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October 21, 2024

The Options Industry Council (OIC)

ETF and Index Options

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Comparing ETF & Index Options

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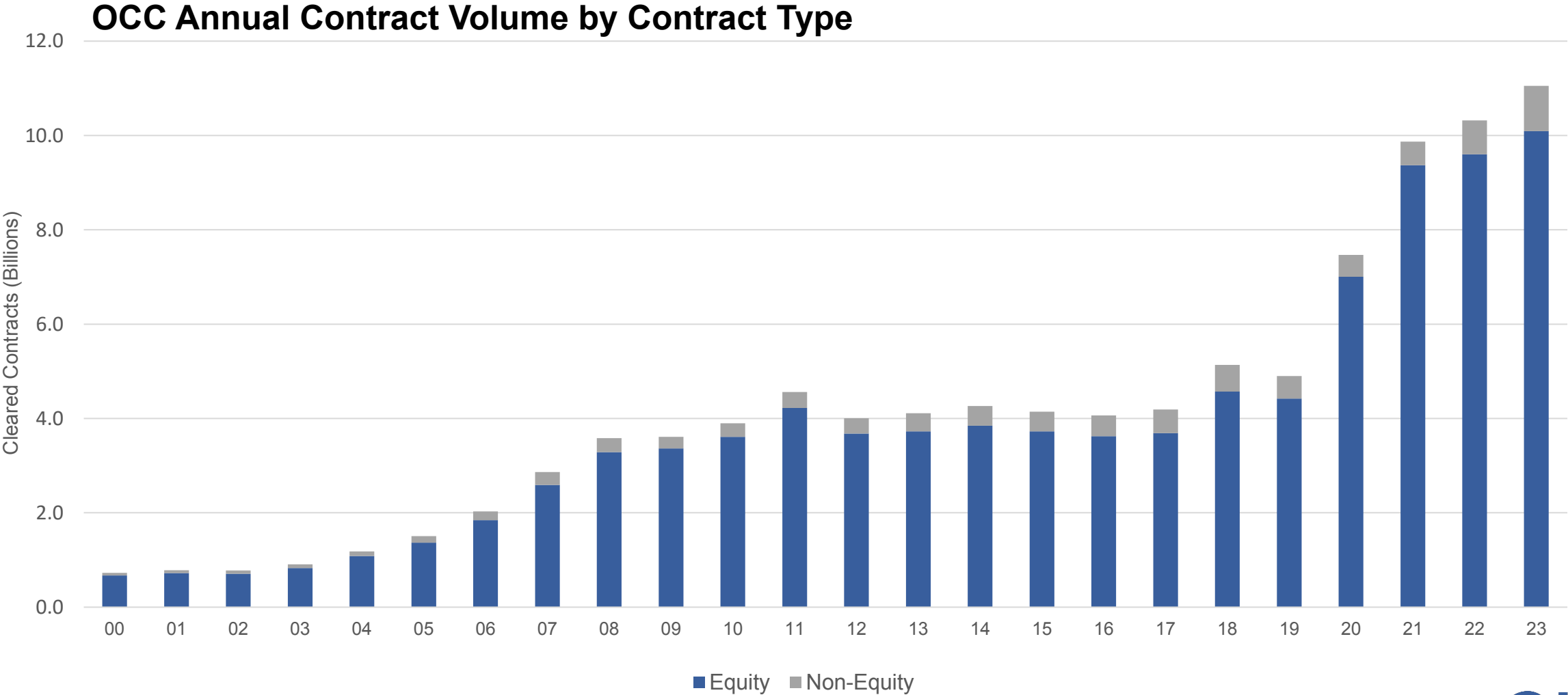


