Introduction to Finance Workshop

Attendance Form

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Financial Sectors

What is Finance

Finance is the study and management of money, investments, and other financial instruments.

It encompasses a wide range of activities, including:

- **Investing:** Making decisions about where to put your money to achieve financial goals.
- **Borrowing:** Obtaining funds from lenders to finance projects or investments.
- **Lending:** Providing funds to borrowers with the expectation of earning interest.
- **Managing Risk:** Identifying and mitigating potential financial losses.
- **Financial Planning:** Developing strategies to achieve financial goals, such as retirement planning or saving for education.

Finance plays a crucial role in the economy, facilitating the flow of capital and enabling businesses to grow and invest.

Different tiers of firms

- **Investment Banks:**
    - **Bulge Bracket:** Dominate the industry, handling large, complex transactions and serving major corporations, governments, and institutional investors. Examples include Goldman Sachs, JPMorgan Chase, and Morgan Stanley.
    - **Middle Market:** Focus on mid-sized companies and transactions, offering a range of services, including M&A advisory, underwriting, and financial restructuring. Examples include Jefferies, William Blair, and Piper Sandler.
    - **Boutique:** Specialize in specific industries or services, providing niche expertise. Examples include Evercore, Moelis & Company, and Greenhill & Co.
- **Other Financial Institutions:**
    - **Commercial Banks:** Provide banking services to individuals and businesses, including deposits, loans, and payment processing. Examples include Bank of America, Wells Fargo, and Citigroup.
    - **Asset Management Firms:** Manage investments for individuals and institutions, including mutual funds, pension funds, and hedge funds. Examples include BlackRock, Vanguard, and Fidelity.

Buy side vs Sell side

- **Buy Side:**
    - **Objective:** Maximize returns for their clients by investing in assets they believe are undervalued.
    - **Key Players:**
        - **Mutual Funds:** Pool money from multiple investors to invest in a diversified portfolio of securities.
        - **Hedge Funds:** Employ a variety of investment strategies, often using leverage and derivatives, to generate high returns.
        - **Pension Funds:** Manage retirement savings for individuals and employees.
        - **Endowments:** Invest funds to support the long-term financial needs of non-profit organizations.
    - **Activities:** Conduct in-depth research, analyze financial statements, and meet with company management to make investment decisions.
- **Sell Side:**
    - **Objective:** Facilitate transactions and generate revenue by providing services to the buy side.
    - **Key Players:**
        - **Investment Banks:** Underwrite securities offerings, advise on M&A transactions, and provide other financial services.
        - **Brokerage Firms:** Execute trades on behalf of clients and provide research and investment advice.
    - **Activities:** Create and market financial products, provide research and analysis, and execute trades.

Investment Management

- **M&A (Mergers and Acquisitions):**
  - **Process:** Involves advising companies on the entire M&A process, from identifying potential targets to negotiating deal terms and completing the transaction.
  - **Roles:** Investment bankers, lawyers, accountants, and valuation specialists.
  - **Types of M&A:**
    - **Horizontal Merger:** Two companies in the same industry combine.
    - **Vertical Merger:** A company acquires a supplier or customer.
    - **Conglomerate Merger:** Two unrelated companies merge.
- **Pensions:**
  - **Defined Benefit Plans:** Provide a guaranteed retirement income based on years of service and salary.
  - **Defined Contribution Plans (e.g., Superannuation):** Employees contribute a portion of their salary to a retirement account, and the employer may match a portion of the contributions.
  - **Management:** Involves selecting investments, managing risk, and ensuring compliance with regulations.
- **PE (Private Equity):**
  - **Strategy:** Invest in privately held companies, often with the goal of improving operations and increasing profitability before selling the company or taking it public.
  - **Types of PE investments:**
    - **Leveraged Buyouts (LBOs):** Acquiring a company using a significant amount of debt.
    - **Growth Equity:** Investing in companies with high growth potential.
    - **Venture Capital:** Investing in early-stage companies with high risk and high potential reward.

Investment Management

- **VC (Venture Capital):**
  - **Focus:** Provide funding to startups and early-stage companies with innovative ideas and high growth potential.
  - **Stages of VC funding:**
    - **Seed Funding:** Initial funding to get a company off the ground.
    - **Series A, B, C, etc.:** Subsequent rounds of funding as the company grows.
  - **Exit Strategies:** Initial Public Offering (IPO) or acquisition by another company.
- **Hedge Funds:**
  - **Characteristics:** Employ a wide range of investment strategies, often using leverage and derivatives, to generate high returns.
  - **Strategies:**
    - **Long/Short Equity:** Betting on both rising and falling stock prices.
    - **Arbitrage:** Exploiting pricing inefficiencies in different markets.
    - **Global Macro:** Making bets on macroeconomic trends.

Active vs Passive Investment

- **Active Investing:**
    - **Goal:** Outperform a benchmark, such as a market index.
    - **Methods:**
        - **Fundamental Analysis:** Analyzing a company's financial statements and industry trends.
        - **Technical Analysis:** Using charts and other technical indicators to predict price movements.
        - **Quantitative Analysis:** Using mathematical models and algorithms to identify investment opportunities.
    - **Advantages:** Potential for higher returns than passive investing.
    - **Disadvantages:** Higher fees, greater risk, and no guarantee of outperformance.
- **Passive Investing:**
    - **Goal:** Track the performance of a benchmark, such as a market index.
    - **Methods:**
        - **Index Funds:** Invest in the same securities as a specific index.
        - **Exchange-Traded Funds (ETFs):** Trade on stock exchanges like individual stocks and track a specific index or sector.
    - **Advantages:** Lower fees, lower risk, and diversification.
    - **Disadvantages:** Limited potential for outperformance.

