



## Diversifying with the Defined Risk Strategy

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## I. EXECUTIVE OVERVIEW

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Swan Global Investments has been managing the Defined Risk Strategy (“DRS”) for over 18 years. With the DRS, Swan believes it has an excellent investment solution that is transparent, repeatable, and scalable. This solution seeks to actively address the biggest threat investors of all types have in meeting their goals, namely, the devastating impact that bear market sell-offs have on an investor’s wealth. Traditionally applied to U.S. Large Cap stocks, the DRS successfully navigated two major bear markets and numerous short-term corrections since 1997.

In order to provide a more complete solution, Swan is looking to apply the benefits of the DRS to a wide range of additional assets. This paper explores that initiative. It starts with a review of the existing DRS’s goals, track record, and methodology. Once established, both the logic of applying the DRS to additional assets and the practical implications

of such an effort are discussed. Next the paper shares backtests of the DRS applied to different assets, and then addresses potential challenges one might encounter when applying the DRS to asset classes other than U.S. Large Cap stocks. The paper then discusses how diversification of multiple asset classes with the DRS applied, could be used to build a better portfolio.

Finally the paper discusses Swan Global Investment’s strategic plan and how the effort to apply the DRS to multiple assets is already well underway. It is unlikely that anyone reading this paper would be surprised by its conclusion- the Defined Risk Strategy is appropriate for many assets and Swan is enthusiastically bringing such solutions to market. We hope that by the end of this paper you will agree with us and are as excited about our vision as we are.

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## II. INTRODUCTION

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Created in mid-1997, the Swan Defined Risk Strategy was conceived as an improvement upon or compliment to the standard asset allocation models that dominate the investment world. By directly addressing systematic risk via the intelligent and efficient use of option strategies, the DRS was designed to remedy the shortcomings of traditional asset allocation, market-timing, sector rotation, and stock-picking. The goal of the DRS is to outperform on an absolute, relative, and risk-adjusted basis most broad market benchmarks and asset allocation portfolios over a full market cycle.

Having recently amassed an 18-year track record, the DRS has delivered on its objective. Compared to the S&P 500, the broader Russell 3000, a 60% S&P 500/40% Barclays Aggregate Bond mix, and the HFRI Fund Weighted Composite, the results have been impressive. Especially notable is the DRS performance through the two recent bear markets of the new millennium. During the dot-com bust of April 2000 to March 2003 the DRS returned a positive 20.63% and during the credit crisis of October 2007 to March 2009 the DRS returned -1.09%. During the same time period the S&P 500 returned -40.93% and -50.17%, respectively.

Manager Performance

July 1997 - September 2015 (Single Computation)



Chart 1  
Source: Zephyr StyleADVISOR

July 1997 - Sept 2015: Summary Statistics	Ann. Return	Cumulative Return	Std Dev	Dot Com Bear Market (4/00-3/03)	Credit Crisis Bear Market (10/07-2/09)	Sharpe Ratio
Swan Defined Risk Strategy (net)	8.50%	343.13%	9.89%	20.63%	-1.09%	0.63
Russell 3000	6.61%	221.64%	15.80%	-40.39%	-50.30%	0.28
60% S&P 500/40% Barclays Agg	6.31%	205.35%	9.30%	-17.15%	-31.65%	0.44
HFRI Fund Weighted Composite Index	6.71%	227.39%	6.99%	1.20%	-19.18%	0.64
S&P 500	6.28%	203.95%	15.46%	-40.93%	-50.17%	0.26

Table 1  
Source: Zephyr StyleADVISOR

Since inception the DRS has invested in exchange traded funds (ETFs) and options based upon large cap U.S. equities. The DRS's long-term success obviously begs the question - is it possible to replicate the strategy successfully in other assets? Could there be a DRS version of small cap stocks,

emerging markets, REITs, or any other "satellite"<sup>1</sup> asset class? We at Swan Global Investments believe the answer to be a resounding yes. This paper builds the case for applying the Defined Risk Strategy to multiple assets.

### III. REVIEW OF THE DEFINED RISK STRATEGY

Before presenting the argument for applying the Defined Risk Strategy to other, non-S&P 500 assets, it is reasonable to review what the DRS is and how it works. The DRS was built around the philosophy that the biggest risk to an investor's wealth is the large scale market sell-offs that regularly occur and devastate the investor portfolios. Since 1929 there have been 25 bear markets, defined as a loss exceeding 20%. These occur on average every 3.4 years and when they do occur they have lasted an average of ten months and had an average peak-to-trough drawdown of 35.4%<sup>2</sup>. During these bear markets traditional asset allocation strategies have failed to adequately protect investors' wealth. Trying to avoid these calamities via market timing, sector rotation, or stock picking is very difficult if not impossible over long time horizons. Therefore, the DRS was designed to directly address systematic risk via the strategic use of options.

The motto of the Defined Risk Strategy is "always invested, always hedged." To that end, the DRS is composed of three separate but complimentary components, namely, 1) equity, 2) hedge, and 3) market-neutral income.

1. Equity: The exposure to equity markets is accomplished via low-cost, passively managed ETFs. Swan does not believe that active stock-picking results in long-term success, but does believe that equity markets offer the best long-term returns. Therefore, approximately

85%-90% of an investment in the DRS goes to a buy-and-hold position in an ETF to obtain market exposure.

2. Hedge: In order to protect the equity position against large drawdowns, a hedge is placed on the equity position via market-traded, long-term put options. The options typically have a target expiration a maximum of two years out and make up 10%-15% of the portfolio. Hedging via long-term puts offers several advantages over short-term puts, namely:

a. Cost-efficiency. The DRS does not hold the put options for the full two years. Instead the puts are sold on the open market with roughly a year left to expiration, and new longer-term puts are purchased to hedge the equity. This process is known as "rolling the hedge." With a year to expiration there remains a significant amount of time value to the option. Thus, the DRS sells the put option before it is exposed to a steep drop-off in value known as time decay or "theta".

b. Volatility Capture. When rolling the hedge as described above, the value of the option will be influenced by prevailing volatility conditions. Should market volatility be higher during the time when the DRS is looking to sell the put option on the open market the increased volatility increases the market price of the option. This is known as an option's "vega".

<sup>1</sup> Some of these assets, like U.S. Small Cap and Foreign Developed, admittedly do play a key role in many investors' portfolios. However, for the sake of convenience, this paper uses the term "satellite" to refer to any asset class that is not U.S. large cap equity/S&P 500 type investments.

<sup>2</sup> Source: Bank of America/Merrill Lynch and Bloomberg.

c. Liquidity. The price of short-term protection tends to spike dramatically during periods of crisis. Ironically it is sometimes too expensive to hedge a portfolio when hedging is most needed. By hedging via long-term puts, the DRS isn't required to hedge while under duress.

d. Opportunity. During those periods of market crisis when the market plunges, the value of the put option can skyrocket. Historically, the DRS has taken advantage of these corrections by selling the put on the open market at a large profit, re-hedging the portfolio, and re-investing the excess proceeds into additional shares of equity. By using a market downturn as an opportunity to invest in the market at depressed prices, the DRS sets up well for market rebounds.

3. Market-neutral Income: While the DRS always maintains a long position in put options for hedging purposes, an additional source of return is income generated from selling

options. By systematically engaging in short-term, non-directional option sales, the DRS seeks to offset the cost of the hedge and also have a third, independent source of returns. These types of trades tend to be most profitable when there is a modest amount of volatility in the markets, so that the DRS can collect a healthy amount of premium by selling options. Moreover, the market neutral income trades tend to work best when there is a large gap between what buyers are willing to pay for short-term protection and the actual, realized volatility of the underlying asset class. By being short volatility in the near-term, the DRS balances out the long volatility of the hedge.

Because Swan does not profess to know the future, we do not engage in market-timing. Therefore, the equity position and hedge is always present, and the market-neutral income trades are almost always in place. It does not matter to Swan if the market has just sold off by 50% or if it is in the midst of a six-year bull run, the process described above remains the same.

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## IV. APPLYING THE DRS TO OTHER ASSETS

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Given the fact that the DRS only requires 1) a liquid ETF for the equity investment and 2) a deep enough option market for hedging and market-neutral income trades, applying the DRS to other assets is straightforward. The success of the DRS depends upon the implementation of our rules and risk controls. With the DRS there is no need for research teams meeting with companies in Germany or Brazil. The DRS does not require complex algorithms unique to each asset class, forecasting which factors are driving its performance. All that is needed is ETF exposure and options, so the process is quite scalable.

Moreover, one could make the argument that the DRS is even better suited for "satellite" assets like small cap stocks, emerging markets, etc. Those assets tend to be more volatile and have larger bear market losses than the U.S. large cap market. The fact that traditional, long-only investments in assets like small caps, foreign developed markets, and foreign emerging markets have been riskier has led to their historical underweighting in all but the most aggressive portfolios. The reason why some of these assets are relegated to "satellite" rather than "core" status in a portfolio has been due to their volatility and bear market losses.

January 1988 - June 2015

Asset Class	Index	Ann. Return	Std Dev	Sharpe Ratio	Maximum Drawdown	Pain Index
Large Cap US Stocks	S&P 500	10.10%	14.38%	0.47	-50.95%	8.92%
Small Cap US Stocks	Russell 2000	9.89%	18.67%	0.35	-52.89%	8.23%
Foreign Developed Stock	MSCI EAFE Index	5.37%	17.18%	0.12	-56.40%	13.43%
Foreign Emerging Stock	MSCI Emerging Markets	10.58%	23.28%	0.31	-61.44%	15.49%
Gold	S&P GSCI Gold	3.03%	15.65%	-0.02	-42.88%	19.21%
Real Estate/REITS	FTSE Nareit All REITs	9.67%	17.45%	0.36	-67.89%	9.33%
Long-Term Bonds	Barclays U.S. Treasury: Long	8.61%	9.74%	0.54	-15.94%	3.43%

Table 2

Source: Zephyr StyleADVISOR

Unlike most strategies, the DRS seeks to profit from volatility and bear markets. As discussed in the previous section, the equity, hedge and market-neutral income components of the DRS were designed to minimize and mitigate the impact of bear markets and actually profit from volatility. For the following reasons, we believe the DRS is even better suited to “satellite” assets.

- The hedge offsets losses in the equity investment during periods of large market sell-offs.
- More frequent and larger drawdowns provide more opportunity for the DRS to opportunistically sell the put options at a profit, re-hedge, and re-invest in the market when the market prices are at depressed levels.
- Volatility cuts both ways. It’s true that satellite assets tend to have steeper drawdowns. But the flip side of the coin is that satellite assets

tend to have sharper, higher rallies. By re-hedging and re-investing after large market sell-offs, satellite DRS should be even better positioned to take advantage of larger rallies.

