

Harvesting the Equity Insurance Risk Premium: Know Your Options

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Introduction

Institutional investors generally rely on equity markets to generate the bulk of the returns necessary to achieve their performance objectives. As they search for new ways to diversify their portfolios, we believe investment strategies that involve systematic sales of equity options can be an attractive addition because they access an alternative source of return: the equity insurance risk premium. In this paper, we review the equity insurance risk premium,¹ explore several strategies for incorporating it into a portfolio, and analyze its impact on performance.

We discuss several key concepts in this paper:

- Trustees are challenged to construct portfolios that achieve their required returns without taking an unwanted level of risk.
- Options selling strategies harvest the equity insurance risk premium and have attractive performance attributes over the long term. Their returns are comparable to equity, with less volatility but still offering diversification benefits.
- The options market is mature, widely traded, and highly regulated; products have evolved to accommodate a variety of implementations to suit return expectations and risk tolerance.
- There is a range of approaches that clients can pursue from simple, rules-based strategies to more active, dynamic strategies.
- We believe options selling strategies represent an attractive and timely opportunity, and many institutional investors should consider such an investment.
- Clients that have higher risk tolerance and less aversion to complexity should consider dynamic strategies, while clients that prefer simple, streamlined solutions should consider rules-based strategies.

The Required Return Dilemma

Institutional investors' return assumptions have fallen over the past decade, but most are still between 7.0% and 8.5% (ranging from under 5.0% to over 9.0%).² Because they have high long-term expected returns, public equities continue to serve as institutional investors' primary return-seeking assets, with 44% invested directly in public equities and another 15% or so exposed to substantially similar risk factors.³ But as the past two decades have vividly demonstrated, large equity allocations make portfolios more susceptible to the equity market cycle volatility that leads to steep drawdowns—most recently, the more than 50% decline experienced during the 2007–2009 financial crisis.

¹ See *Harvesting the Equity Insurance Risk Premium* (Geissinger 2012). <http://www.hekblog.com/wp-content/uploads/2013/09/2013-09-12-Harvesting-the-Equity-Insurance-Risk-Premium.pdf>

² Pension return assumptions are based on all available and reported data from S&P 500 Index companies; Source: J.P. Morgan Asset Management. "Guide to the Markets – U.S." 1Q 2014. Endowment return objectives are based on the responses of 835 organizations; Source: 2013 NACUBO-Commonfund Study of Endowments. January 2014.

³ Public equities include U.S., global, non-U.S., and company securities. Related assets estimated at 15% is based on the total of 26.7% allocated to private equity, real estate (incl. REITs), hedge funds, target date, target risk, multi-asset, balanced, and other investments. The universe includes only defined benefit, defined contribution, and endowment and foundation plans. Source: Greenwich Associates, LLC. "2013 United States Institutional Investors." *Greenwich Market Trends*. December 2013.

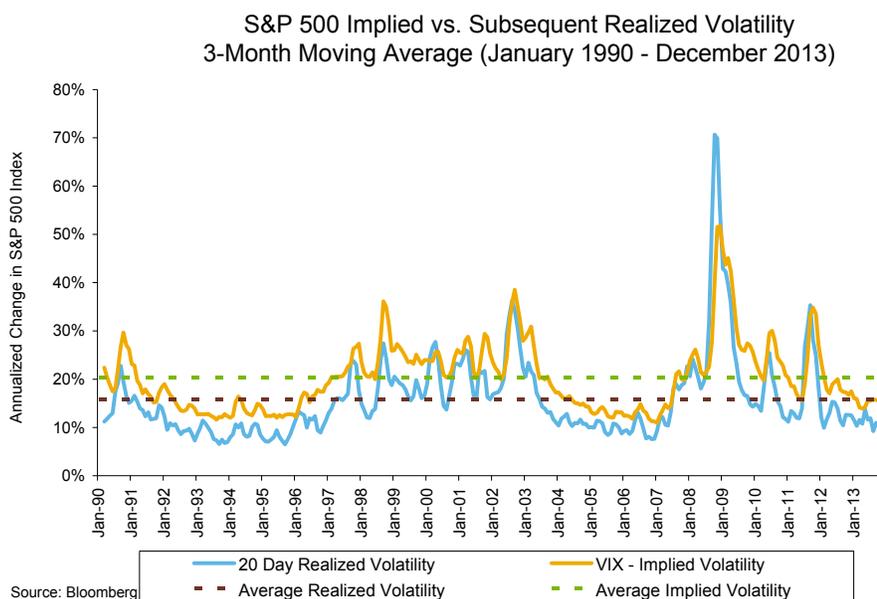
The common problem faced across the institutional investor community today is the ongoing need to generate mid- to high single-digit returns with lower downside risk. But how? The equity insurance risk premium, via systematic sales of equity options, is one potential answer. We believe these types of strategies present a compelling yet underutilized investment opportunity, and institutional investors are uniquely positioned to take advantage of the growing demand for this type of insurance.⁴

