SWAN GLOBAL INVESTMENTS

Understanding the Defined Risk Strategy's Option Premium Component

Frequently Asked Questions

Q: What are the Defined Risk Strategy's option premium trades?

A: The option premium trades, otherwise known as income trades, are the third driver of returns in Swan's Defined Risk Strategy (DRS). The DRS consists of three separate but complementary drivers of performance, namely:

1. A buy-and-hold long position in an equity market
2. A long-term hedge to protect the long position against bear markets
3. Short-term, market-neutral option premium collection trades

These complementary components to the strategy are designed so that the DRS provides consistent returns through declining, flat, or rising markets.

Q: Why does the DRS engage in these trades?

A: The DRS's philosophy is "Always invested, always hedged." The first two components of the strategy address those goals. However, there will be a cost to carrying the hedge in flat or up markets. Even though Swan manages the hedge in a very cost-effective manner, the hedge will be a drag on performance in flat or up markets. The option premium trades are meant to be a market-neutral source of returns that looks to help offset the carrying cost of the hedge.

Q: What market feature do the option premium trades seek to exploit?

Numerous studies have shown that there is a systematic volatility risk premium available in the market for those willing to take the short side of an option trade, particularly on the downside. This is driven primarily by an overall demand in the marketplace for protection against downward moves in the market. Some call this the "fear factor."

However, history has also shown that investor fears are often overblown. The markets tend to overpay for protection against volatility, and more often than not there is a gap between the implied volatility that investors are paying for and the realized volatility that actually occurs. It is this gap between implied volatility and realized volatility that Swan seeks to capture and profit upon via the systematic writing of options in a rules-based, risk-controlled manner.

Furthermore, options have a time component and waste away; this is called time decay. The amount of time decay speeds up closer to expiration as it becomes less and less likely for an option to have value.

Q: What is the basic structure of the trade?

The basic option premium trade is known as a short strangle. In a short strangle, both a put option and a call option are simultaneously sold. The seller of the trade collects the premium for selling both a put and a call.

These options are “written” out-of-the-money, meaning that the strike prices are away from the current levels of the market. In other words, the put option’s strike price is at a level lower than the current market level and the call option’s strike price is at a level higher than the current market level.

At the time the trade is initially established, it is approximately market neutral. The trade is established so that the risks of an up-market move are equally balanced against the risks of a down-market move.

Q: What variables does Swan use to solve the set up and management of the trades?

For entering the trade there is a small window every trading cycle to enter. When entering, the variables considered are:

1. Premium – the overall goal is to maximize the premium collected
2. Volatility – the level of volatility in the market will determine how much premium is collected and how wide the trading bands are at the outset of the trade
3. Delta – balances the risks against up-moves and down-moves. As a market-neutral trade the goal is to be equally balanced between up and down markets
4. Theta/Time – options deteriorate in value over time. Our short positions in options seek to profit from this deterioration.

Bringing these points together in plain English, one can say 1) the goal is to maximize the premium collected, which will be 2) initially dependent upon the volatility conditions of the market. The trade is 3) intended to be market neutral and 4) profits from the time decay of the short options. If the market moves over the lifespan of the trade and the trade becomes unbalanced, additional adjustment trades will be made in order to keep the trade market-neutral and open long enough to profit from the time decay.

Q: At what distances from the market are the puts and calls sold?

The distance from the current market depends upon current market conditions. In more volatile markets, the options are sold “deeper out of the money”, meaning at levels further away from the market. This is for two reasons. First of all, in more volatile markets there is a larger premium to collect. Second, in more volatile markets it is prudent to establish a wider trading range. In less volatile markets, the trading range is narrower.

In addition, the put options and the call options are not usually sold at an equal distance from the market. The trade is established as market neutral, with the risks balanced equally on the upside and the downside. However, in practical terms this means the put option is usually further away from the market than the call option. This is due to a condition in the options market known as “volatility skew” where the downside risk is priced higher than the upside risk.

Q: What is the time horizon for the option premium trades?

The short strangle trades are typically established using options with two to three months to expiration. However, it is exceptionally rare for the trade to be open all the way to expiration. Typically, Swan will close out the trade by buying back the options. The closing of the trade is usually driven by:

1. The trade has hit its pre-determined profit target
2. The options are close to expiration and the conservative thing to do is shut the trade down

The typical holding period for a trade is around 25-40 days.

Q: Do you allow the options to go to their expiration date?