Professional Services & Consulting

Management Consulting

- **Focus:** Helping organizations improve their performance and efficiency by identifying problems, developing solutions, and implementing recommendations.
- **Types of Management Consulting:**
  - **Strategy Consulting:** Developing long-term strategic plans.
  - **Operations Consulting:** Improving the efficiency of an organization's operations.
  - **Financial Consulting:** Providing advice on financial matters.
  - **Human Capital Consulting:** Improving an organization's human resources management.
  - **Technology Consulting:** Helping organizations implement and utilize technology effectively.

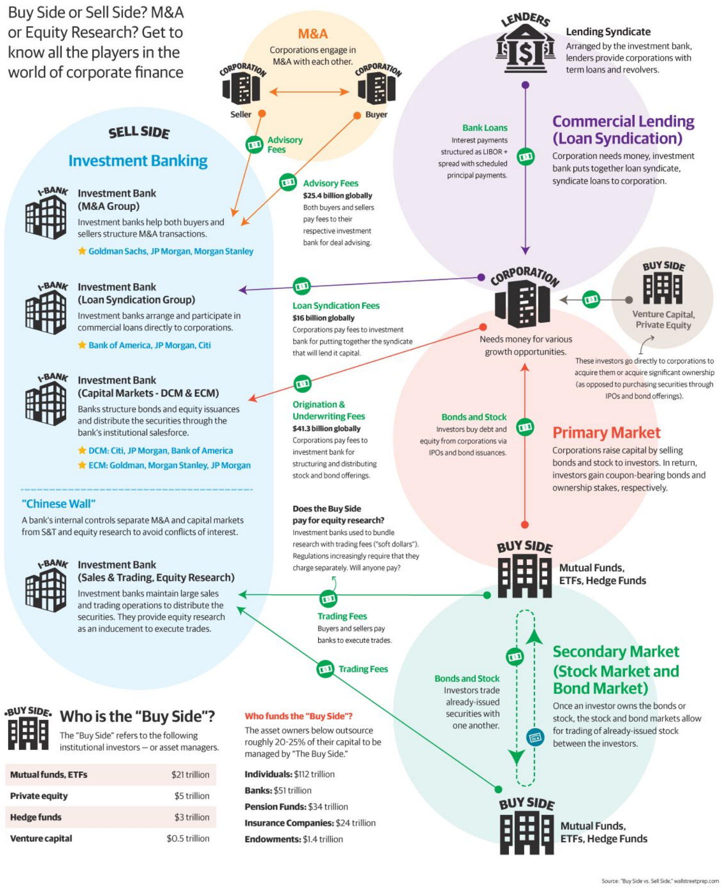
Financial Advisory:

- **Focus:** Providing specialized financial advice and services to businesses, including:
  - **M&A Advisory:** Advising on mergers, acquisitions, divestitures, and joint ventures.
  - **Restructuring Advisory:** Helping companies facing financial difficulties.
  - **Valuation:** Determining the fair value of assets or businesses.

Front-Middle-Back Office

- **Front Office:**
  - **Revenue Generation:** Directly involved in generating revenue for the firm.
  - **Key Roles:**
    - **Investment Bankers:** Advise on and execute M&A transactions, underwrite securities offerings, and provide other financial advisory services.
    - **Sales & Trading:** Buy and sell securities on behalf of clients and the firm, manage risk, and provide market liquidity.
    - **Wealth Management:** Provide investment advice and manage portfolios for high-net-worth individuals.
- **Middle Office:**
  - **Risk Management:** Identify, assess, and manage various types of financial risk, including market risk, credit risk, and operational risk.
  - **Compliance:** Ensure that the firm complies with all applicable laws and regulations.
  - **Other Functions:** Financial control, legal, and human resources.
- **Back Office:**
  - **Support Functions:** Provide essential operational and administrative support to the front and middle office.
  - **Key Roles:**
    - **Operations:** Process transactions, manage settlements, and maintain records.
    - **Technology:** Develop and maintain the firm's technology infrastructure.
    - **Finance & Accounting:** Manage the firm's finances, prepare financial statements, and ensure accurate record-keeping.

Careers In Finance



Stocks, Bonds, & Funds

Terminology

Financial Securities: A broad term encompassing different types of financial produces/assets

Long (Bullish): You’re expecting the value of the security to increase

Short (Bearish): You’re expecting the value of the security to decrease

Bull Market: Typically defined as a 20% increase in stock prices, increase in investor confidence, strengthening economy, rising profits

Bear Market: Typically defined as a 20% decrease in stock prices, decrease in investor confidence, weakening economic, falling profits

Recession: 2 successive Quarters in which an economy’s GDP shrinks

Stocks/Shares

A stock is also known as equity, representing ownership of a corporation

- Companies can offer these publicly through IPOs, or privately to institutional investors
- Shares are listed on exchanges, such as the ASX, NYSE, NASDAQ to name a few
- Can be traded through brokerage firms, which will often charge a fee for this service

Stocks are issued by corporations as a way to raise funds for the business to growth/expand

- Investors are hoping that the business will grow/expand and increase in profitability, eventually being reflected in an increased share price
- Businesses want to attract investors so that they have capital to expand their operations/R&D

Bonds

A Bond is a fixed-income instrument where individuals lend money to the government or a company at a certain interest rate for a certain amount of time.

- Eg I lend Apple $1,000 dollars, at an interest rate of 5% a year, for 2 years.
- At the end of the 1st year, Apple gives me $50, at the end of the 2nd year when the Bond matures, Apple gives me $50 plus the original face value of the bond ($1,000)

Similarly to stocks, bonds are a way for a company to raise money to expand and improve their operations. However, in the event of a default/bankruptcy, bondholders get first dibs to whatever assets are left of the company.

In return, the upside for a bond is limited, whereas stocks have theoretically unlimited upside.