Reviewing the Equity Insurance Risk Premium: Why Selling Options Wins Over Time

In a recent research paper (Geissinger 2012), we described the concept and validated the persistence of the equity insurance risk premium inherent in the price of equity options,⁵ where expected volatility (as implied by the market price of options) is higher than subsequent realized volatility more than 80% of the time. That is, there is a positive expected return to selling options. As with other forms of insurance, the premium income earned by selling options is offset by “loss events” (when the options are in the money at the time of expiration), and the return is the excess premium income after loss payouts.

Interpreting VIX

Implied volatility for the S&P 500 Index is measured by the CBOE Volatility Index (VIX). The VIX reading represents the expected annualized change in price over the next 30 days based on the prices of near-term out-of-the-money options. So if the VIX is 20, roughly the historical average, that means S&P 500 Index options are priced for an annualized volatility of 20% over the next 30 days.



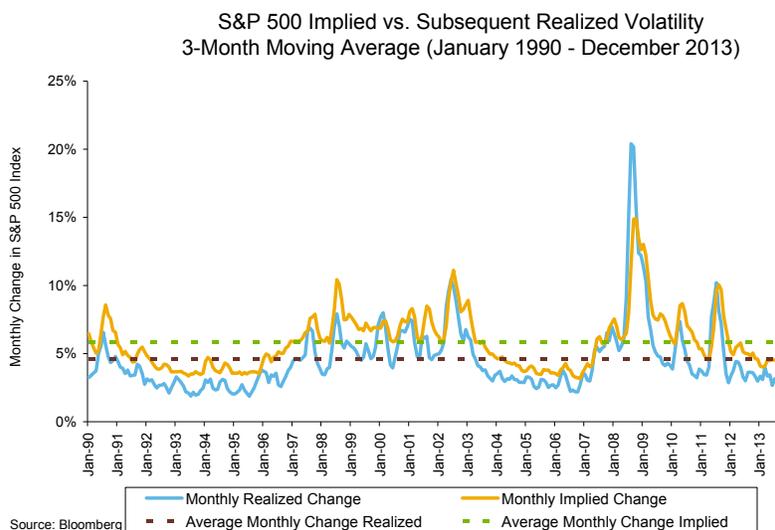
⁴ For an introduction to options markets, please refer to the Appendix.

⁵ In this paper we will focus on options that reference underlying equity assets and generally refer to index options on the S&P 500 Index rather than those on individual stocks.

In the simplest terms, an increase in the demand for options causes the VIX to rise and a decrease in the demand for options causes the VIX to fall.⁶ Spikes in the VIX occur when investors seek protective puts that profit from a price decline, which is why the VIX is often referred to as the “fear gauge.”

As illustrated above, the realized volatility observed in retrospect rarely exceeds the implied level of volatility because of the insurance premium inherent in options prices. This is what allows an investor to keep more premium income than is paid out for exercised options. As long as this relationship holds—and we believe the viability of insurance market forces dictates that it will—systematic options sales will be profitable over time.

