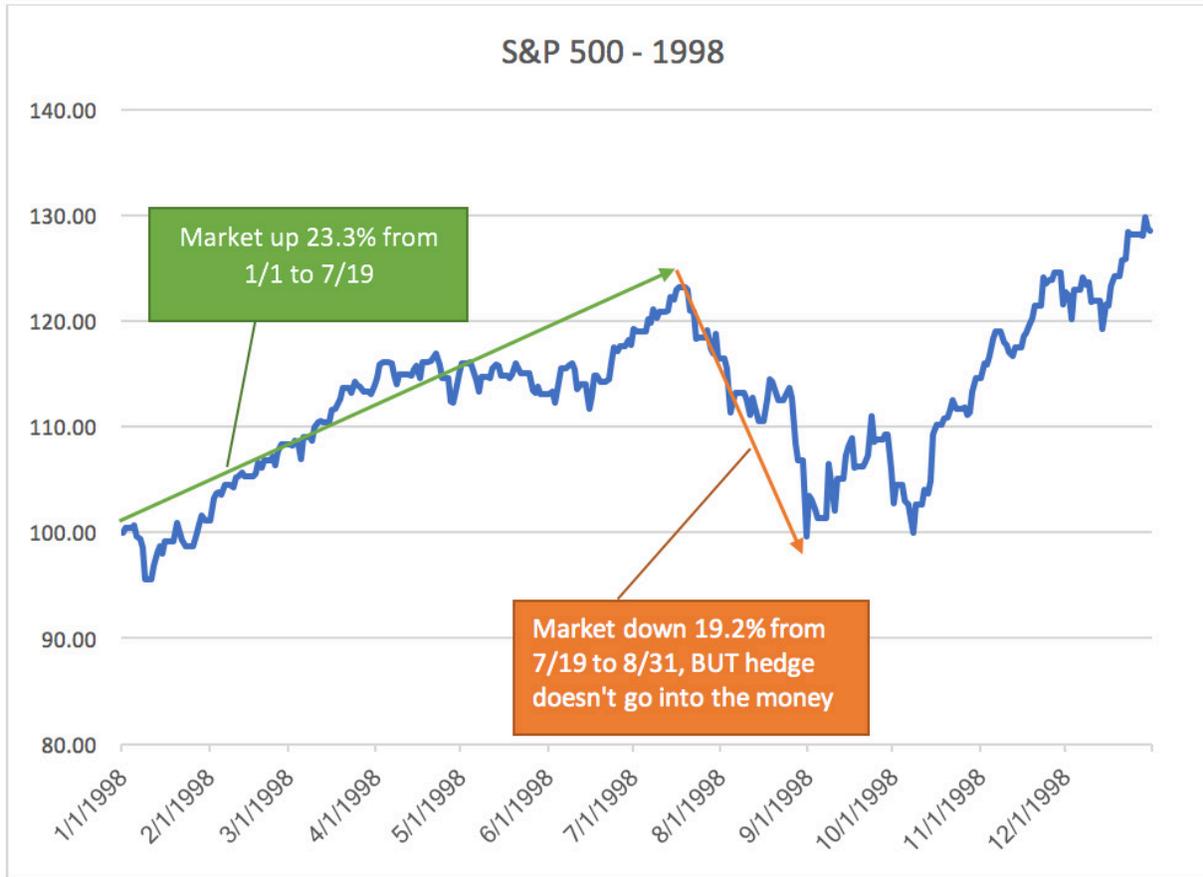


Chart 8. Source: Morningstar Direct, Bloomberg

Returning to our most useful charts, we can see where the DRS was prior to and after the LTCM Crisis.

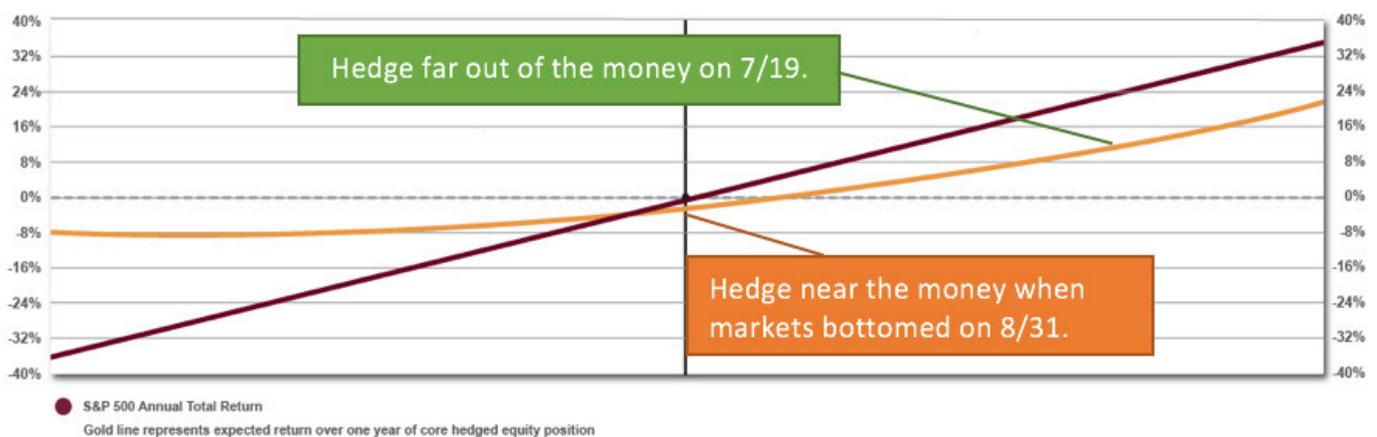


Chart 9. Source: Swan Global Investments; hypothetical representation. The S&P 500 Index is an unmanaged index, and cannot be invested into directly. DRS returns are from the Select Composite, net of all fees. NOTE – this chart is for illustration purposes, not a guarantee of future performance. The charts and graphs contained herein should not serve as the sole determining factor for making investment decisions.

*Favorable example:* Financial Crisis, Sept 08-Feb 09. Although markets had been trending downward throughout 2008, they plummeted in the last four months of the year. The S&P 500 was at 1,468 at the start of 2008 but fell to 1,193 after Lehman failed on September 15th. The S&P 500 ended 2008 at 903 but didn't bottom until March 9th, 2009 at 677. The magnitude of the sell-off in

the markets was so great, we were able to execute not one but two rehedges. Twice our put options went quite deep in-the-money and really proved their value to the portfolio. The DRS was able to sell those put options at a healthy profit and re-invest in the market as the market was trading at a low point<sup>3</sup>.

