Not All Volatility is the Same

Kevin Davitt
Head of Index Options
Content
Nasdaq

Russell Rhoads
PhD, CFA, Head Research & Consulting
EQDerivatives

Exchange and Industry Sponsored Webinars are presented by unaffiliated third parties. Interactive Brokers LLC is not responsible for the content of these presentations. You should review the contents of each presentation and make your own judgment as to whether the content is appropriate for you. Interactive Brokers LLC does not provide recommendations or advice. This presentation is not an advertisement or solicitation for new customers. It is intended only as an educational presentation.
Disclosure:

Options involve risk and are not suitable for all investors. For information on the uses and risks of options, you can obtain a copy of the Options Clearing Corporation risk disclosure document titled Characteristics and Risks of Standardized Options by calling (312) 542-6901.

Futures are not suitable for all investors. The amount you may lose may be greater than your initial investment. Before trading futures, please read the CFTC Risk Disclosure. For a copy visit interactivebrokers.com.

There is a substantial risk of loss in foreign exchange trading. The settlement date of foreign exchange trades can vary due to time zone differences and bank holidays. When trading across foreign exchange markets, this may necessitate borrowing funds to settle foreign exchange trades. The interest rate on borrowed funds must be considered when computing the cost of trades across multiple markets.

The Order types available through Interactive Brokers LLC’s Trader Workstation are designed to help you limit your loss and/or lock in a profit. Market conditions and other factors may affect execution. In general, orders guarantee a fill or guarantee a price, but not both. In extreme market conditions, an order may either be executed at a different price than anticipated or may not be filled in the marketplace.

There is a substantial risk of loss in trading futures and options. Past performance is not indicative of future results.

Any stock, options or futures symbols displayed are for illustrative purposes only and are not intended to portray recommendations.

- IRS Circular 230 Notice: These statements are provided for information purposes only, are not intended to constitute tax advice which may be relied upon to avoid penalties under any federal, state, local or other tax statutes or regulations, and do not resolve any tax issues in your favor.

- Interactive Brokers LLC is a member of NYSE FINRA SIPC.
Not All Volatility is the Same

Kevin Davitt – Index Content, Nasdaq

Russell Rhoads – Head of Research, EQDerivatives & Professor of Finance, Indiana University Kelley School of Business

Interactive Brokers Webinar
June 8, 2022
Not All Vol is the Same

1. Overview
   - NDX
   - Total Returns

2. Options

3. Volatility

4. Markets
   - Relationships
   - Product Information

5. Recap
DISCLAIMER

Index

Nasdaq® is a registered trademark of Nasdaq, Inc. The information contained above is provided for informational and educational purposes only, and nothing contained herein should be construed as investment advice, either on behalf of a particular security or an overall investment strategy. Neither Nasdaq, Inc. nor any of its affiliates makes any recommendation to buy or sell any security or any representation about the financial condition of any company. Statements regarding Nasdaq-listed companies or Nasdaq proprietary indexes are not guarantees of future performance. Actual results may differ materially from those expressed or implied. Past performance is not indicative of future results. Investors should undertake their own due diligence and carefully evaluate companies before investing. ADVICE FROM A SECURITIES PROFESSIONAL IS STRONGLY ADVISED.

© 2022. Nasdaq, Inc. All Rights Reserved.

Options

For the sake of simplicity, the examples included do not take into consideration commissions and other transaction fees, tax considerations, or margin requirements, which are factors that may significantly affect the economic consequences of a given strategy. An investor should review transaction costs, margin requirements and tax considerations with a broker and tax advisor before entering into any options strategy.

**Options involve risk and are not suitable for everyone.** Prior to buying or selling an option, a person must receive a copy of *Characteristics and Risks of Standardized Options*. Copies may be obtained from your broker, one of the exchanges or The Options Clearing Corporation, One North Wacker Drive, Suite 500, Chicago, IL 60606 or call 1-888-OPTIONS or visit www.888options.com.

Any strategies discussed, including examples using actual securities and price data, are strictly for illustrative and education purposes and are not to be construed as an endorsement, recommendation or solicitation to buy or sell securities.
Overview

Nasdaq-100 Index:
Contains the household names leading the new economy forward

- Technology stocks have evolved from creating new and niche consumer products to a group of companies upon which every industry and sector have become dependent. From day-to-day tasks to social interaction, each has an important influence on everyday life.

