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Date: October 09, 2023
Topic: [Covered Calls & Options](#)



GLOBAL X ETFs RESEARCH

Exchange-Listed Options and Their Potential Impacts on Market Volatility

The following is the final part in a 3-part blog series on the market making landscape for exchange traded options. This part discusses potential option market impacts on market volatility and considerations when analyzing the growth in ETF usage of such contract types. [Part 1](#) discussed the role of liquidity providers when it comes to making a market in listed options. [Part 2](#) explained additional options risks that options market makers will need to consider when enacting hedging trades.

Options have remained an attractive avenue for investors seeking to diversify their portfolios away from traditional asset classes. Accessing the exchange traded options markets, investors can implement their own unique strategies to either offset risk, generate income or enhance performance. Fueling the engine that drives accessibility to these public derivatives markets are large institutions that play an essential role as everyday liquidity providers.

Key Takeaways

- Gamma and delta hedging options trades from market makers have the potential to influence movements in the assets underpinning their options. This influence is dependent on supply and demand dynamics within the underlying asset.
- Demand for options strategies in a managed investment vehicle has risen significantly over the last few years. Noticeable ETF demand for these types of strategies highlights the important role market makers play in maintaining option market efficiencies.
- Although growing at a fast pace, the ETF industry’s footprint on implied volatility remains muted. More recently, the options market is signaling other potential causes of declining volatility and recent bullish market sentiment.

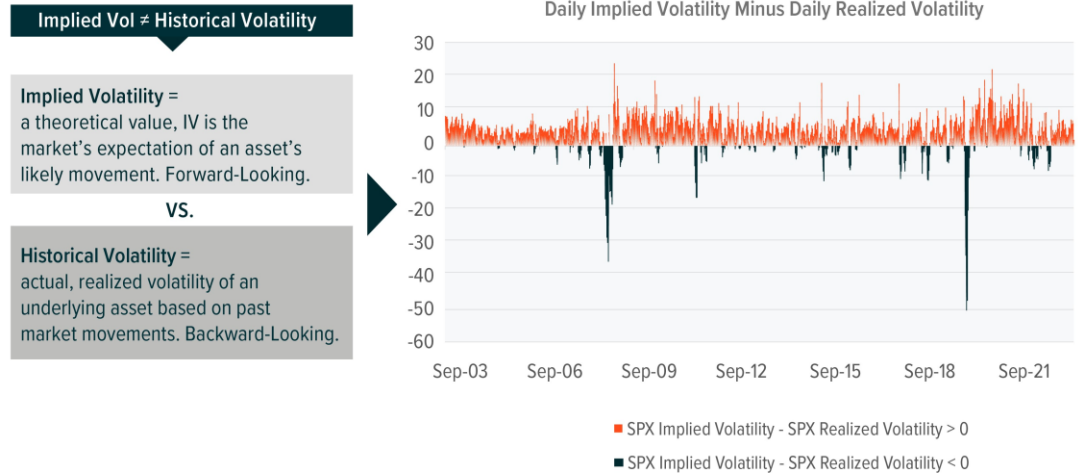
Market Maker Gamma Exposure Is One Component of Potential Movements in Volatility

The Cboe Volatility Index (VIX), a widely quoted implied volatility index, measures the market’s expectations of U.S. equity market volatility over the next 30 days. Typically used as a “fear gauge” for market participants, investors may also utilize this index as a proxy of options valuations. Implied volatility is typically overstated by the options market, relative to historical volatility, particularly since options markets are pricing in the potential for a left tail movement in the underlying asset.



THE OPTIONS MARKET TYPICALLY OVERSTATES VOLATILITY

For Illustrative Purposes Only. Source: Global X ETFs with monthly data from Morningstar Direct measured from 08/31/2013 to 08/31/2023. SPX implied volatility is measured by the Cboe Volatility Index. SPX realized volatility is measured by the Cboe Realized Volatility Index.