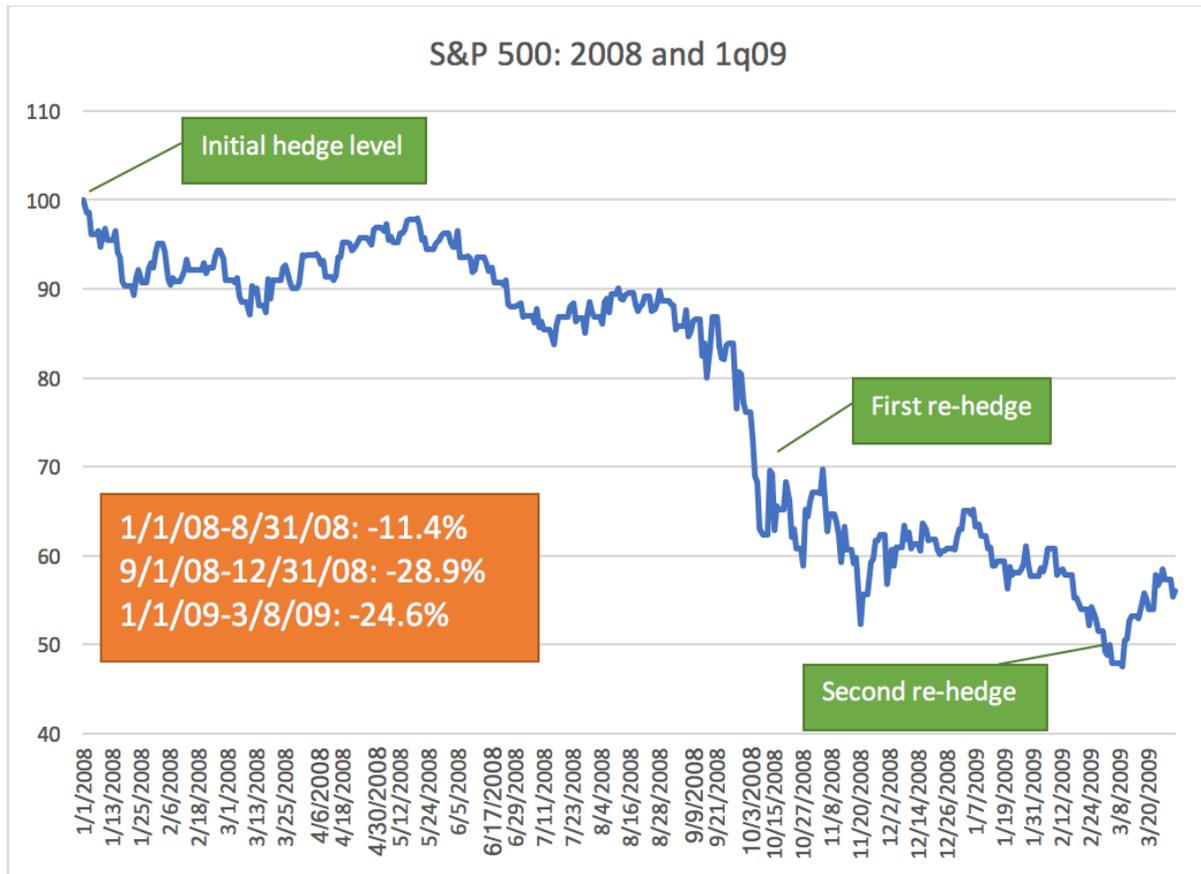


Chart 10. Source: Morningstar Direct, Bloomberg

Below we see the Global Financial Crisis play out on the target return band. This process occurred twice during the crisis, setting up the DRS to perform quite well when markets rebounded in 2009.

<sup>3</sup>Note to Global Financial Crisis: In addition, our option premium trades were able to generate sizable returns.

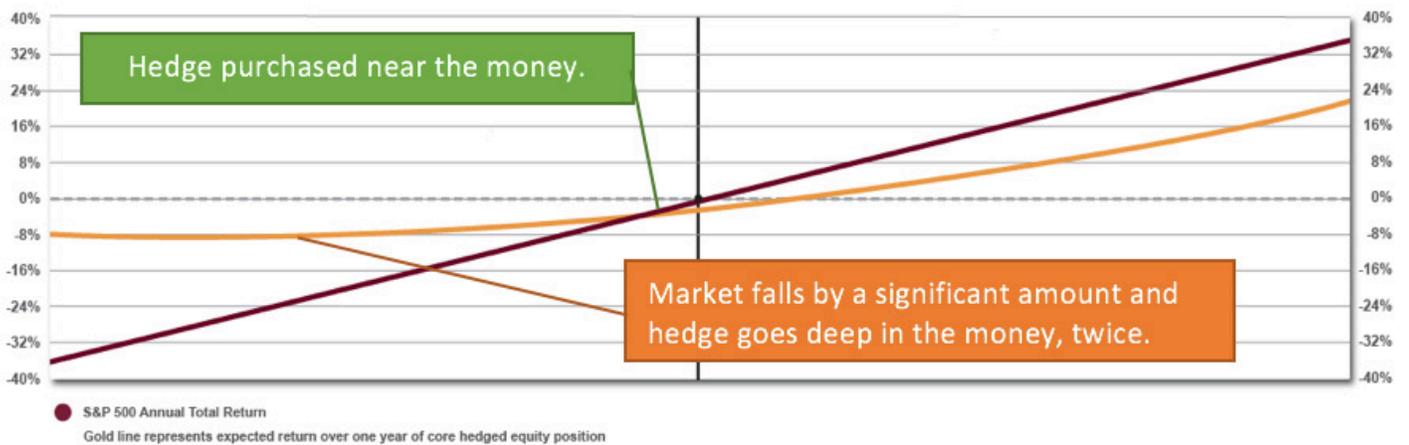


Chart 11. Source: Swan Global Investments; hypothetical representation. The S&P 500 Index is an unmanaged index, and cannot be invested into directly. DRS returns are from the Select Composite, net of all fees. NOTE – this chart is for illustration purposes, not a guarantee of future performance. The charts and graphs contained herein should not serve as the sole determining factor for making investment decisions.

### Duration of the Sell-Off

The duration of a market downturn typically impacts the profitability of the harvesting of option premium trades. Usually during market sell-offs there is a heightened level of market volatility. During these environments, option premium is often described as “rich.” In other words, it’s a seller’s market, and the price of options are high for those willing to write them. **The DRS prefers that the duration of the sell-off last longer, so that we can execute multiple trades at these rich levels**

**of premium.** Conversely, if a sell-off is short-lived and quickly forgotten, we aren’t able to collect as much premium as we would have liked for as long as we would have liked.