Perhaps a more intuitive way of presenting the VIX is to express it in terms of the implied *monthly* change in the S&P 500 Index price level, commensurate with the 30-day period being measured, as opposed to the annualized volatility implication. The chart below shows the historical implied volatility for the S&P 500 Index and the actual, realized volatility observed over the subsequent 30 days. Using the VIX of 20 from the previous example, this means that options premiums are pricing in at a two-thirds chance that the S&P 500 Index will move less than 5.8% over the next 30 days.⁷



Investment Strategies

There are myriad options available that can be used to derive custom market exposures and payoff profiles, but the applicable strategies for institutional investors—those with a repeatable process and positive mean return—can be classified into three different types: covered call, passive, and dynamic strategies. While the approaches are different, they all harvest the equity insurance risk premium and require options expertise from experienced practitioners.

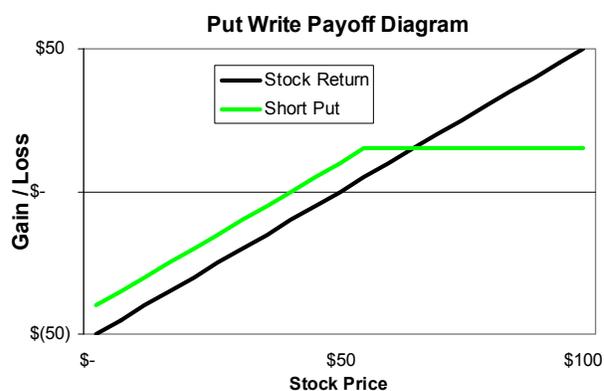
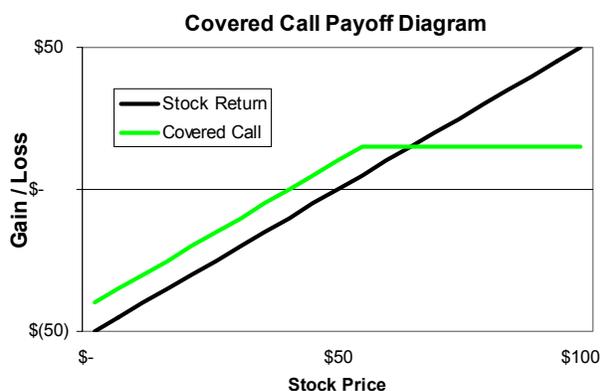
⁶ Source: Chicago Board Options Exchange (CBOE). cboe.com

⁷ Using the calculation for volatility, $(0.20/12^{0.5}) = 5.8\%$.

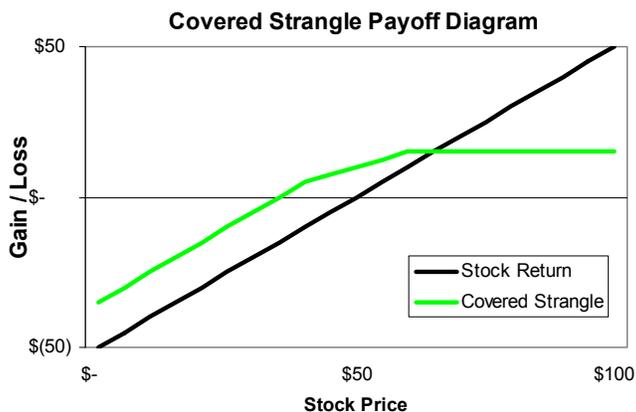
Covered Calls and Put Writes

A covered call strategy describes a portfolio with an asset held long while a call option is sold on the same asset. The purpose is to generate income on the option sale in addition to realizing the gains of the long position, up to a certain price. A covered call investor sacrifices further upside potential during the contract period—usually appreciation beyond several percentage points—in exchange for a greater return if the underlying asset price falls or rises to the break-even point, at which any exercise value can be fully paid for with the premium income. Covered calls are “covered” because the option liability is fully collateralized by the long position should the underlying asset price increase beyond the strike price, in which case the investor’s long position rises commensurately with the call option liability. All or a portion of the investor’s shares are then “called away” at expiration at the strike price cost.

Note that a covered call strategy with an out-of-the-money call option has a similar payoff profile as selling a put option (a put write strategy) that is in the money. As illustrated below, both offer extra income to increase the return within a high probability range of the underlying asset’s price distribution at expiration, and both offer limited extra downside protection compared to a traditional buy-and-hold investment.