- Higher volatility also helps the market-neutral income trades. Again, the success of the short premium trades is partially dependent upon buyers being willing to pay a large enough premium for their short-term protection. By selling these short-term contracts, the more volatile the market, the larger the premium available to the DRS.
- Another factor driving the success of the market-neutral income trades is the gap between the premiums paid for the options and the realized volatility. The larger the gap between implied and realized volatility, the more profitable the short position<sup>3</sup>. With these satellite assets, the “fear factor” is often higher

<sup>3</sup>The reverse of this scenario, if realized ex-post volatility is more extreme than ex-ante volatility, is typically detrimental to the market-neutral income trades.

than it is for large cap U.S. stocks, so the profit potential is higher.

Another favorable trait of applying DRS to assets like small cap and emerging markets is liquidity and capacity constraints. Quite often money managers who have successfully managed a portfolio of under \$500 million struggle to maintain their success when their portfolio grows to \$3 billion or more. Best ideas are hard to implement in less liquid, shallower markets, so money managers are left 1) taking smaller positions in their best ideas than desired, 2) incorporating “second-best” or “third-best” ideas, and/or 3) drifting into larger capitalization names. Some managers recognize this threat and therefore close their funds to new flows above a certain asset level. However the

DRS simply uses broad market ETFs for assets like small cap and emerging markets, and would not be susceptible to these liquidity and capacity problems.

A thorough understanding of the drivers of DRS performance would logically lead one to conclude that the DRS should be able to be successfully applied to other assets. In fact, it seems likely that the DRS would be even more successful in the more volatile assets. For further, in-depth discussion of details of the DRS, please refer to [swanglobalinvestments.com](http://swanglobalinvestments.com). In the following section we discuss whether or not it is practical to implement the DRS across different assets and in section VI we analyze some hypothetical results of the DRS applied to various assets.

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## V. THE PRACTICAL SIDE OF IMPLEMENTING DRS

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While the previous section outlined the theoretical justification for applying DRS to satellite assets, how practical is it to actually implement the strategy? Again, all that is needed in order to apply the DRS to an asset class is a deep enough ETF market and options available on that asset class.

Of course, the ETF market has been growing by leaps and bounds. According to research from BlackRock, the assets under management in exchange traded products, or ETPs (which includes ETFs and ETNs) grew from \$70 billion

in 2000 to \$2.1 trillion as of June 30, 2015. An estimated \$97 billion flowed into ETPs the first half of 2015 alone. Exchange traded funds represent one of the biggest and most successful financial innovations over the last few decades, and the size of the market is only expected to grow.

A similar rate of growth is seen in the options markets. For many assets, the building blocks are in place for a successful implementation for the DRS. The growth in SPX options alone has doubled in the past ten years.

### Assets Under Management, ETPs

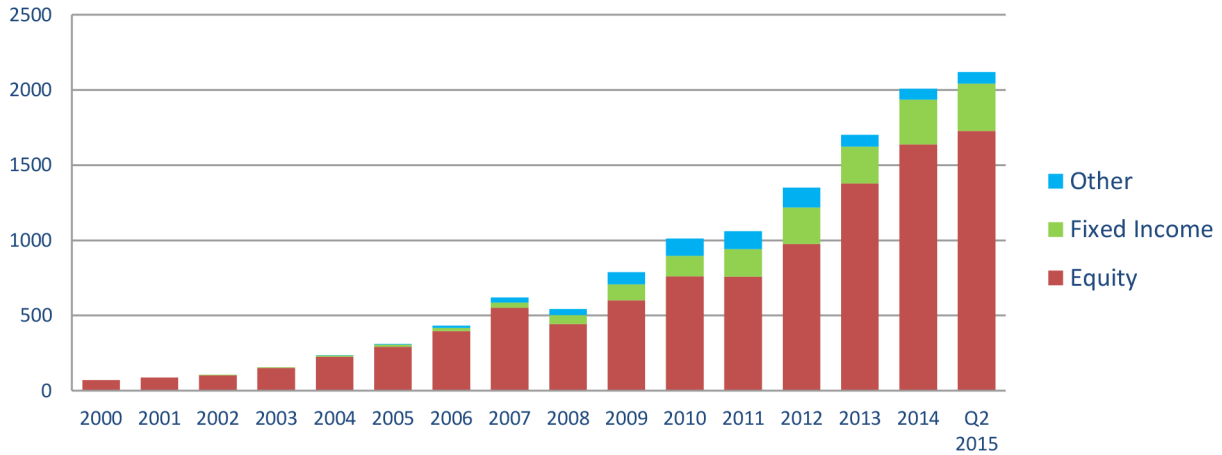


Chart 2

Source: BlackRock, Bloomberg, ICI as of 6/30/15. "Other" category includes alternatives, commodities, currency, target date, asset allocation, and fund of funds

### Exhibit 21 - Notional Value of Average Daily Volume in S&P 500 (SPX) Options (in \$ Billions) (2000-2014)

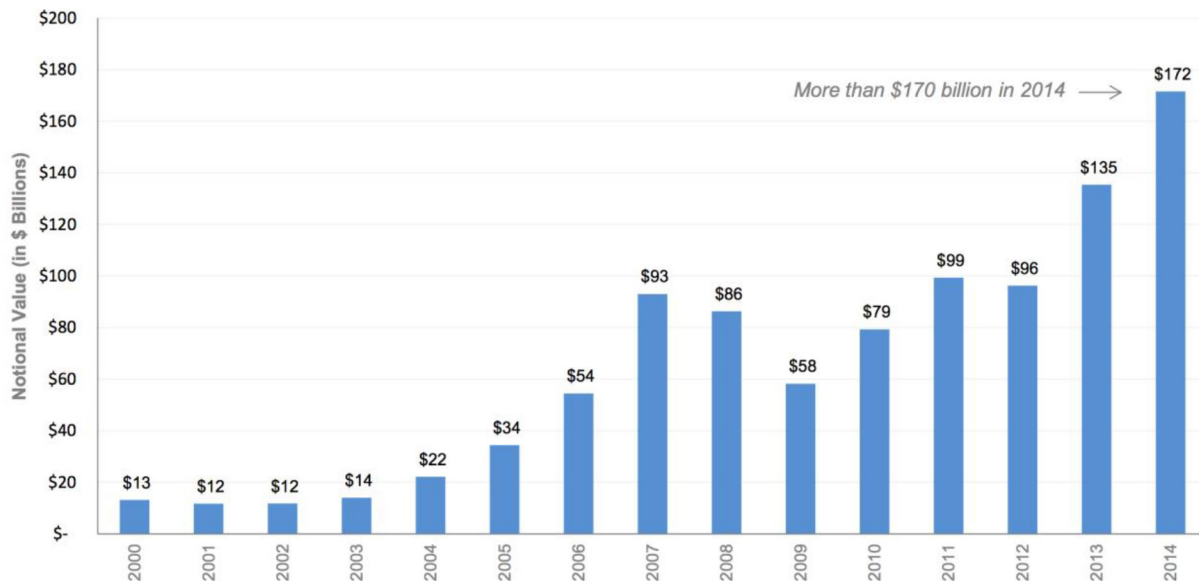


Exhibit 21: Fund managers examine trading liquidity and capacity when considering investment vehicles. The approximate daily notional value of trading in SPX options in 2014 can be estimated by multiplying the average daily volume (888,089 contracts) times the value of the S&P 500 Index (average of 1931) times the \$100 options contract multiplier, for a value of more than \$170 billion per day. Some investors use a delta-weighting multiplier to develop a more conservative estimate for notional value of options trading. Sources: Bloomberg and CBOE.

Chart 3



The growth in options tracking the satellite assets has taken a similar course. There was a dip in trading after the Financial Crisis, but then volume has been generally increasing. The table below shows the open interest in contracts based upon

a selection of ETFs.

The necessary tools are in place to apply the DRS to different assets. The question then becomes, how well would the Defined Risk Strategy have performed?

#### Open Interest on Various ETFs

	IWM – U.S. Small Cap	EEM – Emg Markets	QQQ - NASDAQ	GLD - Gold
Dec-08	5,014,396	2,860,135	5,381,507	834,145
Dec-09	5,437,267	4,589,001	6,586,416	3,869,866
Dec-10	5,106,353	4,742,014	4,613,054	4,084,974
Dec-11	3,769,470	4,390,717	3,743,921	4,779,007
Dec-12	5,335,657	4,596,753	3,985,543	3,897,800
Dec-13	5,131,922	6,120,120	4,463,813	2,932,721
Dec-14	4,778,441	6,108,108	3,813,139	2,333,866
Aug-15	6,703,198	9,921,252	4,015,224	2,741,322

Table 3  
Source: CBOE

## VI. HYPOTHETICAL PERFORMANCE

Because the Defined Risk Strategy follows a strict, rules-based process regardless of the market environment, creating historical backtests for different assets is fairly straightforward. ETF prices are available, as is historical pricing on long and short-term options.

In the strongest possible terms, Swan makes it clear that these numbers are strictly hypothetical backtests. During the time frame of January 1st 2007 to December 31st 2014, Swan was not actively running money in any of these strategies until 2013. These numbers were generated

internally as a “proof of concept” to see if the theoretical justification for applying the DRS to other assets would have worked using historical inputs and fall within an expected return range. These results do not reflect the performance of any actual product. Before embarking on any new product release, it is only prudent to conduct such tests, but anyone viewing this information should recognize these were only tests.

These backtests were created across seven assets, using seven ETFs. Only the data for the flagship, large cap U.S. equity, Swan Defined

Risk Strategy Select Composite reflects the performance of an actual product; the remaining seven assets outlined in the table below are backtested, hypothetical performance.

Asset Class	ETF used	ETF Ticker	Unhedged ETF Abbreviation	DRS Abbreviation
Small Cap US Stocks	iShares Russell 2000	IWM	US SC - ETF	US SC - DRS
Nasdaq 100	PowerShares QQQ	QQQ	Nasdaq - ETF	Nasdaq - DRS
Foreign Developed Stock	iShares MSCI EAFE	EFA	For Dev - ETF	For Dev - DRS
Foreign Emerging Stock	Vanguard FTSE Emerging Markets	VWO	For Emg - ETF	For Emg - DRS
Gold	SPDR® Gold Shares	GLD	Gold - ETF	Gold - DRS
Real Estate/REITS	iShares US Real Estate	IYR	REIT - ETF	REIT - DRS
Long-Term Bond	iShares 20+ Year Treasury Bond	TLT	Long Bond - ETF	Long Bond - DRS

Table 4

The results are certainly encouraging. The hypothetical backtests showed the kind of results one would expect from the DRS: outperformance in

down markets, underperformance in up markets, and an overall reduction in risk.

<sup>4</sup>Swan performed the initial backtests of emerging markets using Vanguard FTSE Emerging Markets ETF (VWO), which tracks the emerging markets index very closely. Additionally, the ETF, EEM (iShares MSCI Emerging Markets) is also used for reference and investment.