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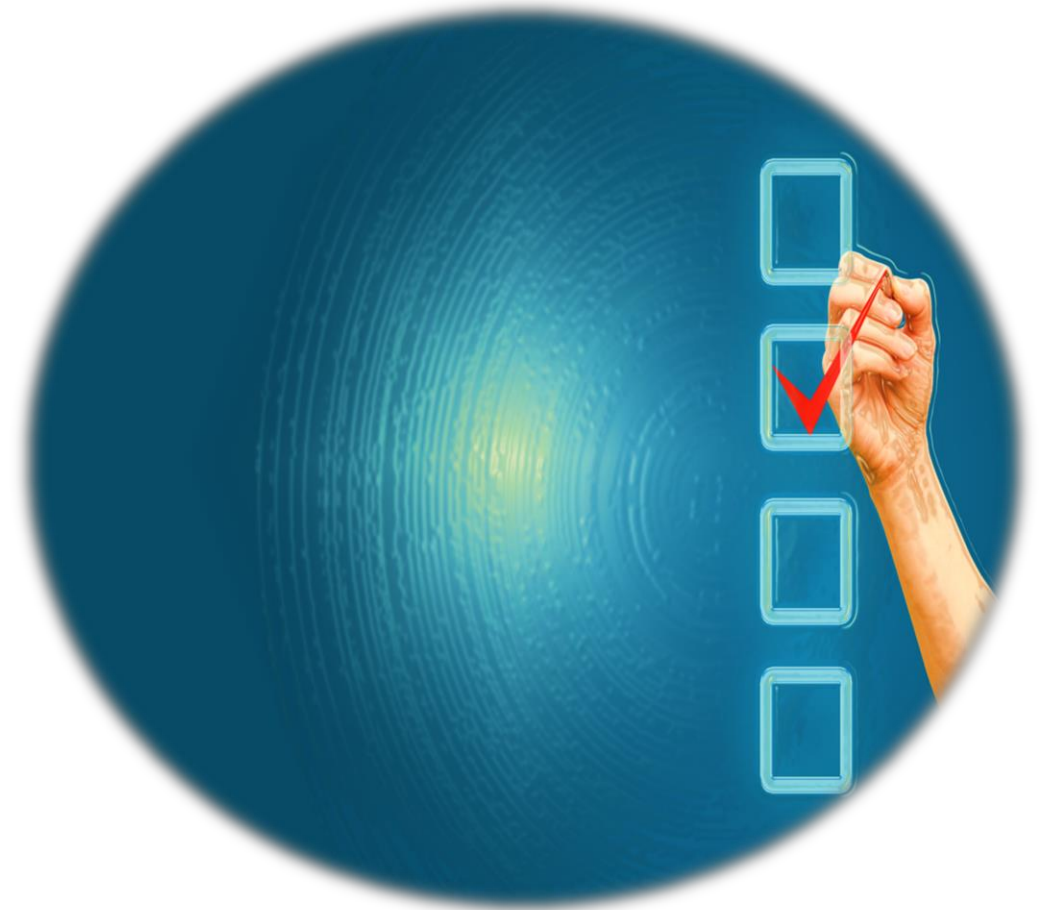


Annual Options Volume 2000-2023



Presentation Outline

- What's an Index?
- Index options compared with equity and ETF options
- Cash vs. physical settlement
- European vs. American-style exercise
- Indices as portfolio-protection tool
- Q&A



What is an Index?



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What is an Index?

- Stock indices, generally, are meant to be broad market indicators
- An index represents a collection or basket of stocks and can be used to gauge the health of global economies and/or specific market sectors
- Stock indices exist for informational purposes only and are not traded directly (as opposed to an index fund or ETF)
- In the United States, three broadly followed indices are:
 - S&P 500 (SPX)
 - Nasdaq 100 (NDX)
 - Dow Jones Industrial Average (DJX)



Some Broadly Followed Indices

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Standard & Poor's 500 Index (SPX)

- 500 of the top companies in the U.S. Stocks
- Approximately 80% of the total value of the U.S. stock market
- Widely used as an indication of movement in the U.S. market

The Nasdaq 100 Index (NDX)

- Large-cap growth index
- 100 largest companies listed on the Nasdaq stock exchange
- Industrial, Technology, Retail, Telecommunication, Biotechnology, Health Care, Transportation, Media and Service companies (no financial stocks)

Dow Jones Industrial Average (DJIA)

- 30 of the largest companies in the United States
- Oldest, most well-known, and frequently used index in the world
- Represents about a quarter of the value of the entire U.S. stock market

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Market-weighted or Price-weighted

Indices are typically either market-weighted or price-weighted. The value for an index like SPX or NDX are simple math calculations taking each component's weightings and automatically calculating an aggregate price based on the price changes of the underlying components

Market-weighted indices represent the total value of each company's market capitalization.

