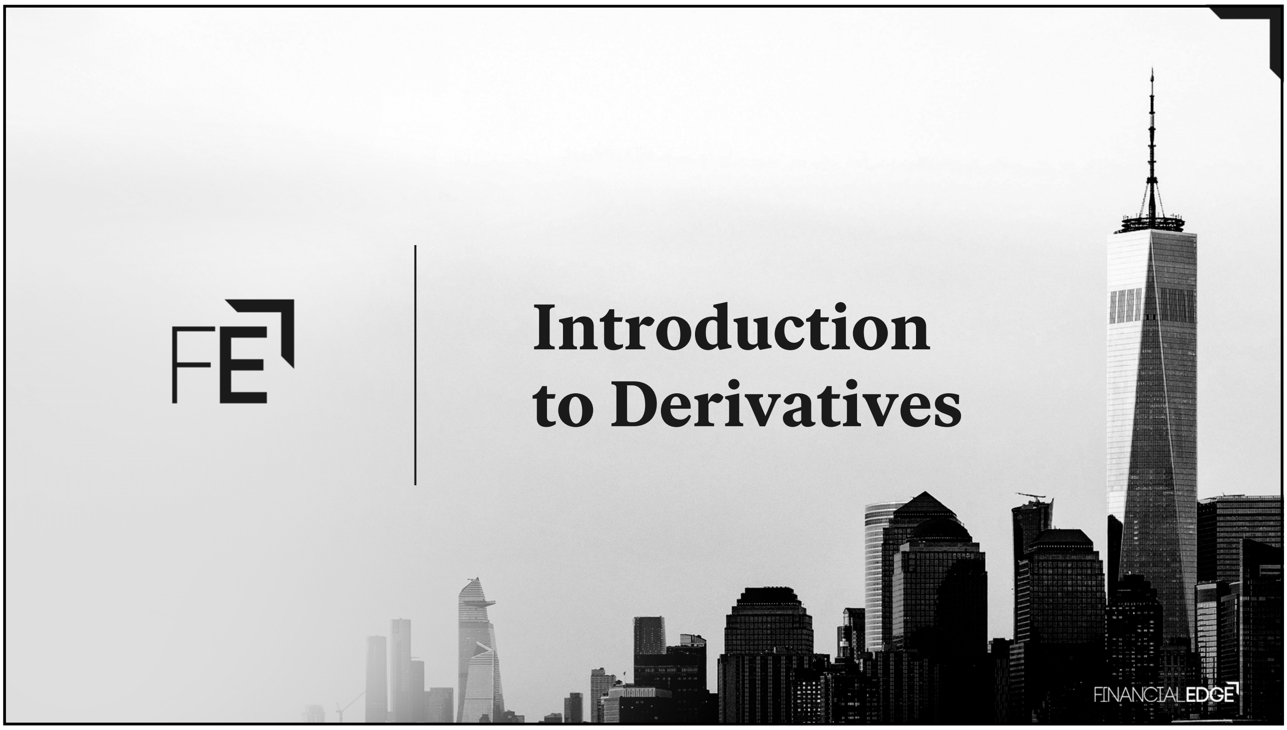
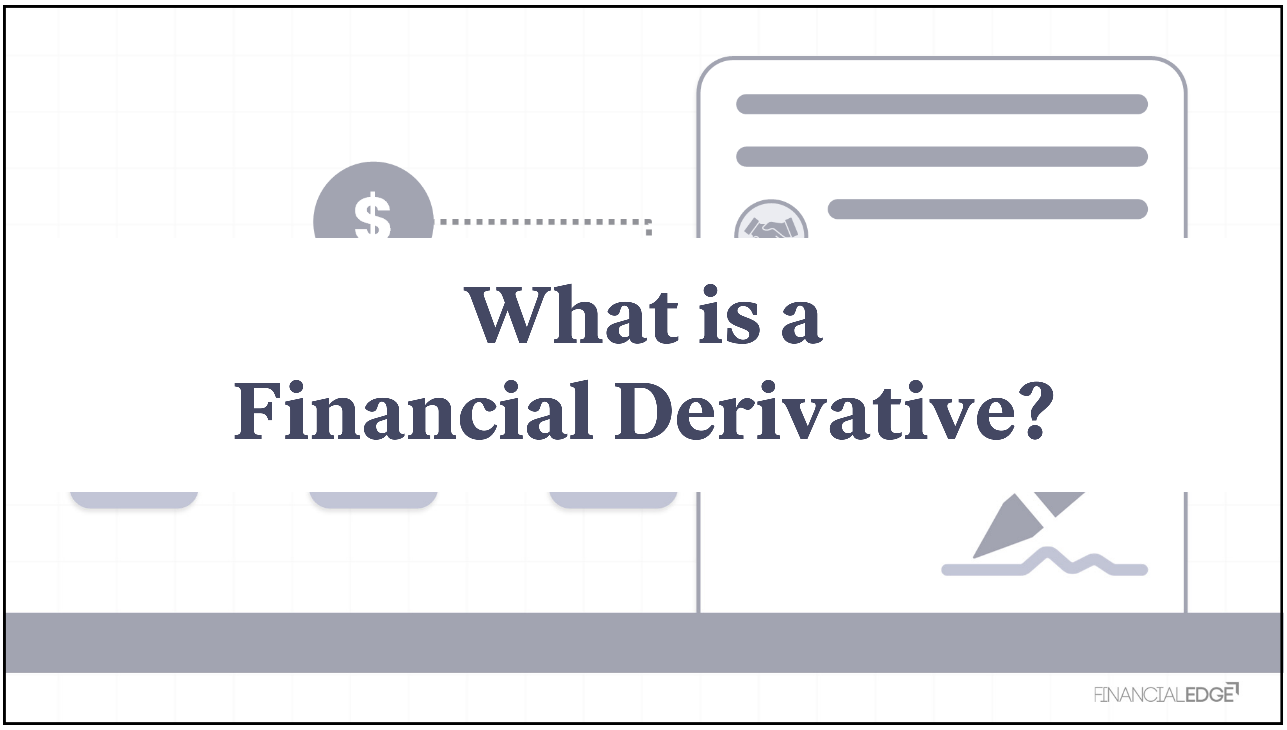
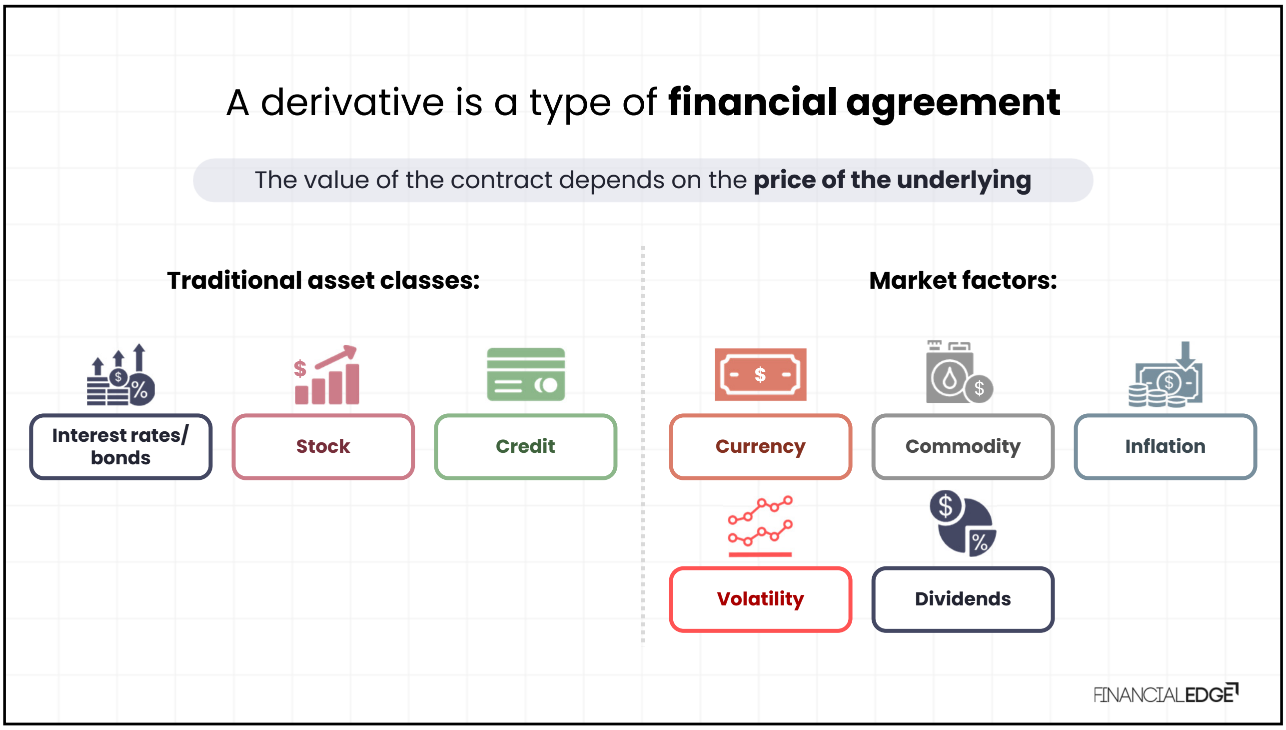
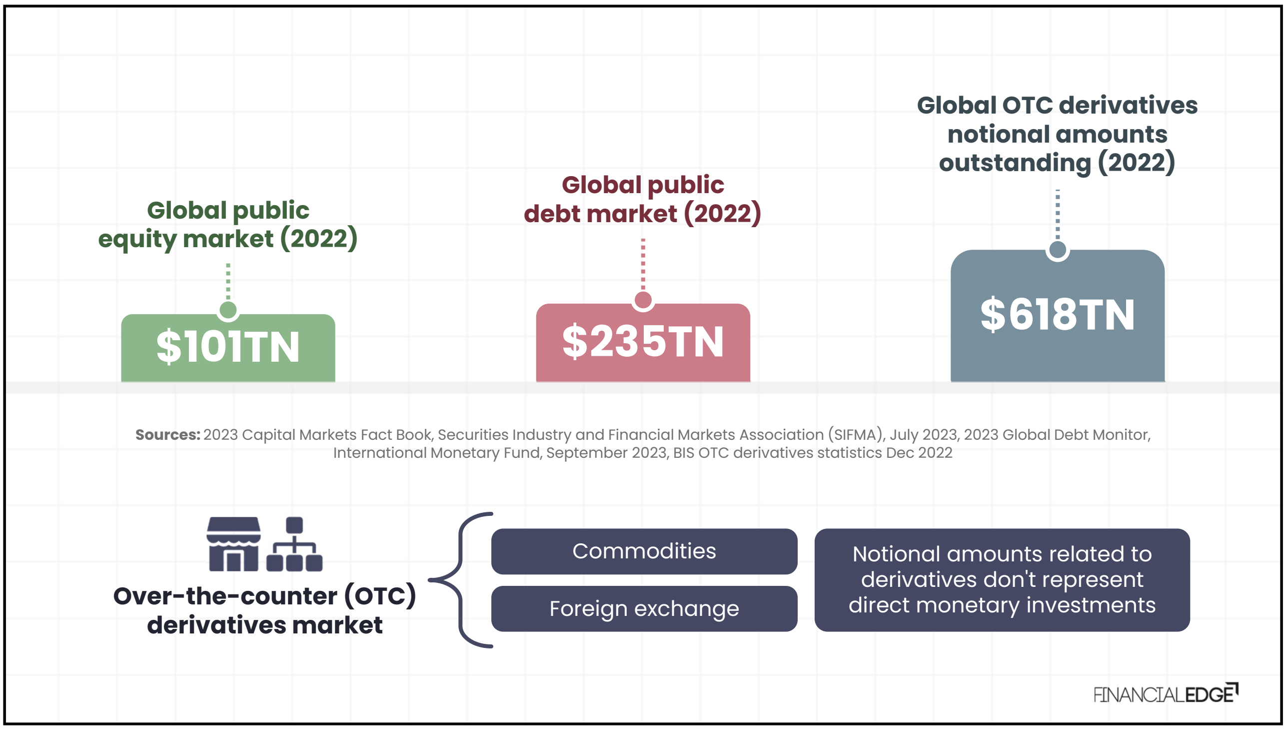