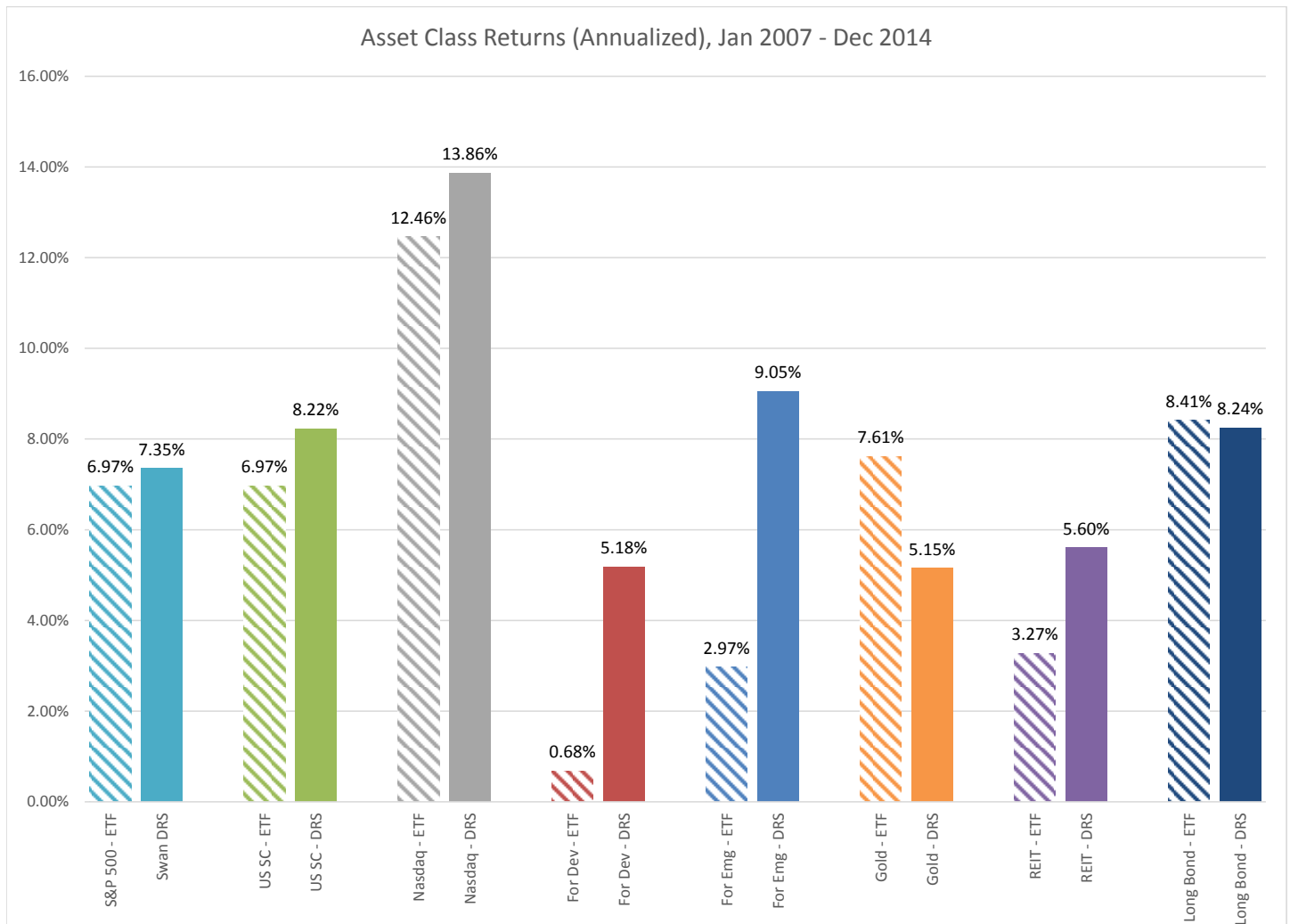


Chart 4  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

During the period under analysis, 2007-2014, most assets saw either a slight or significant improvement of returns using the DRS. Of the eight assets analyzed, all six equity-based assets showed an improvement in hypothetical returns. The two asset classes with lower returns were gold and long-term bonds.

Context is important when understanding why this might be. The test period of 2007-2014 includes the catastrophic bear market of the credit crisis. During that chaotic environment gold and long-term bonds were viewed as “safe harbor” asset classes and saw healthy returns. Between August 2007 and February 2009 the SPY ETF tracking the S&P 500 lost 47.5%. During that same time period

the GLD ETF tracking gold and the TLT ETF tracking long term bonds had returns of 40.9% and 24.6%, respectively. Moreover, gold continued its run well into 2011 as investors worried about the long-term inflationary impact of emergency monetary and fiscal policy on global economies. Between the credit crisis start in August 2007 and its peak in August 2011, GLD had a cumulative return of 170.3%. During that tremendous bull market run for gold, it is no surprise that the hedged DRS version would trail the unhedged version.

But return is only part of the picture. The emphasis of the DRS has always been managing risk.

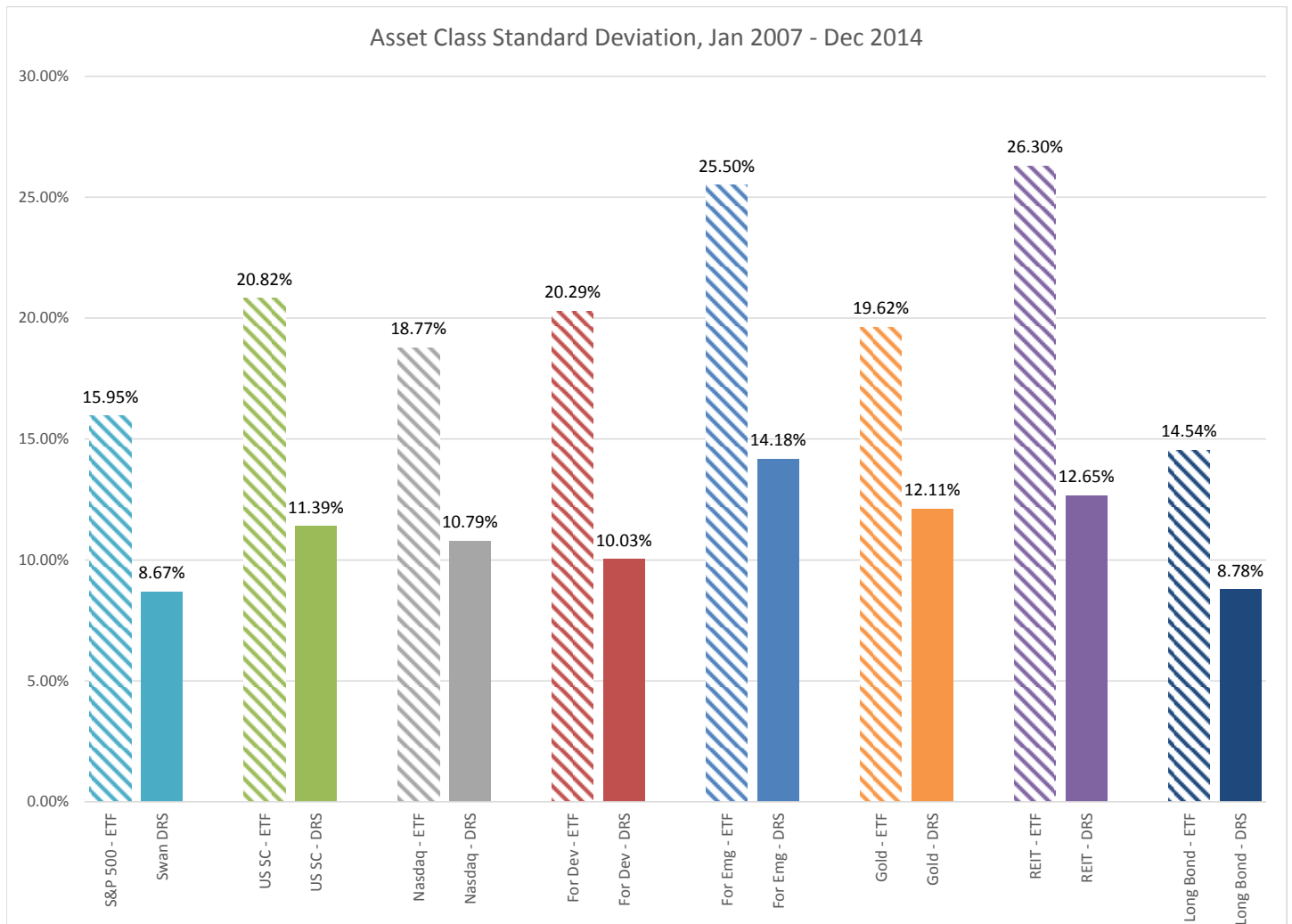


Chart 5  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

The volatilities of each asset class were theoretically reduced significantly by applying the DRS process to these assets. Most standard deviations were reduced by one-third to one-

half of their unhedged levels. The scale of the improvement in risk is roughly similar to what was experienced in the actual DRS Select Composite numbers seen over the entire 18 year track record.