- Market capitalization—It is calculated by **multiplying the price of a stock by its total number of outstanding shares**
 - For example, a company with 20 million shares selling at \$50 a share would have a **market cap** of \$1 billion
 - The S&P 500 Index: market-weighted index
 - The Nasdaq Composite Index: market-weighted index

Price-weighted indices represent the average price of the stocks contained within the index

- Price-weighted indices give greater weight to stocks with higher prices
 - Dow Jones Industrial Average: price-weighted index
 - Higher-price stocks move the index more than those with lower prices



Introduction of Index Options

- With stock indices not directly traded, many financial products have been developed which offer similar risk profiles and characteristics
- Investors and speculators may trade index options to gain exposure to the entire market or smaller sectors

Index Options Compared With Equity and ETF Options

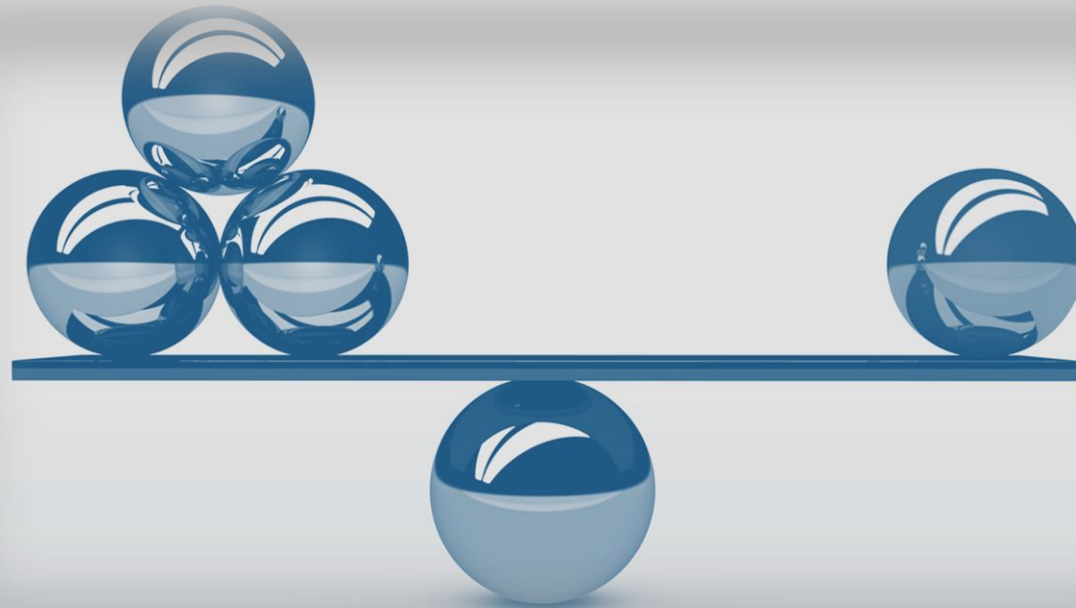
Similarities of Pricing Options

- Index options are similar to equity/ETF options in that they possess the same basic optionality
- All tradeable options give the holder the right (but not the obligation) to buy or sell the value of an underlying at the contract strike price
- The notional value of an option contract can be determined by multiplying the quoted premium amount by the contract multiplier, which is typically 100
- Commonly, the factors that affect the option prices on these products are the same
 - Value of the underlying instrument (an index in this case)
 - Strike price
 - Volatility
 - Time until expiration
 - Interest rates
 - Dividend yields by the component securities



Potential Differences

- **Method of settlement**
 - AM Settlement
 - PM Settlement
- **Exercise Style**
 - European
 - American
- **Deliverable**
 - Physical



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ETFs that Correspond to Indices