It is certainly possible to profitably harvest option premium during periods of low volatility, as the primary driver of an income trade is the gap between implied and realized volatility. However, the “sweet spot” for the DRS is moderate levels of volatility, with VIX levels in the in the mid-teens to low-20s range.

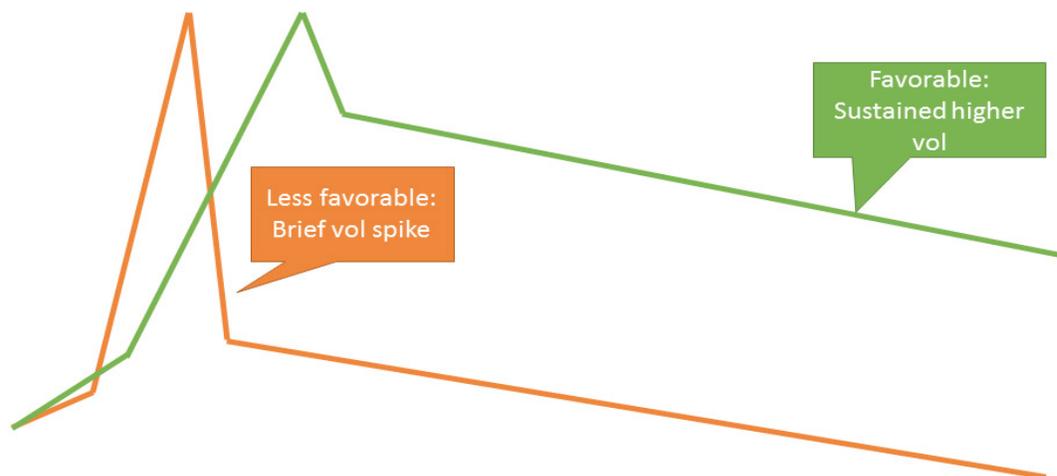


Chart 12. Source: Swan Global Investments; hypothetical representation

*Less favorable example:* Brexit. On June 23rd, 2016, voters in the United Kingdom shocked the political establishment by voting in favor of “Brexit”—the departure of Great Britain from the European Union. Markets responded negatively at first but then quickly rallied. Although the sell-off was worse in European markets, the S&P 500 was down 5.34% over the two trading days of June 24th and 27th. The VIX spiked from 17.25 on June 23rd to 25.76 the following day.

However, markets quickly brushed off its concerns about Brexit. Markets trended back upwards

and by July 8th had recovered all of the losses sustained following the Brexit vote. By July 8th, the VIX was down to 13.20, lower than where it was before Brexit.

During this short sell-off, the DRS did well due to the hedge position, losing less than half of the market over June 24th-27th. However, we would have preferred that the VIX stay at elevated levels in the high-teens or low-20s, instead of dropping back to the depressed levels in the low-teens where the VIX spent most of 2016 and 2017.

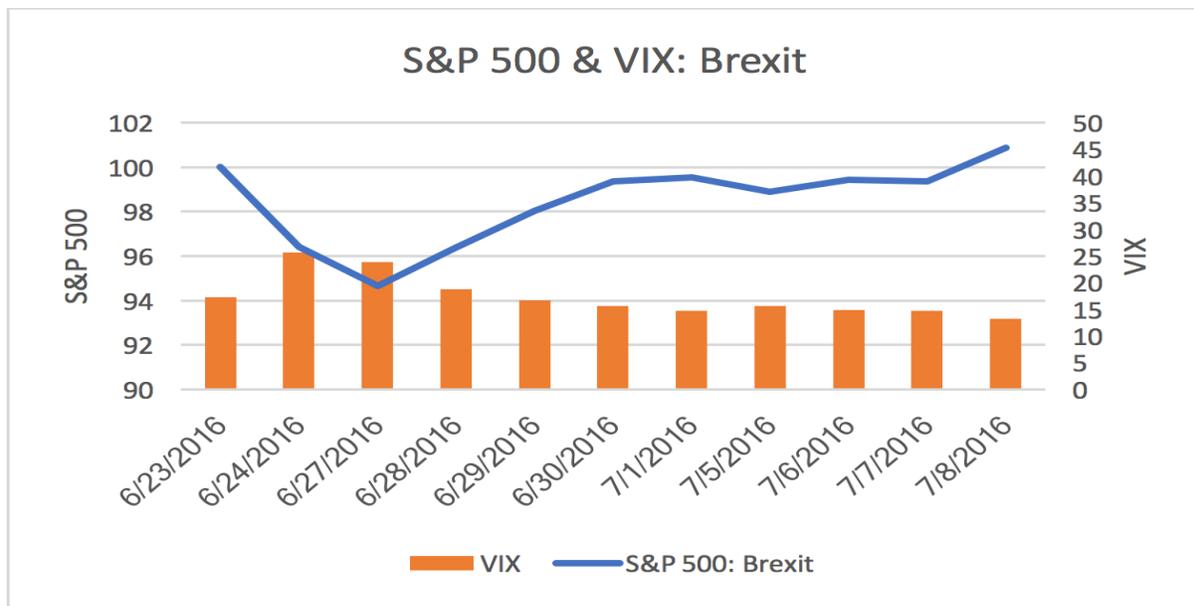


Chart 13. Source: Morningstar Direct, Bloomberg

*Favorable example:* 2007-08, Bear Stearns to Lehman Brothers. During the first half of 2007, markets were up a healthy amount. By mid-July, the S&P 500 was up over 10%, and the VIX spent most of the year in the 12-14 range. However, on July 16, 2007, Bear Stearns disclosed that two of their hedge funds focusing on subprime mortgages were all but wiped out. Many people would later see this as the “canary in the coal

mine” moment that presaged the Global Financial Crisis.

In the year following Bear Stearns’ revelation, the S&P 500 trended nervously downwards, losing almost 18% of its value. More important to the DRS was the fact that the VIX entered a new trading regime, spending most of its time in the high teens or 20s. As stated previously, this is the

“sweet spot” for the DRS, where option premium is both rich and sustained. The DRS did quite well with its harvesting of option premium during this period, the lead-up to the Global Financial Crisis<sup>4</sup>.

In a related note, the start of 2018 bears a striking resemblance to the start of 2007. VIX was at

similarly low levels to start the year. However, 2018 has seen numerous concerns rattle the markets—the end of the easy money period, rising inflation, a potential trade war, etc. Will we see the markets shift from a low volatility regime to a mid-volatility regime, which the DRS prefers? Time will tell.