Introduction
to Derivatives
FINANCIALEDGE


What is a
Financial Derivative?
FINANCIALEDGE

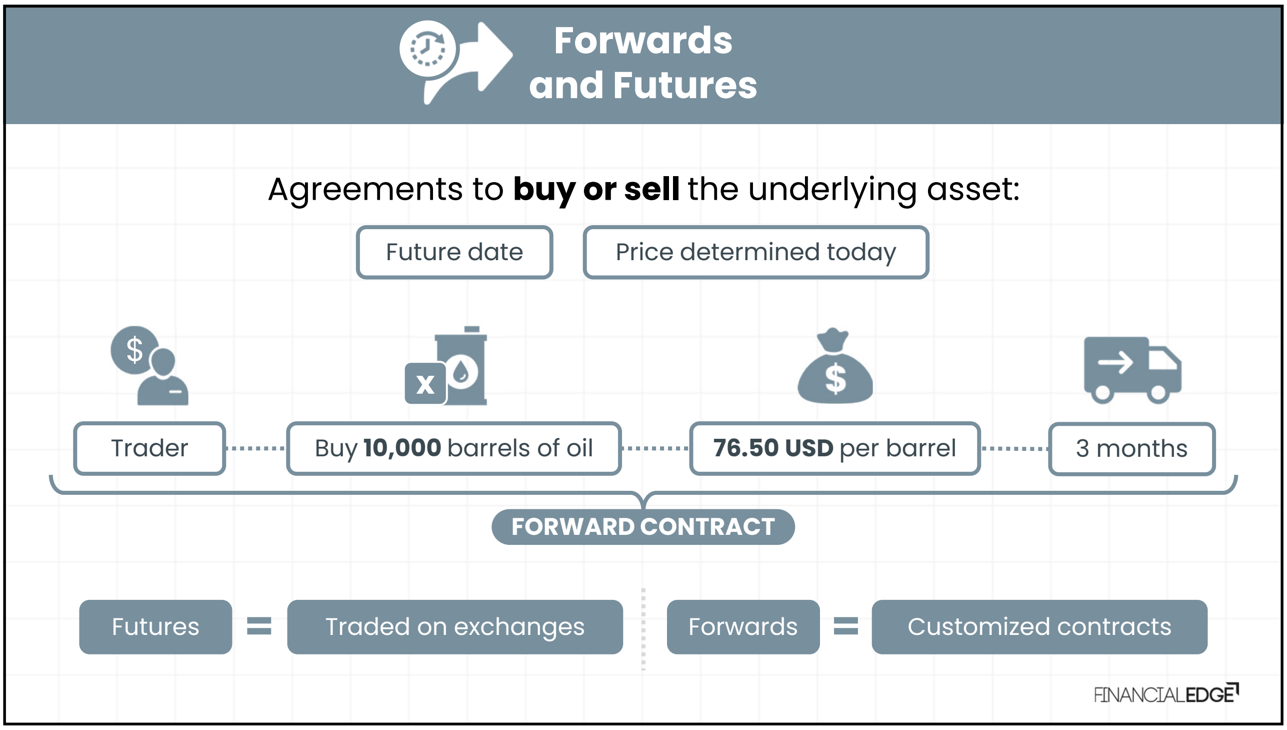

A derivative is a type of **financial agreement**
The value of the contract depends on the **price of the underlying**
Traditional asset classes:
Interest rates/ bonds
Stock
Credit
Market factors:
Currency
Commodity
Inflation
Volatility
Dividends
FINANCIALEDGE