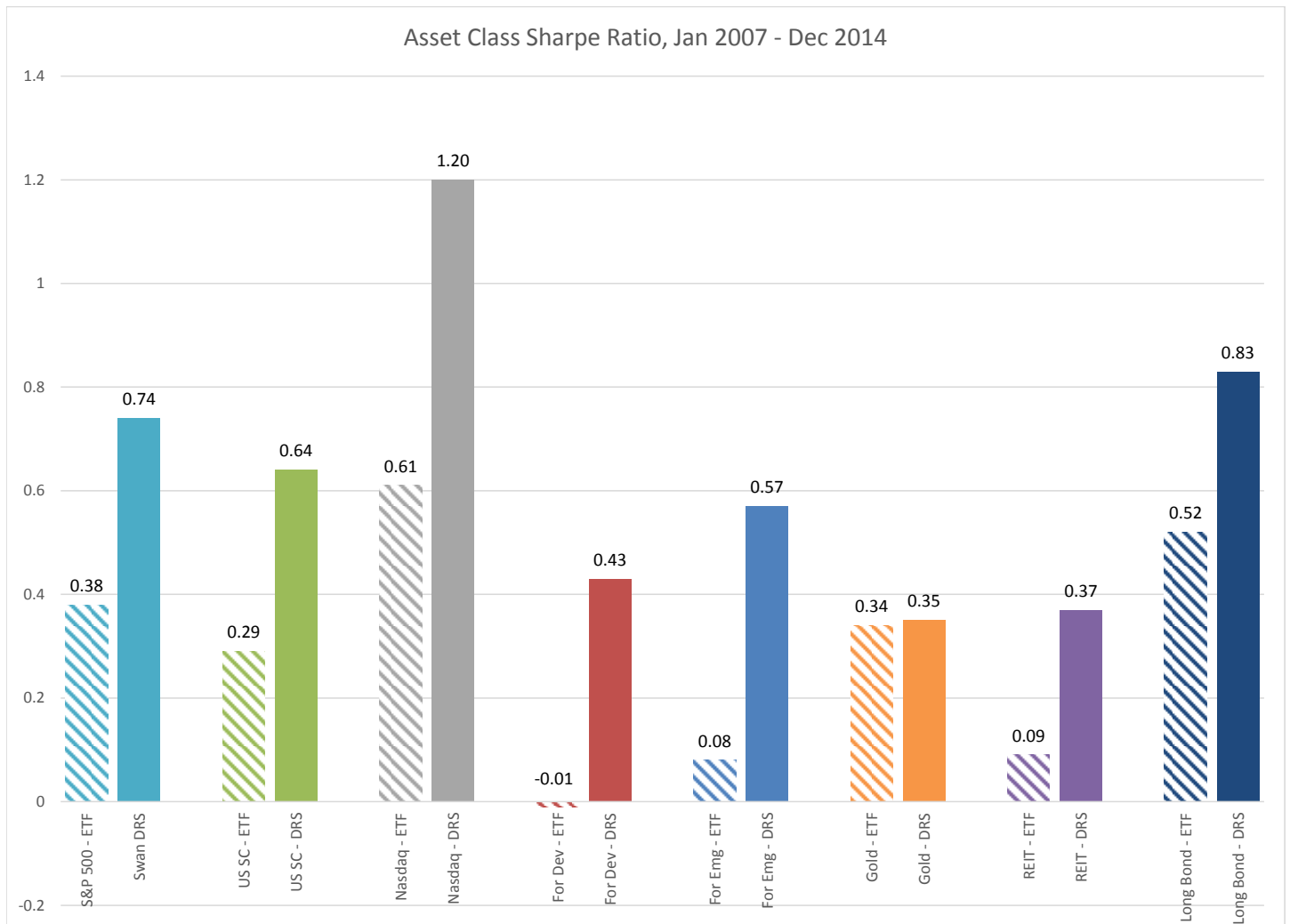


Chart 6  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

Sharpe ratio measures the risk-versus-return trade-off. In essence, the return element of chart 4 is contrasted with the risk element of chart 5 and

the result is the Sharpe ratio in chart 6. The DRS theoretically provides a marked improvement to most assets from a risk/return trade-off standpoint.

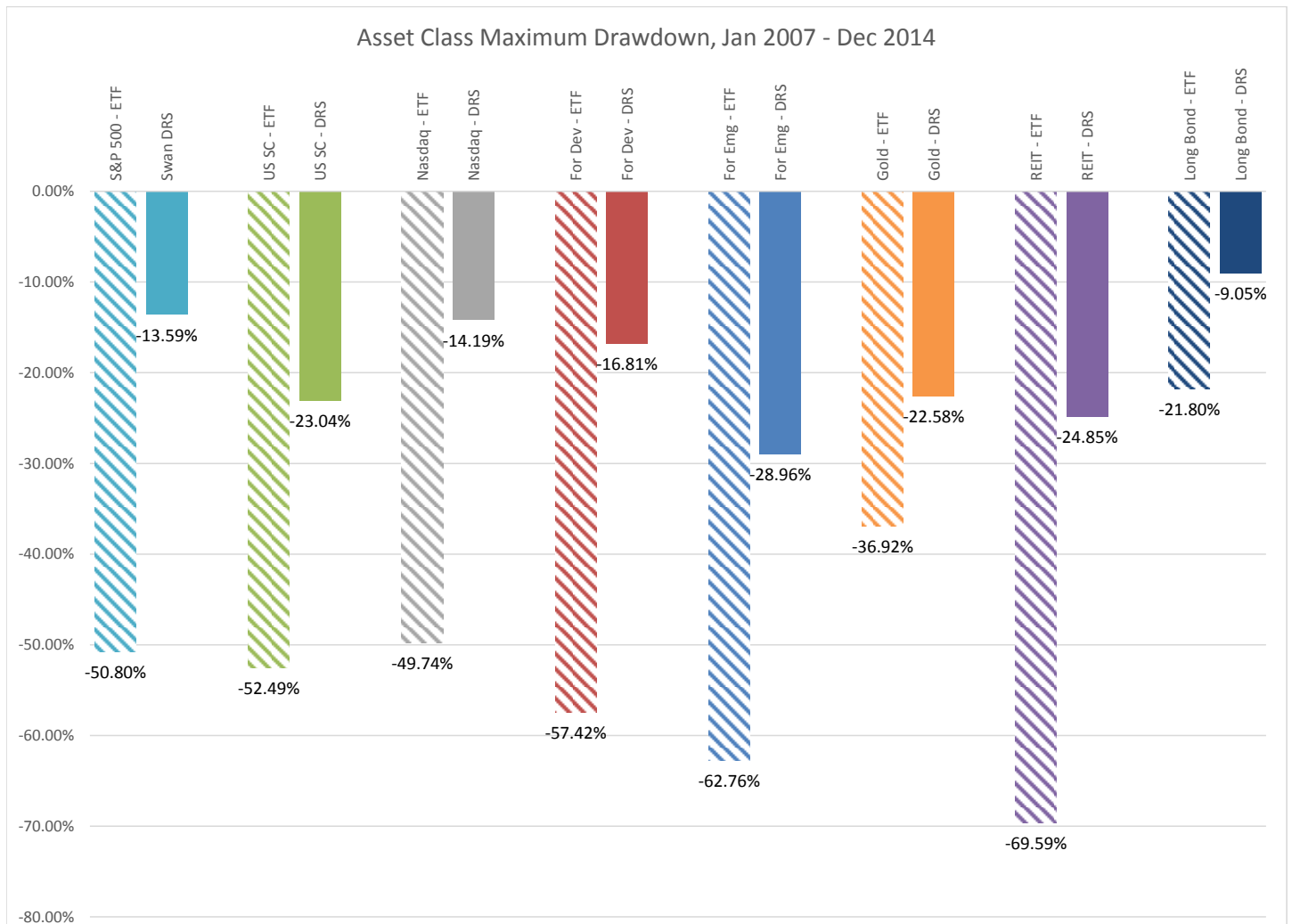


Chart 7  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

However, there is more than one way to measure risk. While standard deviation is the most commonly used risk measure, many investors define risk in terms of capital preservation. For many investors, true risk is simply losing money rather than volatility.

The above graph shows the reduction in maximum drawdown that the DRS brought to these backtests. In dollar terms, a \$100,000 investment in the S&P 500 would have lost \$50,800; many of the other asset classes would have lost more.

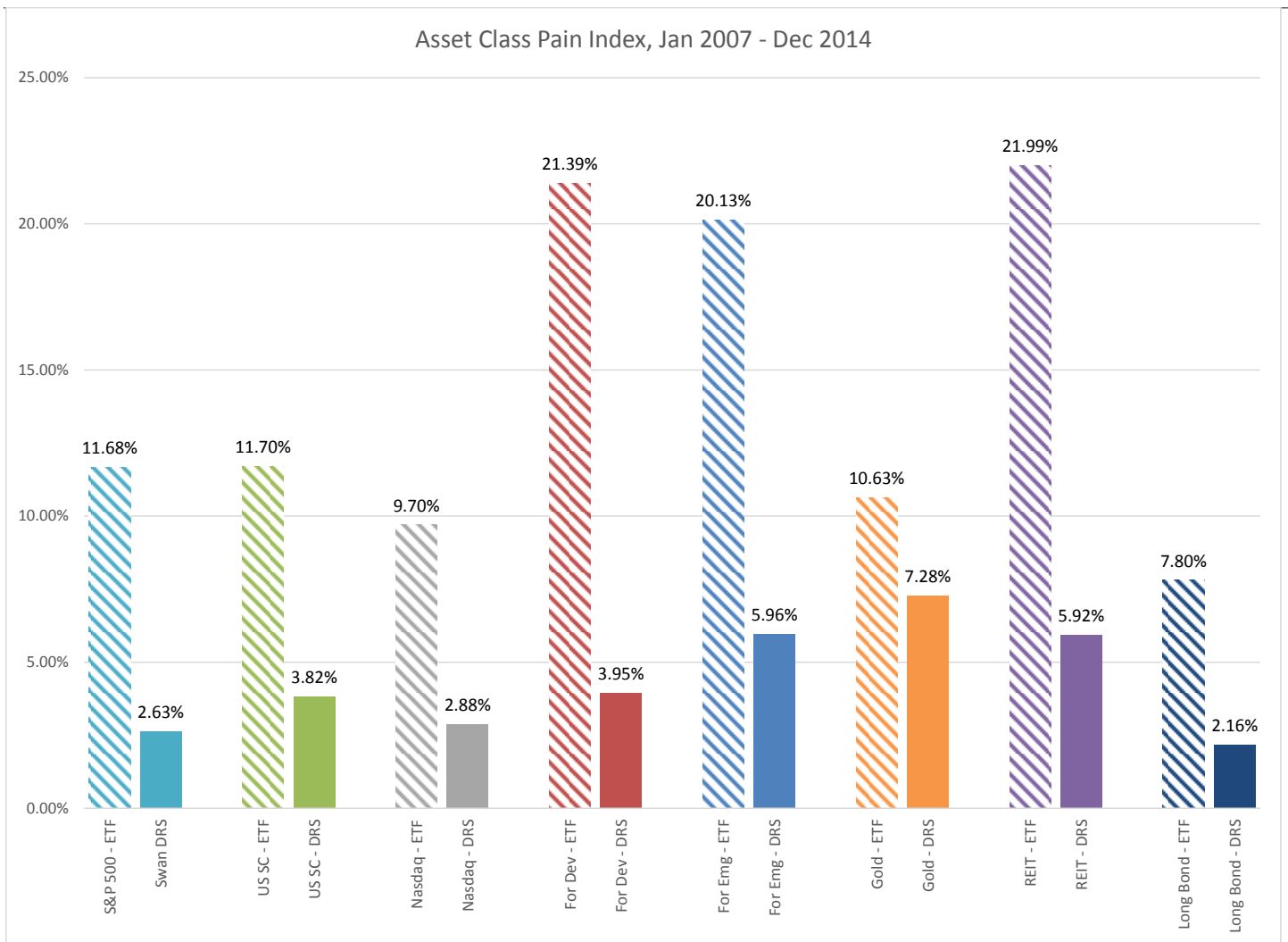


Chart 8  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

A newer, more sophisticated way of measuring capital preservation is known as the pain index. The pain index measures the depth, duration, and frequency of drawdowns. The lower the pain index, the better<sup>5</sup>. The above graph illustrates the unhedged versus DRS version of the assets and the corresponding reduction of the pain index.