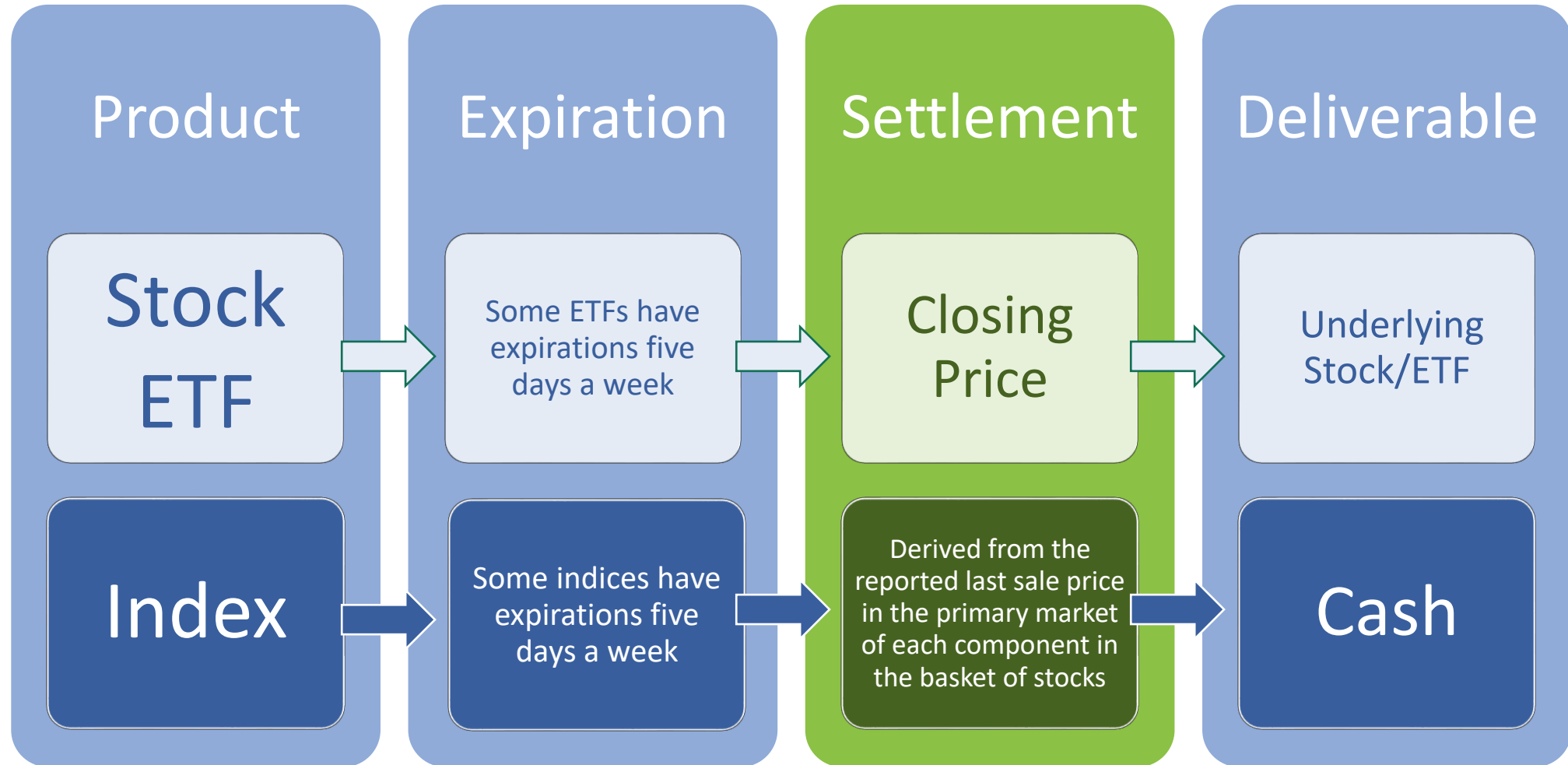
Exchange Traded Funds (ETF) are essentially Index Funds that are listed and traded on exchanges like stocks. An ETF is a basket of stocks that reflects the composition of an Index

Index	ETF	ETF Trust	Contract size of ETF
SPX	SPY	SPDR S&P 500 ETF	1/10 th of SPX
NDX	QQQ	Invesco QQQ Trust	1/40 th of NDX
RUT	IWM	iShares Russell 2000 ETF	1/10 th of RUT
DJX	DIA	Down Jones Industrial Average ETF	1/10 th of DJX

Cash vs. Physical Settlement



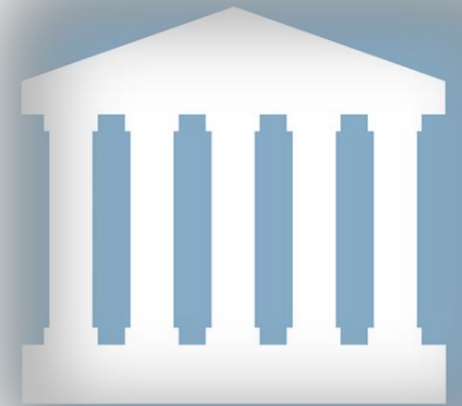
Significantly Different Settlements



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Cash Settlement Value

- Index options have two distinctive option settlements
 - **Weekly** options expire at the end of the day (PM) and derive their settlement value using the reported closing price of each component stock in the index on their primary exchange
 - **Monthly**, standard expiration* index options stop trading at the close on Thursday and expire Friday morning (AM). The AM expiration/settlement price is determined using the opening price of each stock from their primary exchange. The opening price has a unique symbol that represents the opening settlement price. i.e., SET for SPX options