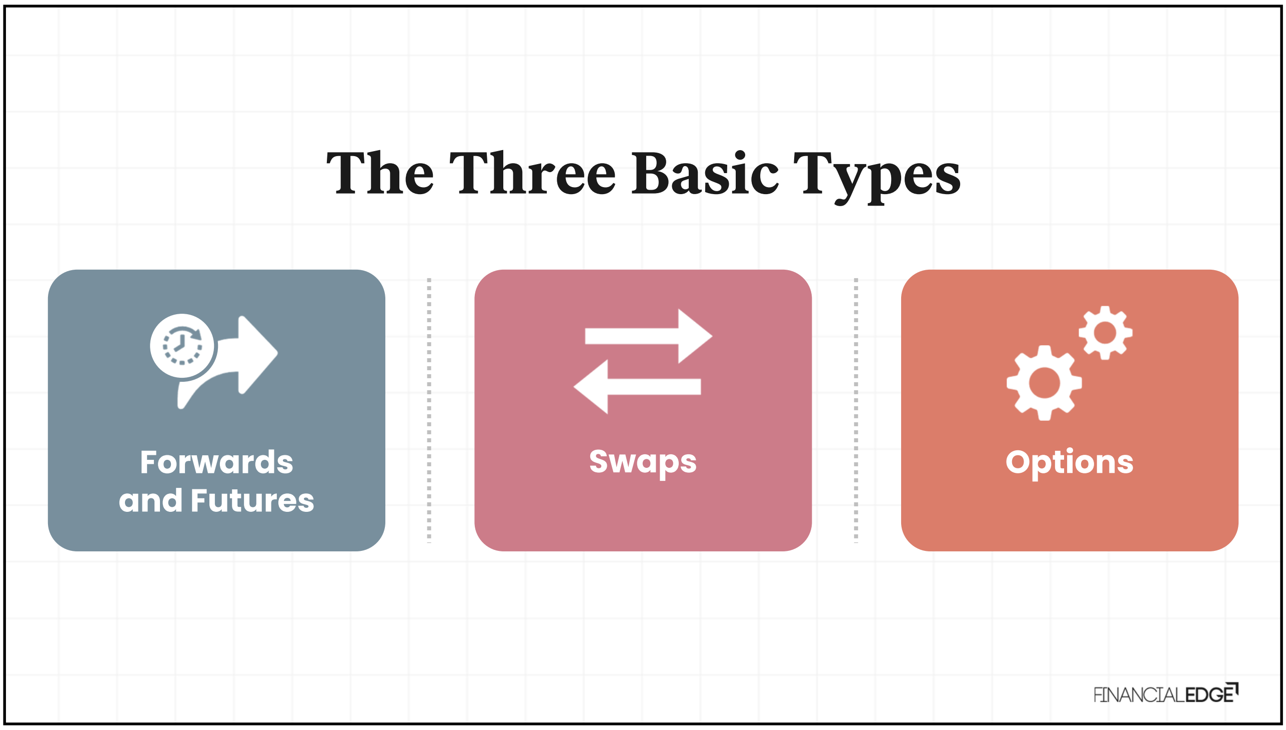

Global public equity market (2022)
$101TN
Global public debt market (2022)
$235TN
Global OTC derivatives notional amounts outstanding (2022)
$618TN
Sources: 2023 Capital Markets Fact Book, Securities Industry and Financial Markets Association (SIFMA), July 2023, 2023 Global Debt Monitor, International Monetary Fund, September 2023, BIS OTC derivatives statistics Dec 2022
Over-the-counter (OTC) derivatives market
Commodities
Foreign exchange
Notional amounts related to derivatives don't represent direct monetary investments
FINANCIALEDGE