Taking the covered call and put write strategies a step further, an investor can combine them and sell both a call and a put while holding collateral in the form of long exposure to the underlying asset and cash, respectively. This strategy, called a covered short strangle, better assures that some or all of the premium income is kept, since at least one of the options is guaranteed to expire worthless and—barring a significant directional move—potentially both will. The payoff profile is pictured below.



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There are many different types of covered call and put write strategies implemented with reference to both individual stocks and indices. A common characteristic is that they have some equity market exposure, but achieve a steadier return stream with a narrower range of return outcomes and lower volatility. It is important to note that as long as the investor is fully collateralized and unlevered, there is less downside potential relative to a long-only investment.

Rules-Based Strategies

Rules-based strategies are designed to systematically capture the equity insurance risk premium by following a repeatable, mechanical process with no subjective input. For example, a rules-based strategy may sell a certain number of contracts with a similar time until expiration at a specified delta or percentage out of the money, staggering them and selling a new set simultaneously upon expiration. Because the manager is responsible for monitoring and execution only, rules-based strategies have lower fees than active strategies. Rules-based strategies are appropriate for investors who are most concerned about earning the equity insurance risk premium and do not wish to incorporate active management.

Dynamic Strategies

Dynamic options strategies are the most actively managed type of options strategy. They provide managers with maximum flexibility in their pursuit of the best risk-reward opportunities for capturing the equity insurance risk premium. These managers may also follow a rules-based process, but can employ many additional subjective elements grounded in deep experience and sophisticated modeling techniques to constantly optimize the payoff structure. Some ways in which dynamic managers aim to add value include:

- Optimize across different equity indices (or ETFs), strike prices, and expiration dates.
- Take a view on the direction of the market or the VIX.
- Adjust the Greeks as they deem appropriate (see the Appendix for a summary of the Greeks).
- Buy deep out-of-the-money puts or calls as a hedge against adverse market outcomes.
- Utilize spread trades to capture a positive payoff if the market closes within a targeted range.
- Manage the collateral pool in a strategy aimed at outperforming a certain benchmark.

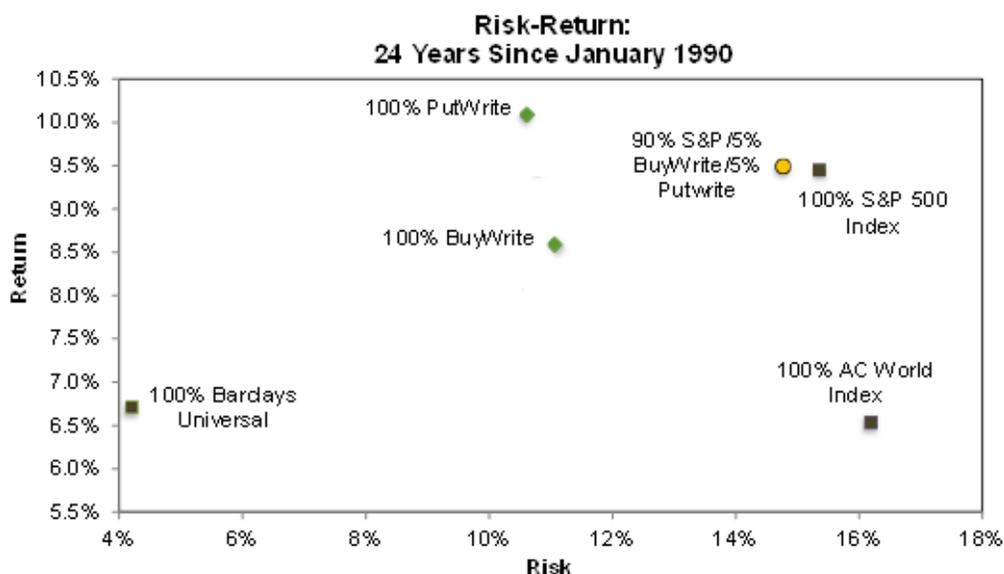
While dynamic strategies have the greatest return potential, they also carry the risks associated with all actively managed portfolios—namely greater loss potential, higher volatility, and a chance that the return objective will not be met. This type of options strategy is appropriate for investors with a return-seeking objective and greater risk tolerance.