**Options that expire on the third Friday of each month are considered standard expiration options*

Standard Option Settlement Symbols

- For index options that expire on the standard Friday, their settlement is based on the opening price on the day of expiration, better known as AM settlement
- The settlement value is derived by using the opening price reported on the primary market of each component stock in the index
- The reported price has a settlement symbol, as opposed to PM settlements that do not have a settlement symbol

Symbol	Settlement Symbol	Monthly/Weekly	Expiration Day	AM/PM	Last Trade Day
SPX	SET	Monthly	Friday	AM	Thursday
NDX	XQO	Monthly	Friday	AM	Thursday
RUT	RLS	Monthly	Friday	AM	Thursday
DJX	DJS	Monthly	Friday	AM	Thursday

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Cash Settlement Example

- With cash settled options expiration, no stock is delivered or called away as the option expires to cash
 - Cash settled options transfer only the intrinsic value to the holder when exercised
 - The difference between the settlement value and the strike price of the option
 - **Long ITM** call example:
 - Long the \$4190 strike call
 - SET value \$4200
 - \$4200 SET value - Long 4190 call = \$10 x 100 multiplier
 - Result \$1,000 cash credit upon expiration
 - **Short OTM** call example:
 - Short the \$4210 strike call
 - SET value \$4200
 - The option writer gets to keep the entirety of the credit received from the premium