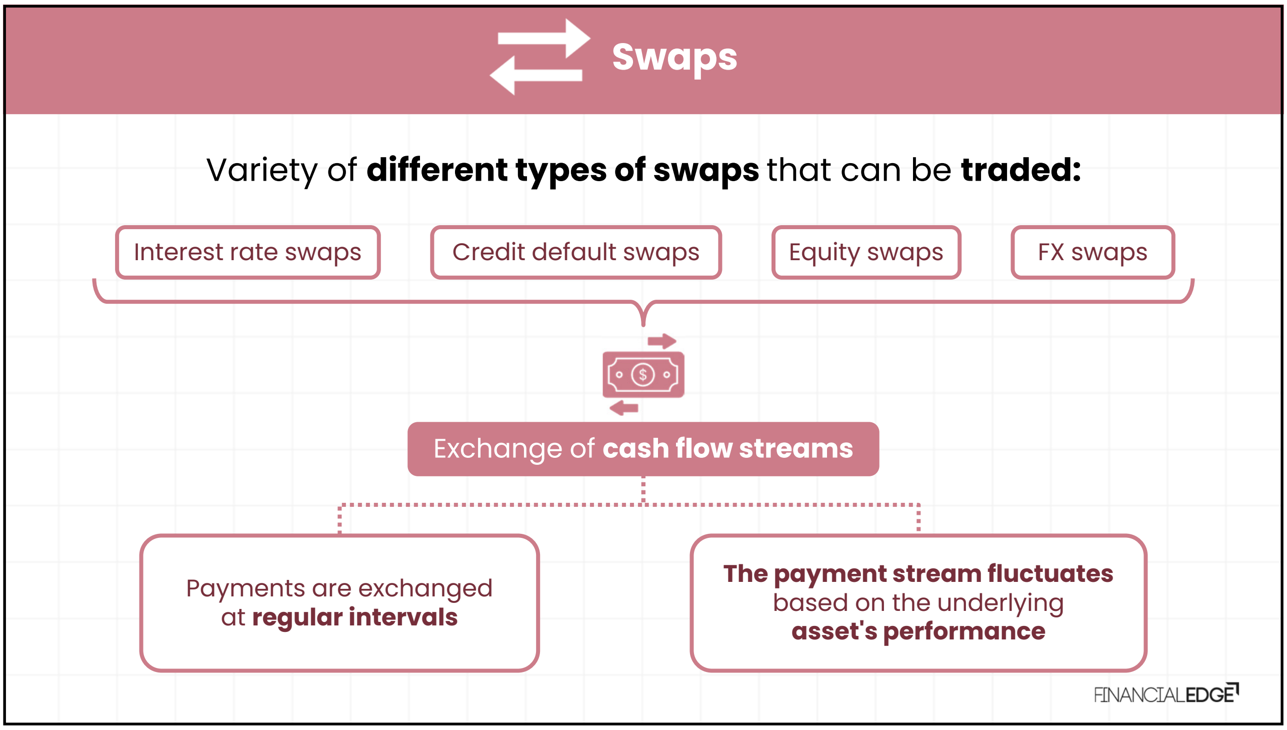
The Three Basic Types of Derivatives

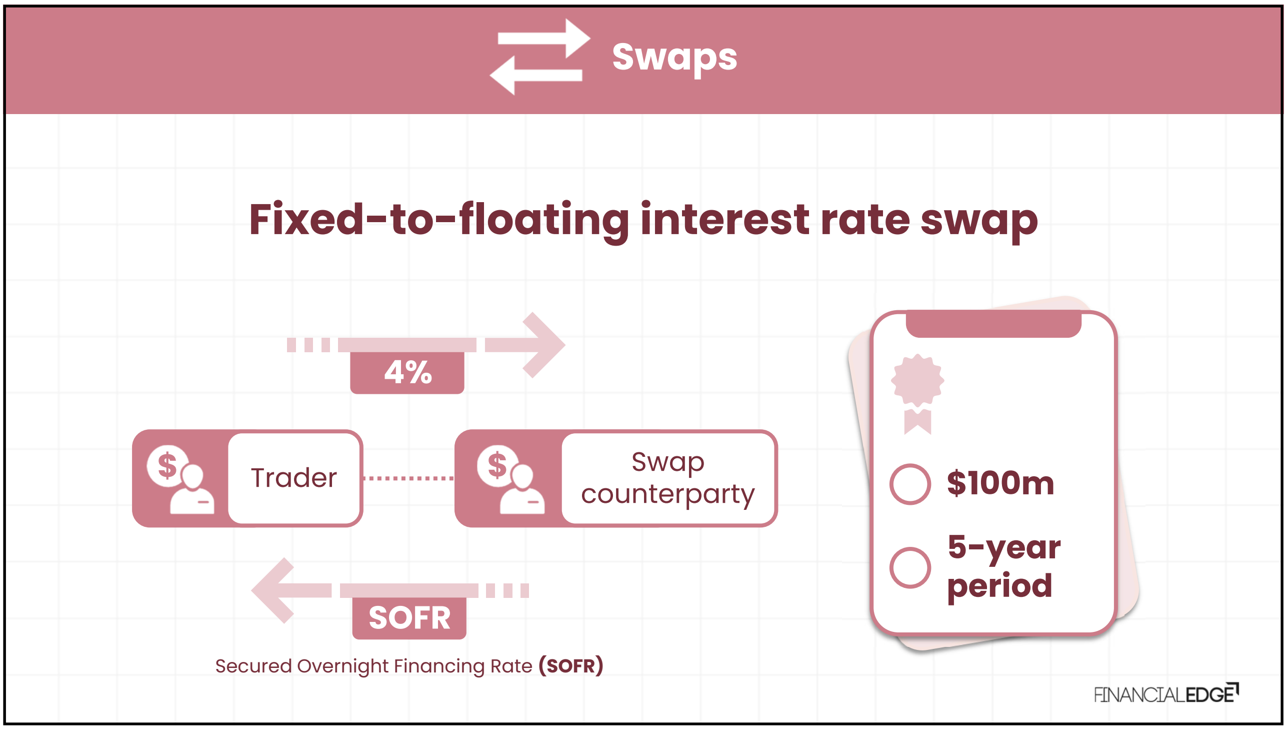
The Three Basic Types

- **Forwards and Futures**
- **Swaps**
- **Options**


Forwards
and Futures
Agreements to **buy or sell** the underlying asset:
Future date
Price determined today
Trader
Buy **10,000** barrels of oil
76.50 USD per barrel
3 months
FORWARD CONTRACT
Futures = Traded on exchanges
Forwards = Customized contracts
FINANCIALEDGE


The Three Basic Types
Forwards
and Futures
Swaps
Options
FINANCIALEDGE


Swaps
Variety of **different types of swaps** that can be **traded:**
Interest rate swaps
Credit default swaps
Equity swaps
FX swaps
Exchange of **cash flow streams**
Payments are exchanged at **regular intervals**
The payment stream fluctuates based on the underlying **asset's performance**
FINANCIALEDGE


Swaps
Fixed-to-floating interest rate swap
4%
Trader
Swap counterparty
SOFR
Secured Overnight Financing Rate **(SOFR)**
$100m
5-year period
FINANCIALEDGE

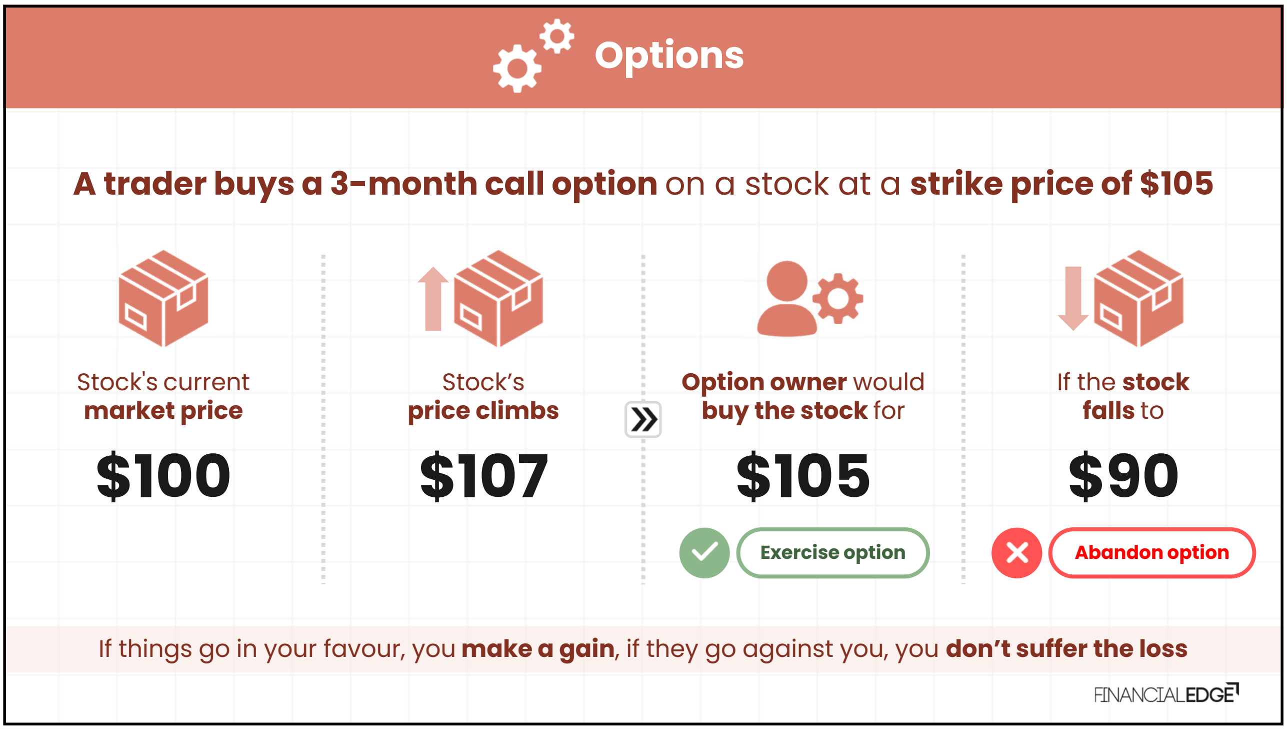
The Three Basic Types

- Forwards and Futures
- Swaps
- Options

Options

Buyer of the option → Right, but not obligation, to **buy or sell** the **asset** at a **predetermined price (strike price)** → On or before the **contract's expiration**

BUY	SELL
Option to **buy** the **underlying asset**	Option to **sell** the **underlying asset**
Call option	**Put option**