Investing vs Trading

Investing

- Long term in nature, with some investors holding a company for life
- Generally concerned with fundamentals of a company, such as revenue, Price-to-earnings ratio, Gross profit margin etc
- Is not a zero sum game, everyone can be a “winner”
- Usually less risky than trading, also requires less time and effort

Trading

- Tends to be short term in nature, however can be broken up further
  - Day trading, Swing trading, Algo trading, and more (Scalping, Arbitrage, Commodities, High Frequency)
- Usually less concerned with fundamentals of a company, focusing more on sentiment, trends, momentum, and price action.

Mutual Funds/ETFs (Exchange Traded Funds)

Mutual Funds (Active Investment)

- Pooled investments managed by professional money managers, benefiting from shared costs and professional expertise
- Examples of Mutual Funds are Superannuation Funds, or 401k Funds that aim to manage the retirement funds of individuals.

Exchange Traded Funds (Passive Investment)

- A passive investment fund that holds multiple underlying assets that can be traded on an exchange
- Designed to track a basket of securities, usually with a “theme” in mind
    - Eg an Oil ETF might hold a mix of Chevron, Exxonmobil, Shell etc

Credit Ratings

3 Main credit rating agencies

	Moody's	S&P	Fitch
Investment grade	AAA	Aaa	AAA
	AA	Aa	AA
	A	A	A
	BBB	Baa	BBB
High yield / speculative	BB	Ba	BB
	B	B	B
	CCC	Caa	CCC
	CC	Ca	CC
	C	C	C
	D	D	D

Represents the creditworthiness of a company or a country, or in other words, their likeliness to default. (Derived from a variety of factors, such as health of cash flows, amount of debt, ability and willingness to repay debt obligations)

11 GICS (Global Industry Classification Standard) Sectors

Consumer Discretionary: Unnecessary purchases (Wants)

Consumer Staples: Necessary purchases (Needs)

uantSoc

FINSOC FINANCE & BANKING SOCIETY

Options, Forwards & Futures

Futures

- A contract where you have an obligation to buy an asset at a predetermined date in the future for a predetermined static price

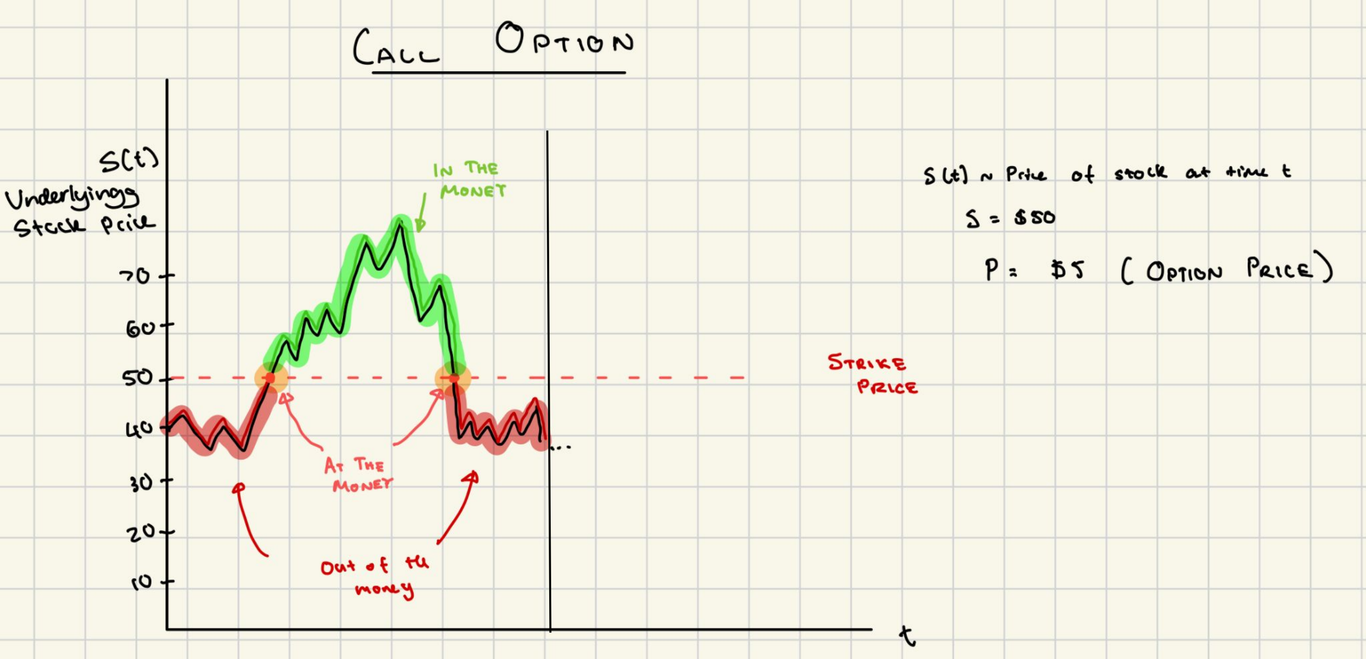
- Spot Price: Current Market Price of Asset
- Futures Price: Price that Asset is bought for in the future