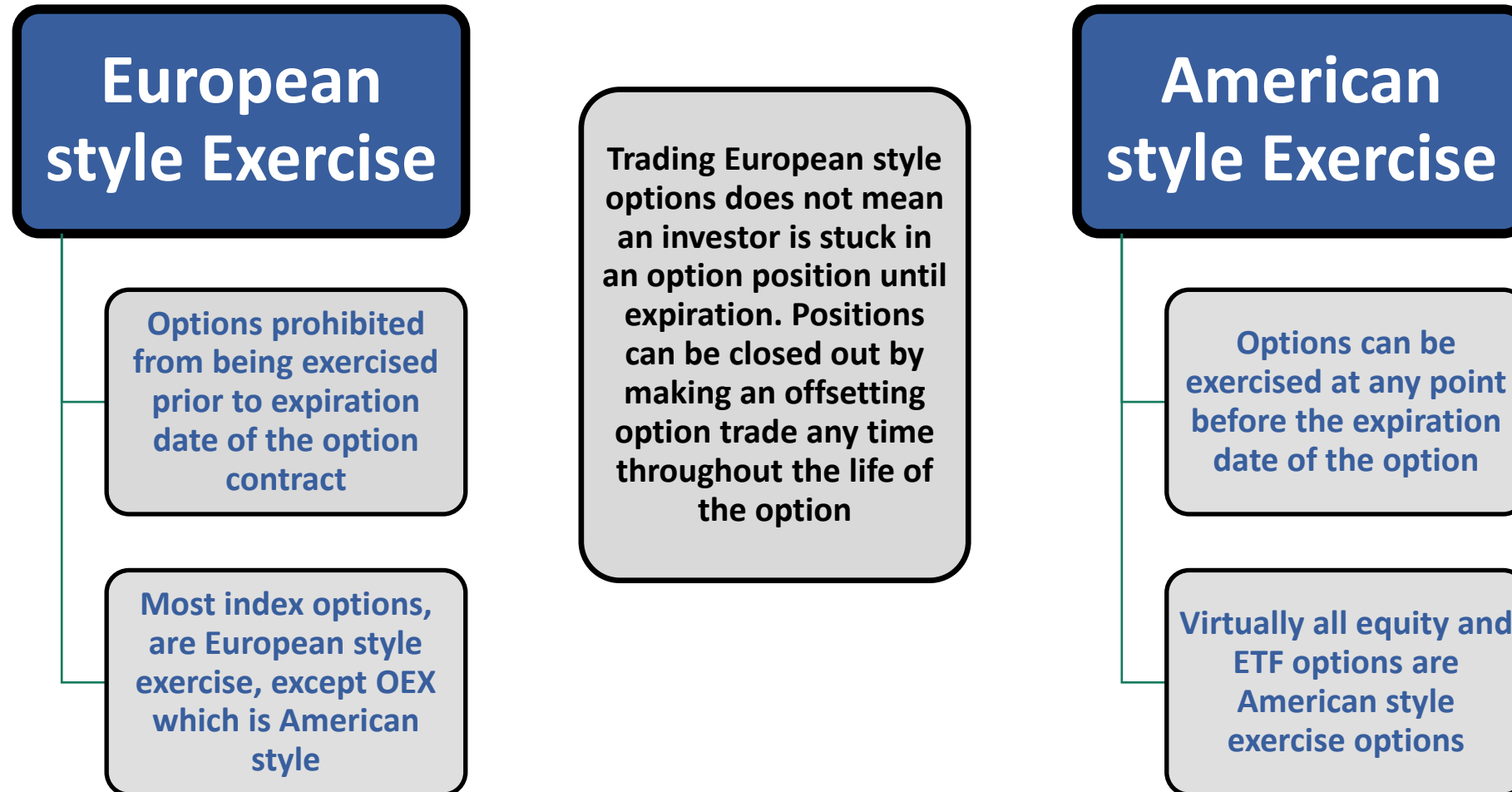
European Exercise

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European Exercise

- A **European** style option contract allows the option holder to exercise the option contract only on its expiration day
- Index options are **European** style, except for OEX (S&P 100 index)
- **European** options cannot be exercised prior to **expiration**
- Equity options, on the other hand, are **American** style meaning they can be exercised anytime, up to and including the day of expiration

European vs American-style Exercise



Indices as a Portfolio Protection Tool



The Versatility of Indices

Index options can offer investors an opportunity either to capitalize on an expected market move or to protect holdings in the underlying instruments

- Indices can offer exposure to the entire market or industry sector through a single transaction
- Index options tend to have lower volatility than options on individual stocks
 - Volatility around earnings reports, mergers, and other news events can have a significant impact on stock options prices. But with index options, those volatile moves tend to smooth out

Potential Examples of Index Options Strategies

Bullish

- **Buying outright an index call option when anticipating the the underlying index to rise**

Bearish

- **Buying outright an index put option when anticipating the underlying index to fall**

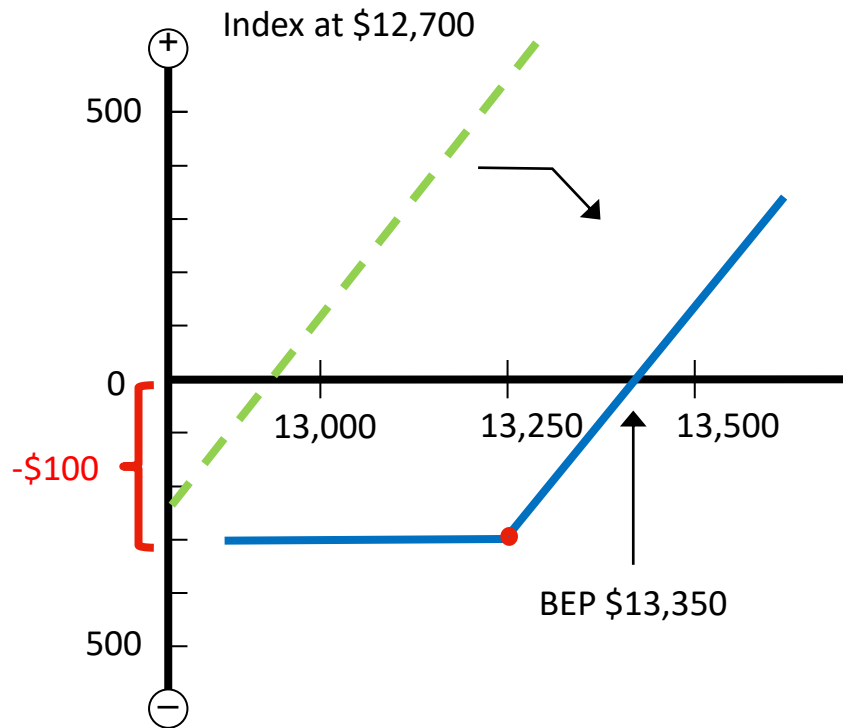
Protection

- **Buying index put options to hedge portfolios as an insurance strategy**

One Potential Bullish Example

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Long Call Example - Nasdaq 100 Index call