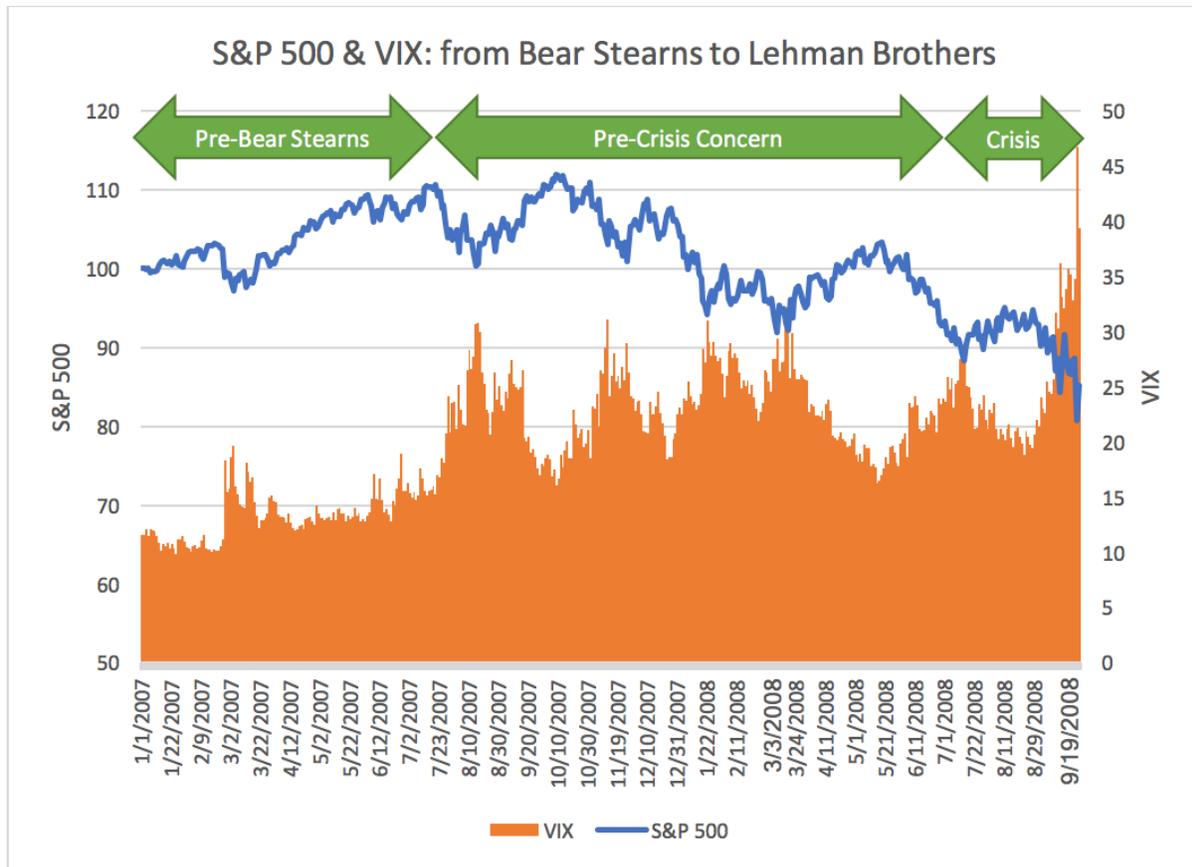


Chart 14. Source: Morningstar Direct, Bloomberg

### Special Situation: V-Shaped Recoveries

If you were to combine unfavorable outcomes for all three primary variables, you get what is known as a V-shaped recovery. V-shaped recoveries are not good for the DRS. In this scenario, the market moves from a low volatility regime to a high volatility regime in short order, as markets sell-off rapidly. The downturn might be in the 10% range, technically a correction. However, shortly thereafter, markets rally sharply and quickly

recover their losses. Volatility reverts back to low levels.

The V-shaped recovery is detrimental to the DRS for the following reasons:

1. The **speed** of the initial sell-off puts the premium collection trades under pressure.
2. The **magnitude** of the sell-off is significant but not enough to where the hedges really start to improve performance.

<sup>4</sup>Note to Pre-Financial Crisis: During the first half of 2008, the DRS also benefitted from the increase in the volatility premium of its hedge and the fact that the hedges spent most of 2008 in-the-money.

3. The **speed** of the recovery on the upside puts the market-neutral premium collection trades under pressure again. However, this time it is the call, not the puts, that are under pressure.
4. The **duration** of the whole correction is short. Volatility falls back to low levels, limiting the DRS's ability to write options at a higher premium level and recoup some of the losses that might have occurred during the sell-off.

*Less favorable example:* At the time of this writing, the February 2018 correction has yet to fully play out. The volatility spike was quite extreme. In percentage terms, the change in five-day realized volatility on the S&P 500 was only surpassed by three historic events: the October 1987 “Black Monday” crash, the May 1940 German blitzkrieg into western Europe, and the May 1948 Israeli declaration of independence. This was a sharper move than the most recent volatility spike in August 2015, yet the DRS performed much better in February 2018 than August 2015.

A month after the sell-off in late January/early February 2018, it would appear that the correction driven by inflation fears would be classified as a V-shaped recovery. However, President Trump’s

unilateral decision to implement tariffs on steel and aluminum imports sent markets scrambling again. February 2018 may be a V-shaped recovery or it may be something else. Only time will tell.

**Special Situation: Extended Decline from Heightened Volatility**

In a previous example we discussed how a period of sustained, range-bound, heightened volatility can lead to profitable premium collection. The example given was the lead-up to the Global Financial Crisis, when the VIX was trading in the “sweet spot” of high teens to mid-20s for an extended period of time.

But what if volatility isn’t range-bound but actually trending in a direction over an extended period of time? If the trend is from a high volatility environment to a lower volatility environment, this situation can be very profitable for a premium collection strategy.

*Favorable Example:* Post-Global Financial Crisis. During the Global Financial Crisis (GFC), the VIX peaked at over 80 on November 20th, 2008. This was an all-time high and an extreme outlier. Compared to other selected crisis, the VIX during the depth of the GFC was significantly higher than other events.