Performance Analysis and Expectations

There is no standardized benchmark for options strategies. They come in many different varieties and lack a common beta component. We feel analyzing the performance characteristics of the CBOE S&P 500 BuyWrite Index (BXM) and CBOE S&P 500 PutWrite Index (PUT) is a good starting point to gauge the equity insurance risk premium return profile through rules-based options sales. The BXM is a covered call strategy that holds the S&P 500 Index long and sells a near-the-money call option with about one month until expiration, and the PUT sells an at-the-money put with about one month until expiration.

To get a sense for the performance benefits of including options strategies in an institutional portfolio, the risk-return chart below compares the CBOE indices with major market indices. As a simplified way to demonstrate the impact on a portfolio, we have substituted an equal-weighted allocation to BXM and PUT for 5% of the allocation to public equity.

As shown, the options indices have delivered strong risk-adjusted returns since their inception and an equal-weight allocation has enhanced the performance of an equity-dominated portfolio.



We highlight the following when analyzing a cross section of different rolling periods (3-, 5-, and 15-year):

- The 15-year rolling return of the portfolio with options is never lower than that of the traditional institutional portfolio.
- The maximum outperformance of the portfolio with options is greater than the maximum underperformance for each set of rolling periods.
- The 5% allocation shift protected 1.0% of total plan assets (-33.2% vs. -34.2%) during 2008.
- While the equity insurance risk premium contributes to better risk-adjusted returns over time, short-term performance (less than a full market cycle) can vary relative to the equity market.

Our studies of PUT and BXM find that monthly options premium income has averaged roughly 1.8%, which exceeds 20% when annualized. (Liabilities from buyers exercising in-the-money options are netted against this income stream; however, as described previously, the equity insurance risk premium overcompensates sellers of options for profits over the long term.) Historically, the range of monthly income has been 0.5% to a much more extreme 8.0% during 2008, amid the greatest prevailing level of implied market volatility we observed during the analysis.

As the performance charts illustrate, selling equity index options has been a powerful strategy for improving risk-adjusted returns historically, even outperforming in poor equity market environments. This is because options tend to get more expensive in down markets as fear drives greater demand for equity

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protection, so option sellers can be paid greater premiums that expedite drawdown recoveries. As a result, we believe the equity insurance premium will continue to persist over the long term, and it will remain a diversifying strategy because the returns for equity insurance will continue to be different from those of the broad equity market.

Risks

Options strategies are unlikely to be immune to the market risks that apply to all investments, but there are additional risks specific to options sellers. In isolation, selling calls will underperform the S&P 500 Index amid market rallies and selling puts will underperform in sharply falling markets, and generally there will be short-term periods when options sales are unprofitable. Additional risk factors include the following:

- Unlike equity index investors who can ride out short-term price swings with no interim consequences for holding their investment, options sellers are obligated to buy or sell at expiration and thereby are dependent on a price path over a defined time range. For example, an investor who sells a call option may experience the misfortune of an underlying asset price surging beyond a strike price prior to expiration, only to see it fall back below the strike price after the option is exercised. This risk can be mitigated by staggering expirations over time to limit sensitivity to any particular combination of strike price and expiration date.
- Long term, it is possible that more investors might notice the equity insurance risk premium and decide to sell options, which could change the supply-demand dynamics and drive down the options premiums in a buyer's market. While the premium would still exist (otherwise sellers would not take the risk), the performance benefit of systematic options sales would likely be reduced.
- It is impossible to predict how successful an options strategy will perform in advance. However, all else equal, desirable conditions include a high level of implied volatility upon inception of the strategy (higher premiums) and a higher cash return on the collateral for put options.
- Options strategies tend to struggle within highly volatile whipsaw markets. In such an environment, realized volatility can exceed implied volatility and allow options a greater chance of landing in the money, while active managers are unable to effectively adjust their positions in response. However, higher premiums accompany higher volatility and options premiums are repriced in real time, so subsequent returns would be expected to improve with an accelerated recovery—which is why systematic options selling strategies have performed well in many historical bear markets.