Forwards

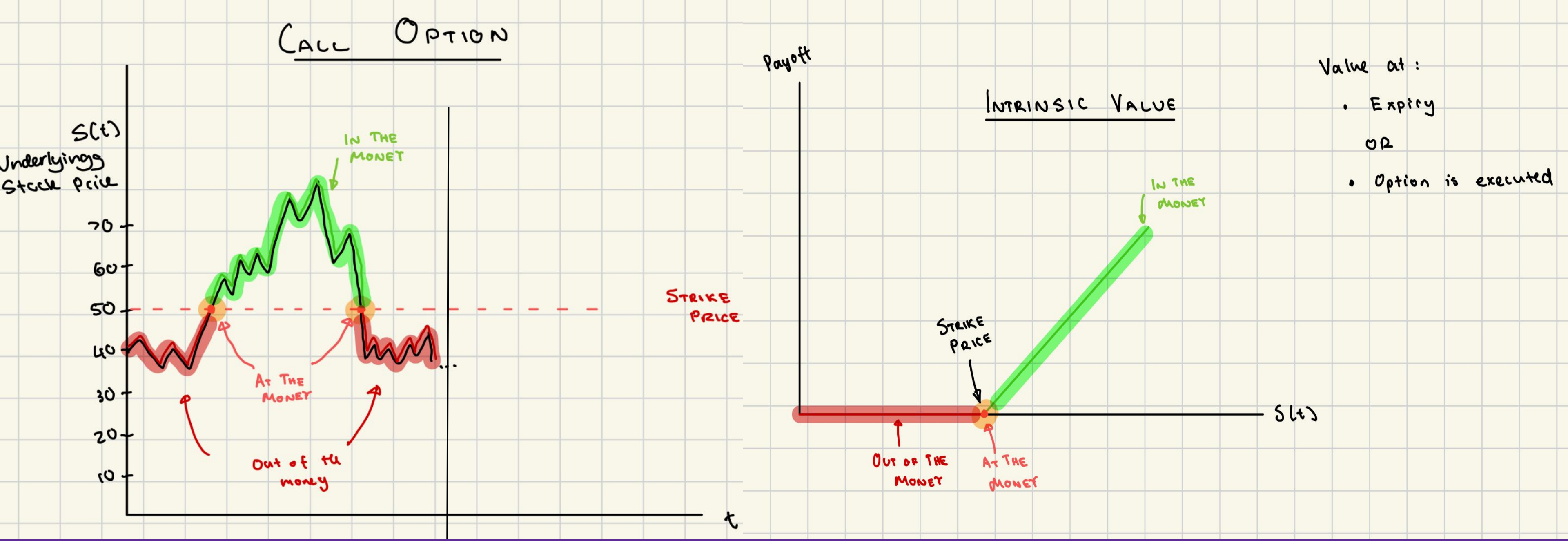
- A futures contract between two parties where the price that is paid in the future is today’s price

Options

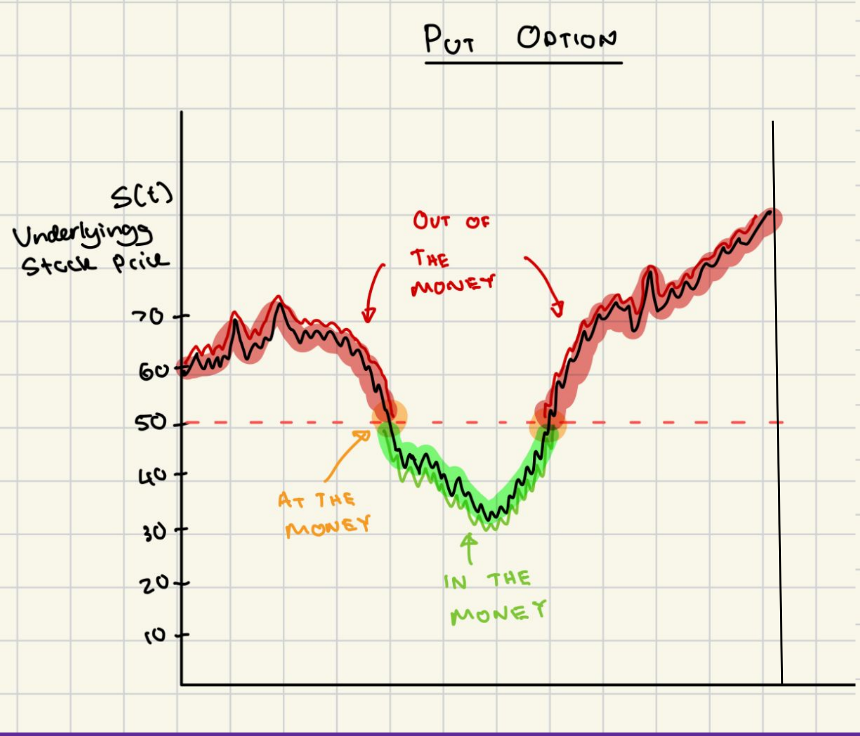
- Strike Price: Price that the option can be exercised
- Underlying: Stock from which option is derived