Event	VIX Peak	Date
Global Financial Crisis	80.86	11/20/2008
Debt downgrade	48.00	8/8/2011
“Flash Crash”	45.79	5/20/2010
Long Term Capital Management	44.28	8/31/1998
September 11th attacks	43.74	9/20/2001

Source: Bloomberg

Without too much risk of over exaggeration, the VIX at an 80-handle indicates investors were betting on a complete collapse of the financial system. While certainly the GFC was the biggest threat to the global economy since the Great Depression, it was nowhere near the full catastrophic meltdown that occurred in the 1930s. The system and the markets eventually stabilized with massive fiscal and monetary support.

At the time, no one could definitively say the end of the world was not at hand. Even after the markets found a bottom on March 9th, 2009, investors did not realize the worst was over. Certainly, very few would have predicted that the markets would go on a nine-year plus bull run. Most were so traumatized by recent events they continued to pay for downside protection—at very high prices. As it turns out, protection after March 9th, 2009 wasn't needed and, more often than not, expired worthless. Since Swan was writing these types of short term options, this was an exceptionally profitable scenario as volatility bled out throughout 2009.

At Swan, we often use the analogy of hurricane insurance to describe this phenomenon. While insurers might endure losses when a hurricane hits, in the aftermath of a catastrophe, the demand for insurance skyrockets. New policies are written at very high premiums, and as long as a second catastrophe doesn't fall too closely afterward, an insurance company can make very healthy returns.

### **Special Situations: Whipsaws**

When markets fluctuate wildly, without a clear direction, it becomes difficult for the premium collection trades. The active management of the DRS seeks to keep a trade open during turbulent times in the market and exploit the heightened volatility. It does so by implementing adjustment trades, which collect higher premium and resets the trading bands in which the DRS can profitably operate.

However, in a “whipsaw” environment, markets oscillate wildly, jumping up and down by several percentage points almost every day. Each time

a new trading band is established, the markets move against it, either on the upside or the downside. Such environments make it difficult for the premium collection trades to remain open and profitable.

*Less favorable example:* Debt downgrade, third quarter of 2011. Markets in August 2011 were marked by “headline risk”. News at the time was dominated by the possibility of the euro unraveling as a single currency and the brinkmanship between Democrats and Republicans around the debt ceiling and fiscal policy. Raising the specter of a catastrophic debt default, politicians played a dangerous game of chicken with the integrity of the U.S. Treasury obligations. Markets whipsawed up and down on every rumor or morsel of news.

With the markets wildly fluctuating up and down as the U.S.'s Treasury debt was downgraded from AAA to AA, it was difficult to establish any kind of short option position that wasn't immediately blown out by market moves. This very trying environment led to losses for the income component of the DRS during the third quarter.

### **Volatility Regimes**

Throughout this paper we discussed how increases or decreases in volatility impact the option premium trades. Chris Hausman, CMT, Director of Risk Management and Chief Technical Strategist at Swan Global Investments, recently wrote an extensive white paper titled “The Vanishing VIX: Implications of Low Volatility on the Market and the DRS” on the topic of volatility.

One of the insights Hausman shares with readers is the danger in using a single, long-term average for volatility. Moreover, there is a danger in assuming that volatility is mean-reverting. Instead, volatility tends to trade in “regimes”—sustained periods when it is low, medium, or high, until some event pushes it into a higher or lower regime.

The chart below displays this phenomenon. The chart is color-coded with green for low volatility regimes (VIX less than 15), yellow for mid-vol (VIX between 15 and 25), and red for high-vol (VIX greater than 25).