The Product Universe

Similar to all alternative investment strategies, manager selection is of key importance. While there is a sizable product universe available for many types of options selling strategies, there are few high-quality institutional offerings. This may reflect the lack of demand to date from institutional investors, possibly due to behavioral influences and misperceptions regarding options strategies—specifically the fear of missing out on upside market moves or having a payment liability in down markets. However, for the same reasons that insurance companies and casinos are profitable (i.e., these businesses offer products for risk-averse and speculative consumers, respectively, at a premium that adequately compensates them for loss events), selling equity options is an appealing investment strategy over time. The small number of high-quality offerings indicates that this return premium remains relatively unexploited, leaving ample opportunity for the strong historical performance to continue in the future.

Investment Vehicles

Investment products are available in mutual fund, commingled fund, and managed account structures, but not all managers offer each. Because mutual funds are often managed for tax efficiency and managed accounts require service providers to facilitate custody and brokerage arrangements, commingled funds are probably the simplest and most cost-efficient means of implementation for most institutional investors with qualified retirement plans, endowments, and foundations.

Reference Indices

Some managers are capable of managing options strategies tied to other equity market indices. Here, however, the primary consideration is the superior liquidity of the S&P 500 Index (and ETF) options, with a focus on the options' premium rather than on the beta reference of those options. Often the strategy is available on a stand-alone basis or as an overlay on top of a predetermined beta (portable alpha).

Fees

The multiformity of the product universe and tiered fee structures make it difficult to ascribe a range of fees for options strategies, but based on our research experience and on information provided by eVestment Alliance, we draw the following conclusions:

- Covered call strategies with active stock selection components typically charge slightly higher fees than traditional active equity mandates (0.6% to 1.0%).
- More passively managed funds that exclude or deemphasize underlying stock selection cost considerably less (0.35% to 0.90%).
- Active options strategies that focus on absolute returns usually include a hedge fund fee structure with management fee (0.0% to 2.0%) and performance fee components (20% to 30% of positive returns) or a combination of the two.

Selecting a Strategy

A specific product within the array of strategies can be selected based on the following criteria:

- **Preferences on equity beta.** Some strategies inherently include equity beta, while others are designed to have almost none.
- **Risk tolerance.** Some strategies are designed to have relatively low volatility, while others take additional risk to maximize the equity insurance risk premium exploitation. We recommend that investors implement their strategies according to risk tolerance, but yet ensure that they get enough exposure to have a meaningful impact on overall portfolio returns.
- **Use of manager skill.** Dynamic strategies tend to make use of manager skill to identify the most rewarded types of contracts, which are rewarded if successful. So, investors should consider the types and levels of exposure for which they want to utilize manager skill. Our view is that the equity markets are more efficiently priced than the equity option markets, and there are mispricings that can be exploited by active management.
- **Fees.** Fees directly erode performance, but may be worthwhile if they are tied to skill that improves overall returns. Investors should consider whether they believe the fees are justified by the returns. Some investors, such as DC plans, may be particularly fee-sensitive, and thus have a strong preference for passive, lower-fee implementations.

Conclusion

The equity options market has evolved into a robust and vital component of capital markets. We believe investors in equity insurance products can capitalize on the following key benefits:

- Options premium income, which provides a source of return diversification.
- Long-term return expectations that are competitive with equity and less volatile.
- Higher premium income that insulates downside exposure as markets become increasingly volatile.

Systematic options selling strategies offer a compelling investment opportunity for institutional investors to diversify their portfolios and improve risk-adjusted returns by harvesting the equity insurance risk premium. Subject to each plan's unique constraints regarding investment horizon, risk and return expectations, and permissible securities, we believe options strategies can contribute to a steadier return pattern while maintaining the long-term capital appreciation benefits of equity allocations.