Implied volatility calculations take the total demand of options into account, regardless of the investor or institution purchasing or selling the respective contracts. These participants and market maker trading activities alike are expected to play a natural role in implied volatility index calculations, as a result. As options volume continues to rise from retail and institutional investors, option liquidity providers have to hedge their exposures immediately to limit their market risks.

THERE ARE NUMEROUS TYPES OF MARKET PARTICIPANTS GENERATING LISTED OPTION DEMAND

Source: Ambrus Capital, Global X ETFs.

Type of Participant	Goal	Option Demand Intentions
Wealth Advisors	Systematically generating yield	Selling Options
Market Makers	Liquidity Providers while hedging greek risks	Agnostic
Volatility Hedge Funds	Speculative traders while hedging greek risks	Agnostic
Event Driven Funds	Speculative/Broad Hedging	Purchasing Options
Retail Traders	Speculative/Broad Hedging	Purchasing Options
Systematic Funds/ETFs	Broad Hedging	Purchasing/Selling Options

It's generally assumed that market makers and dealers are typically sellers of puts and buyers of calls when hedging their books. This may be the case due to secular retail and asset manager demand for purchasing puts as a means to provide portfolio protection while selling covered calls is a popular means of income generation amongst this same group of investors.

Amidst these allocator flows, market makers are standing by to provide liquidity by taking the opposite side of these trades to gamma and delta hedge their books. It's these continuous options flows that will determine market maker's gamma exposure, thus impacting the directionality of their gamma and delta hedging trades upon movements in the underlying.



HOW ARE MARKET MAKERS MAINTAINING A DELTA NEUTRAL HEDGE DURING LONG/SHORT GAMMA REGIMES?

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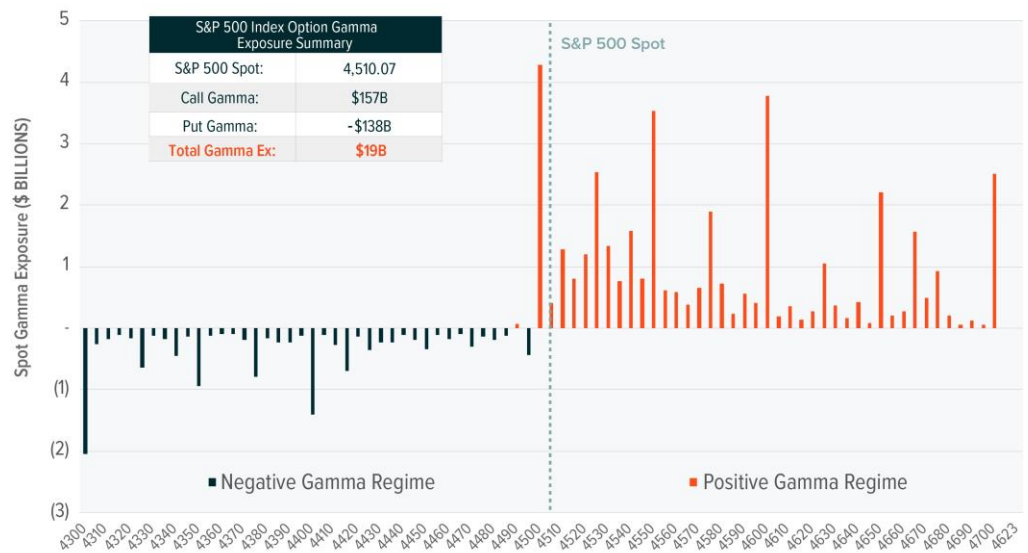
	Positive Gamma Regime	Negative Gamma Regime
Underlying Moves ▲	Short Underlying Asset	Long Underlying Asset
Underlying Moves ▼	Long Underlying Asset	Short Underlying Asset
Potential Impacts on Implied Volatility	Decrease	Increase

In times when market maker gamma exposure is positive, delta hedging flows are expected to move inverse to the direction of the underlying asset and may play a role in dampening volatility. In a short gamma regime, option market makers are taking the opposite approach and are expected to buy and sell the underlying in the same direction to the movements in the underlying asset. This has the potential to create feedback loops that may increase volatility while the former is expected to assist in mitigating volatility.