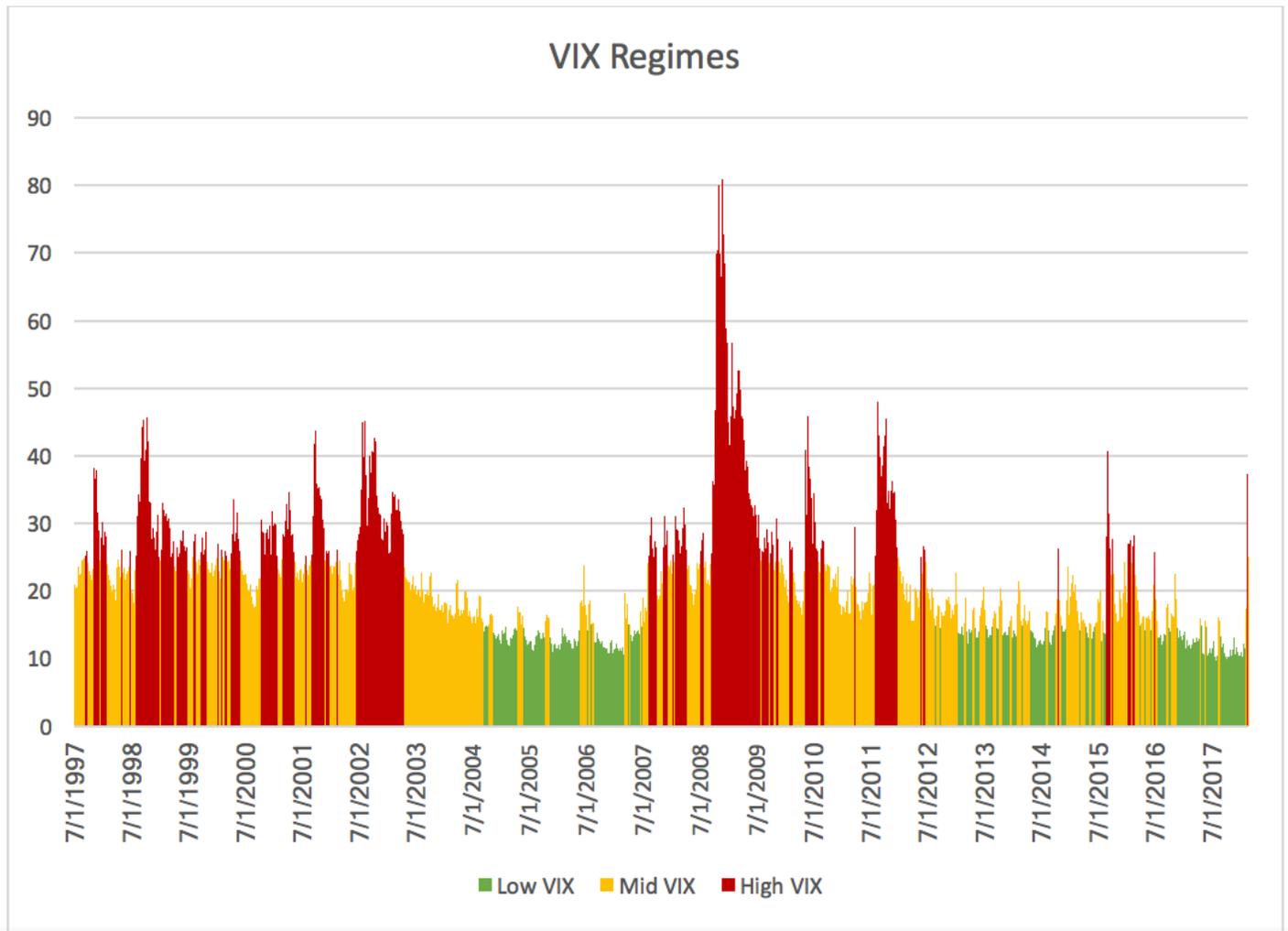


Chart 15. Source: Bloomberg

Earlier when we spoke of the impact of the **speed** of the initial drawdown, we can see both favorable and unfavorable illustrations in the chart above. When volatility spikes and goes from green to red and skips over yellow, that will likely be detrimental. Conversely, if volatility gradually creeps up from green to yellow and potentially into red, that is easier for the DRS to manage.

Following a red spike, we see the **duration** of a drawdown and the heightened volatility environment. If the VIX stays in the red or trends down to yellow, it is generally favorable to the DRS. It means our options are being written at richer premiums and are generally profitable. Conversely, if the VIX drops from red back to

green too quickly, there is a lost opportunity to collect premiums at higher levels.

Premium collection trades can be profitable in low, mid, and high vol environments. While Swan maintains the “sweet spot” is the yellow, mid volatility environment, premium collection can be profitable in high vol and low vol environments if the realized volatility is less than the implied volatility. Because the realized volatility is less than implied volatility more often than not, we engage in the premium collection trades through all three regimes.

Let’s take a closer look at the lead-up and aftermath of the Global Financial Crisis, as it contains several regime shifts.

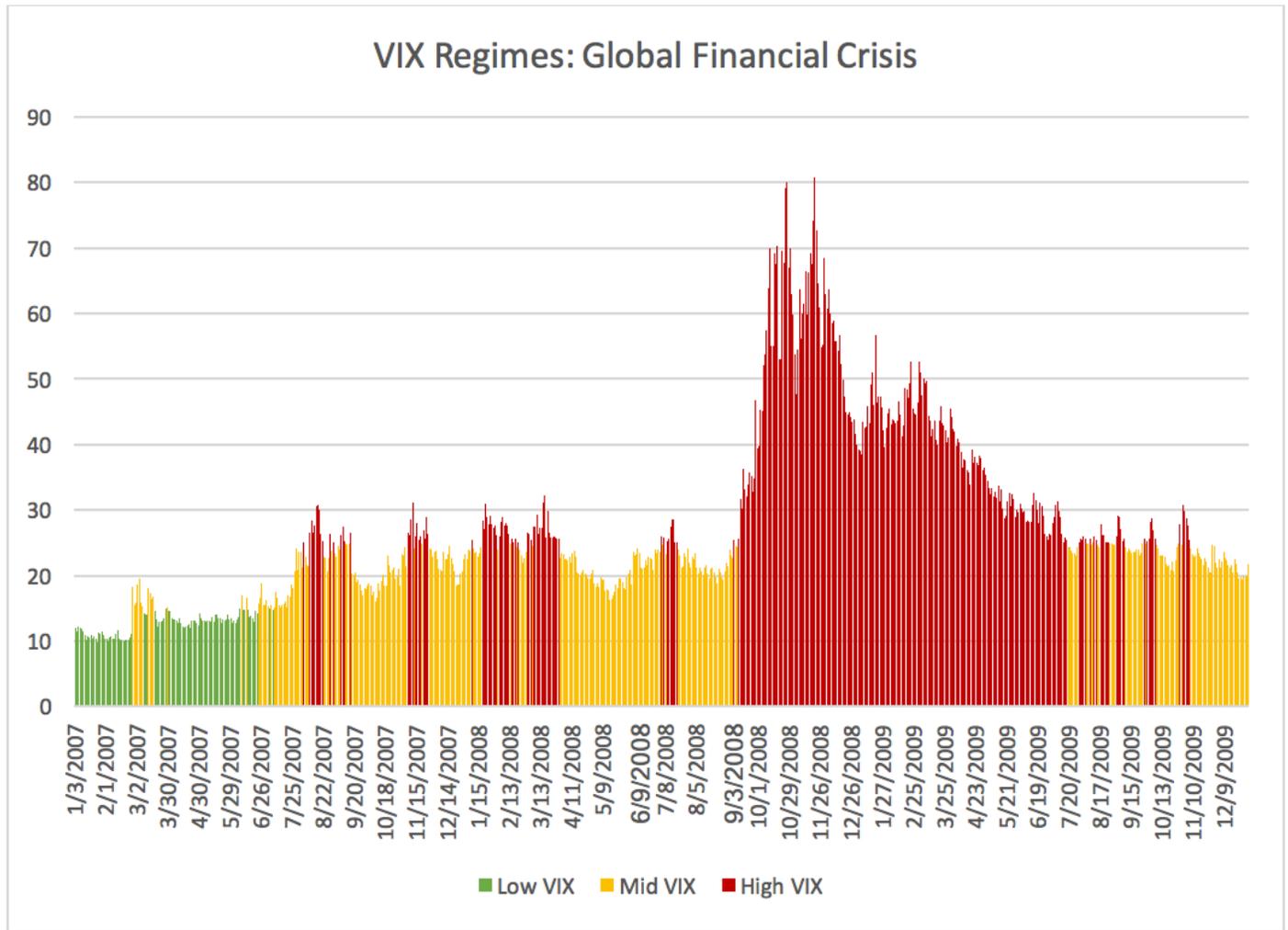


Chart 16. Source: Bloomberg

- Phase One, “Calm Before the Storm” – Volatility starts from a low base during the first half of 2007.
- Phase Two, “Canary in the Coal Mine: Bear Stearns” – Heightened volatility in the latter half of 2007 and first three months of 2008 as investors start to worry about subprime mortgages. Volatility is trading in the “sweet spot” for five quarters. Not too hot, not too cold.
- Phase Three, “Collapse and Panic” – Lehman Brothers fails, setting dominos falling around the globe. Volatility spikes to north of 80 a couple of times in the fourth quarter of 2008. Short volatility trades are hurt.
- Phase Four, “Consolidation” – Although the market continues to fall dramatically during the first two months of 2009, the VIX spends most of its time south of 50. Options written at record high levels of VIX can be closed out for a large profit.
- Phase Five, “Birth of the Bull” – The S&P 500 starts what will be its second-longest bull market on March 10th, 2009, yet no one realizes that at the time. Throughout 2009, markets were up strongly, but the trauma of the Global Financial Crisis still breeds fear in investors. Volatility gradually trends downwards from historically high levels, a very favorable condition for short volatility strategies. This was discussed previously as a special situation.