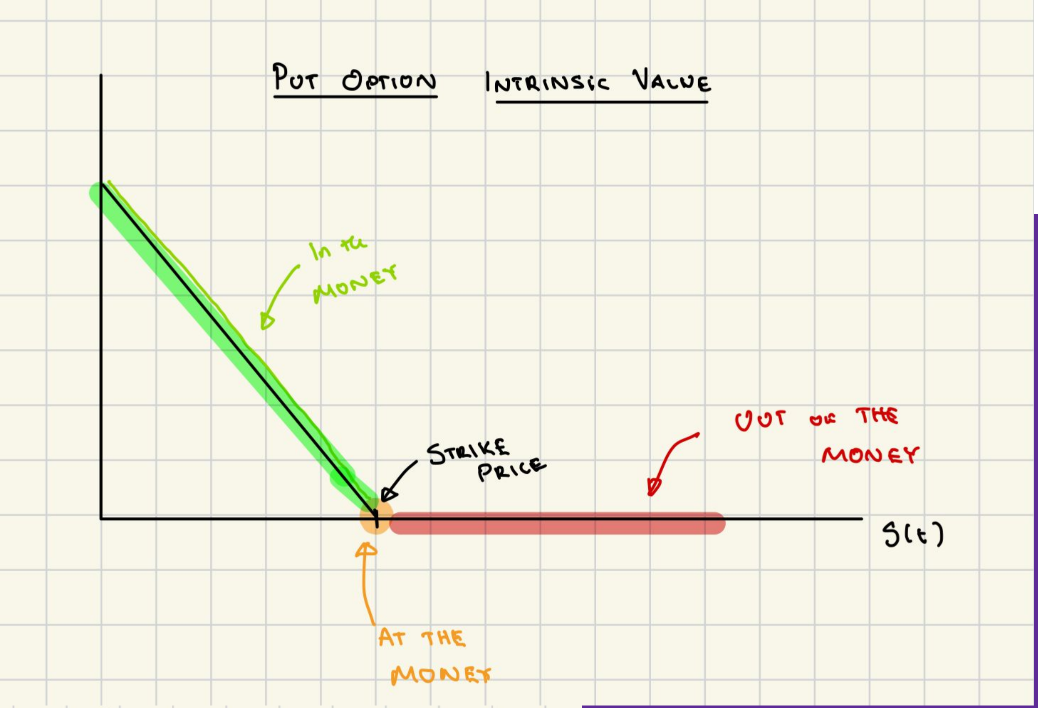


Call Option Payoff Diagram

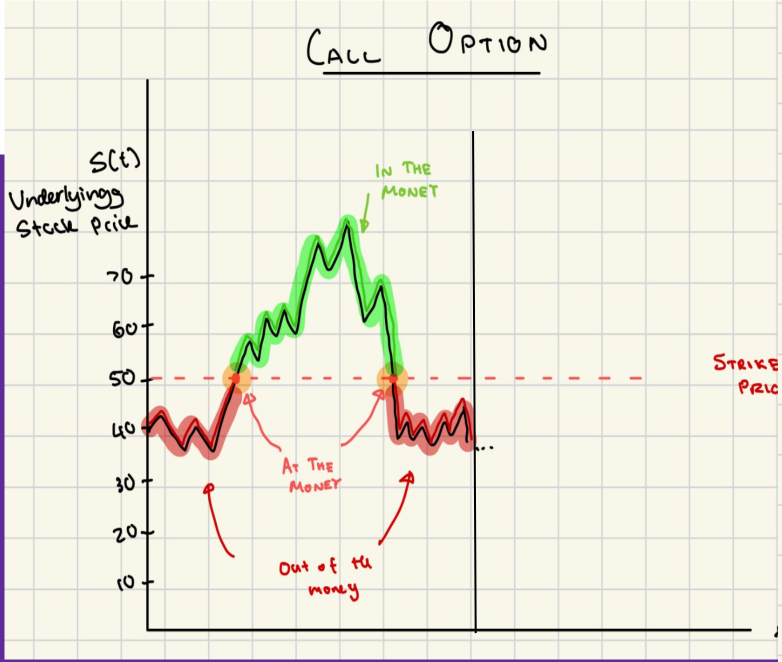


Put Option


Put Option
S(t)
Underlyings Stock Price
70
60
50
40
30
20
10
Out of The Money
At The Money
In The Money

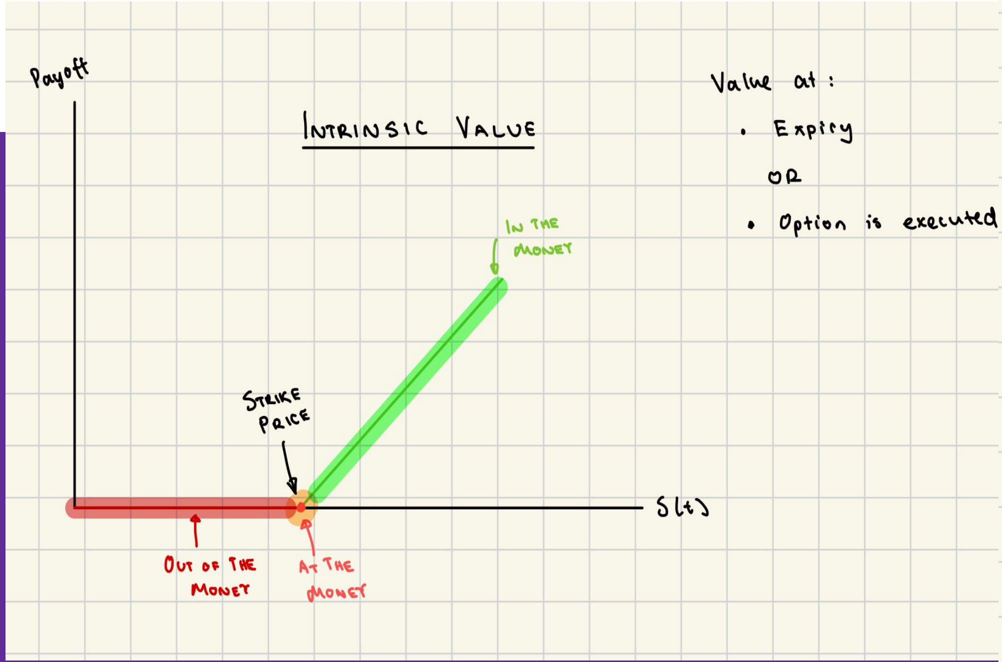

Put Option Intrinsic Value
In the Money
Strike Price
Out of The Money
At The Money
S(t)