Note that the level of impact from these options trading activities will also depend on the level of buying and selling from other market participants who are purchasing an option's underlying asset for their portfolio as a part of their strategies or tactical allocations. Therefore, options market demand may outweigh these allocators, and vice versa.

POSITIVE GAMMA REGIMES HAVE THE POTENTIAL TO MITIGATE REALIZED VOLATILITY

For Illustrative Purposes Only. Source: Global X ETFs using S&P 500 index option trade data from Cboe as of 09/01/2023 1:26PM Eastern Standard Time.



Providing an example of a positive gamma regime, it's important to notate that the above is a snapshot and gamma exposure is expected to change continuously throughout the trading day. With \$19B in net gamma exposure, at 1:26PM EST on 09/01/2023, the S&P 500 index options market was in a positive gamma regime that would have expected to see volatility dampening flows from dealers. Therefore, for every 1% move up in SPX, option dealers would have been expected to be net sellers of the underlying index and vice versa. This may increase the difficulty for the underpinned asset to increase further as SPX's spot price approaches contract strikes with high open interest, thus high dealer gamma exposure.



Demand between the aforementioned participants is expected to increase as listed option trading strategies continue to become more mainstream within the capital markets. Institutions and retail investors alike have differing reasons for their options trading participation. Whether that'd be to manage their own proprietary strategies or to manage regulated investment funds offered to the public, each will have their own footprint on a market maker's hedging trades.

Demand for Investment Vehicle Access to Options Strategies Is on a Positive Trajectory

Today, investors have many access paths to implement options strategies. The most common, "do-it-yourself" ("DIY") investors may implement their own customized options strategy on a particular asset or index. Another option may be to access an institutional-grade strategy through the usage of packaged products or investment funds, alleviating potential operational burden in implementing such a strategy by oneself.

Investment vehicles such as mutual funds, closed end funds in addition to structured notes (a type of structured product issued by a large bank) have a long history within this segment of the asset management industry. The structured note market overall saw \$93B of investor come into these vehicles from 31,614 products within the U.S. markets over the course of 2022.¹ However, ETF issuers have recently launched similar strategies, largely within the past 5 years, to provide investors another avenue of options market access.

Potential Access Vehicles for a Derivative-Based Strategy			
Investment Type	Exchange-Traded Product	Mutual Fund	Structured Notes
Maturity Date	None	None	Yes; Time until expiration depends on the issuing counterparty
Structure	ETF, ETN, Closed-End Funds, or Grantor Trust regulated under the Investment Company Act of 1940	Open-Ended Fund regulated under the Investments Company Act of 1940	Unsecured Debt Obligation and subject to the credit risk of the Issuing Counterparty
Liquidity	Can be bought and sold on an exchange at market price	Can be bought and sold at NAV at the end of each trading day	No secondary market; intended to be held until maturity
Entry/Exit Costs*	1. Trading commissions 2. Implicit trading costs such as bid/ask spreads and premiums/discounts	1. Potentially has front-load fees upon entry ¹ 2. Potentially has back-end fees upon exit ²	1. Commissions paid to the access broker 2. Trading costs to hedge for counterparty hedging purposes
Fees	Total Expense Ratio ³	Total Expense Ratio ³	Structuring and development costs in addition to offering expenses

¹Front-End Load – a fee that is charged upon initial entry into a mutual fund. Front-end load fees will be dependent on the share class and varies per issuer.

²Back-End Load – also known as a contingent deferred sales charge, this is the fee that is charged upon mutual fund redemption. Back-end load fees will be dependent on the share class and varies per issuer.

³Reflects the total annual expense associated with ownership of the fund, including buy not limited to management fees, 12b-1 fees, and acquired fund fees and expenses.