No. The typical trade is held until we hit our profit target or is closed out prior to expiration. One of the main reasons we do this is to minimize "gamma risk." Gamma risk (a/k/a option convexity) is one of the five primary risks that factor into the price of an option and is explained in depth here (link to 7/6/17 blog post).

Gamma risk tends to be highest just prior to expiration of an option, a phenomenon explained in the referenced blog post. Swan prefers to simply avoid that period when gamma risk is at its peak by closing out trades well in advance of expiration.

Q: What is the profit target for the option premium trades?

The DRS has modest expectations for each individual trade. The goal is to gain, over the course of the year, enough option premium to help offset the carrying cost of the hedge in a flat market and potentially be a source of profit in more volatile years.

The overall levels of volatility of the market at the time the trade is initiated will influence the profit target for each trade. In more volatile markets, there is more premium to be had; in less volatile markets, there is less premium to collect.

Just as a good stock-picker has a target sale price on both the upside and the downside when purchasing an equity, so does Swan when it comes to the option premium trades. There are predefined rules that guide the execution of the strategy and dictate when trades are closed down, including when they are profitable.

Q: Does the VIX need to be high in order for the option premium trades to be profitable?

No. The main determinate of whether or not an option premium trade is profitable is the difference between implied volatility (what is expected to happen) and realized volatility (what actually happens). Roughly speaking, the implied volatility is the premium collected from the sale of an option premium trade and realized volatility is the cost to close it out. As long as the proceeds from a sale exceed the cost, the trade can be profitable.

It is true that if the overall level of implied volatility is high, the overall, absolute level of premium to be collected is higher. However, what ultimately determines the profitability of a trade is the spread between implied and realized volatility. This topic is explored in depth here.

Q: Under what conditions will the option premium trades be profitable?

The best case scenario is for the market to stay within the range established when the put and call option were originally sold. If the market stays within the range of the put-strike and the call-strike, they will eventually expire "out of the money". Under such a scenario the options deteriorate in value as they get closer to expiration - this is known as "time decay".

Because these trades are short positions, the fact that they are falling in value is good for the DRS. Swan is able to cover the short position by buying back the options after they have fallen in value. Short-term options tend to deteriorate rapidly in value, which is why the option premium trades are focused on this section of the options market.

Q: Under what conditions will the option premium trades be unprofitable?

The short trade becomes unprofitable should the market move outside of the trading range. If the market moves below the put strike or above the call strike, the option will go "in the money" and the short position will be covered to preclude further losses as a result of market movement.

In fact, the trade can become unprofitable if the market gets close to the strike prices. If the market is trending up or down, those options become more valuable, and thus it becomes costlier to be short those positions.

Swan is very cognizant of these risks and that is where the active management of the trades comes into play.

Q: Are the option premium trades actively or passively managed?

Swan's management of the option premium trades is active. The management style is very much rules-based, where the decisions to implement changes are based upon pre-determined factors. But the rules are designed to manage and mitigate the risks should the trade start to become unprofitable.

This is in stark contrast to an unmanaged, passive strategy where a short option can be exposed to significant losses if allowed to go deep in the money. This approach differentiates Swan from other option premium sellers that are passive in nature with their position management. Passive option selling allows options to breach short strikes and either give up all of the upside or fall over an extended period of time in lockstep with the market. Swan believes that active management is critical to maximizing profits and minimizing losses. It may require more work by the manager, but Swan is willing to do the work for the benefit of the strategy and ultimately investors.

Q: What happens if a trade comes under pressure?

More often than not, the markets stay within the pre-determined trading band and Swan can close out the strangle as intended. However, markets don't always stay in the trading band.

As mentioned before, trades come under pressure if the market moves towards the strike price of either the put or the call. For illustration purposes, let us assume the market is heading downwards and the put option is in danger of going in the money. There are three potential courses of action:

1. We could cross our fingers and hope the market reverses direction.
2. We could shut down the trade entirely and likely take a loss when closing out the put.
3. We could take advantage of the change in market dynamics by adjusting and keeping the trade open longer and profiting from an increase in volatility.

Swan's active management of the option premium trades follows the third option. Swan refers to these as "Adjustment Trades."

If the market has moved downward towards the put strike, it is likely that there has been an overall increase in volatility. An increase in volatility means there are higher premiums in the market. Adjustment 1 entails the closing out of the original short call position and taking profit from that portion and establishing a new call at a lower strike. The premium collected by this new trade is usually higher than before since the market is more volatile.

