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The Options Institute

Designing Outcomes:

From Yes/No Contracts to Options Basics

Stacey Gilbert
Sr. Director of Client Education of The Options Institute
Cboe Global Markets

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As with all investments, your capital is at risk

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As with all investments, your capital is at risk

Designing Outcomes

From Yes/No Contracts to Options Basics

STACEY GILBERT

Sr. Director, Client Education
The Options Institute, Cboe Global Markets

Introduction

About Cboe & The OI

Cboe was founded in 1973 as the first US listed options exchange. More than 50 years later, we are now the world's go-to derivatives and securities exchange network, delivering cutting-edge trading, clearing and investment solutions to people around the world.

For over 40 years, Cboe Global markets has backed The Options Institute, Cboe's education team, for investors to learn about financial markets and derivatives products from the experts.

Stacey Gilbert

Sr. Director, The Options Institute, Cboe Global Markets

22 years at Susquehanna International Group with experience trading options and ETFs on an exchange and trading desk, running the education program and heading the Derivative Strategy team.

6 years at Glenmede Investment Management as CIO and co-Portfolio Manager of Derivatives.

Disclosures and Disclaimers Related to Cboe Options and Futures Products

- The information and any hypothetical scenarios provided are for general educational, informational, and illustrative purposes only and should not be construed as a recommendation to buy or sell any security, future, financial instrument, investment fund, or other investment product, or as investment advice.

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Upcoming Live Classes

Jul 13	**IBKRWebinar:** Markets vs. Polls: Understanding What Markets Really Are
Jul 20	**IBKRWebinar:** Understanding Binary Outcomes: Converting Opinions to Expectations
Jul 21	Introduction to Options & Office Hours
Jul 27	**IBKRWebinar:** Designing Outcomes: From Yes/No Contracts to Options Basics

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Learning Objectives

01 Review Yes/No contracts and the risk/reward profiles

02 Identify key similarities and differences between Yes/No contracts and traditional options contracts

03 Evaluate and select appropriate use cases for Yes/No contracts and options based on market views and risk preferences

01

Recap: Yes/No Contracts

Exposures and Payouts

Yes/No Contract

- A Yes/No contract is a financial contract that **pays a fixed amount if a specified condition is met** at expiration, and nothing if it is not.
- In other words, it has **only two possible outcomes**: a predetermined payout or a total loss of the investment.

Hypothetical Example of Yes/No Contracts

Investor 1 – Yes/No Contract

Paid **$0.45** for a Mini-S&P 500 Index (XSP) “Yes” contract that the Index will finish at or above $727 tomorrow.

Note: Cboe S&P 500 based Prediction Market Contracts have a multiplier of 100, so the total cost for the Yes/No contract is $45.

Any trading symbols, Index, entities or investment products displayed are for illustrative purposes only and are not intended to portray recommendations. Past performance is not necessarily indicative of future results.

What Are the Contract Terms?

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1	2	3	4
What is the event?	When is the event?	Who decides the result?	How does the contract settle?*
Mini-S&P 500 Index Closing Price (XSP)	**Tomorrow's Close**	**S&P Dow Jones Indices**	**Above: Contract Pays $100** **Below: Contract Pays $0**

*Cboe S&P 500-linked Prediction Market Contracts have a multiplier of 100, so the total value at expiration is $100 (Success) or $0 (Unsuccessful)

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Payout Example: Yes/No Contract

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"Yes" Contract

- Below $727: **Lose $45**
- At or above $727: **Potential Profit $55**

Q&A

02

Calculating a Fair Value for a Contract

Converting Outcomes to Contract Prices

What is the likelihood of a fair coin landing on heads?

1. Outcome Framing

Out of 100 replications of the event, how often would the outcome occur?

2. Frequency

50/100

3. Likelihood

50%

4. Price Translation

50% of $1.00 is $0.50

5. Fair Value

Contract for Heads is worth $0.50

6. Edge Identification

If offered at less than $0.50, potential opportunity

Price Translation

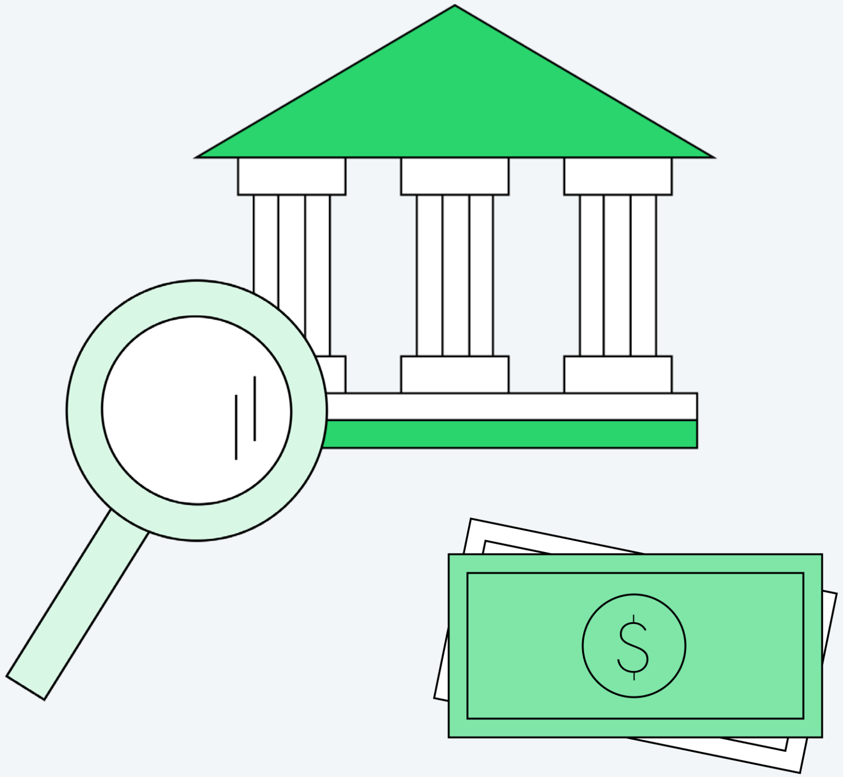
What is Price Translation?