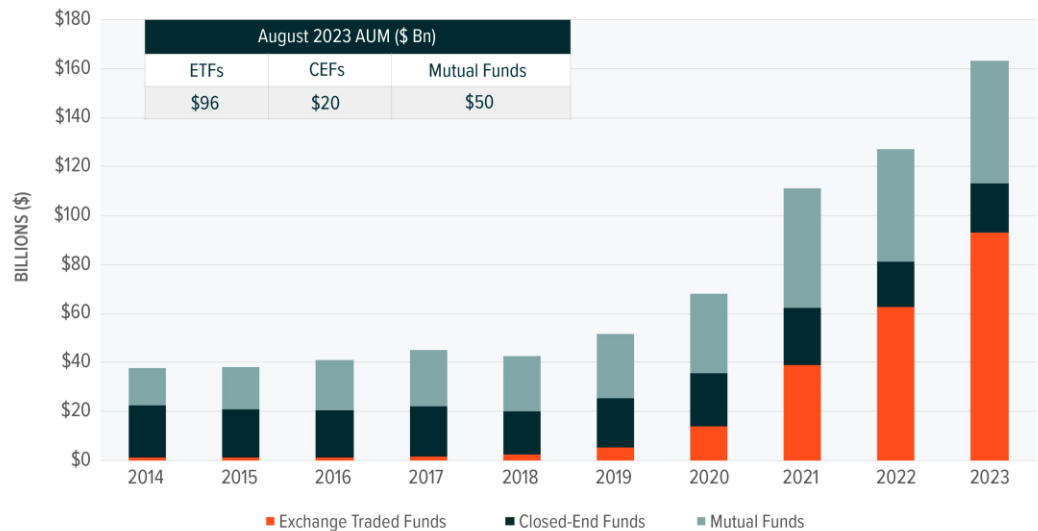
Recently, the ETF wrapper has garnered the most interest relative to other investment fund structures. Generally, equity-based, derivative strategy ETFs in the U.S. markets obtain exposure to a



particular basket of stocks, either passively or actively managed, in conjunction with an option overlay underpinned by assets or indices of similar characteristics to the stock portfolio. These systematized strategies may offer a level of predictability amidst potential macroeconomic fears.

ETFs HAVE BECOME THE FAVORABLE VEHICLE OF CHOICE FOR DERIVATIVE BASED STRATEGIES

Source: Global X ETFs with data sourced from Morningstar Direct. ETF Categorizations of strategies are determined by Global X while Closed End Fund and Mutual Fund classifications are based on Morningstar Categories. Data measured from 12/31/2014 to 08/31/2023.



Market Makers, ETFs, and Their Potential Impacts on Implied Volatility

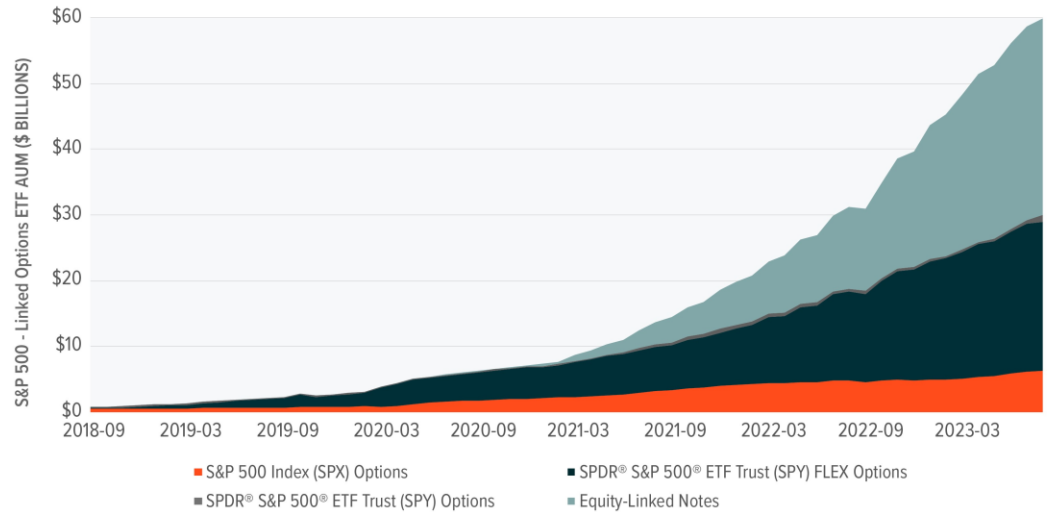
Increasing the velocity of options trading, liquidity provider hedging flows help maintain a balanced backdrop for option market stability. However, this has also raised questions as to if these hedging flows, and equity fundamentals less so, are impacting equity market volatility.