Index spot price: \$12,700

Call Strike price 13,250

Index call option premium: \$100

90 days till expiration

Contract cost: \$10,000 ($\100×100)

Breakeven point: \$13,350 ($13,250 + \100)

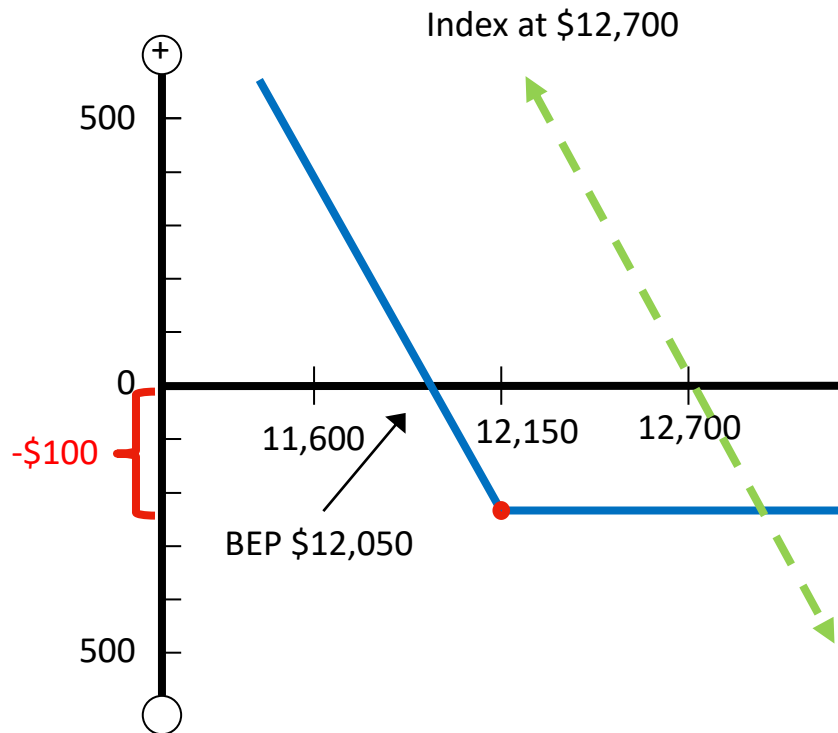
At expiration Index: \$13,500

- Proceeds: \$25,000 ($13,500 - 13,250$) $\times 100$
- Profit: \$15,000 ($\$25,000 - \$10,000$)

One Potential Bearish Example

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Long Put Example - Nasdaq 100 Index put



Index spot price: 12,700

Put Strike price 12,150

Index call option premium: \$100

90 days till expiration

Contract cost: \$10,000 ($\100×100)

Breakeven point: 12,050 ($12,150 - \$100$)

At expiration Index price: \$11,950

- Proceeds: \$20,000 ($12,150 - 11,950$) $\times 100$
- Profit: \$10,000 ($\$20,000 - \$10,000$)

Index Protective Put



Protection

- Protective put options allow the investor to sell an index value at a fixed price for a given time frame
- Investing in a protective put is a strategy intended to safeguard a portfolio against market downturns without sacrificing the individual components in the portfolio
- If the index price falls below the long-put strike, an increase in the notional value of the put could offset the notional losses on the portfolio from the market decline



Determining Notional Value

- Notional value measures the total current value of a derivatives contract
- Index options use a multiplier of 100
 - For example, an option contract on an index has a multiplier of 100
 - The \$4,000 strike option has a notional value for one contract of: **$100 \times \$4,000 = \$400,000$**



If an investor wants to protect the entirety of a portfolio valued at \$800,000, **two** of the 4,000 strike puts might be required

How Much Protection?

If an investor wanted to protect a million-dollar portfolio

- Protecting 100% of the portfolio
 - 100% = \$1,000,000 of the portfolio
 - Difference in value between the index level and strike price of the put: ***None***
- Protect 80% of the portfolio
 - 80% = \$800,000 of the portfolio
 - Difference in value between the index level and strike price of the put: ***\$200,000***
- Protecting 30%
 - 30% = \$300,000
 - Difference in value between the index level and strike price of the put: ***\$700,000***

Selecting Strike and Time Frame

Investor who has \$1.2 million invested in a diversified portfolio and is expecting a major downswing in the market in the next six months.