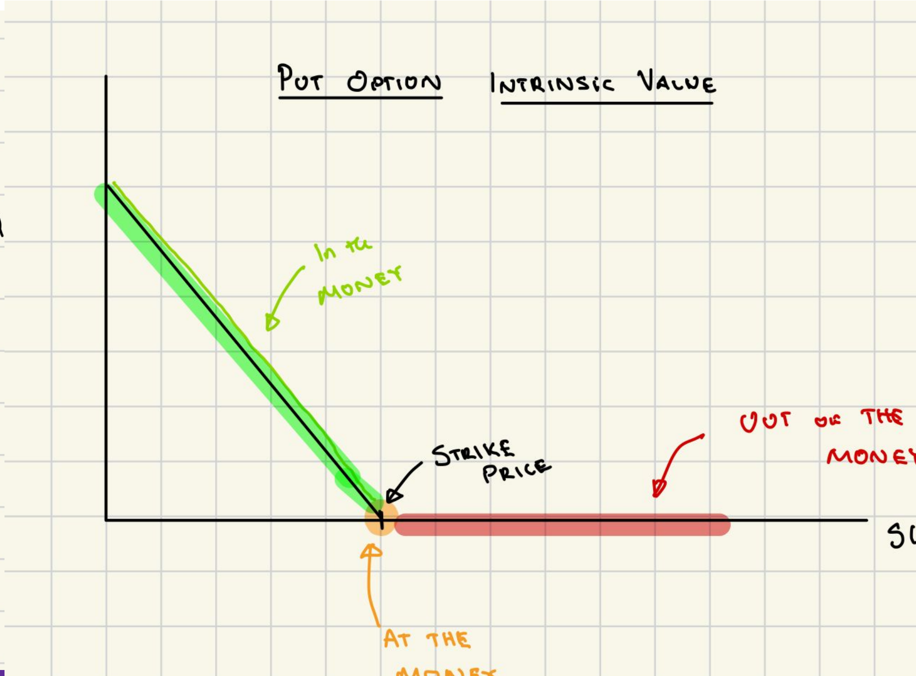
American vs European



Intrinsic Value

- At a certain period of time, the payoff of the option
- The value gained if the option contract is executed





Extrinsic Value

- Extra value that factors in the potential of the option going more in the money at expiry
- Determined mainly through:
- Time until expiry
- Volatility of Underlying asset
- Proximity to Strike Price

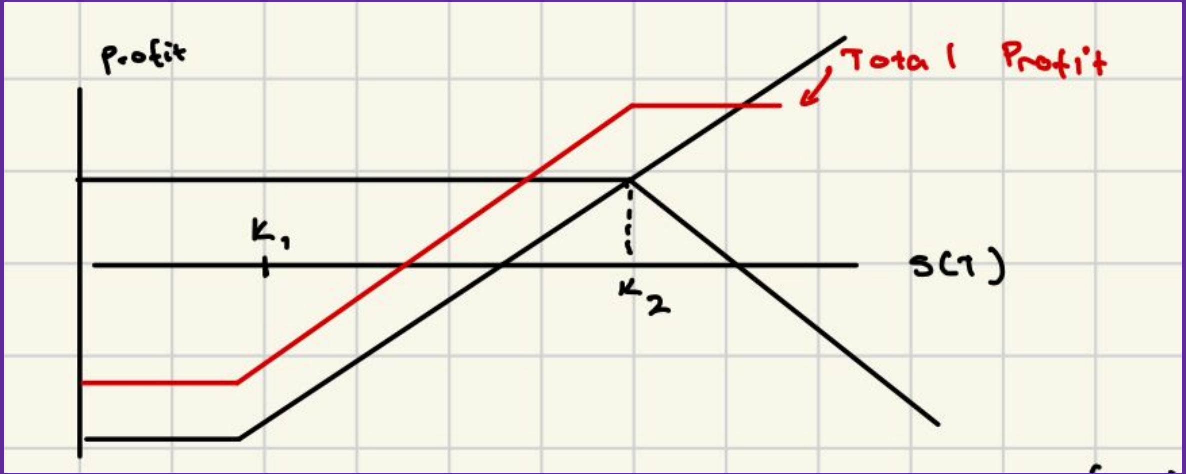
Option Spreads

- It is the simultaneous purchase and sale of options
- Done to limit risk, while enhancing returns