- GE, Chicago Gas Company, American Sugar Company, and the other original Dow Industrials helped spur the economic growth of the US economy in 1896.

- Today, Apple, Amazon, Intel, and Microsoft have become global leaders in the technology sector by helping create products which continue to be in high demand from consumers. From computers to cell phones, all of these products will continue to become more advanced in the future.

- From a social perspective, Facebook has become a quick and efficient way of interacting with friends around the globe. Starbucks also continues to improve its efficiency to customers by utilizing advanced technology.

Any trading symbols, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations.
Overview

Nasdaq-100 Index: Performance

Source: Nasdaq, FactSet, Bloomberg. Data as of 8/31/2021

Past performance is not necessarily indicative of future results.
Overview

Performance Data (Total Return)

<table>
<thead>
<tr>
<th>Year</th>
<th>Nasdaq-100 (%)</th>
<th>S&amp;P 500 (%)</th>
<th>Correlation NDX + SPX</th>
<th>Calendar Year Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>19.24%</td>
<td>5.49%</td>
<td>0.890</td>
<td>18.68%</td>
</tr>
<tr>
<td>2008</td>
<td>-41.57%</td>
<td>-37.00%</td>
<td>0.945</td>
<td>42.22%</td>
</tr>
<tr>
<td>2009</td>
<td>54.61%</td>
<td>26.46%</td>
<td>0.935</td>
<td>26.47%</td>
</tr>
<tr>
<td>2010</td>
<td>20.14%</td>
<td>15.06%</td>
<td>0.949</td>
<td>19.48%</td>
</tr>
<tr>
<td>2011</td>
<td>3.66%</td>
<td>2.11%</td>
<td>0.948</td>
<td>23.75%</td>
</tr>
<tr>
<td>2012</td>
<td>18.35%</td>
<td>16.00%</td>
<td>0.920</td>
<td>15.44%</td>
</tr>
<tr>
<td>2013</td>
<td>36.92%</td>
<td>32.39%</td>
<td>0.901</td>
<td>12.49%</td>
</tr>
<tr>
<td>2014</td>
<td>19.40%</td>
<td>13.69%</td>
<td>0.924</td>
<td>14.06%</td>
</tr>
<tr>
<td>2015</td>
<td>9.75%</td>
<td>1.38%</td>
<td>0.947</td>
<td>17.85%</td>
</tr>
<tr>
<td>2016</td>
<td>7.27%</td>
<td>11.96%</td>
<td>0.916</td>
<td>16.17%</td>
</tr>
<tr>
<td>2017</td>
<td>32.99%</td>
<td>21.83%</td>
<td>0.801</td>
<td>10.32%</td>
</tr>
<tr>
<td>2018</td>
<td>0.04%</td>
<td>-4.38%</td>
<td>0.949</td>
<td>22.70%</td>
</tr>
<tr>
<td>2019</td>
<td>39.46%</td>
<td>31.49%</td>
<td>0.950</td>
<td>16.31%</td>
</tr>
<tr>
<td>2020</td>
<td>48.88%</td>
<td>18.40%</td>
<td>0.937</td>
<td>36.29%</td>
</tr>
<tr>
<td>2021</td>
<td>27.51%</td>
<td>28.71%</td>
<td>0.877</td>
<td>18.52%</td>
</tr>
</tbody>
</table>

Source: Nasdaq, FactSet, Bloomberg. Data as of 12/31/2021

Past performance is not necessarily indicative of future results.
Overview

1-Year Excess Return vs. Volatility

Source: Nasdaq, FactSet, Bloomberg. Data as of 12/31/2021

Past performance is not necessarily indicative of future results.
Overview

Nasdaq-100® Index Options Narrative
Main Drivers over the past 2 Years

• Elevated volatility and uncertainty surrounding the U.S. election and COVID-19 fueled record levels of retail participation in the U.S. markets last year
• Retail options strategies such as stock replacement, yield enhancement and portfolio protection were widely used during market fluctuations
• Appetite for options on the Nasdaq-100 companies has grown as these companies have continued to drive the global economy during a uniquely challenging year
• Options have presented investors an additional way to express their interest in these great companies

Source: Nasdaq, FactSet, Bloomberg. Data as of 12/31/2021

Options involve risk and are not suitable for all investors. Multiple leg strategies, including spreads, will incur multiple transaction costs.
Vol Recap