Options
A trader buys a 3-month call option on a stock at a strike price of $105
Stock's current market price
$100
Stock's price climbs
$107
Option owner would buy the stock for
$105
Exercise option
If the stock falls to
$90
Abandon option
If things go in your favour, you make a gain, if they go against you, you don't suffer the loss
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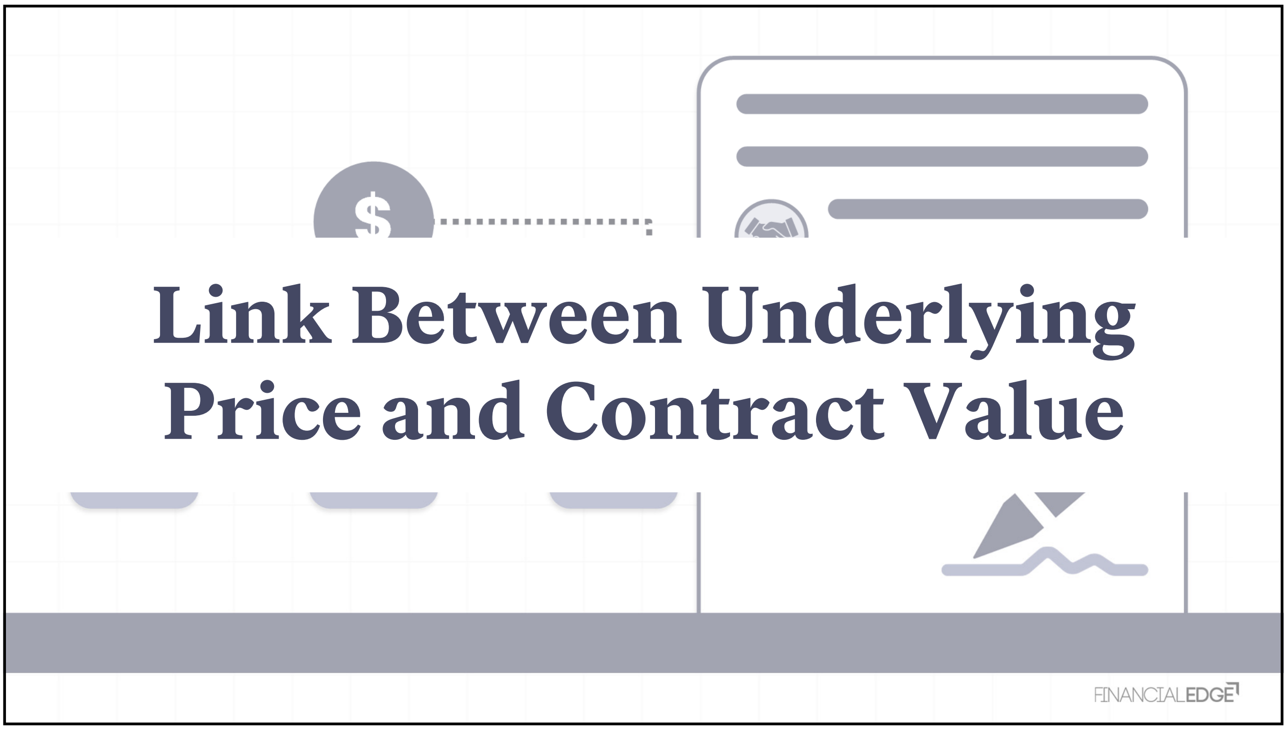
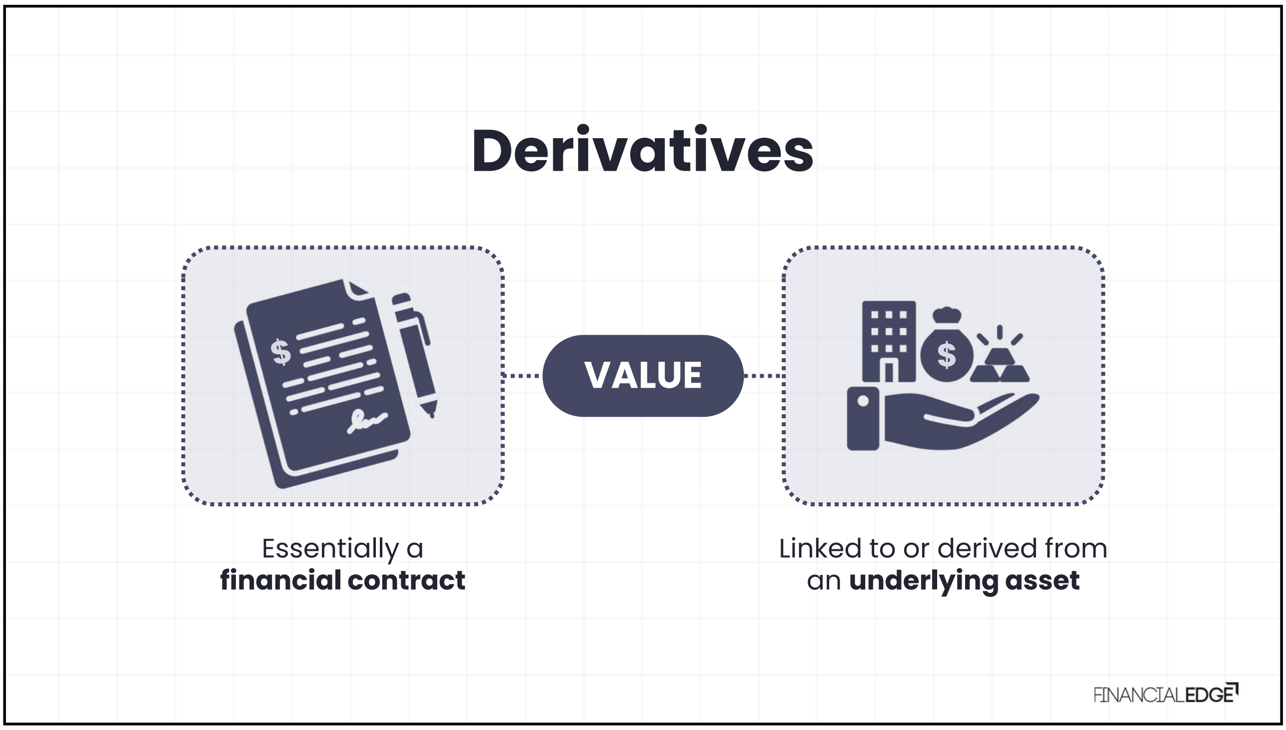
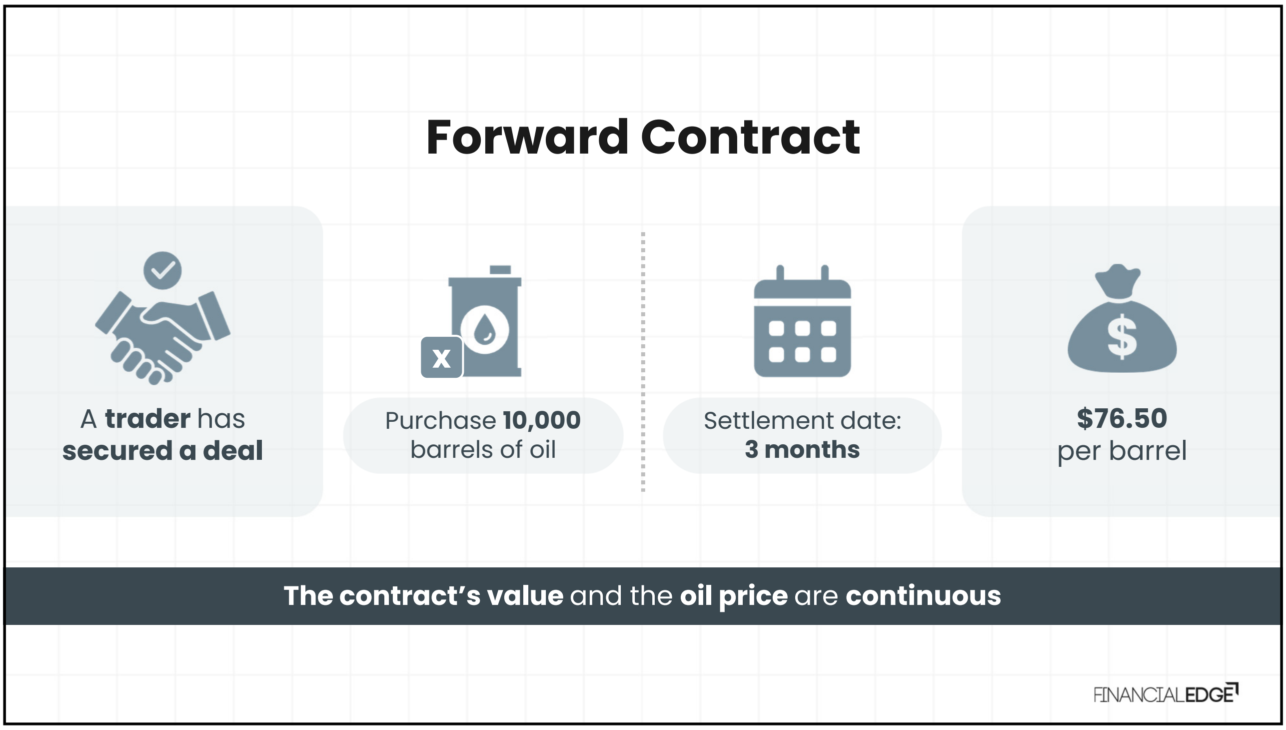
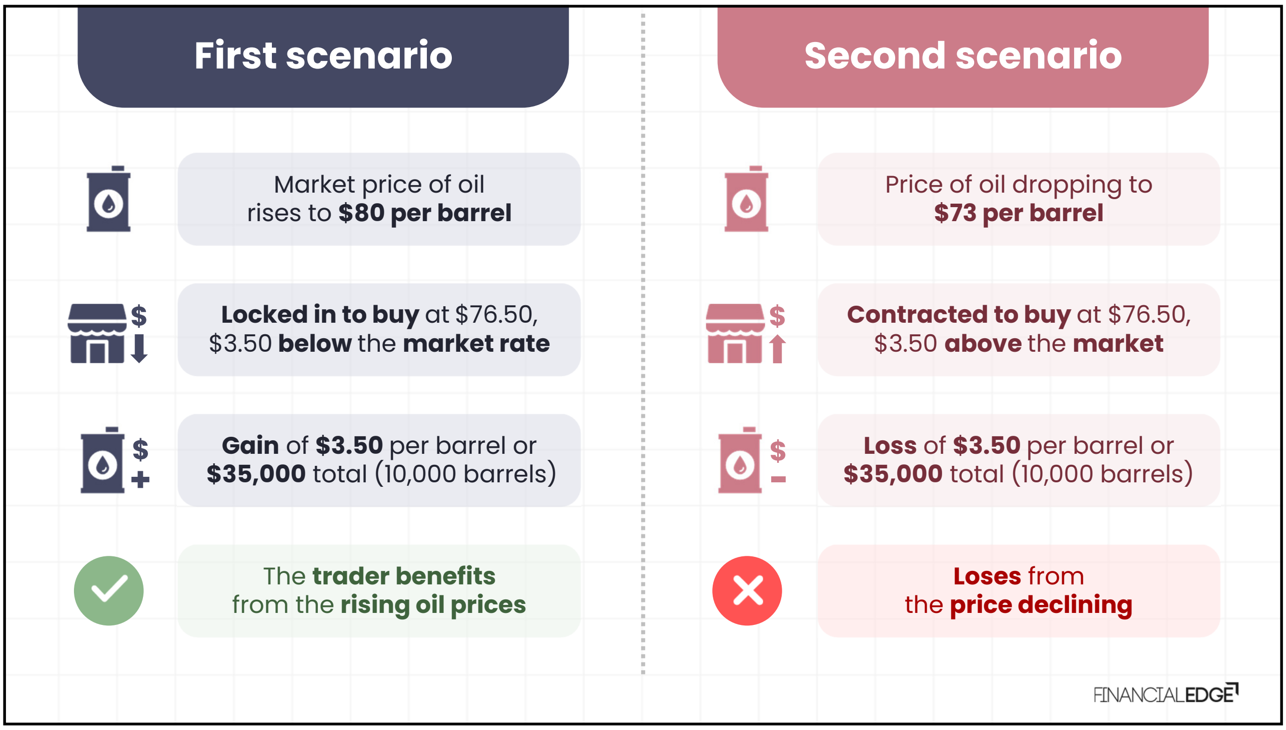
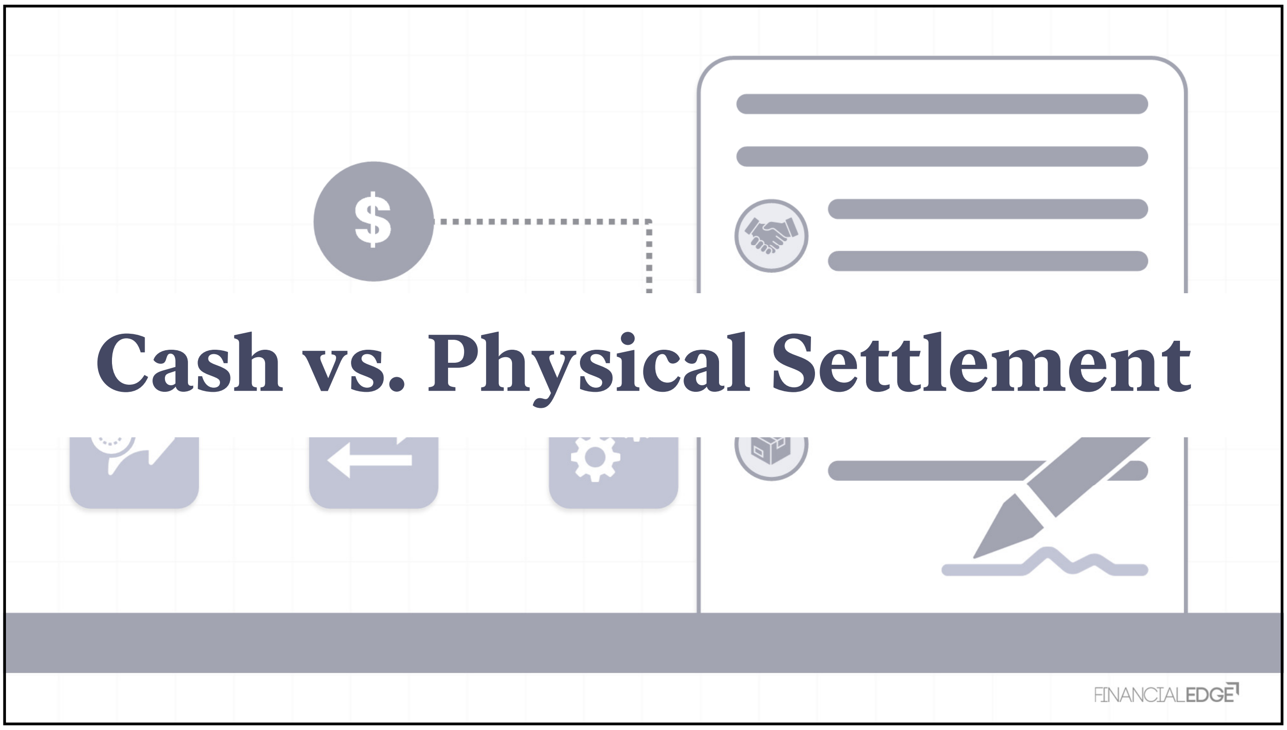
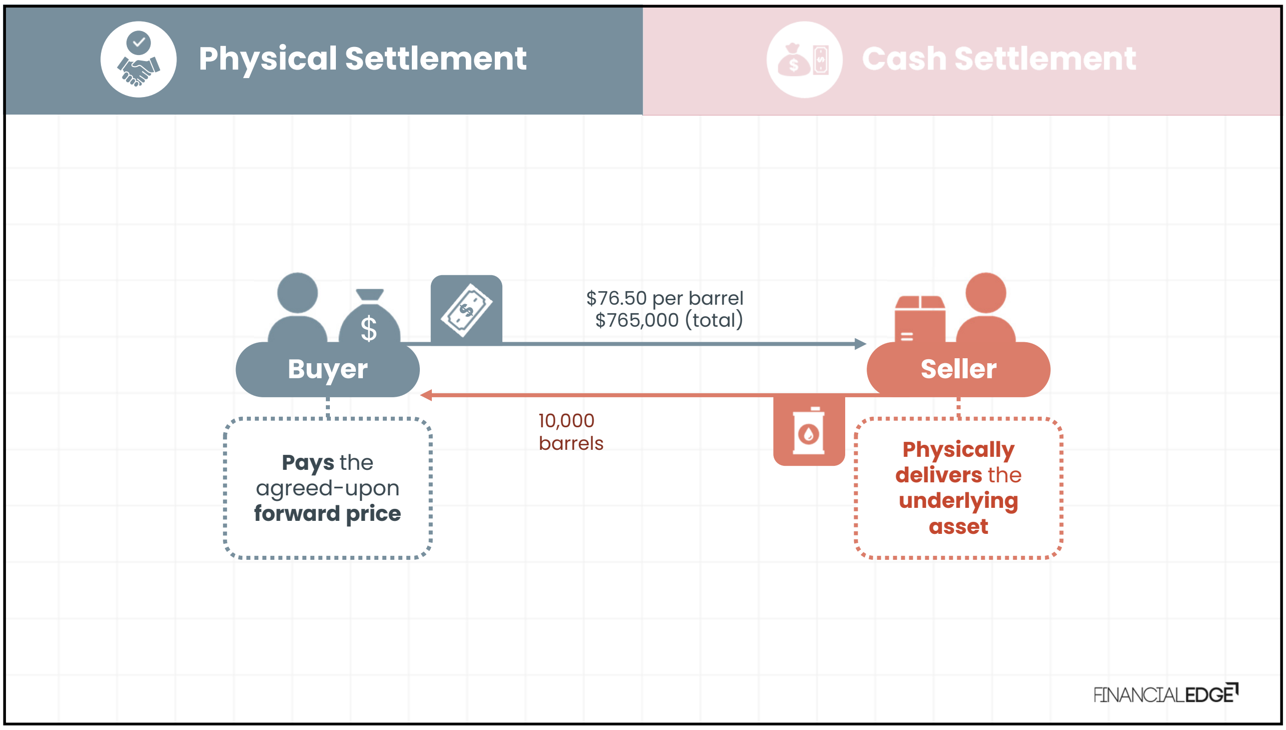

