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INVESTMENTS

LEARNING FROM THE MISTAKES OF OTHERS

Three Common Missteps of Failed Options Strategies

Marc Odo, CFA®, CAIA®, CIPM®, CFP®, Client Portfolio Manager

INTRODUCTION

There is a familiar story that pops up every so often in the pages of the financial press: “Option Strategy Blows Up, Loses Nearly All of Investors’ Money.” Readers shake their heads and wonder how anyone could be so foolish to lose 50%, 75% or 100% so quickly. When faced with the possibility of catastrophic outcomes, some investors conclude options are inherently dangerous instruments and should be avoided altogether.

We believe this line of reasoning is far too simplistic. It is our position that there is nothing fundamentally dangerous or risky about options. Used correctly, options can create just about any risk/return profile desirable. Options are simply a tool. Like a power drill or an automobile, they can be used safely and be very helpful—unless the user is reckless or ignorant about their characteristics.

Technically, an option is nothing more than a contract between two parties. Moreover, options are a zero-sum game. Every dollar lost by one party is a dollar made by someone else. When a single trade or an overall strategy posts a loss, that money didn’t simply evaporate. Whoever was on the opposite side of that trade made a correct call and was rewarded for it.

It is not the options themselves that are risky; it is how they are used that matters.

There are lessons to be learned from the mistakes of others. It is an unfortunate truth that the investment landscape is littered with strategies that blew up spectacularly over the last few decades. Rather than discard these experiences entirely, we should seek to learn from them. While the names change and the circumstances are different, a few “common threads” or themes emerge upon closer inspection. Identifying these themes and learning from them is the focus of this paper. By the end, this should help readers understand what to examine during their due diligence when considering options-based strategies.

THREE KEY ELEMENTS

Upon examining the blow-ups that have occurred, there appear to be three primary areas where option strategies can get into trouble. Typically, it is not just one factor that sinks a ship, but a combination of two or all three of these factors. These factors are:

1. Excessive Leverage
2. Lack of Liquidity
3. Inadequate Risk Controls

Each of these will be discussed in turn, then we will provide a theoretical case study. While this paper will focus on options-based strategies, this list of the three keys can be applied to many past blow-ups, both big and small. One could argue that Long Term Capital Management (1998), Metallgesellschaft MG (1992) and even the big one, the Global Financial Crisis (2007-09) could be traced back to excessive leverage, lack of liquidity, and inadequate risk controls.



Excessive Leverage

First, it is important to acknowledge that options are levered instruments. A typical option contract covers 100 shares of an underlying asset. The calculation for notional value is:

Contract size X Underlying price = Notional Value

If the standard contract size is 100 and the price on the S&P 500 is, say, \$2,500, an option contract on the S&P 500 has a notional value of \$250,000. Certainly, one of the first factors one should understand when dealing with options is just how much notional value is covered by a standard contract on a given asset.

That said, when option strategies tend to get in to trouble with leverage, it tends to be related to the coverage ratios between the number of options shorted or written against the amount of collateral owned. Option writers are often described as having a high probability of a small gain, coupled with a low probability of a large loss. If the low-probability/high-loss scenario comes to pass, the obligation to cover the losses can overwhelm the ability of the collateral to offset losses.