- Investor wants to protect **90%** of the portfolio value= **\$1,080,000**
 - Underlying Index currently trading at **\$4,100**
 - Notional value of the Index using multiplier of 100 - \$410,000,
 - 90 % of \$410,000 of the notional value = \$369,000
- Closest strike price is \$3,700 x 100 multiplier = \$370,000
- Total protection - **3 puts with strike price \$3,700 = \$1,110,000**
(3 x \$3,700) x 100 multiplier
 - \$3,700 strike put with 6 months till expiration \$120 premium

Cost of protection = \$36,000 (\$120 x 3 x 100 multiplier) or 3% of the value of the portfolio

Evaluate Protection vs Cost

Continuing with the example of hedging 90% of the portfolio for six months, the investor would purchase 3 of the \$3,700 strike put at current cost of \$120 per contract.

- Total cost of protection = \$36,000
- Is buying total protection worth it or not?
- If yes, buy the 3 puts
- If not, the investor could do a shorter-term put option
- Or select less protection by buying lower strike put

It's a Give and Take Process

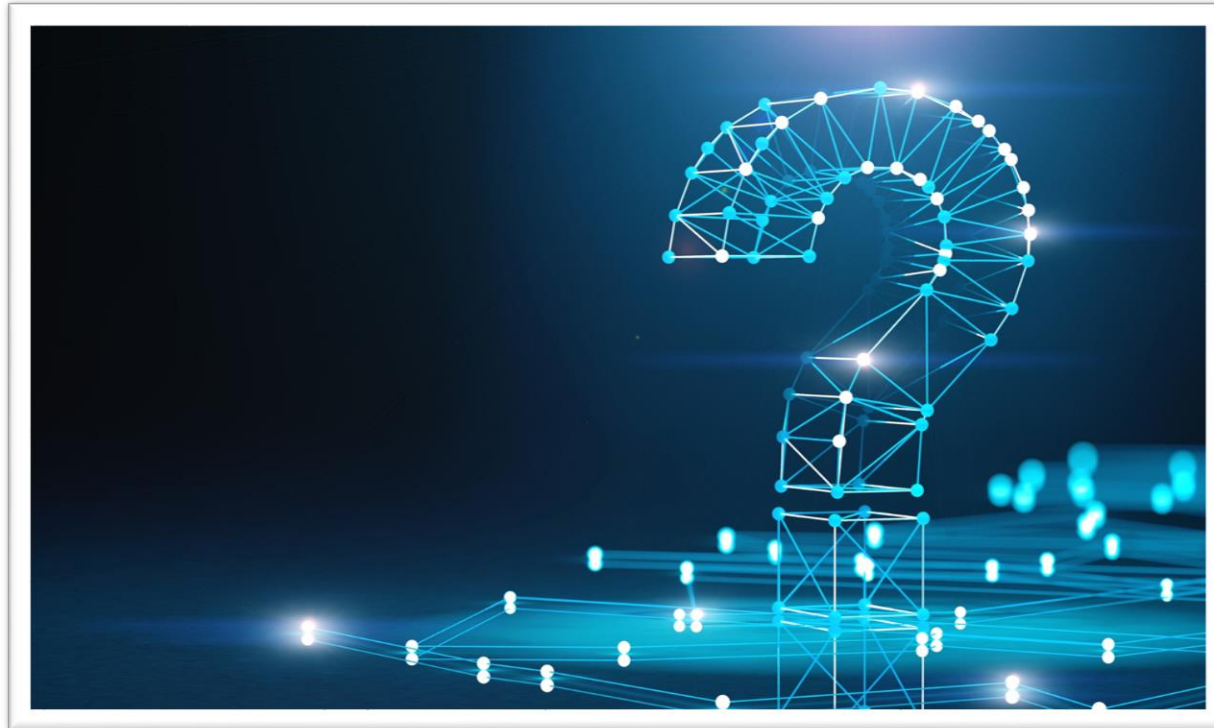


Summary

- Stock Indices are not traded directly
- Indices are either Market-weighted or Price-weighted
- Similarities: pricing of the options
- Differences:
 - AM/PM vs PM only
 - European style vs American Style
 - Cash vs Deliverable
- Option strategies:
 - Bullish
 - Bearish
 - Protective



Q & A



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