Link Between Underlying Price and Contract Value
FINANCIALEDGE

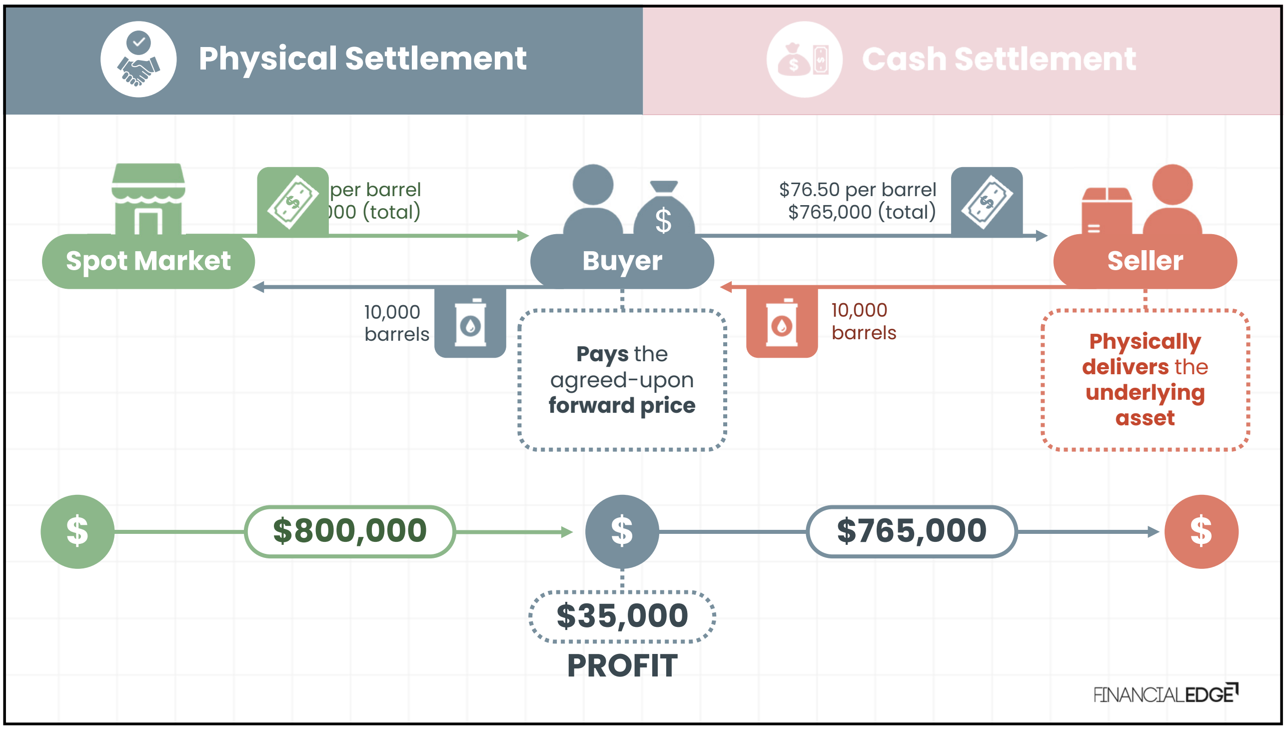

Derivatives
VALUE
Essentially a
financial contract
Linked to or derived from
an underlying asset
FINANCIALEDGE

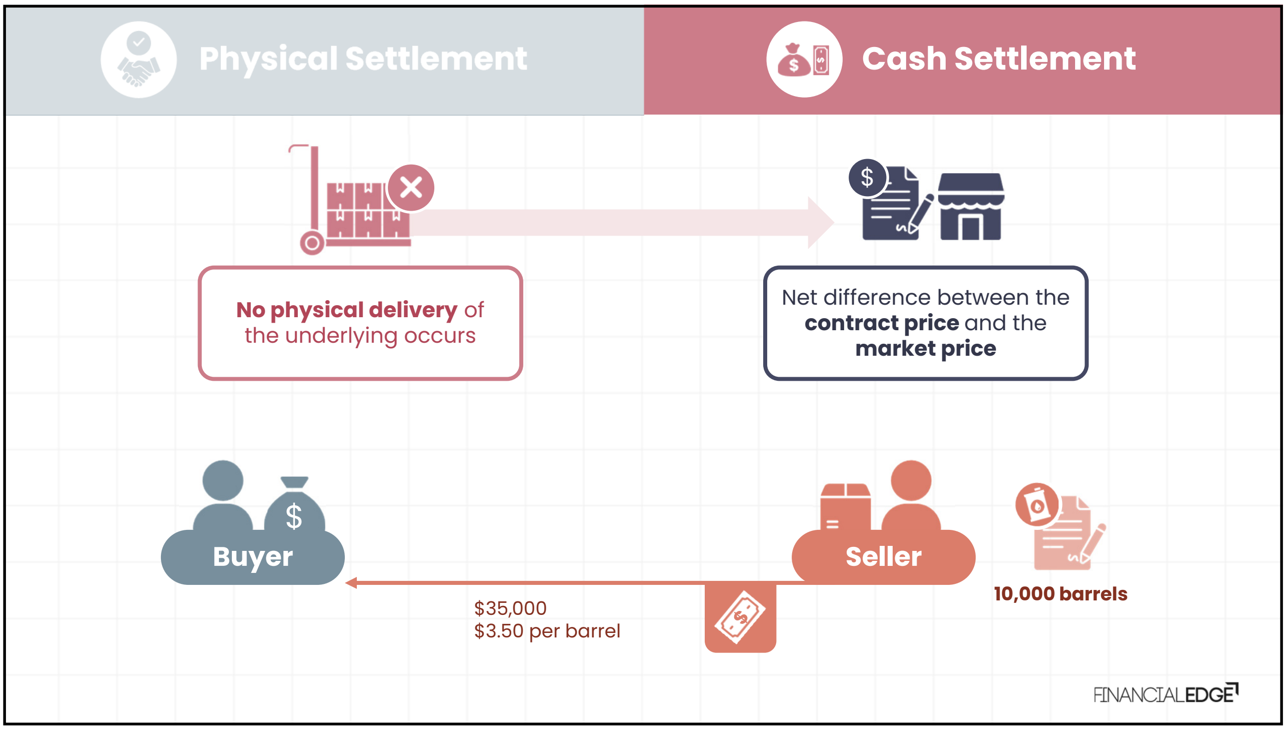

Forward Contract
A trader has
secured a deal
Purchase 10,000
barrels of oil
Settlement date:
3 months
$76.50
per barrel
The contract's value and the oil price are continuous
FINANCIALEDGE