- Turns a belief about an outcome (likelihood) into a contract price you would be willing to pay

- For a Yes/No contract, two values need to be known to determine the price translation:

    - **How likely are all outcomes of the event?**

    - **What is the contract's value at settlement of each result?**



Expansion of Price Translation Into Contract Value

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Question 2: What is the contract's value at settlement of each result?

Fair Value of the Coin Flip Contract is **what** happens blended with **how often** it happens

Likelihood of Heads

$$\frac{50}{100} \; or \; 50\%$$

Settlement Value of the Contract if Heads: $1

YES

NO

Likelihood of Not Heads (Tails)

$$\frac{50}{100} \; or \; 50\%$$

Settlement Value of the Contract if Tails: $0

What Happens
1. Heads – win $1
2. Tails – win $0

+

How Often
1. Heads – 50%
2. Tails – 50%

=

Fair Value of Contract
"Yes" Value + "No" Value = Contract Value
(50% x $1) + (50% x $0) = $0.50

Expansion of Price Translation Into Contract Value

Question 2: What is the contract's value at settlement of each result?

Mini S&P 500 Index to Close At or Above $740 Tomorrow

Today's Price: **$726.05**

Fair Value of the Yes/No Contract is **what** happens blended with **how often** it happens

YES

Likelihood of XSP finishing at or above $740 tomorrow

$$\frac{5}{100}\ or\ 5\%$$

Settlement Value of the Contract if $740 or Higher: $1

NO

Likelihood of XSP finishing below $740 tomorrow

$$\frac{95}{100}\ or\ 95\%$$

Settlement Value of the Contract if Below $740: $0

What Happens
1. Above $740 – win $1
2. Below $740 – win $0

+

How Often
1. Above – 5%
2. Below – 95%

=

Fair Value of Contract
"Yes" Value + "No" Value = Contract Value
(5% x $1) + (95% x $0) = $0.05

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Examples: Yes/No Contracts

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Will the Mini-S&P 500 Index (XSP) close at or above $740 tomorrow?

XSP Price History

ALL | 3M | **1M** | 1W | 1D

Today's Price

$726.05

Place Your Trade

YES 05c	NO 95c
Quantity (contracts)	Quantity (contracts)
01 – +	01 – +

Order Summary

	YES		NO
Avg price	05c / contract	Avg price	95c / contract
Total cost	$0.05	Total cost	$0.95
Max payout	$1.00	Max payout	$1.00
Potential gain	+$0.95 (+1,900%)	Potential gain	+$0.05 (+5.30%)

Buy YES | **Buy NO**

Resolution Criteria

This market resolves YES if XSP closes at or above **$740** by tomorrow, as referenced by the closing prices published by Cboe Global Markets.

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Examples: “Yes” Yes/No Contracts

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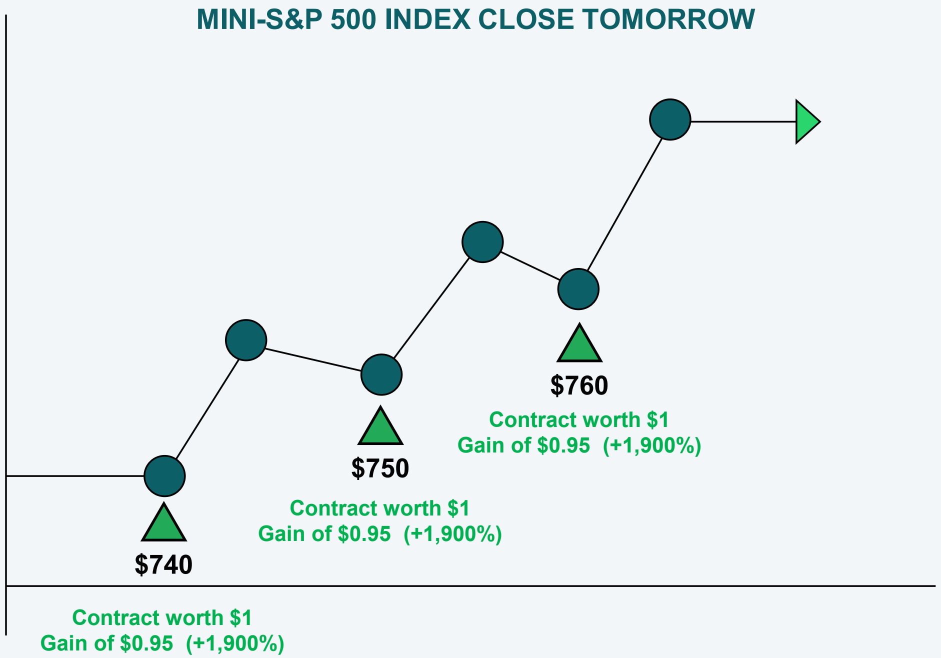
Will the Mini-S&P 500 Index (XSP) close at or above $740 tomorrow?

Today’s Price

$726.05

Will the Mini-S&P 500 Index close at or above $740.00 tomorrow?

YES 05c	NO 95c
Potential gain	Potential gain
+$0.95 (+1,900%)	+$0.05 (+5.30%)



Resolution Criteria

This market resolves YES if XSP closes at or above **$740** by tomorrow, as referenced by the closing prices published by Cboe Global Markets.

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Direction & More

01

Is there a contract that allows expression of opinion on the directional move of the stock…

02

But also rewards for the magnitude of the move in that direction?

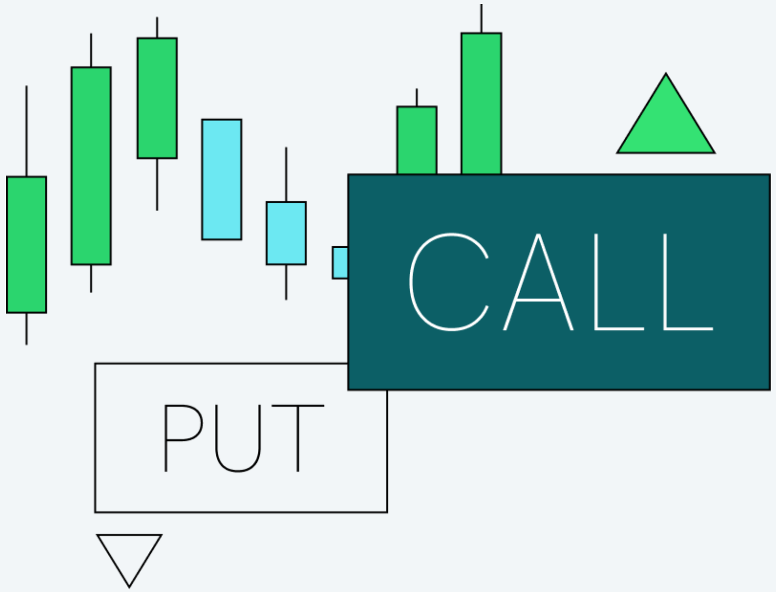
03

Intro to Options

Options 101

What Is An Option?

A financial contract that conveys to the owner *the right, but not the obligation*, to buy or sell (depending on type) the underlying asset at a *specific price* within a *specific timeframe*.



Yes/No vs. Option

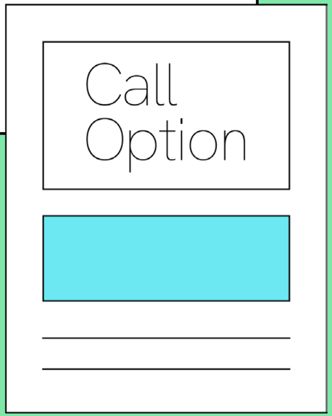
- **Yes/No Contracts** pay $1 if the outcome occurs (Yes) or $0 if it does not (No).
- **Options Contracts** expire worthless if the outcome is not met and increases in value as the outcome is met and exceeded.

04

Call Options

Call Options

A financial contract that conveys to the owner the *right, but not the obligation,* to **buy** the underlying asset at *a specific price* within a *specific timeframe*.



Educational Disclaimer – Call Options vs. "Yes" Contracts

For educational purposes, our comparison and analysis of binary contracts to option contracts will be exclusive to *Cboe-listed S&P 500 Index-linked Prediction Market "Yes" binary contracts and Cboe-listed mini-S&P 500 Index Call Options (XSP).*

Please note that listed options have different types of options mechanics. We are focused on European, cash-settled options only. For more information on other types of options mechanics, consider visiting The Options Institute Learnings Portal (cboe.com/OILP) or join us for Options 101 & Office Hours.

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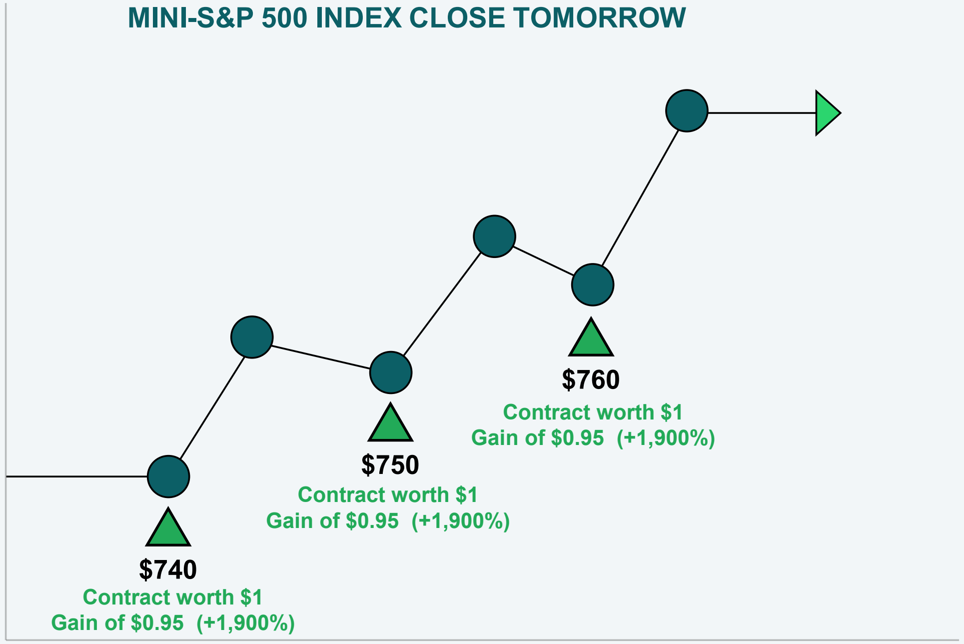
“Yes” Contract vs. Long Call Option

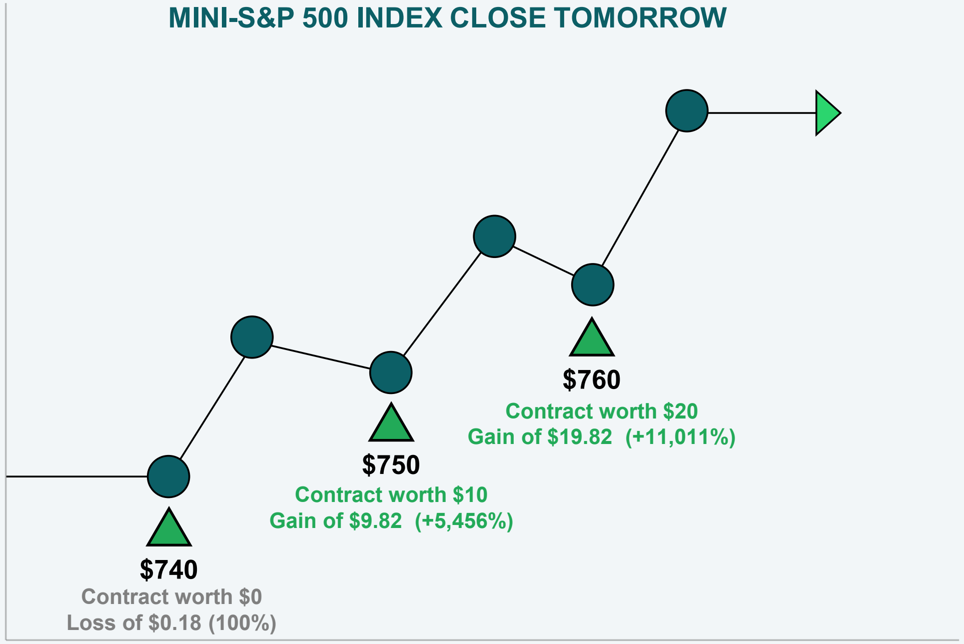
Will the Mini-S&P 500 Index close at or above $740.00 tomorrow?
(Current price $726.05)

YES 05c	NO 95c
Potential gain	Potential gain
+$0.95 (+1,900%)	+$0.05 (+5.30%)



Fair value of a call contract with a $740 strike on the Mini-S&P 500 Index expiring tomorrow?
(Current price $726.05)

18c
Potential gain
?



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“Yes” Contract vs. Buying Call Option on Mini-S&P 500 Index

	“Yes” Contract[1]	Buying Call Option[2]

[1] “Yes” contracts are Cboe S&P 500 based prediction market Yes/No contracts.
[2] Call Options on Cboe’s Mini-S&P 500 Index (XSP) are European, cash-settled. For more information about options mechanics, please visit The Options Institute Learning Portal (www.cboe.com/oilp)

Expansion of Price Translation Into Contract Value

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Question 2: What is the contract's value at settlement of each result?

Mini S&P 500 Index to Close Above $740 Tomorrow

Today's Price: **$726.05**

Fair Value of the Yes/No Contract is **what** happens blended with **how often** it happens

YES

Likelihood to Close Above (In the Money)

Likelihood to Close at $740.00
Likelihood to Close at $740.01
Likelihood to Close at $740.02
Likelihood to Close at $740.03, etc

Settlement Value of the Contract if $740 or Higher: *Varies*

NO

Likelihood to Not Close Above (Out of the Money)

95/100 *or* **95%**

Settlement Value of the Contract if Below $740: $0

What Happens

1. Above $740 – Every $0.01 move higher the value increases by $0.01
2. Below $740 – worth $0

+

How Often

1. Likelihood of every value $740 and above
2. Below – 95%

=

Fair Value of Contract

"In the Money" Value + "Out of the Money" Value = Contract Value

(likelihood at each value $740+ x value at each price) + (95% x $0) = $0.18

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Hypothetical Example of Yes/No vs. Call Options

Investor 1 – Yes/No Contract

Paid **$0.05** for a Mini-S&P 500 Index (XSP) “Yes” contract that the Index will finish at or above $740 tomorrow.

Investor 2 – Call Option

Paid **$0.18** for a Mini-S&P 500 Index (XSP) 740 strike call that expires tomorrow.

Today’s XSP Price

$726.05

Note: Cboe S&P 500 based Prediction Market Contracts have a multiplier of 100, so the total cost for the Yes/No contract is $5. US Listed options also have a multiplier of 100, so the total cost for the call contract is $18.

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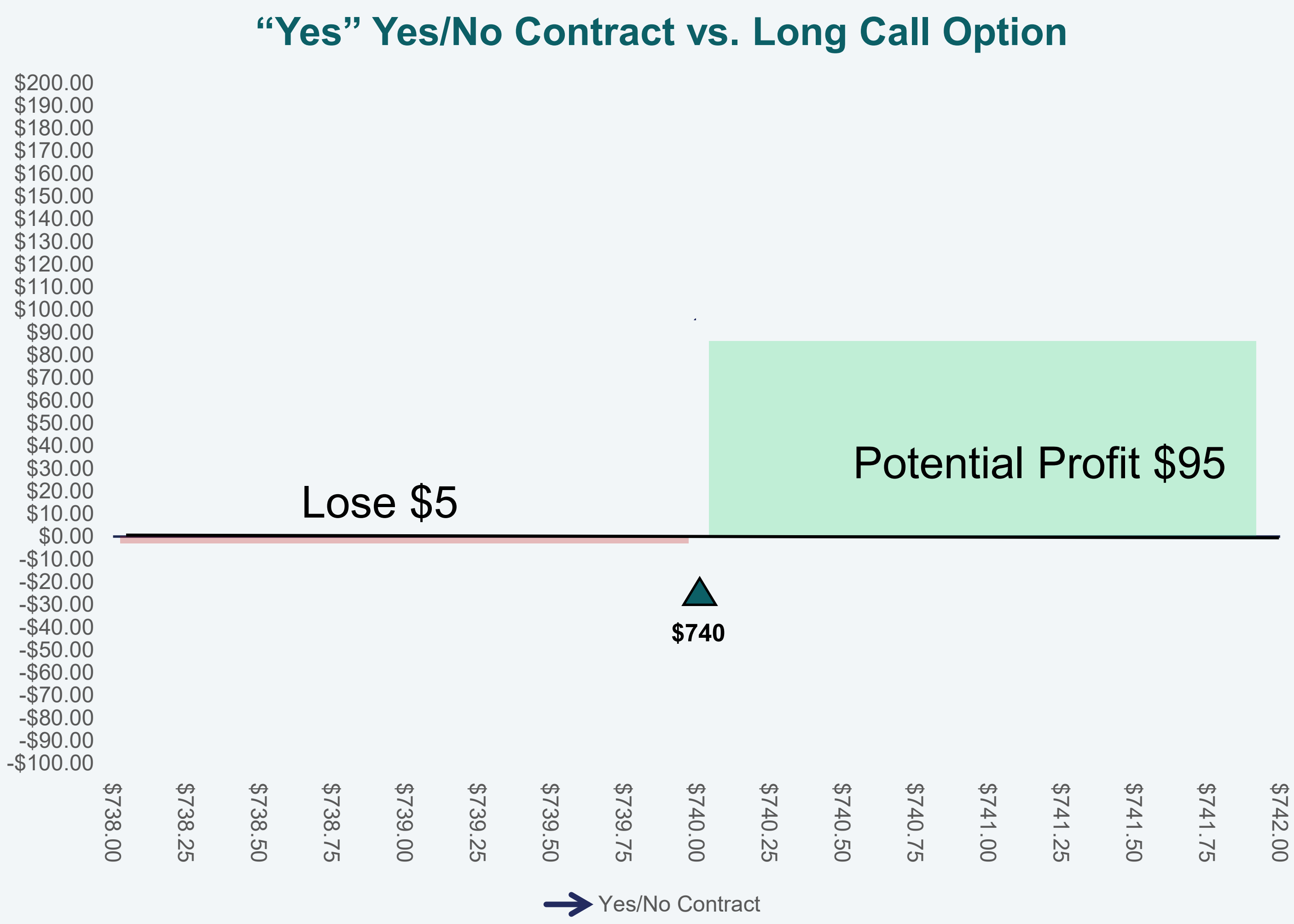
Payout Comparison: “Yes” Contract vs. Call Option

“Yes” Contract

- Below $740: **Lose $5**
- At or above $740: **Potential Profit $95**



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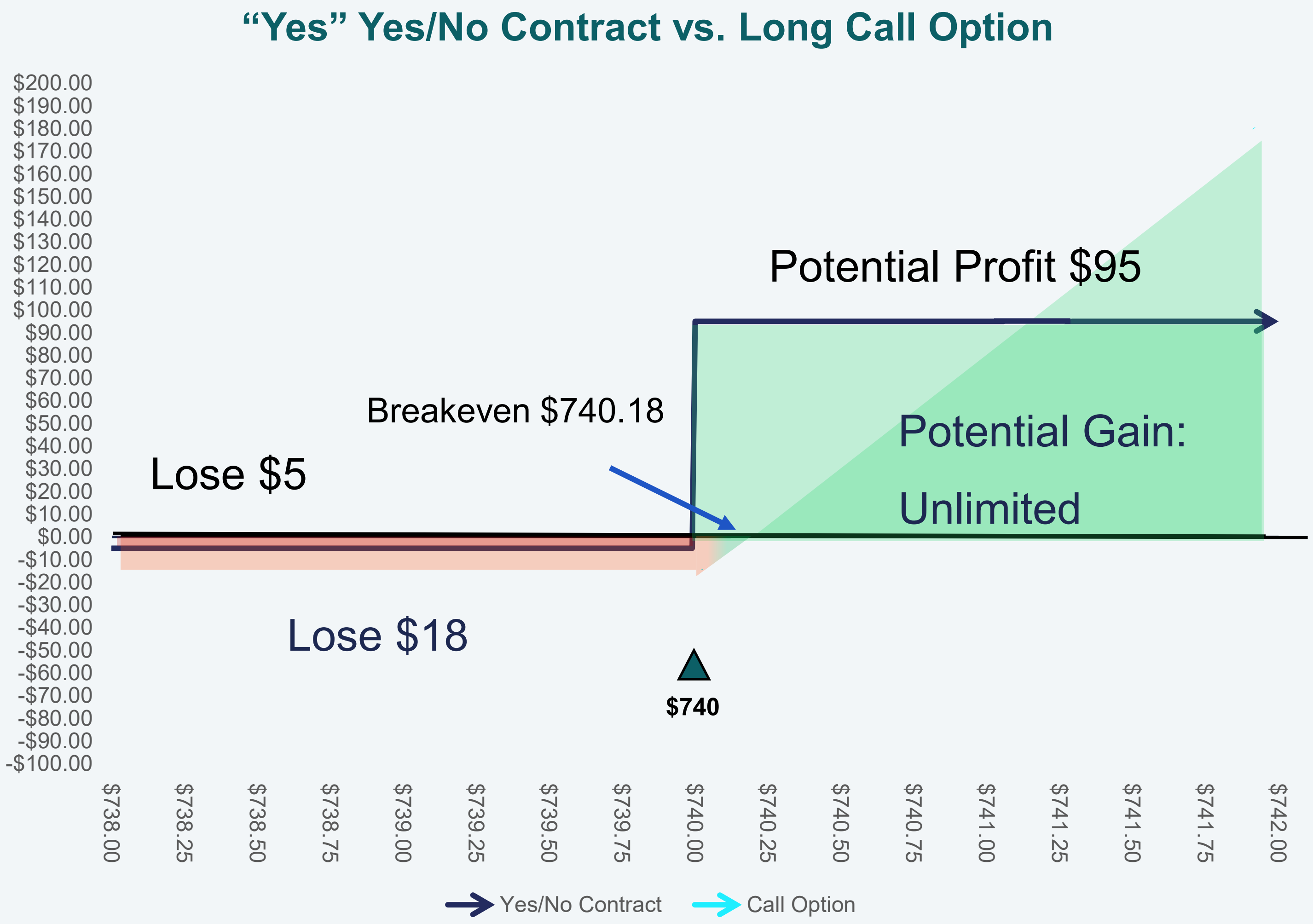
Payout Comparison: Yes/No Contract vs. Call Option

"Yes" Contract

- Below $740: **Lose $5**
- At or above $740: **Potential Profit $95**

Call Option

- Below $740: **Lose $18**
- At or above $740: **Unlimited Potential Gain (potential gains start after breakeven)**



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Use Cases – "Yes" Binary Contract vs. Buying Call Option

	"Yes" Contract[1]	Buying Call Option[2]

[1] "Yes" contracts are Cboe S&P 500 based prediction market Yes/No contracts.
[2] Call Options on Cboe's Mini-S&P 500 Index (XSP) are European, cash-settled. For more information about options mechanics, please visit The Options Institute Learning Portal (www.cboe.com/oilp)
[3] Assumes same strike/contract level and same expiration date

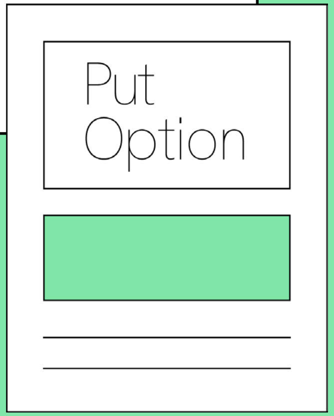
Q&A

05

Put Options

Put Options

A financial contract that conveys to the owner the *right, but not the obligation,* to **sell** the underlying asset at a *specific price* within a *specific timeframe.*



Educational Disclaimer – Put Options vs. “No” Contracts

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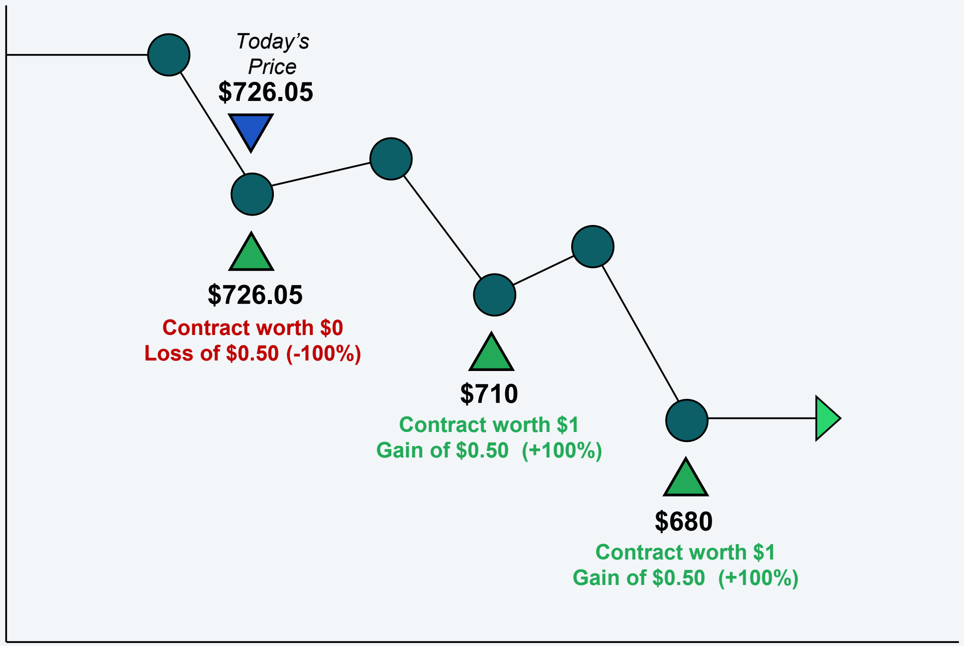
“No” Contract vs. Long Put Option

Will the Mini-S&P 500 Index close above $726.05 tomorrow ?
(Current price $726.05)

YES 50c
Potential gain
+$0.50 (+100%)

NO 50c
Potential gain
+$0.50 (+100%)

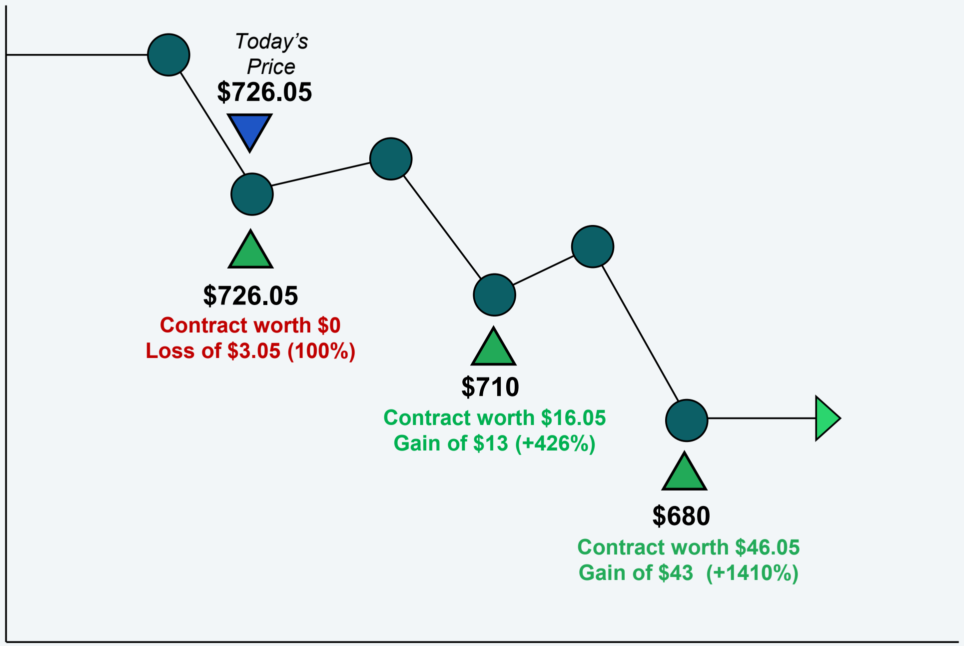
MINI-S&P 500 INDEX CLOSE TOMORROW



Fair value of options contract gaining exposure to the Mini-S&P 500 Index close below $726.05 tomorrow?
(Current price $726.05)

$3.05
Potential gain
?