Amongst U.S.-listed, derivative-based ETFs, the S&P 500 has been the most popular index underpinning options used within these strategies. S&P 500 Index (SPX) options, options on S&P 500 tracking ETFs such as the SPDR® S&P 500® ETF Trust (SPY), or synthetically through the usage of equity linked structured notes have been the largest avenues of obtaining derivative exposure to this index. Currently, the combined assets under management (AUM) within these specific ETF options strategies encompasses 58% of all derivative-based, U.S. domiciled ETFs and signifies the market’s preference for broader U.S. equity exposures.²



S&P 500-LINKED OPTIONS ETFS HAVE GAINED SIGNIFICANT TRACTION WITHIN THE U.S. ETF MARKETPLACE

Source: Global X ETFs with data sourced from Morningstar Direct. Categorizations of strategies are determined by Global X. Data measured from 08/31/2018 to 08/31/2023.



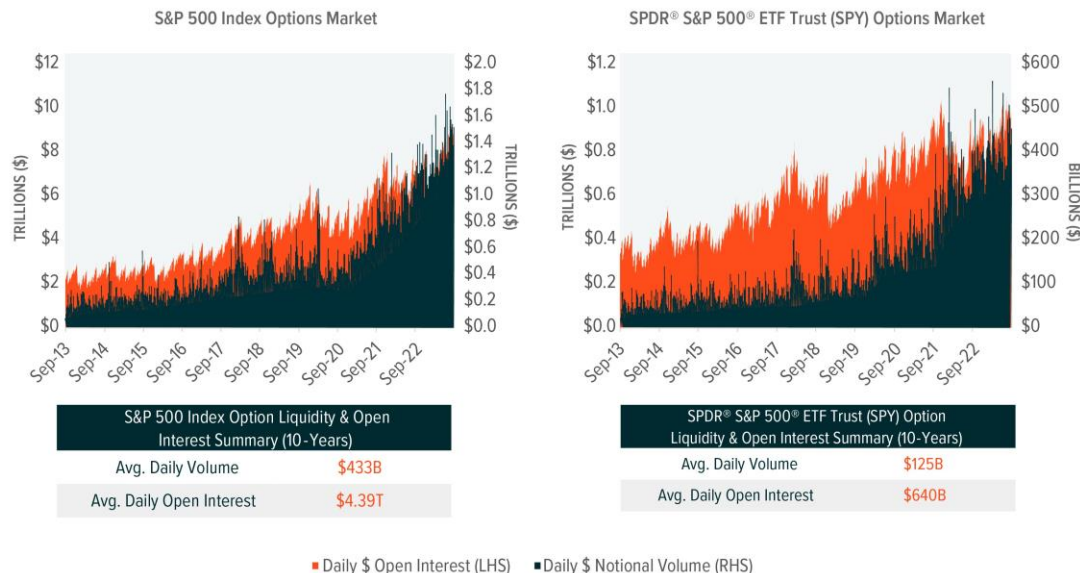
However, the S&P 500 and SPY options market has a history of demonstrating ample liquidity and average open interest has increased significantly post-COVID 19 across both option types. The above data also discounts the fact that SPX or SPY option overlay strategies are implementing different strategies with differing notional exposure coverage ratios across contracts of differing strikes and expirations. Assuming notional exposures of their options overlays equal the AUM of each fund, this would assume that SPX-linked options overlay strategies are only accounting for roughly 1.17% of combined SPX and SPY daily average open interest.