Bull Call Spread

- Buying a call (K1)
- Selling a Call (K2)
- K1 < K2

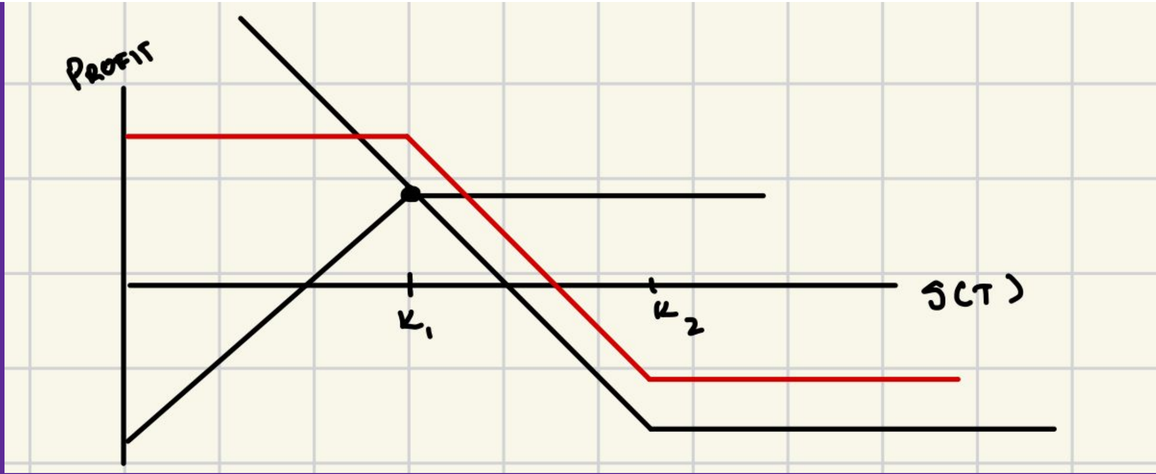
Estimating Price to go up



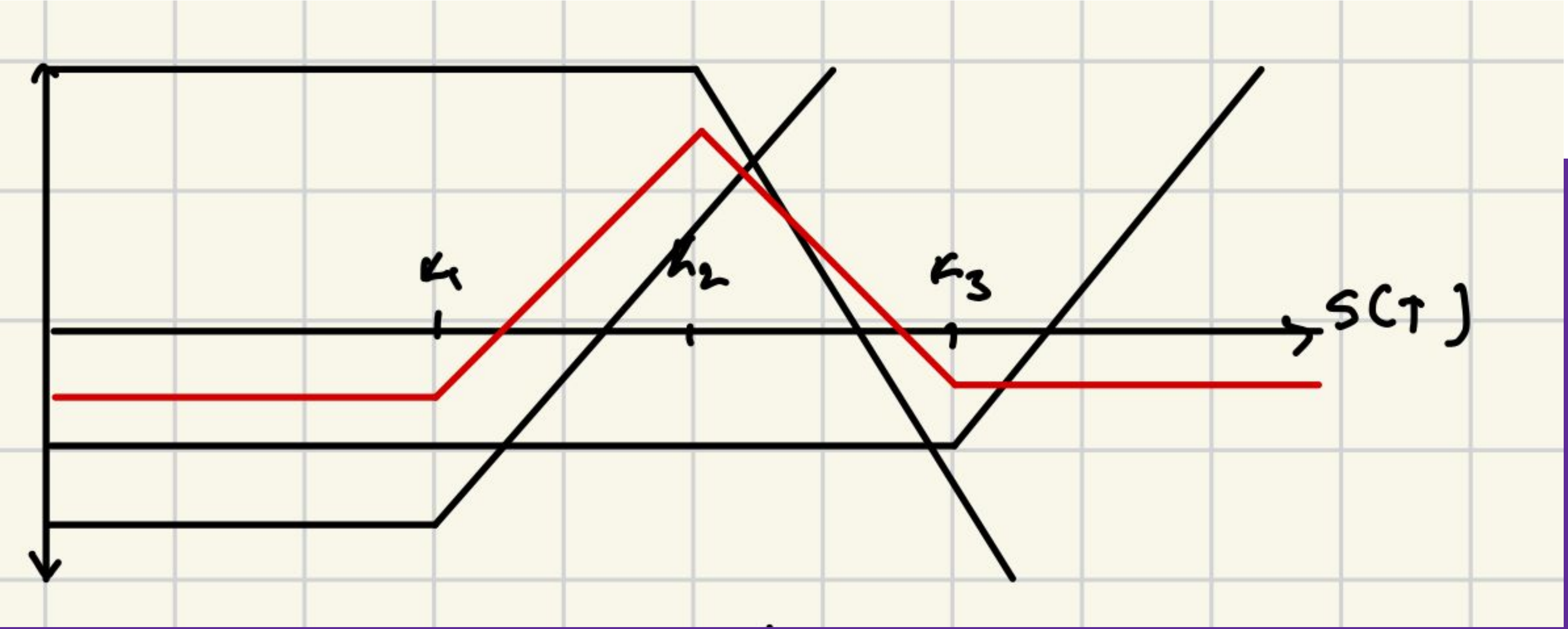
Bear Put Spread

- Selling a Put (K1)
- Buying a Put (K2)
- K1 < K2

Expecting Price to decrease



Butterfly Spread



Options Glossary

- Underlying: Stock from which the option is derived
- Price: The price at which the option is bought or sold
- Strike Price: Price that the option can be exercised
- Time to Maturity: Time until the option expires

Simple Option Pricing Framework

In 1827, a Botanist named **Robert Brown** noticed pollen grains jittered randomly under a microscope and thought they were alive.

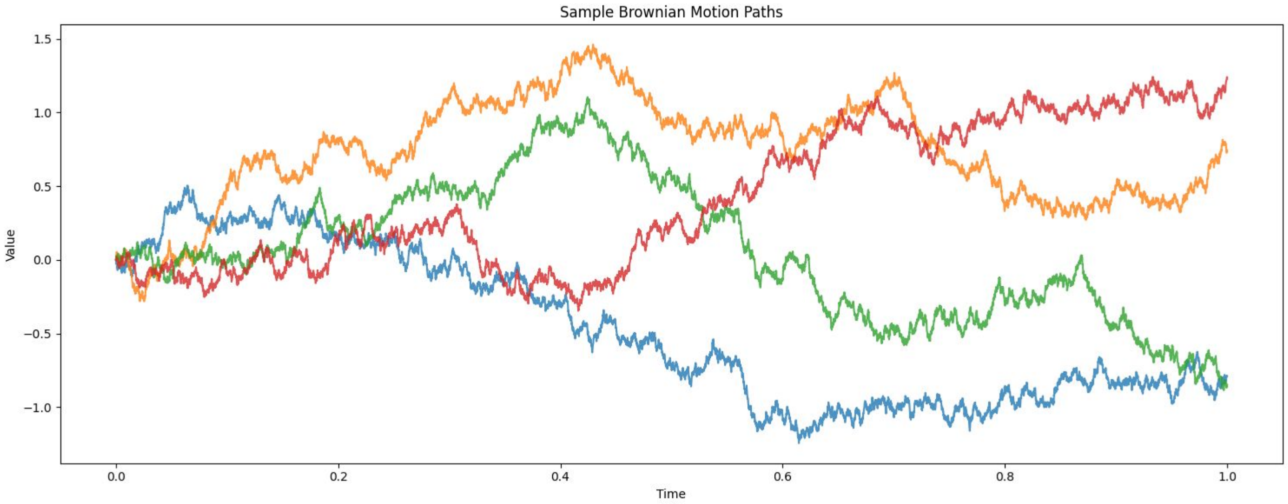
Turns out, this random movement observed in nature, later dubbed **Brownian Motion** would be used to **price options**.