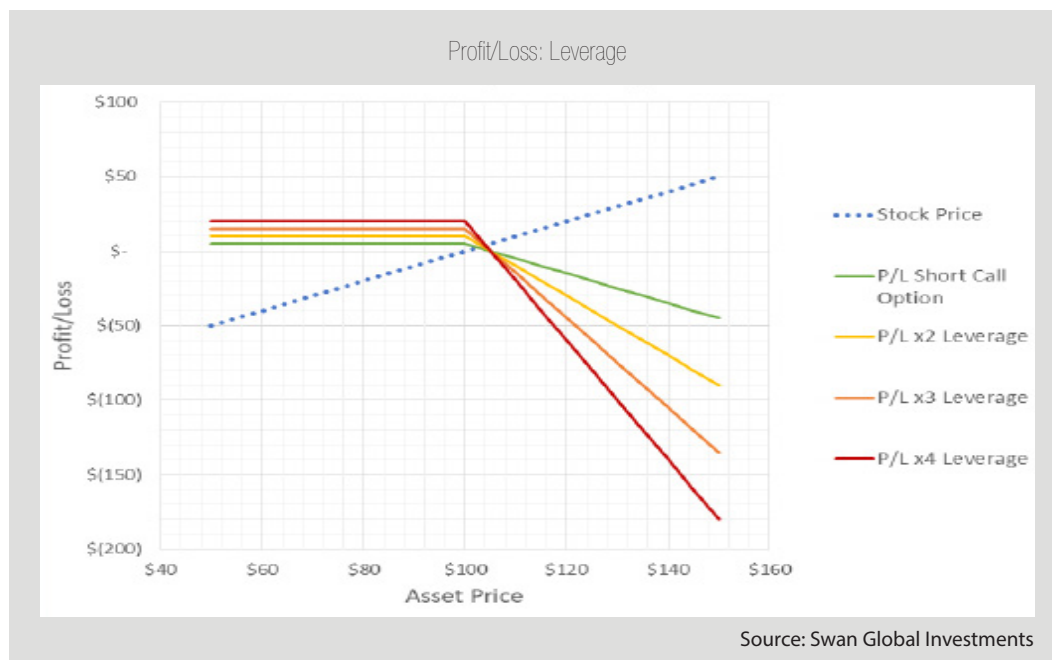
The simplest example of this situation is writing “naked” options. In the chart below, we see a standard “hockey stick” diagram that illustrates the profit and losses associated with writing a call on a given asset. The writer collects the premium. If the asset stays flat or goes down, the option expires out-of-the-money. The writer keeps the premium and is free from any further obligation. However, if the asset value goes above the strike price the losses are theoretically uncapped.



If the position is “covered”, meaning the writer also owns the underlying asset, the losses from the written call are offset by the gains in the long position. The owner of this trade is disappointed that the gains in his asset have been sold off to someone else, but should be relieved that he was not on the hook for losses.

A “naked” position, however, lacks the offsetting position of the underlying asset. If the asset goes past the strike price the writer of the option is responsible for covering the losses. Those losses can rack up and without sufficient collateral the writer can find it difficult to cover losses.

This scenario can be dramatically exacerbated if the manager chooses to write multiple options on a given asset. In the profit/loss diagram below, we see a situation where someone chooses to write multiple call options on an asset. It is frightening to see how quickly losses can get out of control when a position is leveraged.



This is a simple illustration of the impact leverage can have in an adverse market move. When analyzing the graveyard of historical blow-ups, a common theme was the excessive use of leverage when writing options. Therefore, when considering an options strategy to include in a portfolio, it is important to inquire about the amount of leverage the strategy takes on and how it has or could affect the fund in a worst case scenario.



Lack of Liquidity

Options are just like stocks or bonds in the sense that the liquidity experience can be entirely different depending upon the security. Typically, no one has any problems trading Apple stock or on-the-run U.S. Treasury bonds. However, the bid-ask spreads on a microcap stock or a small-issue, high yield bond can be vast. The same dynamic is true in options.

The table below shows the top five exchange traded options in terms of volume on a randomly selected date (12/14/18). In these instruments, billions of dollars can be traded without any discernible impact on price.

VOLUME (12/14/18)	UNDERLYING	DESCRIPTION
7,749,626	SPY	S&P 500
1,957,012	QQQ	Nasdaq
1,107,952	EEM	Emerging Markets
277,860	HYG	High Yield Bonds
215,370	EFA	Foreign Developed

Source: Cboe

On the other hand, options on more obscure underlying assets can be thinly traded and have wide bid-ask spreads. Those investors who dabble in this space obviously think it is worth it. Just like microcap stocks or high yield bonds, profit opportunities sometimes exist in the less efficient corners of the market. Looking at recent average daily volume, provided by the Cboe, the vast majority of option volume resides in just a few names. In fact, the top 1% of single stocks that trade options account for approximately 45% of the average daily volume. However, the problem with liquidity is that it tends to evaporate when you need it most.