Going into more detail, the below graph is one Swan often uses to compare actual performance against expected performance on an annual basis. In chart 9, the data used is actual performance data for the Swan DRS Select Composite, focused upon U.S. large cap equity (i.e. the S&P500).

1. The straight, red diagonal line represents the passive S&P 500 index.
2. The curved, gold line represents the target/expected profit-loss profile of the combined equity and hedge position of the DRS ETFs and long put options. In up markets the equity+hedge position lags the market, but in down markets the equity+hedge position flattens out even though the market may continue to sink.
3. The blue band around the gold, curved line indicates the impact the market-neutral income trades has on the profit/loss profile of the equity+hedge position. Overall, the market-

<sup>5</sup>For a more thorough discussion of the pain index, please refer to Swan's white paper "Hope For The Best and Prepare For the Worst" by Marc Odo, which can be found here: <http://swanglobalinvestments.com/resources/>

income trades are expected to be profitable, but there certainly exists the possibility that they might not be. The band introduces a range of expected returns around the equity+hedge line.

4. The dots on the chart represent the calendar year returns of the DRS from 1998 to 2014. Most years the actual historical returns of the DRS fell in or near the expected return band.<sup>6</sup>

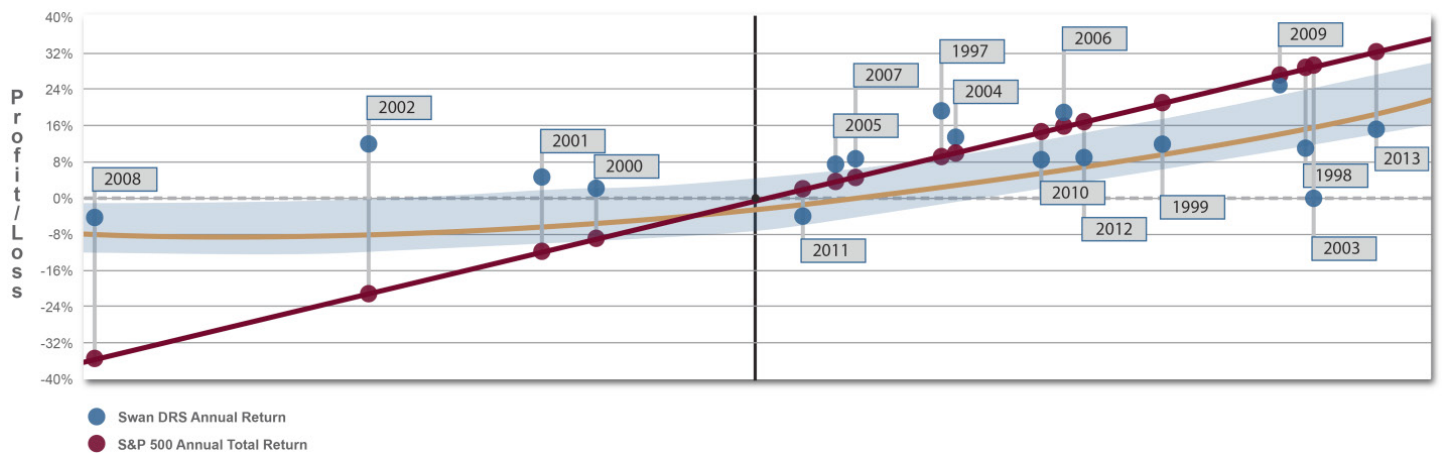


Chart 9  
Source: Swan Global Investments, LLC.

As part of our research, Swan analyzed whether the hypothetical performance calculated via the

backtests fell within expected return bands for the years 2007 to 2014. Below are the results.

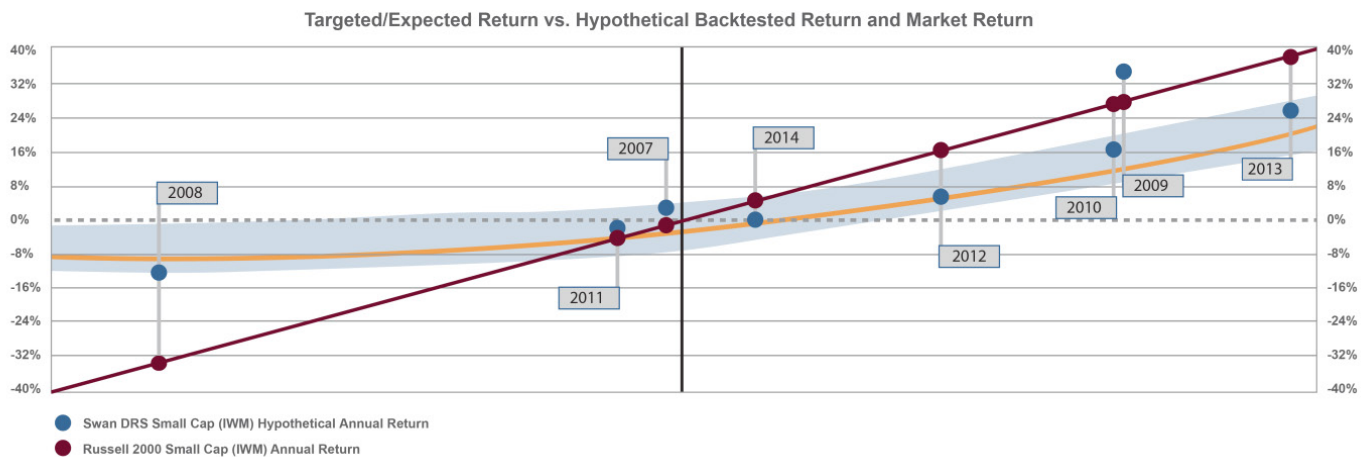


Chart 10  
Source: Swan Global Investments, LLC.

<sup>6</sup>For a more complete discussion of historical results, please contact Swan at [swanglobalinvestments.com](http://swanglobalinvestments.com)



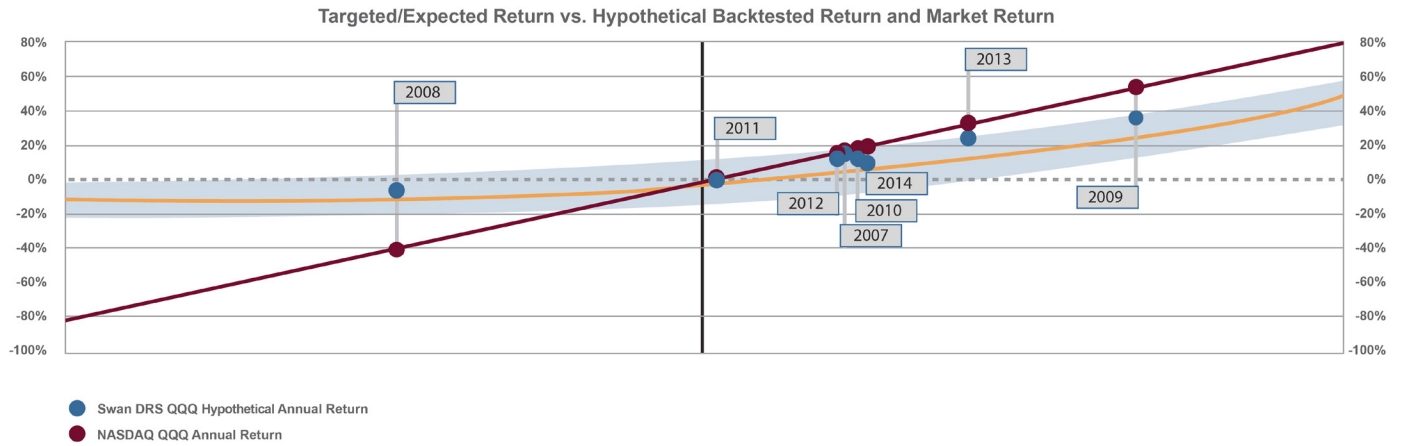


Chart 11  
Source: Swan Global Investments, LLC.

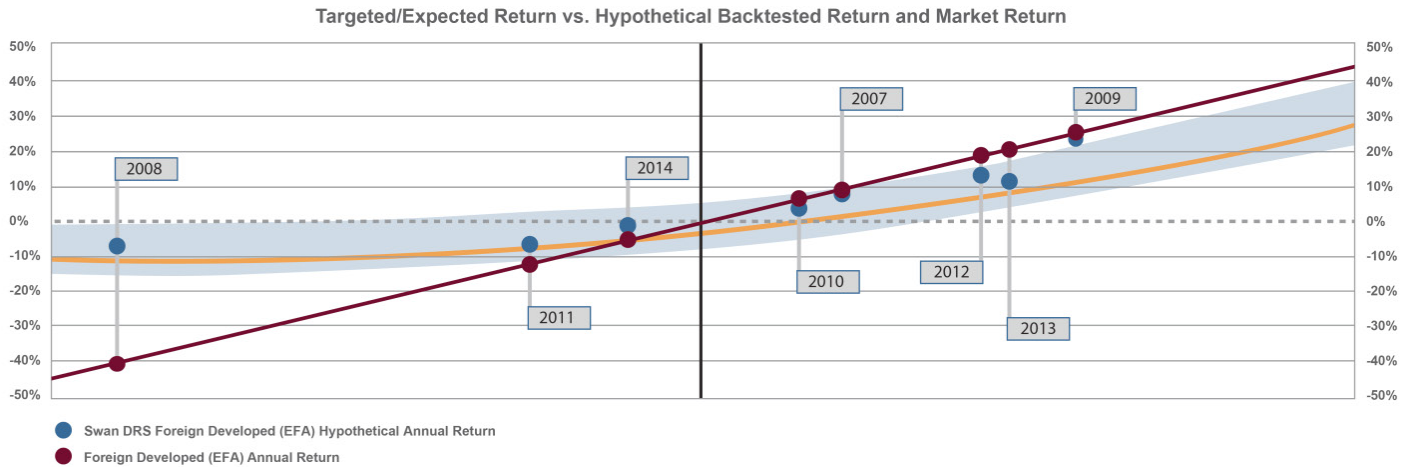


Chart 12  
Source: Swan Global Investments, LLC.