**Recap**

The three primary variables discussed in this paper are summarized in the table below:

	Component of DRS Most Affected	Favorable	Less Favorable
Speed of Drawdown	Income	Gradual	Rapid
Magnitude of Drawdown	Hedge	Bear market	Correction
Duration of Drawdown	Income	Extended	Brief

While the above table is a useful summary of the different variables, what makes the situation more complex is that none of these variables happen in isolation. For example, the August 2015 sell off was a situation where the markets experienced a correction, not a bear market. Moreover, it came on very quickly but didn't last long. The way all three of these variables broke were unfavorable for the DRS. However, as stated at the outset, no two downturns are ever the same, as illustrated in the six examples in this paper.

**The Importance of Harvesting Risk Premium to the Defined Risk Strategy**

When investors focus on short-term DRS underperformance, usually over a day or two, more often than not it is the option premium trades that are responsible for the "underperformance." During periods of market stress, investors sometimes call in to question the value that the income trades bring to the overall DRS.

We believe that short-termism risks losing the forest for the trees. Trades that harvest premium play an essential role in the DRS, but people tend to notice the income trades only when things go wrong. Swan has modest expectations for the harvesting of option premium trades. We target somewhere between 30-50 basis points per month. In normal circumstances when the income trades are grinding out gains, one or two basis points added per day is easily overlooked. However, over the course of a year they add up. Over our 20+ year history, there have only been three calendar years when the income trades were negative.

In spite of the occasional short-term set-back, we believe the harvesting of risk premium is a persistent source of absolute returns. Such trades are usually profitable if the implied volatility exceeds the realized volatility. Regardless of whether volatility is high or low, a profit potential exists as long as that spread is positive.

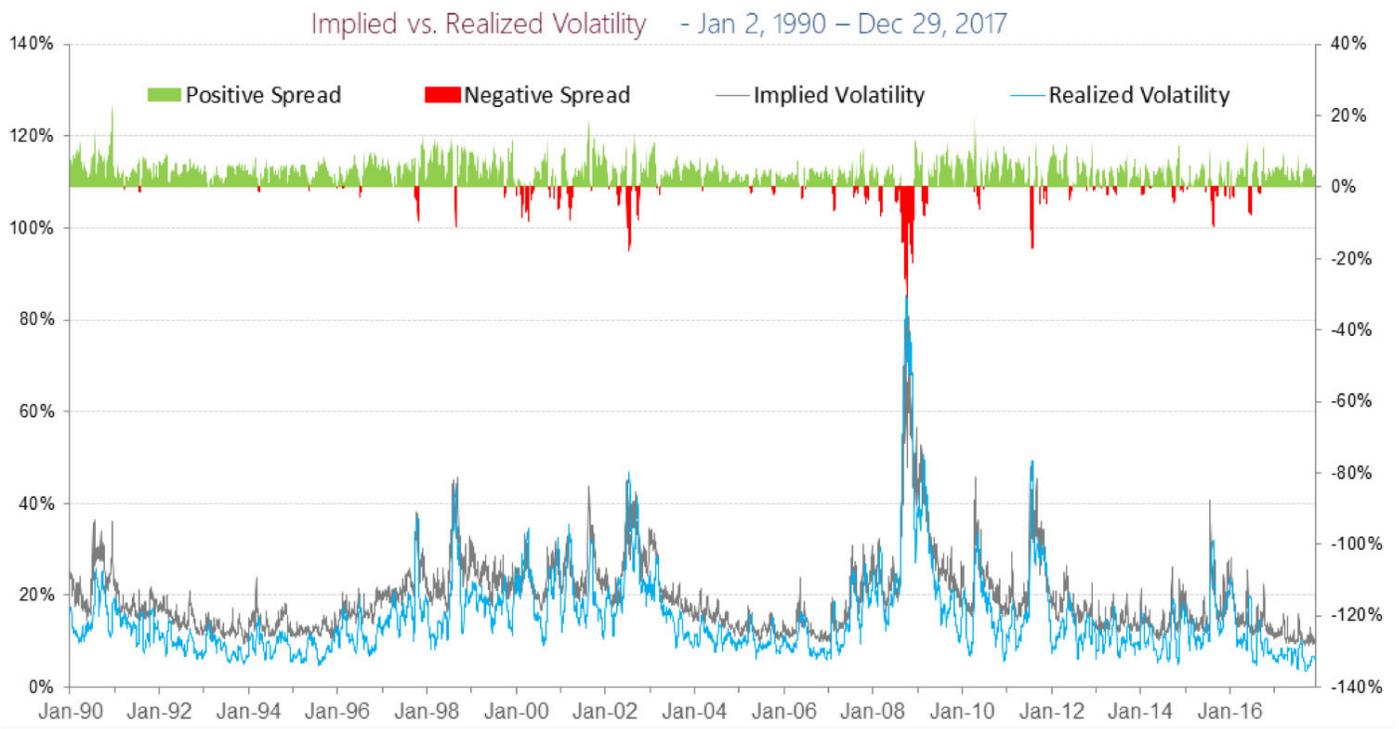


Chart 17. Source: Bloomberg and SG Financial Engineering

Moreover, as mentioned in the “Duration” section, sustained periods of higher volatility following a vol spike tend to be favorable as the premium in the market is rich and favors short volatility strategies.

Most importantly, the income trades allow the DRS to maintain its “always invested, always hedged” philosophy. Without the harvesting of the risk premium component, the cost of maintaining the hedge would be too high. Were it not for the income trades, the DRS would be forced to

- Lower the level of protection by lowering the strike prices on the hedges,
- Protect less than the full notional value of the equity investments, and/or
- Employ a “risk-on/risk-off” approach where Swan would attempt to guess when hedging is or isn’t necessary.

None of these alternatives are deemed particularly attractive. Historically speaking, the harvesting of risk premium trades have accounted for a significant portion of the DRS’s total return. A fourth, equally unappealing alternative would have been to disengage from the harvesting of risk premium entirely in which the absolute return of the DRS would have been much lower.

In spite of the short-term losses that are sometimes incurred during the initial stages of a sell-off, Swan has proven that over the long haul the harvesting of risk premium is a profitable enterprise. While the speed, magnitude, and duration of market sell-offs will determine the relative success of the hedging and premium collection trades, Swan believes both are essential elements when preparing for downturns.