Top % of Names	ADV %
1%	45%
2%	56%
5%	73%
10%	85%

Source: Cboe

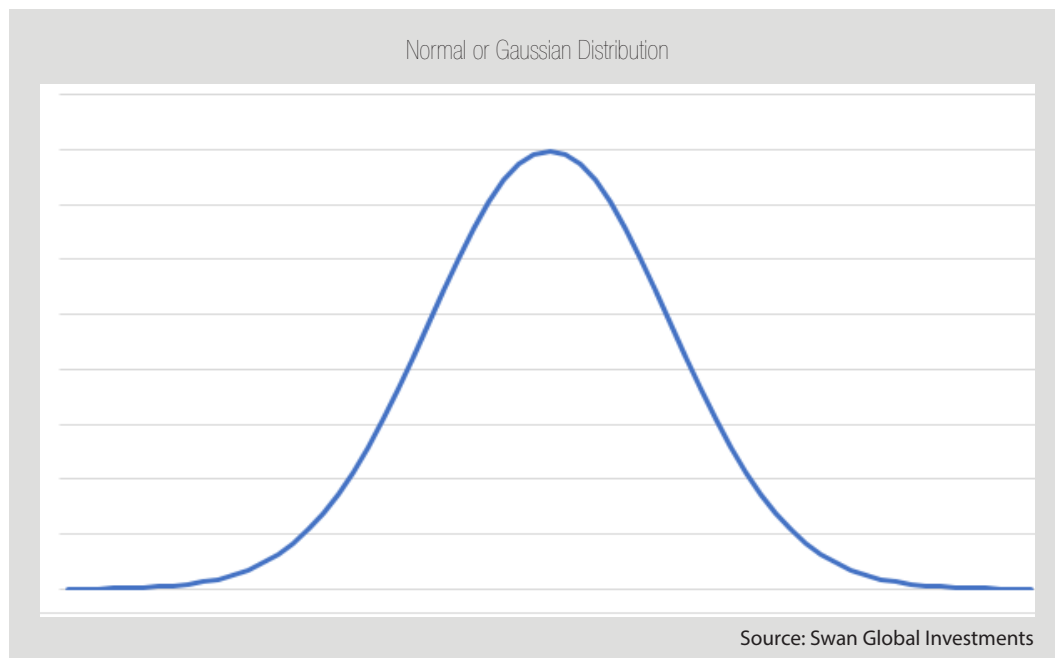


In periods of market panics or sell-offs, trading in already illiquid securities can grind to a standstill. Even some of the most liquid securities, like the SPDR ETF, can see wider bid-ask spreads during large market moves.

Illiquidity tends to mix poorly with leverage and can rupture a strategy's risk controls. High leverage might force a manager to close out his position right at the time when pricing is at its most unfavorable. The risk controls used might have used pricing sourced from normal markets and failed to anticipate just how wide bid-ask spreads can be in a panic. We will discuss how such a scenario might play out in the theoretical case study at the end of this paper.

Inadequate Risk Controls

Virtually every option trader will tell you they have risk controls in place. However, whether or not the risk controls are useful depend upon a number of factors. A major contributor to poor risk management decisions lies with not understanding the distributional choices when dealing with financial instruments. Many make the assumption that a particular security's distribution is Gaussian, or normally distributed. The graph below illustrates a normal distribution.