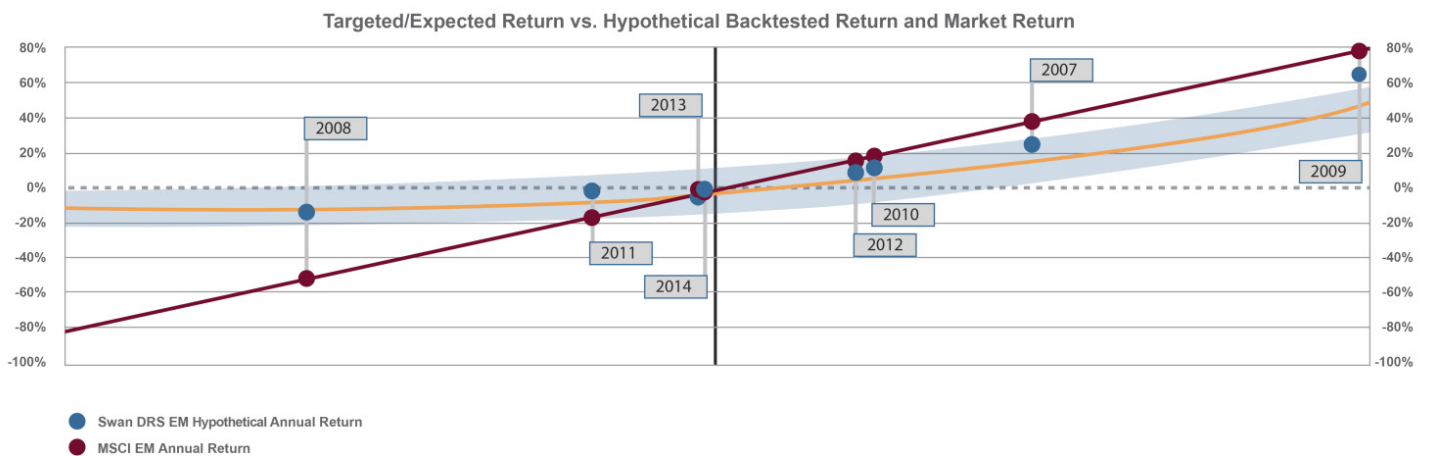


Chart 13  
Source: Swan Global Investments, LLC.

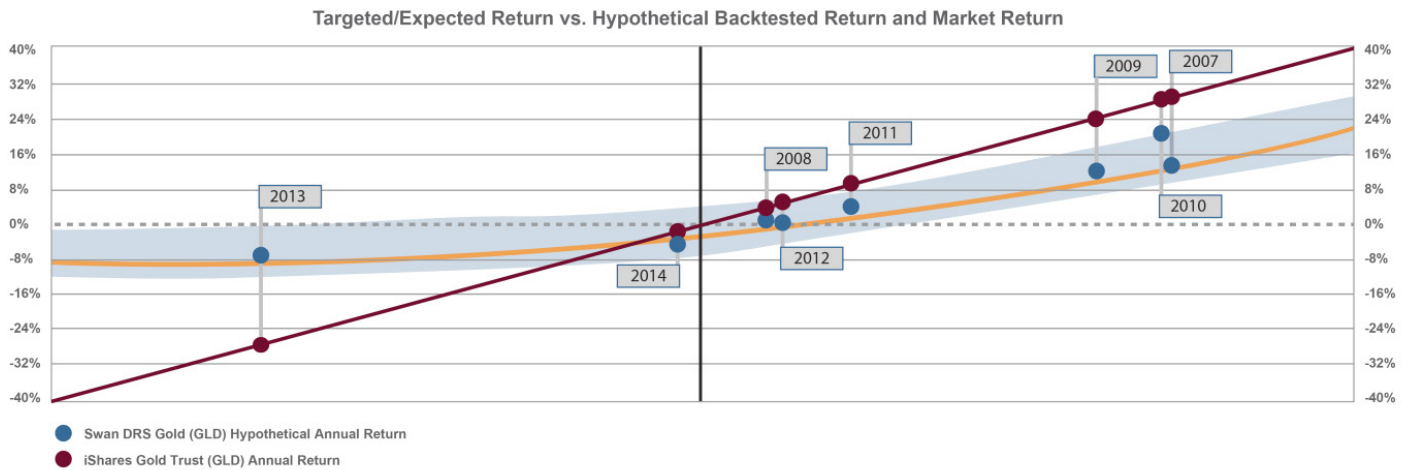


Chart 14  
Source: Swan Global Investments, LLC.

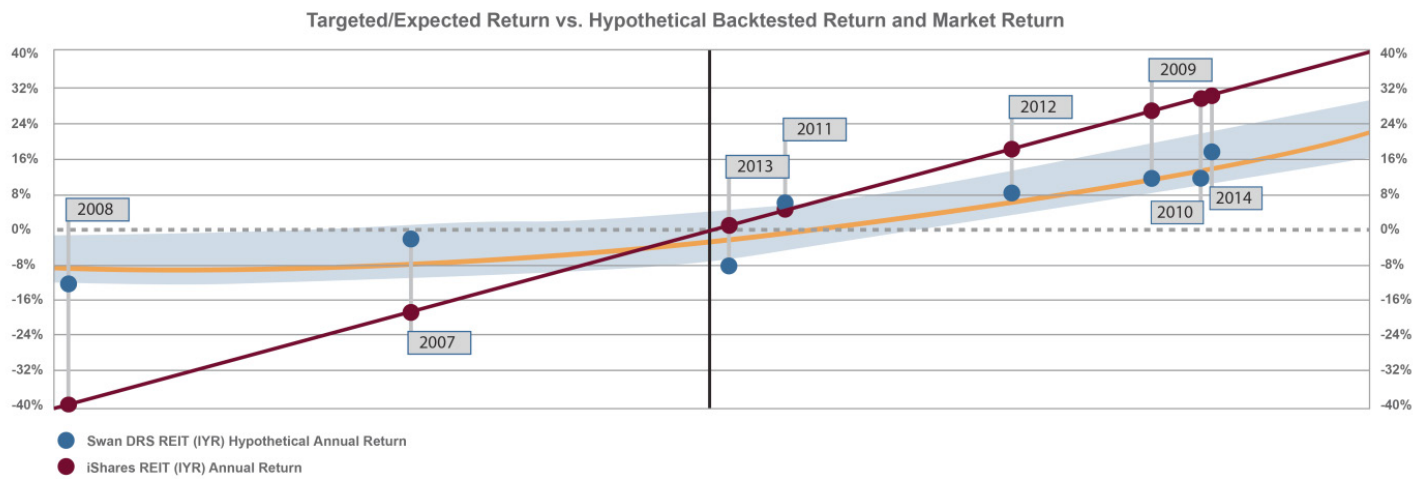


Chart 15  
Source: Swan Global Investments, LLC.

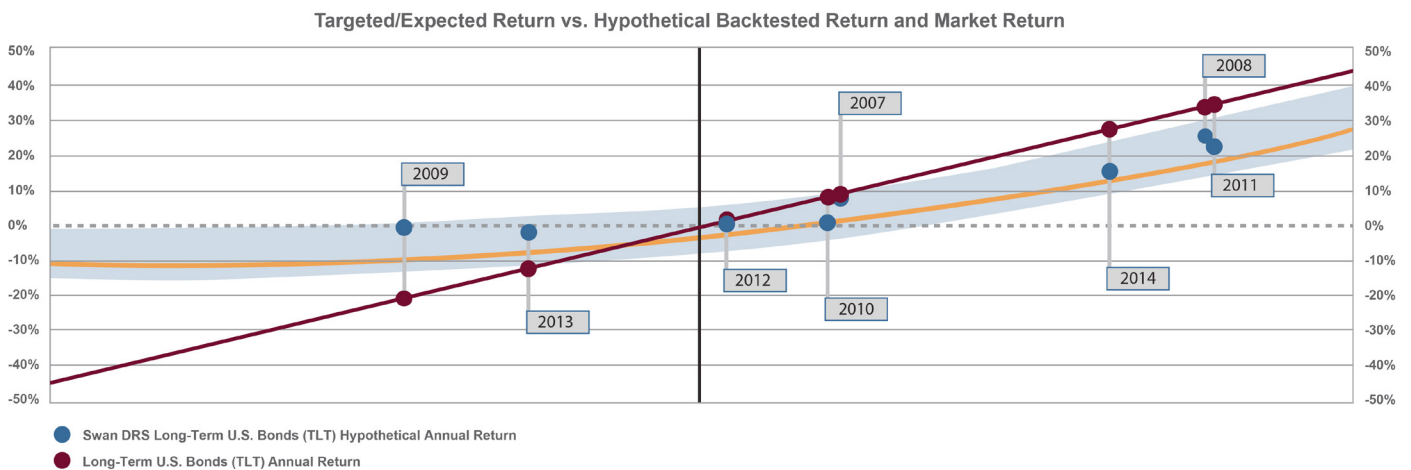


Chart 16  
Source: Swan Global Investments, LLC.

With one exception, the hypothetical, backtested calendar year returns fell within or above the ranges predicted by the ex-ante models. The one exception was Real Estate in 2013, when the

backtest had a return of -8.64% and the lower band of the expected return range of Real Estate's 2013 return of 1.16% was around -6.5%.

## VII. USING THE DRS WITH SATELLITE ASSETS WITHIN THE CONTEXT OF A LARGER PORTFOLIO.

For many years the investment industry has preached that one should diversify into other assets to reduce overall portfolio risk. The well-known argument is that various assets go through different cycles of relative over- or under-performance and that the safest route is to “cover all your bases” by allocating a portfolio’s assets

over multiple, non-correlated assets. Tables like the one below are often used to make the point about the cyclicity of asset class performance and the difficulty of using past performance to predict future performance.

Calendar Year Returns of Asset Class ETFs, Sorted From Highest to Lowest Returns

2007	2008	2009	2010	2011	2012	2013	2014
For Emg: 37.26%	Long Bond: 33.92%	For Emg: 75.32%	Gold: 29.27%	Long Bond: 33.96%	For Emg: 19.20%	US SC: 38.69%	Long Bond: 27.30%
Gold: 30.56%	Gold: 4.96%	Nasdaq: 54.70%	US SC: 26.93%	Gold: 9.57%	For Dev: 18.82%	Nasdaq: 36.63%	REIT: 26.69%
Nasdaq: 19.02%	US SC: -34.10%	REIT: 30.45%	REIT: 26.58%	REIT: 5.52%	REIT: 18.21%	US LC: 32.31%	Nasdaq: 19.18%
Long Bond: 10.23%	US LC: -36.81%	US SC: 28.43%	Nasdaq: 19.91%	Nasdaq: 3.38%	Nasdaq: 18.12%	For Dev: 21.39%	US LC: 13.46%
For Dev: 9.88%	REIT: -39.88%	For Dev: 26.92%	For Emg: 19.46%	US LC: 1.89%	US SC: 16.69%	REIT: 1.16%	US SC: 5.03%
US LC: 5.14%	For Dev: -41.02%	US LC: 26.37%	US LC: 15.06%	US SC: -4.44%	US LC: 15.99%	For Emg: -4.92%	For Emg: -0.07%
US SC: -1.78%	Nasdaq: -41.73%	Gold: 23.99%	Long Bond: 9.05%	For Dev: -12.25%	Gold: 6.60%	Long Bond: -13.37%	Gold: -2.19%
REIT: -18.47%	For Emg: -52.23%	Long Bond: -21.80%	For Dev: 8.15%	For Emg: -18.75%	Long Bond: 2.63%	Gold: -28.33%	For Dev: -6.20%

Chart 17  
Source: Zephyr StyleADVISOR

While diversification is certainly a logical and compelling solution, the unfortunate reality is that it often failed to deliver on its purported benefits during those times of crisis. Successful diversification strategies depend upon low correlations reducing the volatility of the overall

portfolio. But in times of crisis many assets saw their correlations increase rather than decrease, and the benefits of diversification deserted investors when it was most needed.