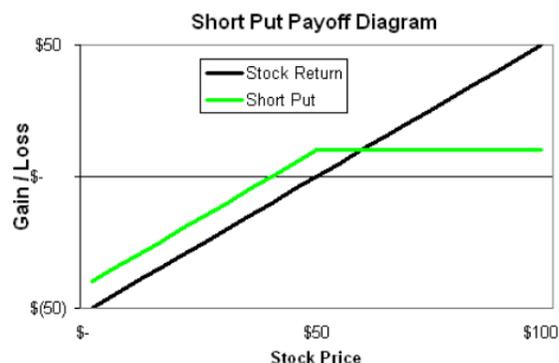
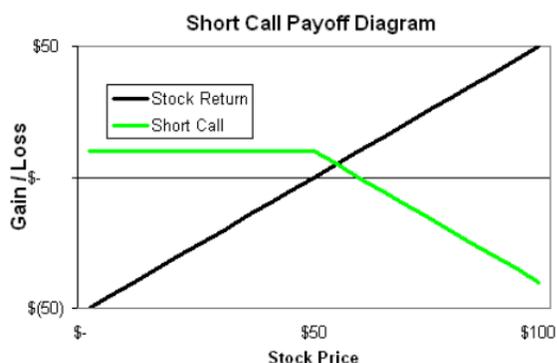
Appendix: Options Market Primer

Equity options have become increasingly important to financial markets. A variety of market participants use them as tools for hedging, income generation, rebalancing, speculation, and a capital-efficient means of expressing an investment view. So why have they been unable to find a place in many institutional portfolios? Potential reasons include complexity, reservations regarding the use of derivatives, and a lack of enough familiarity among many investors. With that in mind, an overview of options markets is appropriate.

Options Basics

Options are financial contracts in which a buyer pays a premium for the right to buy (if a call option) or sell (if a put option) an underlying asset at a specified price (the strike price) at or before a certain date (the expiration date). On the other side of the trade, sellers of options are obligated to sell (if a call option) or buy (if a put option) the underlying asset at the strike price if the option is “in the money” at expiration and the buyer elects to exercise, or they simply keep the premium if the option is “out of the money” and worthless at expiration. The maximum gain for a buyer who is “long” on an option is the difference between the strike price and the market price of the underlying asset multiplied by the number of shares per contract (typically 100) less the up-front premium paid, while the maximum loss is limited to the amount of premium paid for the option. Only a premium is required to initiate a long position, which enables a buyer to gain significant exposure with a relatively small amount of capital.

The exhibits below include the basic payoff structures for selling call and put options. The investor earns a premium and (on a stand-alone basis) is exposed to a loss if the underlying asset price is above the strike price at expiration in the case of the short call, or if the underlying asset price is below the strike price at expiration in the case of the short put. It is important to note that if the investor is fully collateralized and unlevered, there is less downside potential relative to a long-only investment. (Note that the charts describe a return range of -100% to 100% for illustrative purposes, and that in practice an index usually remains relatively close to the current level, especially over the near term.)



A broad range of financial instruments have functional options markets, each with a unique set of expirations, strike price intervals, and terms for settlement. The more heavily traded contracts are available with weekly and even custom expiration dates over time periods longer than one year, while those with less liquidity may be available only monthly or quarterly with a more selective number of strike prices. Options that reference an index or something that cannot be delivered—such as the level of