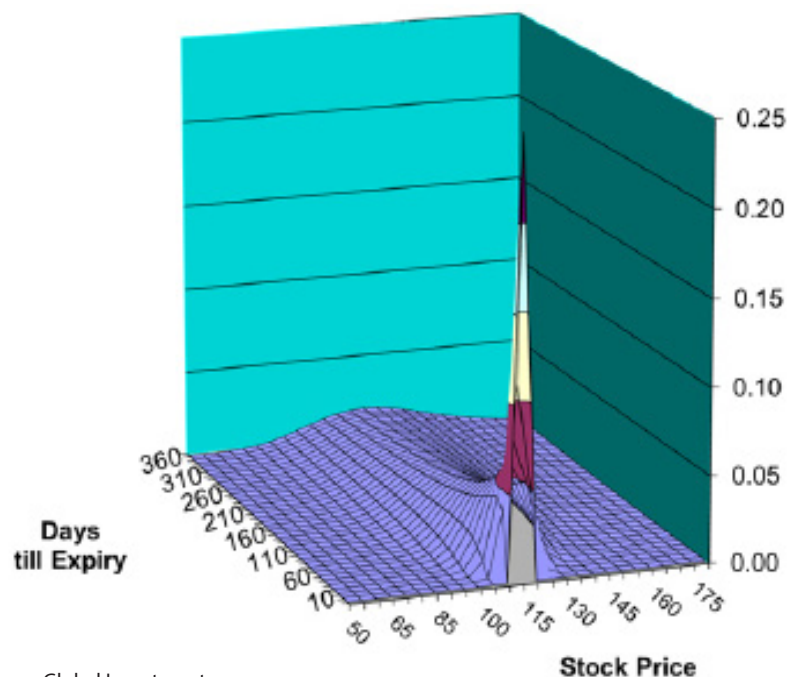


The problem is many option-based strategies will not fit into this neat structure. If the data does not fit, any assumptions made off of the above curve might be inaccurate. Even before a proper distribution can be estimated, a series of questions must be addressed when vetting the data:

- Is it discrete or continuous?
- Can a reasonable estimate of the outcomes based on probability be determined?
- How do outliers impact the results? Do they skew the distribution one way or another?
- When outliers do occur, how far do those tails extend? What happens “beyond the horizon”?
- What data set do we have available to analyze? If there are no “bad” occurrences contained within the data set, does that mean the model will assume bad outcomes are impossible?

This is just a small sample of the many questions that must be answered before any trade or position is placed, especially when using options which have asymmetric payoffs. Most blow-ups occur simply by an underestimation of the convexity, or non-linear behavior, that options bring into a portfolio.

Within the options world, risks are measured against a variety of factors, commonly known as “the Greeks”. These measure an option’s price sensitivity to variables such as moneyness, volatility, time to expiration, interest rates, etc. A complete discussion of the Greeks is outside the scope of this paper, but one of the Greeks serves as a useful illustration of the variability of an option’s risk factors:



Source: Swan Global Investments



The graph above illustrates gamma risk, or how quickly the delta of an option changes. In this example volatility is set to 25% but days to expiration and stock price are variables. In the vast majority of observations, gamma risk is small to negligible. However, in certain circumstances (i.e. close to expiration and at-the-money) gamma risk becomes exceptionally high. The point of showing this graph in the discussion about risk models is that an inexperienced options trader might discount the impact of gamma risk because under many scenarios it is irrelevant. To do so would be foolish, because in other scenarios gamma risk is quite relevant.

That said, simply having risk controls is not enough. One must actually stick to the risk controls when the going gets tough. Failing to implement risk controls can have catastrophic consequences. Although risk controls exist to protect against major losses, investors can let emotions overcome logic, and let their well-designed risk controls fall by the wayside. The best risk controls in the world are useless if they are ignored or overridden.

In some of the historic blow-ups, there was a tendency to “let it ride” or even worse, “double down” on a losing position. After the fact it is difficult for outside observers to determine what decisions were made by a doomed manager in the heat of the moment. However, it is sometimes possible to identify when a desperate strategy hangs on to a losing trade far too long in hopes of a reversal. In extreme cases, a desperate strategy might increase their exposure in hopes that a big win in a trade will recover any previous losses. Like a Blackjack player using a “Martingale” strategy, this is a risky approach that can bankrupt a player.