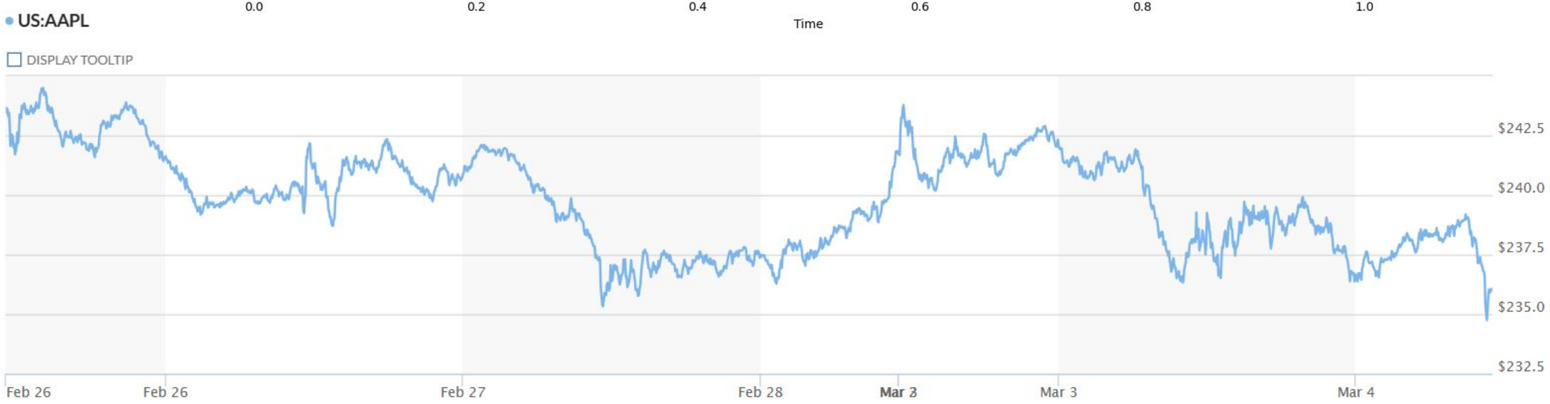
To price an option, one needs to anticipate the underlying's trajectory.

The stock seems to **fluctuate up and down in no particular order** - like the randomness in pollen grains.

In continuous time this is a Wiener Process / White Noise.

$$W_t \sim N(0, t)$$


Sample Brownian Motion Paths
Value
Time
1.5
1.0
0.5
0.0
−0.5
−1.0
0.0
0.2
0.4
0.6
0.8
1.0


US:AAPL
DISPLAY TOOLTIP
$242.5
$240.0
$237.5
$235.0
$232.5
Feb 26
Feb 26
Feb 27
Feb 28
Mar 3
Mar 3
Mar 4

Geometric Brownian Motion

More **popular stock price model** than plain Brownian Motion.

$$dS_t = rS_t\,dt + \sigma S_t\,dW_t \quad \rightarrow \quad S_t = S_0 e^{(r-0.5\sigma^2)t+\sigma W_t}$$

Change in stock price = time trend + random noise.

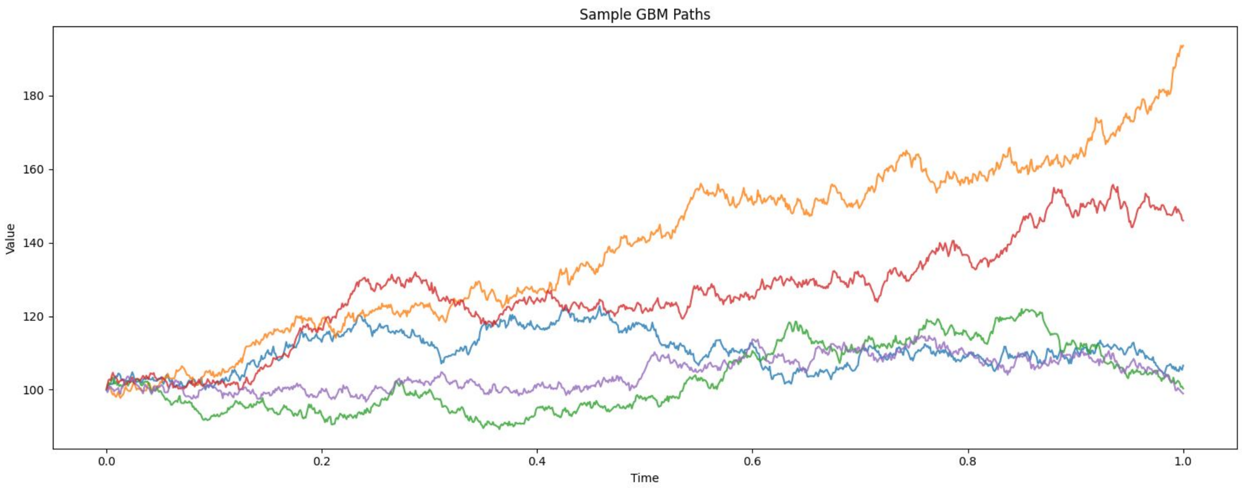
Ensures stock prices cannot be negative.

Allows the stock price to **'drift'** rather than 'hover' like Brownian Motion.

Assumed stock price movement for the **Black-Scholes formula** for European option prices:

$$C = S_0 N(d_1) - Ke^{-rT} N(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S_0}{K}\right)+(r+\frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}} \qquad d_2 = d_1 - \sigma\sqrt{T}$$


Sample GBM Paths
Value
180
160
140
120
100
0.0
0.2
0.4
0.6
0.8
1.0
Time


O 60.49 H 64.77 L 57.00 C 57.31 Vol 1.62b
yahoo!finance
250.00
235.93
225.00
200.00
175.00
150.00
125.00
100.00
75.00
Apr Jul Oct 2021 Apr Jul Oct 2022 Apr Jul Oct 2023 Apr Jul Oct 2024 Apr Jul Oct 2025

Further Stock Price Modelling

These models can only go so far without fundamental analysis.

Extensions of GBM:

- Stochastic volatility
- Poisson Jump-Diffusion
- Mean-Reversion Models

NSDQ: PDD

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