NDX – Realized Vol (30D)
Highest in a Decade (Excluding Feb/March 2020)

Source: Nasdaq, Portfolio Labs. Data as of 5/19/2021
Vol Recap

Comparing NDX & SPX Realized Vol (30D)
Wide-spread as of mid-May

Source: Nasdaq, Portfolio Labs. Data as of 5/19/2021
Past performance is not necessarily indicative of future results.
Vol Recap

NDX – Most Significant Drawdown in a Decade

Source: Nasdaq, Portfolio Labs. Data as of 5/19/2021
Past performance is not necessarily indicative of future results.
Options

Open Interest Continues to Grow

NDX FAMILY OPTIONS
OPEN INTEREST 2018 - PRESENT

Options involve risk and are not suitable for all investors. Multiple leg strategies, including spreads, will incur multiple transaction costs.
Volatility

What’s Volatility Telling Us?

**CLIFF NOTES:**

- The VIX Index need not measure 40 or higher for US equity markets to find support
- Supply & Demand are the critical drivers of all functioning markets
- The implication of previous VIX spikes and structured product blowups reduced overall leverage in the market now (think inverse vol products + short condors)
- Realized volatility is driving VIX
- Longer term Index IVs are elevated
- Realized vol may be “higher” for longer

---

**Volatility Market Perspective**

May 20, 2022

• ‘The Revolution Will Not Be Televised,’ Gil Scott-Heron
• ‘The Market Bottom Will Not Be TeleVIXed,’ Dennis Davitt

When Gil Scott-Heron wrote that the revolution will not be televised, he meant that the event or experience which will result in a sea change or culture shift, is impossible to capture on film. The moment happened, but it is intangible. Traders will in hindsight point to previous explosions in the VIX as the sign of a capitulation in the equity market and as an indicator to buy the market. This time it will be different, and I hope this short note can shed some light on why there will not be a VIX spike to capture on film.

Supply and demand are the underlying reasons for price action in any market. In the case of the options/volatility market it is important to know not only what the supply demand dynamic is, but also who are the players driving it and why. I feel that investors being short volatility positions has NEVER been the reason for spikes in the VIX, but more to do with the leverage that some short volatility investors had in their portfolios. The most often referred to incident in VIX spikes was Volmageddon in February of 2018, which was driven by the worst type of short volatility leverage. The leverage was massive and 90% of the investors had no idea they held so much risk in their portfolios. The result of this was overnight clearing house liquidation. This sort of liquidation is commonly referred to as “the tap on the shoulder” that resulted in many a legendary short volatility blow-ups, causing a VIX spike and corresponding market capitulation in the underlying equity market.

Because of so many “taps on the shoulders” over the last three years, the AUM in the short volatility community has been decimated, steam rolled, the Bulls post Jordan…… Just look at the news this week of the Allianz PMs hiding in from the SEC in bathroom! The leverage in Short Condos; short exotic variance, and Volatility Risk Premium (VRP) have all experienced outsized losses leading to redemptions. The VIX above 30% is still rarefied air… And yet, if it not coming from the short volatility funds, then why the elevated level? Primarily it has to do with the realized volatility of the underlying market. The realized volatility of the underlying SP 500 is above 27% and with implied volatility of options trading between 24%-27% (this translates to VIX at 30%). It is profitable to own options with such an active and volatile cash market. This is the opposite of 2017 where the VIX was at 10% and the realized was 7%.

The elevated options pricing is not limited to the front month options; going out 12 months we see elevated option prices which may foretell an increase in the volatility of the equity market through this time next year. So can the VIX go higher, absolutely, but I do not foresee the closing of levered short options positions causing a traditional spike like it has in the past. I do see an options market that will trade in line with a more volatile market, however this time it will not provide an image, The Bottom will not be TeleVIXed.

Source: Millbank Dartmoor Portsmouth

Options involve risk and are not suitable for all investors. Multiple leg strategies, including spreads, will incur multiple transaction costs.
Volatility

What’s Volatility Telling Us?