Compounding the problem, many of the assets that were introduced into portfolios for diversification

purposes actually performed worse during the Financial Crisis than the U.S. large cap position at the core of many investors' equity positions. The graph below (Chart 18) shows the returns for various asset class ETFs. As one would expect,

traditional safe havens like gold and Treasury bonds fared well as the equity markets collapsed. However, adding exposure to assets like small cap, international, and emerging markets would have been detrimental to a U.S. large cap portfolio.

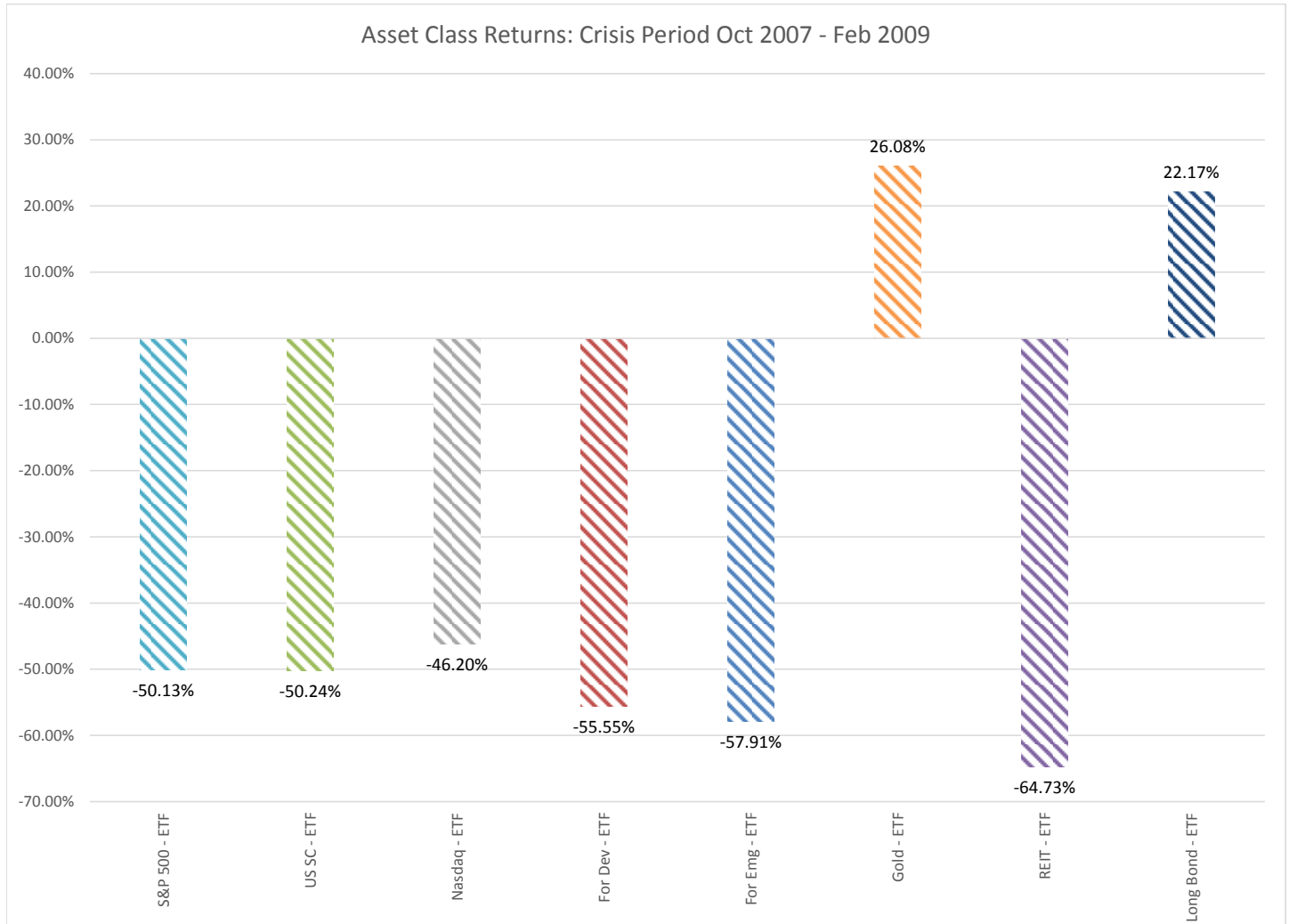


Chart 18  
Source: Zephyr StyleADVISOR

Swan believes that by applying the Defined Risk Strategy to satellite assets, investors can finally realize the benefits of diversification. Applying the DRS to other assets, changes the risk, return, and correlation profiles of those assets. Swan does this by protecting against major market sell-

offs, profiting from volatility, and still participating in the upside. Below is a return chart showing how the DRS process hypothetically changed the performance of the assets during the Financial Crisis.

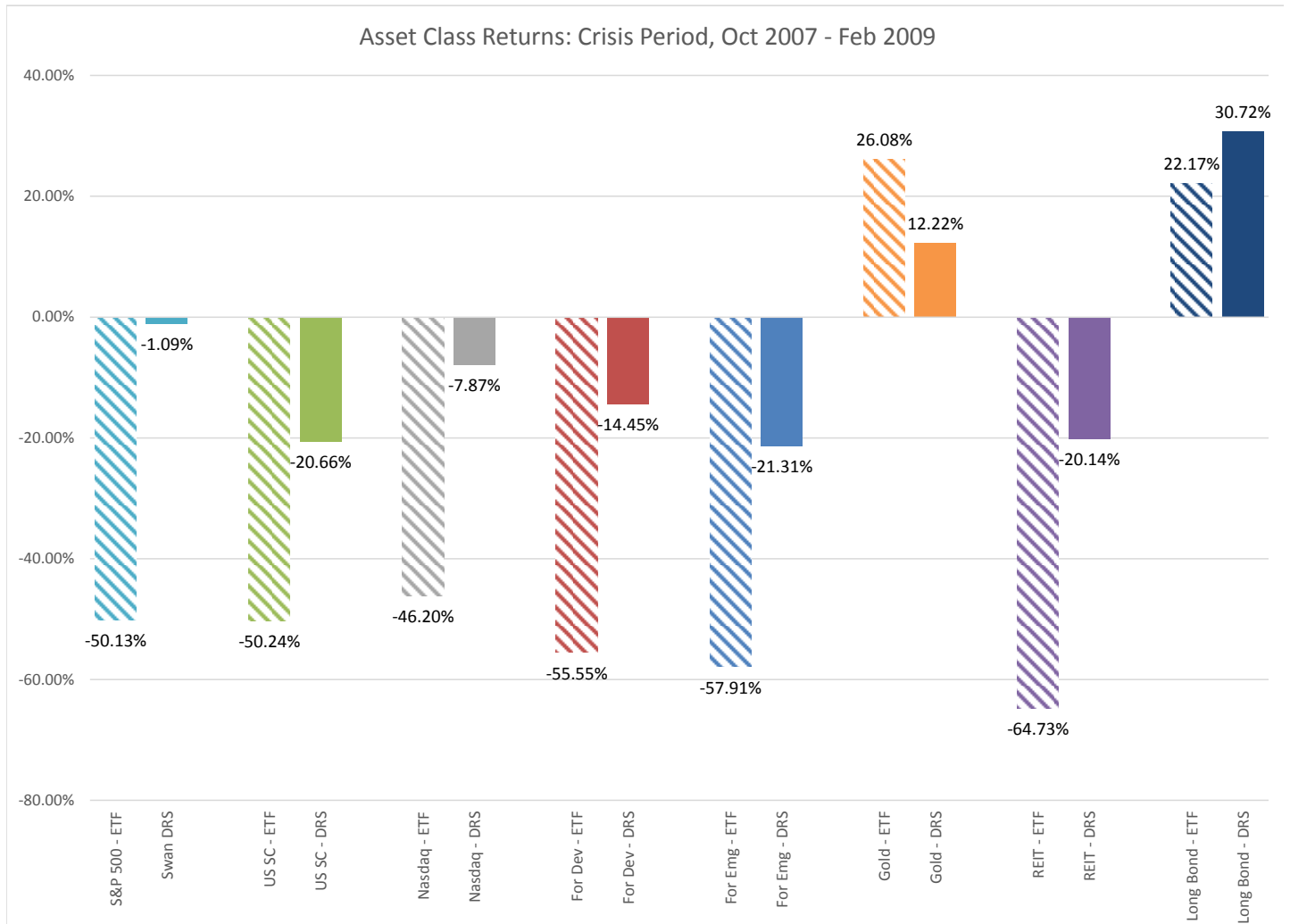


Chart 19  
Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

Also displayed in Chart 20, are calendar returns of hypothetical DRS performance by asset class, sorted from highest to lowest. There are several takeaways from the below table.

1. First, even after applying the DRS process, there are still divergences between best and worst assets on an annual basis and anticipating future performance from previous performance remains difficult at best. The case for diversification providing benefits still holds.
2. The second take away is the across-the-board improvement on the lower portion of the table. The “worst” performances of the DRS versions are a fraction of the unhedged ETFs. Across eight years and eight assets there are 64 data points. With

the unhedged versions of the ETFs there were 12 instances of double-digit losses, eight of which exceeded a loss of 20%. With the DRS backtests, there were only three instances of double-digit losses, all in 2008 and none of which exceeded 20%.

The flipside of this table is the upside; the best-performing assets across the sorted tables. While the DRS versions of the assets do not capture 100% of the gains of the unhedged versions, there are still significant positive absolute returns prevalent across the upper half of the table.