This is also known as "flattening the trade". If the market is trending strongly in one direction, the original short strangle trade is unbalanced; it is no longer market-neutral. By implementing Adjustment 1 the trade is moved back to more of a market-neutral stance and hopefully the premiums collected from Adjustment 1 will help offset the losses in the original trade or maybe even turn the trade into a profitable one. More often than not adjustment 1 results in a profitable trade.

Should the market continue to trend downwards, Adjustment 2 is implemented. Adjustment 2 closes out the original short put position, but simultaneously establishes a new put deeper out of the money. Again, the justification for the adjustment trade is to take advantage of changing market conditions. As the market moves downwards, there is usually much more premium to collect by the selling of options. Adjustment 2 seeks to use that new premium to offset losses that might have occurred when the original trade moved outside the original trading range. Adjustment 2 is typically performed to lower losses already incurred.

If the market still continues to trend in the same direction, the entire trade is shut down. This is rarely necessary, but the rules are that a trade does get shut down in a strongly trending market.

It should also be noted that the same adjustment trades occur on the upside in a strong up trending market.

Q: What are some negative case scenarios for the option premium trade?

The worst-case scenario for the option premium trades are "whipsaws", where the market moves rapidly and violently back and forth. The active management process and the adjustment trades outlined previously are designed to keep a trade open and establish new trading bands around the market. In an exceptionally volatile market, like that seen in August 2011 when the U.S. Treasury debt was downgraded to AA, the market saw major moves on a daily basis over the course of several weeks (5 of 6 days saw

moves each day of at least +/- 4.4%). The new trading bands came under pressure very quickly after being established. This kind of environment is bad for the premium collection trades, which by their very nature are designed to be market neutral.

In addition to the "whipsaw" environment described previously, the other worst-case scenario would be a very large global market sell-off that occurs while U.S. markets are closed. As stated previously, Swan is quite cognizant of the risks that come with a short-selling option strategy and is very active in the management of these risks. If markets sell off significantly while open, Swan will enact their various adjustment trades in order to minimize losses. However, if the global markets crash while the U.S. market is closed, this could trigger market circuit breakers at or near open, similar to what occurred August 24th, 2015. If, somehow, the options market could not trade, the short positions in the DRS would be at risk of short-term losses.

On the bright side, this type of environment usually creates higher premiums that can make it easier to have profitable trades in following months (a sort of hangover effect).

Q: What is this "hangover effect"?

Although short-term volatility spikes can have a short-term detrimental impact on the option premium trades, in the months following a volatility spike the DRS has usually seen its subsequent option premium trades recuperate a good portion of losses that might have occurred. Usually if the market shifts from a low volatility to a high volatility regime due to a short-term panic in the market, it is rare that volatility goes all the way back down to low levels following a scare. Investors remain skittish and option premiums are higher than they were before the panic. The DRS is able to capitalize on this by collecting larger premiums and establishing wider trading bands following a scare like those in August 2011 or August 2015.

The DRS has a variety of unique features that can act as a hedge to certain components to offset losses. For example, the DRS' option premium trades, taken as a whole, have built in compensation for volatility changes. This is the idea that within a crisis exists an opportunity. While volatility adversely affects the value of current "income" strategies, it has the opposite effect on the sale of new strangles. More specifically, entering into new strangles at heightened levels of volatility can more than overcome short-term losses caused by market anomalies. In addition, the income component is diversified in multiple ways to capture market discrepancies with respect to not only volatility, but skew and term structure. All these mechanisms required for option pricing represent "opportunities" that can be statistically harvested through active management.

This gets back to Swan's focus as a long-term holding. Although individual trades may experience losses in the short-term, the overall strategy was designed to take advantage of high probability trades and generate alpha over the long-term and work in conjunction with the other components (core equity and long-term hedge).

Q. What happens if the market experiences a "flash crash"?

Under normal circumstances, if the market drifts too close to the strike prices around the options, Swan will make adjustment trades, for the reasons previously discussed. This active management of the trades has been a source of positive returns of the DRS over the years.

However, if the markets spike or drop rapidly towards the strike prices of the short option, the rules have the DRS simply closing out the trade to minimize losses.

It is worth noting that markets have evolved and improved in order to reduce the risks of intraday sell-offs. Currently there are multiple "circuit-breakers" that halt trading in the face of big, intra-day sell-offs. The market-wide circuit breakers implemented in February 2013 are:

- Overnight: 5% drop halts trading
- Level 1: a 15-minute halt to trading if there's a 7% drop in the S&P 500 from its previous close
- Level 2: an additional 15-minute halt to trading if there's a 13% drop in the S&P 500 from its previous close
- Level 3: trading is halted for the day if there is a 20% drop in the S&P 500

A repeat "Black Monday", October 19, 1987 is not conceivable under current market rules.