**Summary**

While it is tempting to focus on individual events, the risk in doing so may be detrimental to investors' long-term financial plans. There have been many short-term shocks and spikes over the last twenty years, including:

- 1998 - Russian default/LTCM crisis
- 2000 – Dot Com bubble bursts
- 2001 – September 11th attacks, invasion of Afghanistan
- 2002 – Sarbanes-Oxley Act passed in the wake of accounting scandals
- 2007-09 – Housing bubble bursts; biggest financial crisis since Great Depression
- 2010 – “Flash Crash” in May; intra-day losses on the DJIA are almost 1,000 points

- 2011 – Downgrade of U.S. Treasury debt from AAA to AA
- 2015-2016 – Fears of a “hard landing” in China cause steep sell-offs in August 2015 and early 2016

The Defined Risk Strategy has weathered all of these storms. The goal of the DRS has always been to provide the investor with a smoother, safer ride through a full market cycle, incorporating both a bull market and a bear market. The graphs below illustrate how we have been successful in this endeavor. Each line represents a ten-year return in the S&P 500 (left) or the DRS (right). The only difference is when the initial investment was made. Each line represents a ten-year period with a different inception date, and every period represents a full market cycle as it includes at least one, if not two bear markets.

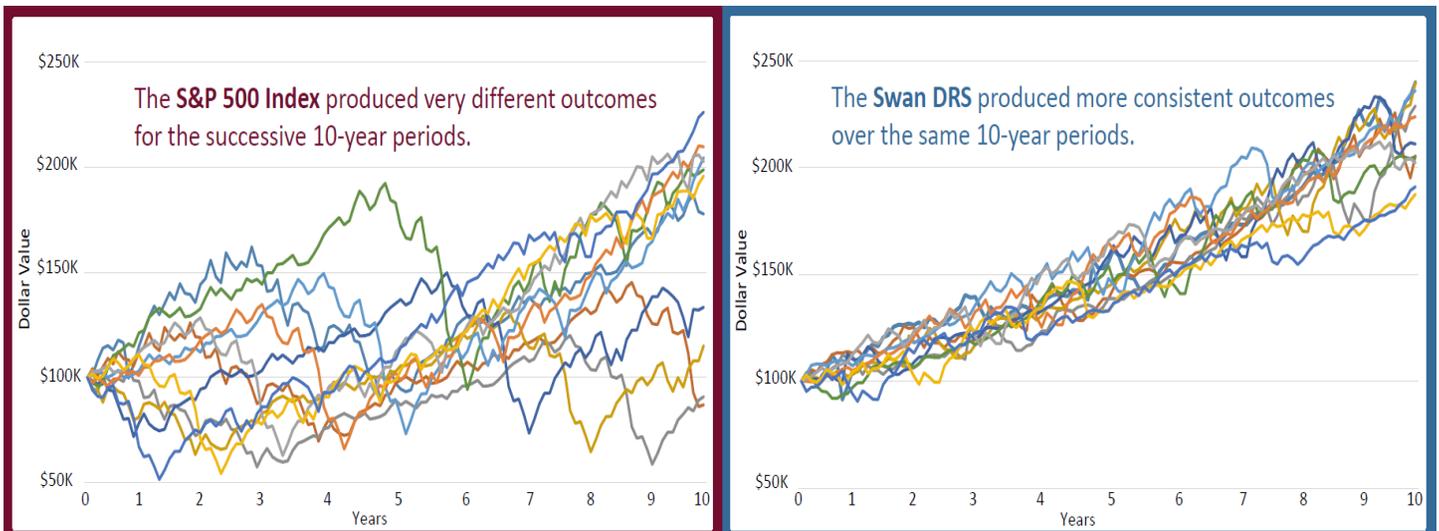


Chart 18. Source: Zephyr StyleADVISOR and Swan Global Investments. All data based on historical performance of the S&P Total Return Index and the Swan DRS Select Composite. Prior performance is not a guarantee of future results. The graphs above show an investment of \$100,000 over eleven successive, 10-year investment periods. The first period is 1/1998 to 12/2007; the last period is 1/2008 to 12/2017.

The difference in results is stark. While the unhedged S&P 500 has had outcomes all across the board, the DRS has been able to maintain a much tighter range of outcomes by mitigating the impact of those two big bear markets. A poorly-timed investment in the S&P 500 may have lead to “lost decades,” where investors faced negative ten-year returns. In contrast, even the worst ten-year returns in the DRS have been respectably

positive.

Does the DRS trail in bull markets? Absolutely. Does the DRS sometimes suffer in short-term situations? It has done so in the past and will most likely do so in the future. But if addressing systematic risk is an investor concern, we believe the DRS has a place in any portfolio.

## FOOTNOTES

### Important Disclosures:

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Additional information regarding Swan's policies and procedures for calculating and reporting performance returns is available upon request. Swan claims compliance with the Global Investment Performance Standards (GIPS) and has prepared and presented this report in compliance with GIPS standard. Swan's compliance with GIPS has been independently verified from its inception on July 1, 1997 through December 31, 2016. A copy of the verification report is available upon request. To receive copies of the report please call 970.382.8901 or email [operations@swanglobalinvestments.com](mailto:operations@swanglobalinvestments.com). Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation. The Defined Risk Strategy Select Composite demonstrates the performance of all non-qualified assets managed by Swan Global Investments, LLC since inception. It includes discretionary individual accounts whose account holders seek the upside potential of owning stock, and the desire to eliminate most of the risk associated with owning stock. The composite relies on LEAPS and other options to manage this risk. Individual accounts own S&P 500 exchange-traded funds, LEAPS associated with the ETFs, as well as option strategies based on other widely traded indices. The Defined Risk Strategy Select Composite includes all nonqualified discretionary accounts which are solely invested in the Defined Risk Strategy. Stock and options are the primary components of the strategy. The performance benchmark used for the Defined Risk Strategy is the S&P 500 Index comprised of 500 large-capitalization stocks, and which does not charge fees. 130-SGI-040418

## ABOUT SWAN GLOBAL INVESTMENTS

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Randy Swan started Swan Global Investments in 1997 looking to supply investment management services that were not available to most investors. Early in his financial career, Randy saw that options provided an opportunity to minimize investment risk.

His innovative solution was the proprietary Swan Defined Risk Strategy, which has provided market leading, risk-adjusted return opportunities through a combination of techniques that seek to hedge the market and generate market-neutral income.



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