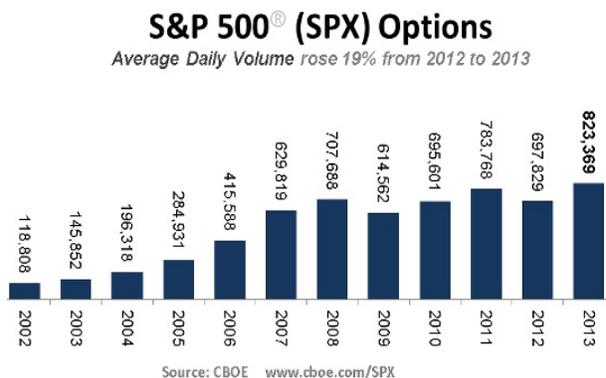
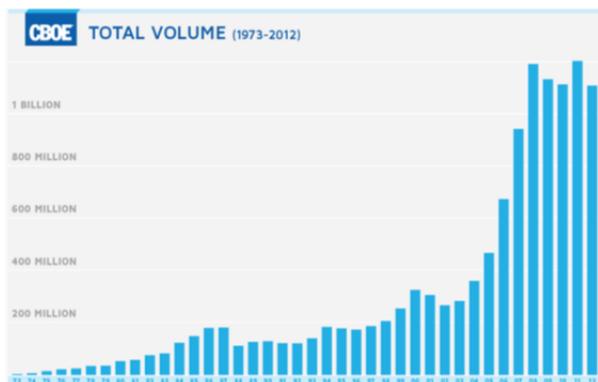
interest rate or volatility—are settled in cash, while options on individual stocks and ETFs are settled in delivery of shares.

Valuation

An options chain for a given asset on an options exchange lists the available call and put options across various strike prices at a specified expiration date, and the real-time premium required for each, which represents the current market value. The value of an option can be broken down into intrinsic value and time value components. Options have intrinsic value only if they are in the money (the price of the underlying asset exceeds the strike price of the option in either direction). Therefore, the value of out-of-the-money options is based on variables that affect the probability that the option will move into the money, including the time until expiration, implied volatility of the underlying asset, risk-free interest rate, and any dividends to be paid out from the underlying asset over the life of the contract. Because more time and a wider expected price range allow for a greater chance that they will land in the money, longer-dated options on more volatile assets are more expensive than near-term options on less volatile assets.

Options Marketplace

Over the course of the four decades since trading of exchange-listed options commenced at the Chicago Board Options Exchange (CBOE), options markets have evolved dramatically, especially in recent years, with an array of products offered to meet growing demand from investors. According to CBOE, during the 2013 calendar year over one billion options contracts were traded, and as of December 2013 there were nearly 300 million options contracts outstanding. This significant growth in products, volume, and importance to capital markets is a testament to their staying power.



Today, all options contracts listed on U.S. exchanges are centrally cleared and guaranteed through The Options Clearing Corporation (OCC), which is equally owned by its member exchanges and operates under the jurisdiction of the Securities and Exchange Commission (SEC) and the Commodities Futures Trading Commission (CFTC).⁸ This eliminates counter-party risk for both buyers and sellers of equity options.

⁸ Visit optionsclearing.com for further information on the role of The Options Clearing Corporation.

The Greeks

Delta, theta, vega, rho, and gamma (collectively known as “the Greeks”) measure an option price’s sensitivity to changes in the price of the underlying asset, time decay, implied volatility, the risk-free interest rate, and changes in the option’s delta, respectively. Controlling for these variables is extremely important in managing an options portfolio.

An option’s delta measures its sensitivity to changes in the price of the underlying asset. Values assigned to delta range from -1.0 to 1.0, where deep out-of-the-money options with very little chance of being in the money at expiration have a delta near 0.0 because their values appreciate very little until there is a significant change in the underlying asset price. Conversely, deep in-the-money call options have a delta near 1.0 and deep in-the-money put options have a delta near -1.0 because they move almost in lockstep with the price of the underlying asset. Despite their smaller premiums, which reflect a lower chance of landing in the money (delta is roughly equal to this probability), sales of low delta options—those with strikes that are several percentage points out of the money and short time frames before expiration—have historically provided optimal results.⁹

When the underlying asset has less time to increase or decrease in price, the option price decreases gradually as it approaches expiration. This decay in time value accelerates as the expiration date draws near, which is a key driver of the excess return for options sellers and makes sales of near-dated options, such as those with one or two months until expiration, the most attractive. All things equal, because longer-dated options (several months to more than a year until expiration) have a greater chance of landing deep in the money and very short-dated options (one or two weeks until expiration) can introduce unwanted volatility, neither may be particularly attractive for systematic options sales.

⁹ Hill, J., Balasubramanian, V., Gregory, K., Tierens, I., 2006, Finding Alpha via Covered Index Writing, *Financial Analysts Journal*, 62(5), 29-46.

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