Q. Is it possible that losses in the short options "overwhelm" the protection provided by the hedge?

The DRS is designed to be invested in the markets but minimize the large drawdowns associated with bear markets. The primary portion of the strategy that helps mitigate losses is the long-term hedge. The hedge position is always a part of the holdings of the strategy. That said, there are certain rare potential scenarios, such as those described previously, where losses in the short options in the short-term could reduce the effectiveness of the hedge on the overall portfolio performance.

The hypothetical scenarios where Swan might expect outsized losses on the short options usually involve a case where Swan is unable to quickly close out their short trades. These scenarios might involve:

- A period when the market is closed for numerous days, like following September 11th, 2001
- A global, off-hours large correction, like August 2015
- An intraday "flash crash", like May 2010

It is worth noting that the DRS has successfully weathered each of the types of scenarios discussed. In each scenario the option premium trades did experience losses. However, in each of the same scenarios the hedge proved its worth.

Swan has always positioned the DRS as offering protection in bear markets. Bear markets are defined as losses greater than 20% and often go on for years. The types of events described as potentially damaging to the option premium trades are very short-term in nature - usually measured in days, if not minutes. The DRS is a long-term strategy for long-term investors.

Q: What historical examples can you cite as examples of these "worst-case" scenarios?

In the case of the "whipsaws", a good illustration is August 2011. The third quarter of 2011 was marked by headline risk. News at the time was dominated by the possibility of the euro unraveling as a single currency and the brinksmanship 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, day after day.

When realized volatility threatens to exceed implied volatility, the option premium trades can lose money. As discussed previously, the DRS has strict risk controls designed to mitigate the danger of a put strike or a call strike having too big of an impact. 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 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.

That said, there are three things to remember. First of all, most other types of alternative or hedge fund strategies also performed quite poorly in 2011's risk-on/risk-off environment. Second, in the second and fourth quarters of 2011 the option premium trades performed well as the market moved more normally. Finally, 2011's overall loss of -5.38% (net) and -4.34% (gross) is very modest and should be bearable to most investors.

An example of "off-hours global crash" is what happened on August 24th, 2015. During the preceding week, fear had been building up in global markets over a potential "hard landing" in the Chinese economy. Markets had been selling off throughout the week of August 17th through 21st, but on Monday, August 24th those fears reached a fever pitch. Sell-offs started in Asia, moved across Europe, and finally hit the U.S. shores. At open, markets fell off dramatically, with numerous pricing issues in the exchanges taking place. Interestingly, the markets quickly recovered almost half of its losses within 30 minutes. The following day, Tuesday, August 25th saw additional losses. Markets remained quite volatile over the course of the next few months.

Although the performance of the Defined Risk Strategy suffered during this "flash crash", there were some important takeaways. First of all, the hedge component of the DRS, the holdings in long-term put options, performed exactly as intended. The value of the long puts went up, offsetting some of the losses in other portions of the portfolio. Second, Swan was able to liquidate their exposure to the short put when the market opened significantly down. The rules of the DRS dictate that positions be closed out in such an environment, since it is always unknown where markets will go. As it turned out markets recovered significantly within the first 30 minutes, but the risk-control rules demanded that we close those positions. Finally, the DRS was able to exploit the elevated levels of volatility throughout the remainder of 2015 and "claw back" some of the losses sustained in August. This is the "hangover effect" explained previously.

The August 2015 period is explored in depth in this blog post and a follow-up white paper "A Summer Squall or the Start of Hurricane Season?".

While August 2011 and August 2015 were extreme events, it is important to remember the DRS has experienced many extreme environments where the option premium trades have come under pressure. The Long-Term Capital Management crisis of 1998, September 11th (markets closed for one week and re-opened 10% lower), and the "flash crash" of May 2010 are some other examples where option premium trades lost money. However, Swan has always taken the position that the long-term benefits of engaging in premium collection outweighs the short-term risks that are occasionally realized. Moreover, the premium collection is a compliment to the other two pillars of the overall strategy, the equity position and the hedge.

Q: Historically what percentage of the option premium trades were profitable?

Roughly two-thirds of the time the option premium trades were profitable without any need for active management. The market stayed range-bound within the short time frame they were open and Swan has been able to collect the premium and move on.