THEORETICAL CASE STUDY

We have identified excessive leverage, lack of liquidity, and insufficient risk controls as the primary drivers of blow-ups. While each are major stand-alone risks, it doesn't take much imagination to see how there is a multiplier effect when all three are in play. Problems can snowball and get out of hand quickly. Let us discuss how a theoretical blow-up might occur.

Say, for example, Strategy X is in the business of writing puts on an obscure asset. Because these options are not frequently traded they carry an illiquidity premium. They are "richer" than comparable, more liquid options on more popular assets. The portfolio manager uses inadequate risk models and assumes 1) the probability of the trade going wrong is infinitesimal, and 2) if the trade goes wrong it can still be unwound without lasting damage.

Based upon faulty estimates, the portfolio manager leverages up Strategy X by writing five times as many options on the asset. Maybe the portfolio's positions are naked and don't own the underlying asset. Strategy X sits back and happily collects fat premiums by writing puts...until one day things go wrong.

Some news or event causes the asset to drop 10% in value. The strategy is naked and owns no offsetting asset to hedge out the downward move. If Strategy X had only written one put, it could probably cover the short and live again to fight another day. However, in our scenario the strategy is 5x levered, and these puts are deep in the red.

The portfolio manager would like to stop the bleeding by buying back the short positions. However, in the face of this sell-off the liquidity in these options has dried up. The bid-ask spreads are ten times as large as they

were previously. Although the risk controls on his screens are flashing red and telling our unfortunate portfolio manager to close out and cover his trades, he simply cannot afford to do so. He overrides his risk controls.

So instead the portfolio manager keeps the trades open, goes home, and spends a sleepless night praying the markets will reverse course in the morning. If he's especially bold or desperate, he might have even "doubled down" by putting on some new trades that would benefit from a reversal.

The next day or days arrive. If the asset bounces back and approaches its previous levels the losses would be unrealized and the portfolio could potentially recover. If the strategy is not required to report daily pricing or mark-to-market, it is entirely possible this event qualifies as a near-miss and no one is ever the wiser.

However, this paper is about blow-ups. Maybe the asset loses an additional 10% the following day. Liquidity is worse. The strategy is more leveraged than it was before. The strategy enters a death spiral, its losses are so extreme they cannot be recovered. The best and perhaps only option is to shut down trading and return whatever little capital remains to the investors. Sometimes it is not even up to the portfolio manager. Before losses spiral out of control, a clearing firm can enter the mix and perform their version of portfolio "surgery" in the form of a forced liquidation.

Obviously what we are describing here is a "worst-case" scenario. Most experienced option strategies are well aware of these risks and do everything they can to avoid being on the cover of the Wall Street Journal. However, there is no denying that worst-case, blow-up scenarios have occurred before and will occur again if investors pay insufficient heed to excessive leverage, illiquidity or have poor risk controls.



CONCLUSION

After reading the above “worst case scenario” some might be tempted to avoid options-based strategies altogether. Unfortunately, ascribing these characteristics and expectations to all options strategies is a mistake too many investors make. Options based strategies can fill a useful role within a portfolio. Each options-based strategy has a certain objective, so investors can easily find an options-based strategy that meets their needs.

The intent of this paper was to draw attention to the characteristics that can pose risks to investors rather than condemn all option strategies. Not all strategies have these risks, so it's important to know how to separate them. This paper is intended to assist and guide investors and analysts in their due diligence of options-based strategies with the education necessary to make their decisions.

To further assist in these efforts, Swan Global Investments has authored a white paper titled “Know What You Own: Understanding the Options Category.”



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Market risk is too big a threat to investors to be dealt with passively. So we hedge it.

Our simple, yet innovative investment philosophy is the foundation of our Defined Risk Strategy, a rules-based, multi-asset hedged equity strategy, with a track record of generating consistent returns while defining, or limiting, downside risk to improve investment outcomes and protect irreplaceable capital through full market cycles.



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1099 Main Ave., Suite 206
Durango, CO 81301