As notated earlier, mutual funds, closed end funds, and structured products may also be implementing similar strategies. However, ETFs offer daily transparency with higher levels of insight into their portfolio footprint. This may also another reason as to why ETF demand for such exposures are increasing. As the popularity of the options-based ETFs increases and fund sizes increase, market makers may use multiple access vehicles to hedge their exposures from index-tracking ETFs and their corresponding options markets as well as the futures market.



S&P 500 LINKED EXCHANGE TRADED OPTIONS HAVE A HISTORY OF AMPLE LIQUIDITY AND OPEN INTEREST

Source: Global X ETFs with data sourced from Bloomberg Markets using daily data measured from 09/01/2013 to 08/31/2023.



Conclusion

Investment strategies implementing derivative-based overlays have demonstrated significant growth over the last few years, particularly within the ETF wrapper. With daily transparency, ETF access has been an important tool for investors as they seek to access strategies from simplistic to the most complex to diversify portfolio exposures. Options dealers are significant contributors to this growth as these types of strategies tend to be systematic in nature when it comes to the rolling schedules of their underlying options holdings. As options markets expand across popular large and small-cap indices, these liquidity providers have many types of hedging vehicles in their quiver as a means to conduct their hedging activities while keeping spreads tight.

Footnotes

1. SRP News (2023, January 20th). "Spotlight on...top issuers in the US (FY 2022)". Structured retail products.
2. Source: Global X ETFs with data sourced from Morningstar Direct. Categorizations of strategies are determined by Global X. Data as of 06/30/2023.

Glossary

S&P 500: S&P 500 Index tracks the performance of 500 leading U.S. stocks and captures approximately 80% coverage of available U.S. market capitalization. It is widely regarded as the best single gauge of large-cap U.S. equities.

Call Option: An option that gives the holder the right to buy an underlying asset from another party at a fixed price over a specific period of time.

Put Option: An option that gives the holder the right to sell an underlying asset to another party at a fixed price over a specific period of time.

Risk-Free Rate: The theoretical rate of return on an investment with zero risk. Government bond yields are the most commonly used risk-free rates.



Delta: The sensitivity of the price of an option to changes in the price of the underlying. Delta is a good approximation of how the option price will change for a small change in the value of the underlying.

Gamma: A numerical measure of how sensitive an option's delta (the sensitivity of the option's price) is to a change in the value of the underlying.

Theta: The change in price of an option associated with a one-day reduction in its time to expiration; the rate at which an option's time value decays.

Vega: A measure of the sensitivity of an option's price to changes in the underlying's volatility.

Strike Price: The fixed price at which an option holder can buy or sell the underlying asset. Also called 'exercise price'.

"At-The-Money": An options contract whose strike price is equal to that of the current market price of the underlying security.

"In-The-Money": Options that, if exercised, would result in the value received being worth more than the payment required to exercise.

"Out-Of-The-Money": Options that, if exercised, would require the payment of more money than the value received and therefore would not be currently exercised.

Option Roll: refers to closing an existing options position while opening a new position in another option of the same underlying asset with similar characteristics.

Moneyness: describes the intrinsic value of an option in its current state and is the difference between the strike price stated in the contract relative to the reference asset's price.

Notional Exposure: the total value controlled by a portfolio of options contracts. Notional exposure is calculated by multiplying the number of contracts held by the underlying index price and multiplying this product by the contract multiplier.

Coverage Ratio: The notional exposure of a portfolio's options allocation divided by the total net assets managed by the same strategy. The greater the coverage ratio, the greater the options overlay's potential control over risk reward outcomes.

Investing involves risk, including the possible loss of principal. This information is not intended to be individual or personalized investment or tax advice and should not be used for trading purposes. Please consult a financial advisor or tax professional for more information regarding your investment and/or tax situation.