Historic performance is not a predictor of future performance, but by applying the active management rules known as Adjustment 1 and Adjustment 2 when the markets move against the trade, Swan has been able to improve the success rate from about 66% to roughly 80%.

Q: Do you only harvest premium in S&P 500 options?

In the case of the flagship U.S. large cap Defined Risk Strategy, S&P 500 options are the primary investment choice. However, they are not exclusively used. Sometimes options on other assets like Russell 2000 (RUT) or Nasdaq (NDX) can look more attractive, and offer "richer" premiums. Swan will occasionally trade in these options if the opportunity arises. These indices are traditionally highly correlated to the S&P 500. Not all products trade the same way and that goes for the volatility as well.

With Swan's other strategies based upon U.S. small cap, foreign developed and emerging markets, the options used in the premium collection are primarily options related to each of those respective asset classes, but on rare occasion, small defined positions can be taken in other indices like RUT or NDX.

Q: Do you only engage in short strangle trades?

Although the short strangle trades described previously are the primary premium collection trade, the DRS will on occasion opportunistically engage in other types of premium collection trades like iron butterflies, iron condors, and spread trades. These trades are smaller, risk-capped, and not always present in the DRS.

Iron butterfly and iron condor trades are similar to the strangle trade described at length previously, where both a call option and a put option are sold short. However, in order to control the risk in a strangle, an iron butterfly/condor will also purchase a put and a call further out of the money. These "wings" of the iron butterfly or condor serve to protect the kind of extreme, adverse movements described previously. This is why iron butterflies and condors are typically described as "risk-capped". There is a finite amount of money at risk in such trades.

Q: Why are the option positions showing up as a negative value on my statement or in Morningstar?

As a reminder, the options are sold short. This means Swan sells the options now, collects the premium in cash, and intends to purchase them back later at a lower price. In the interim, the short sale shows up as a negative value on a monthly statement or in a Morningstar report. This is the standard way short sales are reported.

If you wish to track the performance of the option premium trades in your personal account the better place to look would be on a "Realized Gain/Loss Report," if you have access to one.

Important Notes and Disclosures:

Performance results are presented in U.S. dollars and are net-of-actual-fees and trading expenses and reflect the reinvestment of dividends and capital gains. Actual fees may vary based on, among other factors, account size and custodial relationship. No current or prospective client should assume future performance of any specific investment strategy will be profitable or equal to past performance levels. All investment strategies have the potential for profit or loss. Changes in investment strategies, contributions or withdrawals may cause the performance results of a client's investment portfolio to differ materially from the reported composite performance. Different types of investments involve varying degrees of risk and there can be no assurance that any specific investment will either be suitable or profitable for a client's investment portfolio. Historical performance results for market indices and/or categories generally do not reflect the deduction of transaction and/or custodial charges or the deduction of an investment management fee, the incurrence of which would have the effect of decreasing historical performance results. Economic factors, market conditions, and investment strategies will affect the performance of any portfolio and there are no assurances that it will match or outperform any particular benchmark. 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.

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There are eight DRS Composites offered: 1) The DRS Select Composite which includes non-qualified accounts; 2) The DRS IRA Composite which includes qualified accounts; 3) The DRS Composite which combines the DRS Select and DRS IRA Composites; 4) The DRS Institutional Composite which includes high net-worth, non-qualified accounts that utilize cash-settled, index-based options held at custodians that allow participation in Clearing Member Trade Agreement (CMTA) trades; 5) The Defined Risk Fund Composite which includes mutual fund accounts invested in the S&P 500; 6) The DRS Emerging Markets Composite which includes mutual fund accounts invested in emerging markets; 7) The DRS Foreign Developed Composite which includes all research and development account(s), and mutual fund accounts invested in foreign developed markets; 8) The DRS U.S. Small Cap Composite which includes all research and development account(s), and mutual fund accounts invested in U.S. small cap issues. 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. Swan's compliance with GIPS has been independently verified for the periods July 1, 1997 through December 31, 2016. The Spaulding Group conducted Swan's verification. 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. Verification assesses whether (1) the firm has complied with all the composite construction requirements of GIPS on a firm-wide basis, and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with GIPS. Verification does not ensure the accuracy of any specific composite presentation.

The benchmarks used for the DRS Select Composite include the S&P 500 Index, which consists of approximately 500 large cap stocks, and a 60/40 blended composite, weighted 60% in the aforementioned S&P 500 Index and 40% in the Barclays US Aggregate Bond Index. The 60/40 is rebalanced monthly. The Barclays US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS and CMBS (agency and non-agency). 330-SGI-120617