CLIFF NOTES:

• “Reflexivity” – positive and negative feedback loops are impacting markets
• Growth in options trading (and expiries) -> higher reflexivity (gamma exposure)
• Ongoing wealth transfer to new, more risk seeking group (HODL, FOMO, YOLO)
• Concentration of risk (big banks, wholesalers, etc.) and exposure (AAPL, GOOGL, MSFT, AMZN, TSLA)
• Dodd Frank, Structured products, & passive indexing
• Crowded rooms with narrow doors
• Value of active vol exposure

Source: Ambrus Capital – Kris Sidial
Volatility

What’s Volatility Telling Us?

CLIFF NOTES:

- Financial conditions analysis accounts for US Dollar (weak v. strong), Corporate Bond Spreads (wide v. narrow), Equity Market (strong v. weak), and Interest Rate Term Structure (carry v. inversion)
- The “transmission mechanism” for the FOMC is tighter financial conditions
- Analogous to 2018 rate liftoff?
- Approaching 2011 conditions – Implications?
- Volatility clusters (2011 & 2018)

Source: Bloomberg/The Daily Shot
Relationships

Growth vs. Value Stocks Ratio
What are the implications for NDX performance?

Source: LongTermTrends.net
Past performance is not necessarily indicative of future results.
Product Information

XND – Nasdaq-100® Micro Index Options Product

- XND is based on 1/100\textsuperscript{th} the full value of the Nasdaq-100 Index.
- Designed to provide market participants with a more precise and manageable way to hedge or gain exposure to the Nasdaq-100 Index
- Weekly & Monthly expirations listed

Contact Information

For further information, please contact: Email: options@nasdaq.com
nasdaq.com/solutions/nasdaq-100-index-options

<table>
<thead>
<tr>
<th>Multiplier</th>
<th>$100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expiration Date</td>
<td>Monthly expirations, Monday, Wednesday and Friday weekly expirations and LEAPS</td>
</tr>
<tr>
<td>Strike Price Intervals</td>
<td>Generally $1.00 wide</td>
</tr>
<tr>
<td>Strike Prices</td>
<td>In, at, and out of the money strike prices will be initially listed with each</td>
</tr>
</tbody>
</table>

Options involve risk and are not suitable for all investors. Multiple leg strategies, including spreads, will incur multiple transaction costs.
Product Information

VOLQ Index & Options

Introducing VOLQ
Volatility Index for Retail / Institutional Investors
Based on Nasdaq-100 Index Options

01
AM-settled Volatility Index Options and Futures Contracts

02
30-Day Implied Volatility Trade NDX Large Cap Growth Vol versus S&P500 Vol

03
Traditional $100 Options Multiplier (Same multiplier as NDX and Nasdaq PHILX Sector Indexes)

GROWING THE FAMILY OF NASDAQ-100 OPTIONS

Options involve risk and are not suitable for all investors. Multiple leg strategies, including spreads, will incur multiple transaction costs.
Portfolio Risk

What’s in Your Portfolio?

• While weighing the components of your portfolio, you may notice a return profile resembling that of an index

• Portfolios with a broad-based exposure in companies focused on innovation tend to have a strong correlation with our Nasdaq 100 Index Products

• Options can be used to minimize risk and protect the value of your portfolio
Benefits of NDX Options for Portfolio Hedging

**Cash Settlement**
- Delivery of cash rather than underlying stock
- No risk of forced delivery

**European Style Expiration**
- Contracts can only be exercised at expiration
- No risk of early exercise/assignment

**Easy Profit/Loss Calculation**
- One index point equals $100
- Simple profit/loss

**Tax Advantages**
- Favorable capital gains tax treatment- 60% long term/40% short term
Portfolio Risk

RECAP

Overview
- NDX Index continues to reflect the “new economy”
- The NDX has significantly outperformed the S&P 500 over the past 15 years

Volatility
- NDX tends to move with greater velocity (but not always)
- Both realized and implied volatility measures are historically high
- Current NDX drawdown is the worst since Financial Crisis
- NDX/XND/NQX liquidity profile continues to improve

Macro Research
- Less leverage in “the system” compared to 2018
- Realized vol may remain higher for longer
- Shift toward short term derivatives increasing market “reflexivity”
- Significant wealth transfer occurring to more risk seeking demographic

VOLQ
- Index tracks 30D ATM NDX volatility and Options were just introduced
Questions?

Email:
indexoptions@nasdaq.com

VOLQ Overview:
https://www.nasdaq.com/VOLQ

VOLQ Futures Spec Sheet: