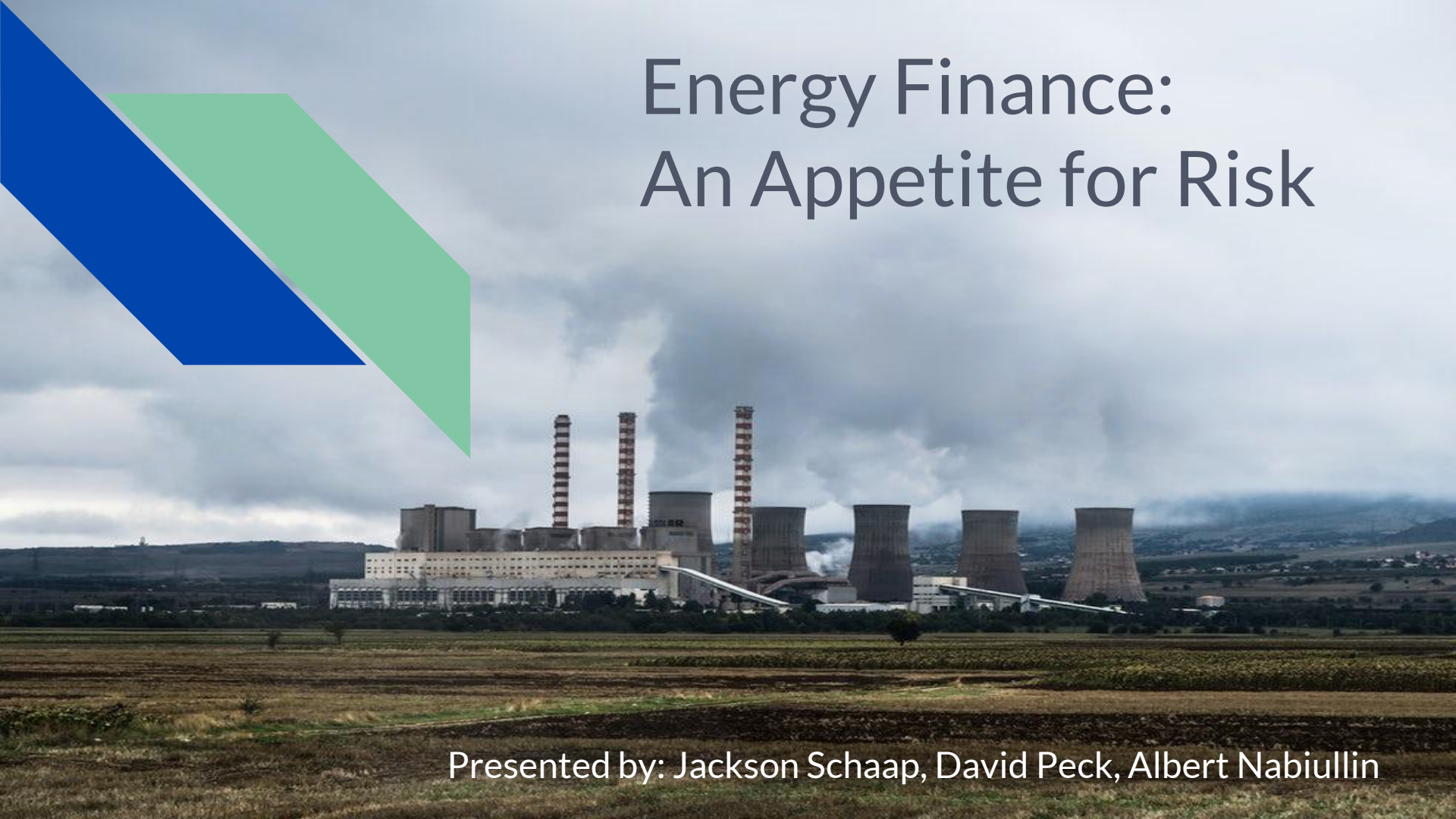




Energy Finance: An Appetite for Risk



Presented by: Jackson Schaap, David Peck, Albert Nabiullin



Agenda

Would You Rather?

- Risk Aversion
- Risk Seeking
- Options Shape Risk

Background on Options

- Calls and Puts
- Long and Short
- Strike, Spot, Premium

Real-World Examples

- 1979 Oil Crisis
- 2001 Fraud Scandal
- Payoff Visualization

Would You Rather?

Get a check for \$500,000



<http://capitalsoup.com/2014/04/18/sunny-isles-beach-man-claims-500000-playing-20x-the-cash/>

Flip a fair coin for either \$0 or \$2,000,000



<http://capitalsoup.com/2014/04/18/sunny-isles-beach-man-claims-500000-playing-20x-the-cash/>

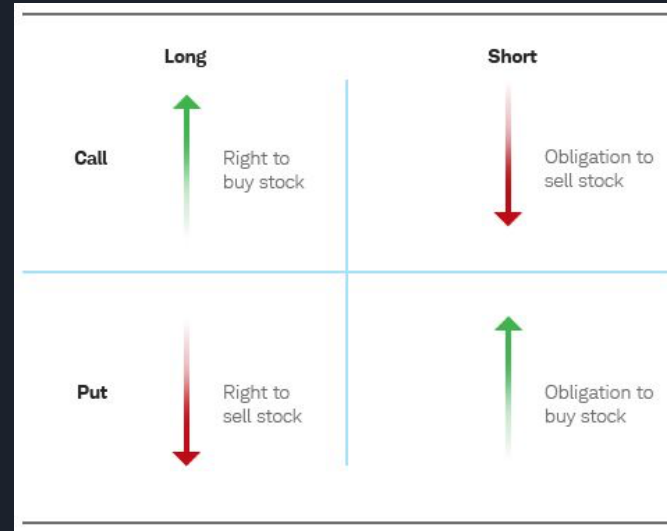
Options Help Companies Shape Risk

- **Key Notes (Options)**

- Financial derivatives (contracts)
- Predetermined price and date (asset)
- Buyers have *no obligation*, i.e. the option, to complete the transaction

- **Risk Management Methods**

- Hedging: to protect assets against price changes
- Speculation: to bet on market price changes



Options: Price Components



<https://unsplash.com/photos/hpjSkU2UYSU>

Price	Definition
Strike (K)	Future agreed upon asset price
Spot (S)	Market price at specified date
Option (a.k.a. Premium) (V)	Cost to purchase option today

1979 Oil Crisis: A Call Example

Imagine I own a gasoline station in 1979, and I'm worried that tensions in Iraq may increase the price I pay for gasoline.

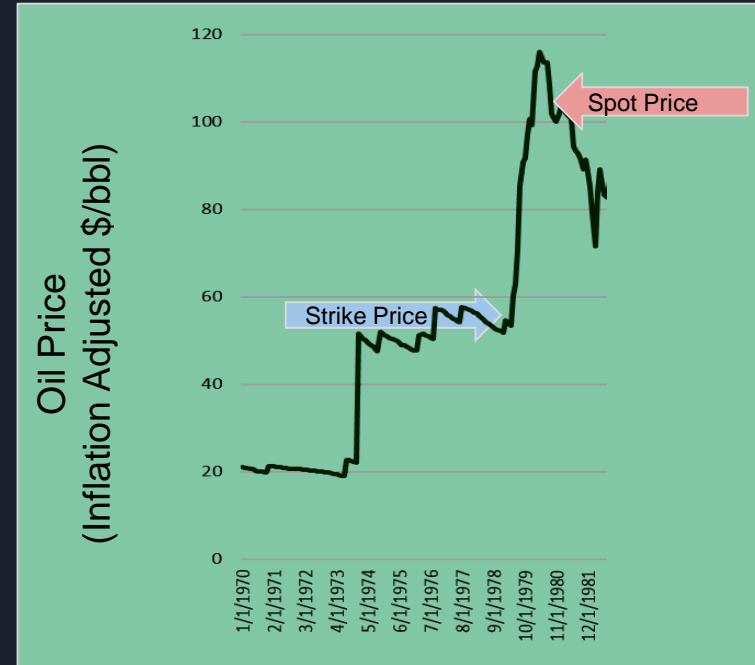
How can I use options to hedge my situation?



<https://unsplash.com/photos/TNvdQm6X1uk>



<https://unsplash.com/photos/qwe8TLRnG8k>



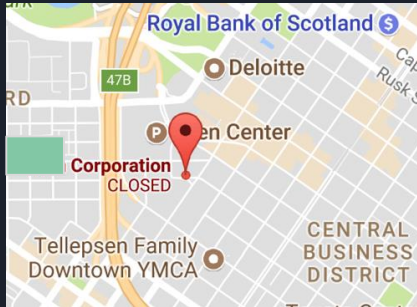
Reminder: A call is the right to buy at a prespecified future price.

https://mises.org/sites/default/files/styles/full_width/public/oil2.png?itok=CSyoSA_J

Stock Price Predictions in 2001: A Put Example

Imagine it is August 2001 and I hear rumors that an American commodities company is hiding billions of dollars in debt from failed deals. These rumors make me think their stock price will sharply decrease in the next 3 months.

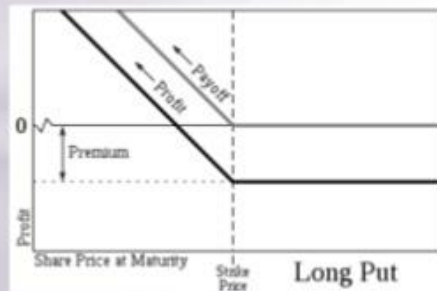
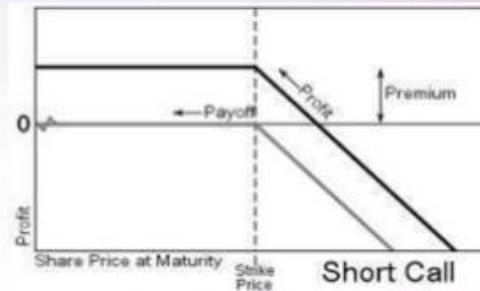
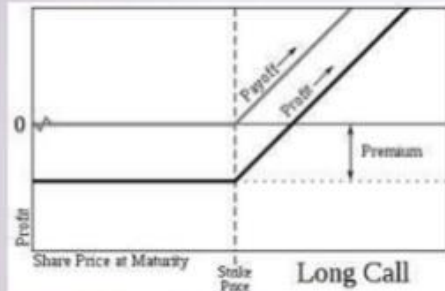
How can I use puts to shape my risk if I own company shares?



Reminder: A put is the right to sell at a prespecified future price.

When am I Making Money on my Options?

Option Pay Off



Options Play a Large Role in Decision Making

- Over 10 million options contracts are traded daily
 - <https://www.theocc.com/webapps/daily-volume-statistics>

Finance Jargon



Real World Application



Sources and Further Learning Material

STAT/ECON 449 - Quantitative Financial Risk Management

An Excellent Introductory Book and an Excellent Advanced Book on Options:

Shreve, Steven E. *Stochastic Calculus for Finance I: The Binomial Asset Pricing Model*.
Springer Verlag New York, 2004. Print.

Shreve, Steven E. *Stochastic Calculus Models for Finance: Volume 2: Continuous Time Models*.
Springer Verlag New York, 2004. Print.