MINI-S&P 500 INDEX CLOSE TOMORROW



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“No” Contract vs. Buying Put Option on Mini-S&P 500 Index

“No” Contract[1]	Buying Put Option[2]

[1] “No” contracts are Cboe S&P 500 based prediction market Yes/No contracts.
[2] Put Options on Cboe’s Mini-S&P 500 Index (XSP) are European, cash-settled. For more information about options mechanics, please visit The Options Institute Learning Portal (www.cboe.com/oilp)

Hypothetical Example of Yes/No vs. Long Put Options

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Investor 1 – Yes/No Contract

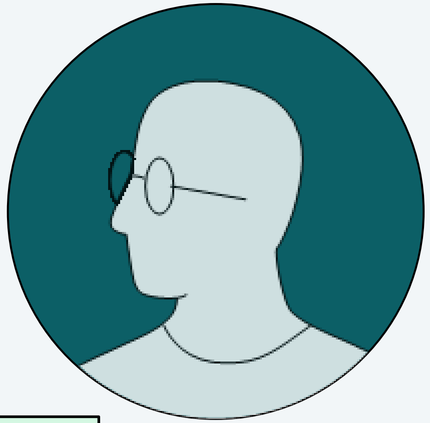
Paid **$0.50** for a Mini-S&P 500 Index (XSP) “No” contract that the Index will finish below $726.05 tomorrow.

Investor 2 – Put Option

Paid **$3.05** for a Mini-S&P 500 Index (XSP) 726.05 strike put that expires tomorrow.

Today’s XSP Price

$726.05



Note: Cboe S&P 500 based Prediction Market Contracts have a multiplier of 100, so the total cost for the Yes/No contract is $50. US Listed options also have a multiplier of 100, so the total cost for the call contract is $305.

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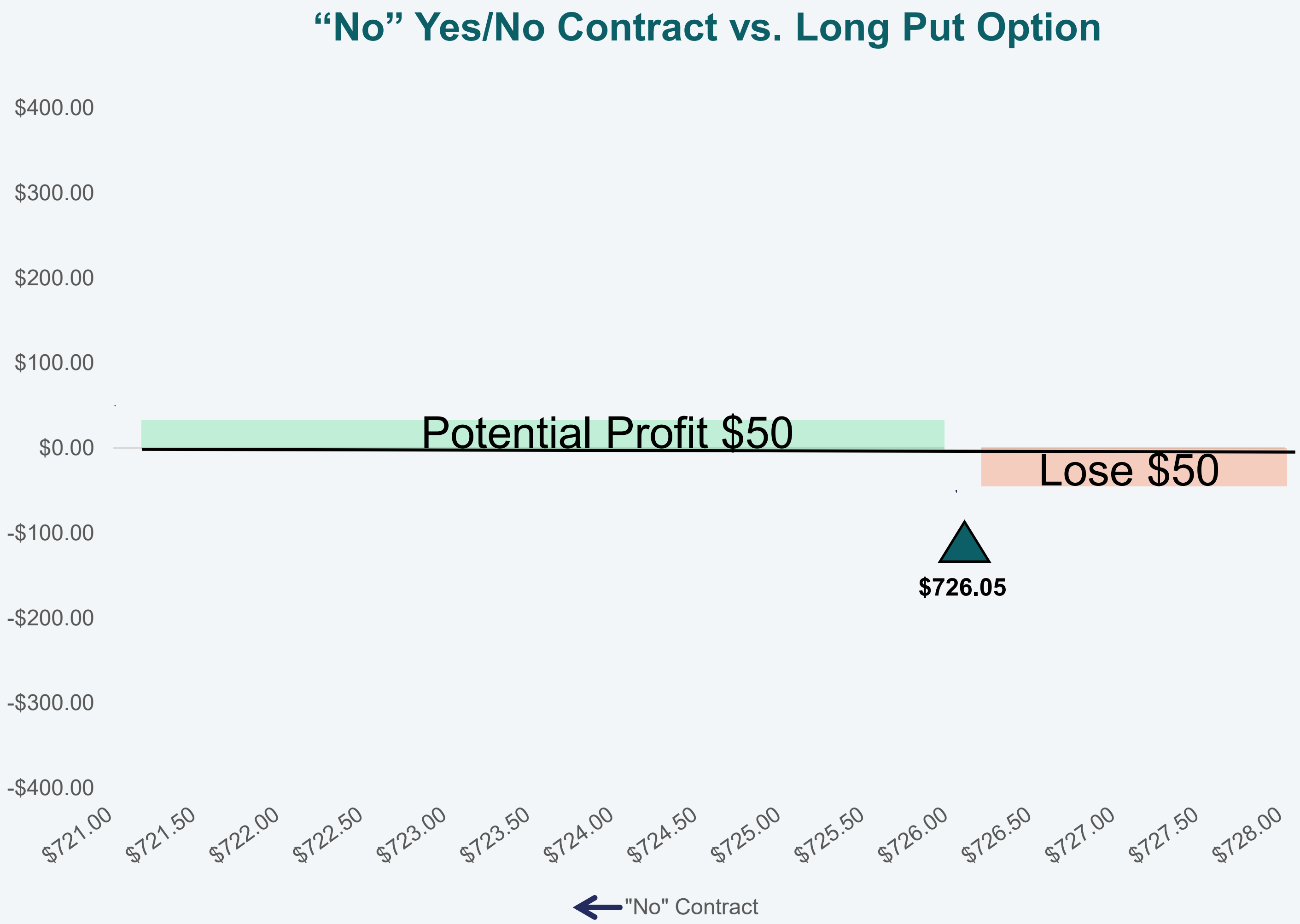
Payout Comparison: Yes/No Contract vs. Call Option