3. The final takeaway also has to do with opportunity. Across these eight years and eight assets, the performance of the actual,

Swan Defined Risk Strategy Select Composite (represented as the DRS in this chart) never appeared in the top or even second position in the

tables. There were always other DRS options with hypothetical performance better than the Large Cap U.S. option.(ie., Swan DRS S&P 500)

Calendar Year Returns of DRS Backtests, Sorted From Highest to Lowest Returns

2007	2008	2009	2010	2011	2012	2013	2014
For Emg: 24.49%	Long Bond: 26.09%	For Emg: 67.12%	Gold: 21.97%	Long Bond: 22.30%	Nasdaq: 14.02%	US SC: 26.91%	REIT: 17.47%
Nasdaq: 18.3%	Gold: 1.24%	Nasdaq: 38.78%	US SC: 16.94%	REIT: 6.09%	For Dev: 13.55%	Nasdaq: 24.60%	Long Bond: 15.44%
Gold: 14.60%	DRS: -4.50%	US SC: 35.10%	Nasdaq: 14.27%	Gold: 5.06%	For Emg: 12.55%	DRS: 14.34%	Nasdaq: 11.31%
DRS: 8.81%	Nasdaq: -6.71%	REIT: 29.55%	For Emg: 13.14%	Nasdaq: 2.03%	REIT: 9.71%	For Dev: 11.99%	DRS: 6.52%
For Dev: 7.79%	For Dev: -7.07%	For Dev: 25.32%	REIT: 11.08%	For Emg: -2.67%	DRS: 9.01%	Long Bond: -2.64%	US SC: 0.10%
Long Bond: 7.13%	REIT: -12.35%	DRS: 25.00%	DRS: 8.10%	US SC: -2.75%	US SC: 7.70%	For Emg: -5.04%	For Emg: -0.97%
US SC: 3.93%	US SC: -13.88%	Gold: 11.98%	For Dev: 4.03%	DRS: -5.38%	Long Bond: 0.54%	Gold: -6.15%	For Dev: -2.87%
REIT: -1.82%	For Emg: -17.54%	Long Bond: -0.45%	Long Bond: 1.38%	For Dev: -7.13%	Gold: 0.40%	REIT: -8.64%	Gold: -4.71%

Chart 20

Source: Swan Global Investments, LLC and Zephyr StyleADVISOR

Swan believes that applying the DRS across a wide array of assets provides better building blocks for portfolio construction. By building a portfolio out of DRS assets, Swan believes an investor can get the best of both worlds. On one hand, the investor has the traditional benefits of diversification, such as:

- A bigger opportunity set
- Non-dependency on a single asset class for returns
- Lower overall portfolio volatility via the mixing of uncorrelated assets

In addition, a portfolio of DRS assets has the unique benefits of the DRS such as:

- Downside protection
- Lower overall volatility
- Better risk-return measures
- Improved long-term performance

To use an analogy, if one uses better ingredients it is quite likely that the cake baked will taste much better.

## VIII. EXCEPTIONS/PROBLEMS/OBJECTIONS

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In the interest of presenting a fair and balanced argument, it is reasonable to present some of the concerns or objections to applying the DRS to other assets.

**Income.** Detrimental to the DRS's market-neutral income trades are periods when volatility conditions in the market swiftly move from complacency to panic. Examples include the 1998 Long Term Credit Management debacle, the 2011 U.S. sovereign debt downgrade, or the China-slowdown fears in late August 2015. These are environments when markets fluctuate wildly up and down in a short span, usually driven by temporary headline news risk. During these choppy environments the markets are constantly in danger of breaching the trigger points in the income trades and adjustment trades are often rendered obsolete as soon as they are implemented.

With the more volatile assets under consideration, it is reasonable to assume that the "whipsaw" effect would be more pronounced. The DRS has strict monitoring and adjustment protocols in place to monitor all income trades, especially during whipsaw markets. These risk controls are especially important in the more volatile assets. Despite this, it is possible that the income component might be less consistent or more volatile than the pattern seen with the historical Swan DRS Select Composite. In addition, some assets do not have as large of a historical risk premium, such as REIT's. In the case of REIT's, this could potentially be impacted by the higher yield of REIT's priced into the premium of the options.

**High yield bonds.** One might consider high yield bonds to be a good candidate for the DRS. High yield bonds are occasionally beset by large sell-offs and rallies. While it is true the underlying asset class has favorable characteristics, currently the liquidity of options traded on high yield bond ETFs is too low to successfully implement the DRS. Swan intends to monitor the situation and reconsider if sufficient liquidity comes to the high yield bond market.

**Investment grade bonds.** Some of Swan's clients have asked about the possibility of applying the DRS to broad-based, core investment grade bonds, like the AGG/Barclays US Aggregate Bond Index. While certainly concerns about rising interest rates on the principal value of bonds are legitimate, analysis of the risk/return characteristics of core investment grade bonds indicates DRS would not significantly benefit the asset class. As described in section III, the DRS works best for volatile assets prone to periods of significant drawdown. The Barclays US Aggregate has not displayed those characteristics. Furthermore, its historical return and standard deviation has not been high enough to provide a good vehicle for the DRS.

That said, the long end of the bond market does have the kind of return/risk characteristics Swan seeks when implementing the DRS. The high duration, 20+ year portion of the Treasury market is a candidate for a DRS product. The tables below shows the yearly returns and some key metrics for both the AGG (iShares Core US Aggregate Bond ) and the TLT (iShares 20+ Year Treasury Bond).

January 2007 – September 2015	Return	Standard Deviation	Maximum Drawdown	Pain Index
AGG	4.57%	3.92%	-4.09%	0.70%
TLT	7.64%	14.77%	-21.80%	7.84%

Asset Class	2007	2008	2009	2010	2011	2012	2013	2014	YTD
AGG	6.66%	7.57%	3.29%	6.37%	7.69%	3.76%	-1.98%	6.00%	1.00%
TLT	10.23%	33.92%	-21.80%	9.05%	33.96%	2.63%	-13.37%	27.30%	-0.22%

Table 5

Source: Zephyr StyleADVISOR

Gold. One product could be difficult to provide wide access to potential investors, such as through a 40 Act fund or mutual fund. Mutual fund regulations require that 90% of income be qualified or good income. Commodities and gold, as well as ETFs such as GLD, do not qualify as good income and thus are difficult to own or hold substantial allocations to these positions in 40 Act

funds. One of the only ways the strategy could be applied within a 40 Act fund is through using gold futures traded through a commodity trading advisor owned by a controlled foreign corporation (CFC). Although this is potentially feasible, it involves additional risks and tracking the spot price of gold could be more difficult for a gold-based DRS product.

## IX. STRATEGIC PLAN

Based upon the theoretical justifications outlined in sections IV and V and the hypothetical results in section VI, Swan Global Investments is excited about the opportunity to launch multiple open-ended mutual funds focused on various assets

with the DRS applied. By providing better building blocks covering the spectrum of often-used assets, Swan believes investors can create stronger, more durable portfolios. The process is already underway.



Swan DRS Asset Class Family	
Existing Assets	Incept Date
U.S. Large Cap	July 30, 2012
Emerging Markets	December 30, 2014
Forthcoming or Potential	
U.S. Small Cap	Late 2015
Developed Markets	Late 2015
Gold	TBD
REITs	TBD
Long-Term Bonds	TBD
Nasdaq QQQ stocks	TBD

Table 6

On December 30th, 2014, Swan launched the emerging markets asset class with the DRS. For further information on it, please reference our website and a prospectus: [www.swandefinedriskfunds.com](http://www.swandefinedriskfunds.com). Emerging markets was selected as the first satellite fund because we felt emerging markets was the asset class that could benefit most from the Defined Risk Strategy process and provide some non-correlation to U.S. large cap equities. Many investors understand the logic of investing in emerging markets. Frequently cited reasons include:

- Demographics, resources, and economic improvement support high growth rate estimates for Emerging Markets
- Emerging Markets are beginning to drive consumption
- Unfavorable demographics in many developed

economies

- More attractive valuations relative to U.S. and Developed Markets
- Potential for diversification from other assets

In spite of these reasons, emerging markets are typically underrepresented in many portfolios. Given the high levels of volatility and the extreme sell-offs that periodically hit emerging markets, it is no surprise many investors remain uneasy about the asset class (see table 2 back in section IV). The DRS process was designed to limit drawdowns through the use of hedging and profit from volatility via the generation of market-neutral income. Our hope is that by addressing the two biggest risks of emerging markets, investors can approach the asset class with a fresh set of eyes.

## X. SUMMARY

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We believe that any volatile asset class that is prone to large sell-offs and subsequent rebounds is a candidate for the Defined Risk Strategy. As long as liquid ETFs and liquid options are available on such assets, we believe the DRS can deliver respectable returns in up markets and contain risks in down markets. Swan is committed to providing investors with better, smarter solutions via the Defined Risk Strategy.

Swan Global Investments has begun actively managing strategies in separately managed accounts for gold since March of 2013 and foreign developed since January of 2014. Numerous other

assets began trading in early 2015, including small cap, long-term bonds, and REITs. So far, the results have been encouraging. The intent is to release two more open-ended mutual funds by the end of 2015, with the most likely candidates being small cap and foreign developed. In early 2016, it is likely that a few more funds covering different assets will be added to the line-up. The goal is to have a whole line-up of DRS products covering multiple assets, so that investors can build truly superior portfolios, less dependent on one particular asset class or market cycle.

## IMPORTANT DISCLOSURES/NOTES:

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Swan Global Investments, LLC is a SEC registered Investment Advisor that specializes in managing money using the proprietary Defined Risk Strategy (“DRS”). SEC registration does not denote any special training or qualification conferred by the SEC. Swan offers and manages the DRS for investors including individuals, institutions and other investment advisor firms. Any historical numbers, awards and recognitions presented are based on the performance of a (GIPS®) composite, Swan’s DRS Select Composite, which includes non-qualified discretionary accounts invested in since inception, July 1997, and are net of fees and expenses. Swan claims compliance with the Global Investment Performance Standards (GIPS®). The verification and performance reports are available upon request. The S&P 500 Index is a market cap weighted index of 500 widely held stocks often used as a proxy for the overall U.S. equity market. Indexes are unmanaged and have no fees or expenses. An investment cannot be made directly in an index. Swan’s investments may consist of securities which vary significantly from those in the benchmark indexes listed above and performance calculation methods may not be entirely comparable. Accordingly, comparing results shown to those of such indexes may be of limited use.

Some performance information includes back-tested performance and data across various asset classes, including performance data under assumption that the Swan Defined Risk Strategy was applied. Actual results may materially vary and differ significantly from the suggested hypothetical and back-tested analysis performance data. This analysis is not a guarantee or indication of

future performance. Investments in foreign securities involve additional risks including currency risk. References to the S&P 500 and other indices and benchmarks are for informational and general comparative purposes only. All results contained in the above-referenced and attached illustrations including all tables, charts, and graphs, are presented for illustration purposes only. The calculations presented here are believed to be reliable, but their accuracy or completeness cannot be guaranteed. No guarantee is given as to actual investment results, thus the assumed growth rate used may or may not be attained. The resulting hypothetical analysis is not actual performance history. This analysis is not a guarantee or indication of future performance. The adviser’s dependence on its DRS process and judgments about the attractiveness, value and potential appreciation of particular ETFs and options in which the adviser invests or writes may prove to be incorrect and may not produce the desired results. There is no guarantee any investment or the DRS will meet its objectives. All investments involve the risk of potential investment losses as well as the potential for investment gains. Prior performance is not a guarantee of future results and there can be no assurance, and investors should not assume, that future performance will be comparable to past performance. All investment strategies have the potential for profit or loss. Further information is available upon request by contacting the company directly at 970-382-8901 or [www.swanglobalinvestments.com](http://www.swanglobalinvestments.com).

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## 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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