"No" Contract

- At or above $726.05: **Lose $50**
- Below $726.05: **Potential Profit $50**



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Payout Comparison: "No" Contract vs. Put Option

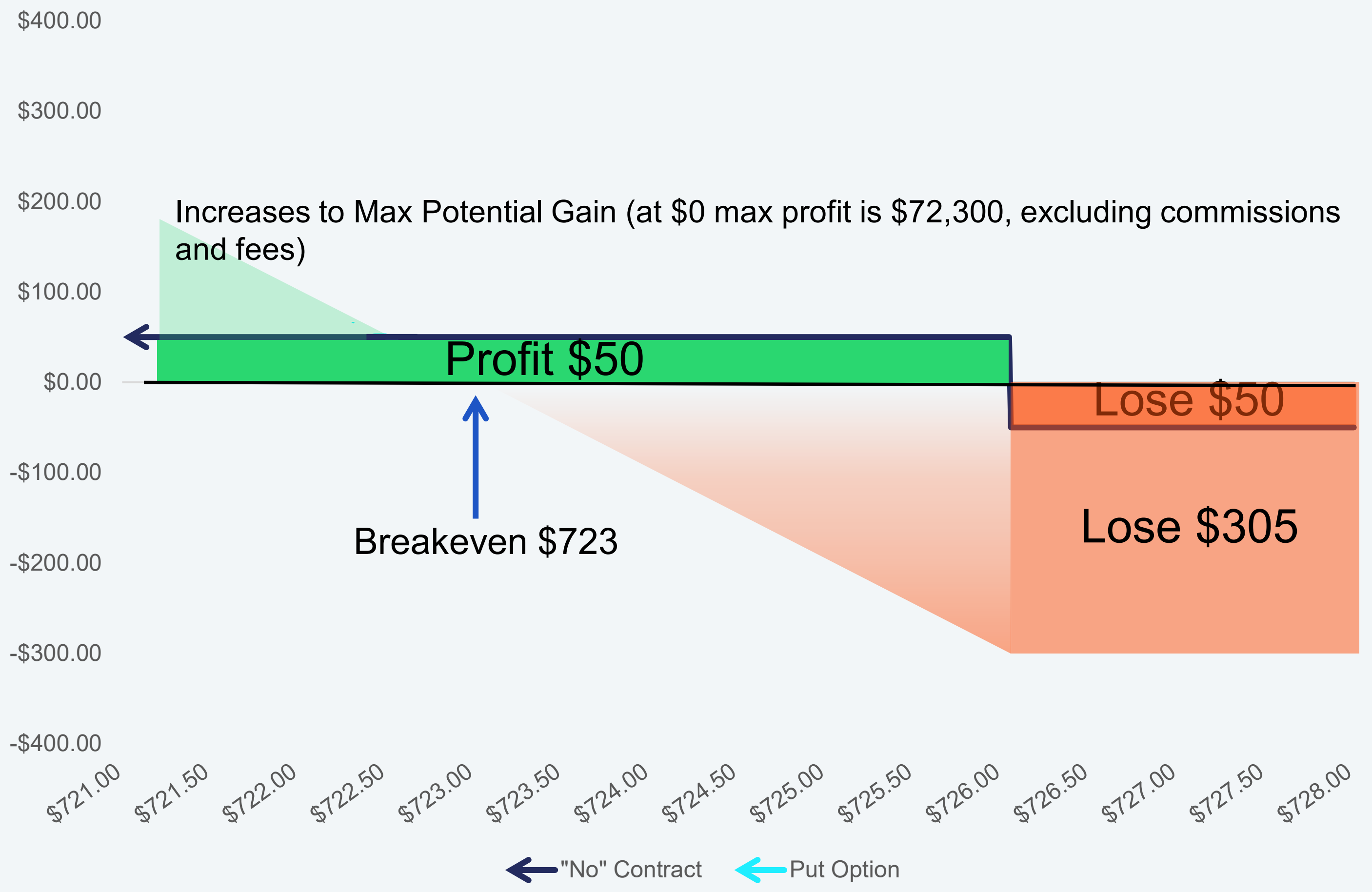
"No" Contract

- At or above $726.05: **Lose $50**
- Below $726.05: **Potential Profit $50**

Put Option

- At or above $726.05: **Lose $305**
- Below $726.05: **Notable Potential Gain (potential gains start after breakeven...)**

"No" Yes/No Contract vs. Long Put Option



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Use Cases – "No" Contract vs. Buying Put Option

"No" Contract[1]	Buying Put Option[1]

[1] "Yes" contracts are Cboe S&P 500 based prediction market Yes/No contracts.
[2] Call Options on Cboe's Mini-S&P 500 Index (XSP) are European, cash-settled. For more information about options mechanics, please visit The Options Institute Learning Portal (www.cboe.com/oilp)
[3] Assumes same strike/contract level and same expiration date

Q&A

Review

01

Review Yes/No contracts and the risk/reward profiles

02

Identify key similarities and differences between Yes/No contracts and traditional options contracts

03

Evaluate and select appropriate use cases for Yes/No contracts and options based on market views and risk preferences

Q&A

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State of the Options Industry

Quarterly derivatives market insights

Macro Volatility Digest

Weekly Market Commentary on cross-asset derivatives

Volatility Insights

Thematic pieces on emerging trends in volatility trading

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Upcoming Live Classes

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The value of digital asset futures may be derived from the continued willingness of market participants to exchange fiat currency for digital assets, which may result in the potential for permanent and total loss of value of a particular digital asset should the market for that digital asset diminish or disappear.

The nature of digital assets may lead to an increased risk of fraud or a cybersecurity event. A cybersecurity event could result in a substantial, immediate, and irreversible loss for market participants that invest in digital asset futures. Even a minor cybersecurity event in a digital asset is likely to result in downward price pressure on that digital asset and related digital asset futures and potentially other digital assets and digital asset futures.

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