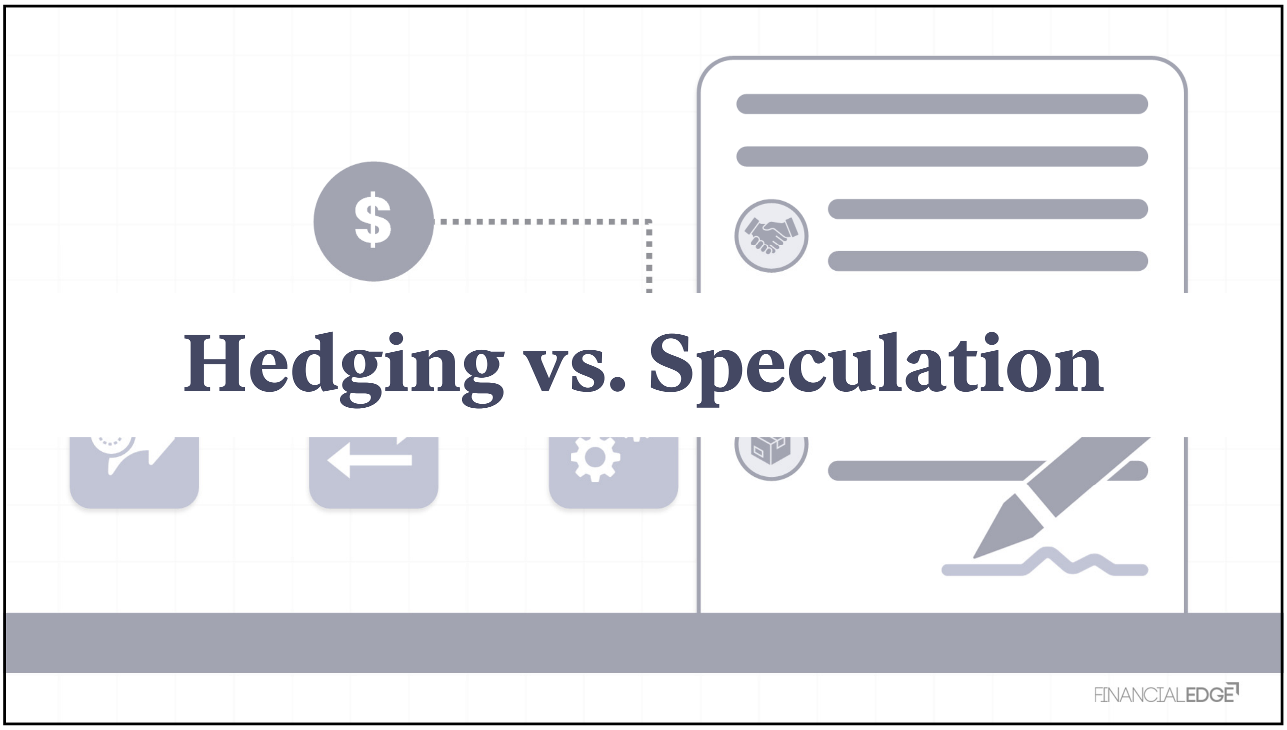

First scenario
Market price of oil rises to **$80 per barrel**
Locked in to buy at $76.50, $3.50 **below** the **market rate**
Gain of **$3.50** per barrel or **$35,000** total (10,000 barrels)
The **trader benefits** from the **rising oil prices**
Second scenario
Price of oil dropping to **$73 per barrel**
Contracted to buy at $76.50, $3.50 **above** the **market**
Loss of **$3.50** per barrel or **$35,000** total (10,000 barrels)
Loses from the **price declining**
FINANCIALEDGE


Cash vs. Physical Settlement
FINANCIALEDGE

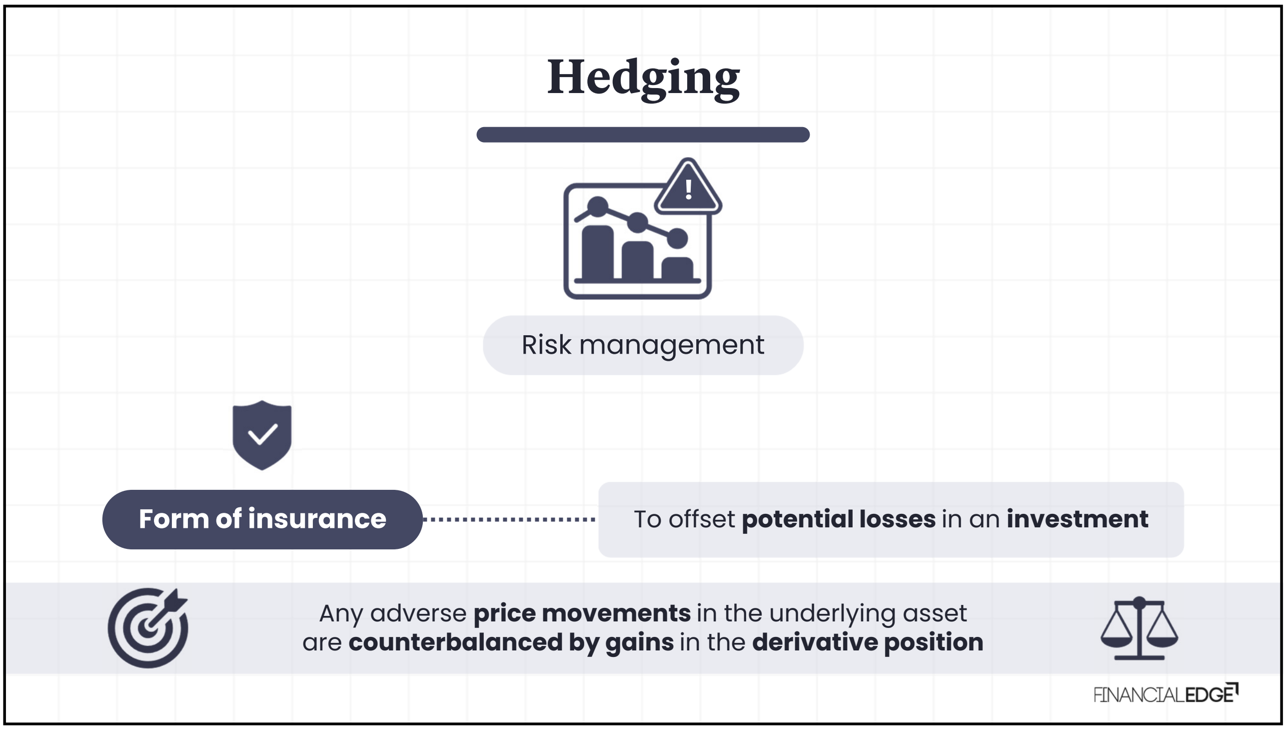

Physical Settlement
Cash Settlement
$76.50 per barrel
$765,000 (total)
Buyer
Seller
10,000
barrels
Pays the agreed-upon forward price
Physically delivers the underlying asset
FINANCIALEDGE

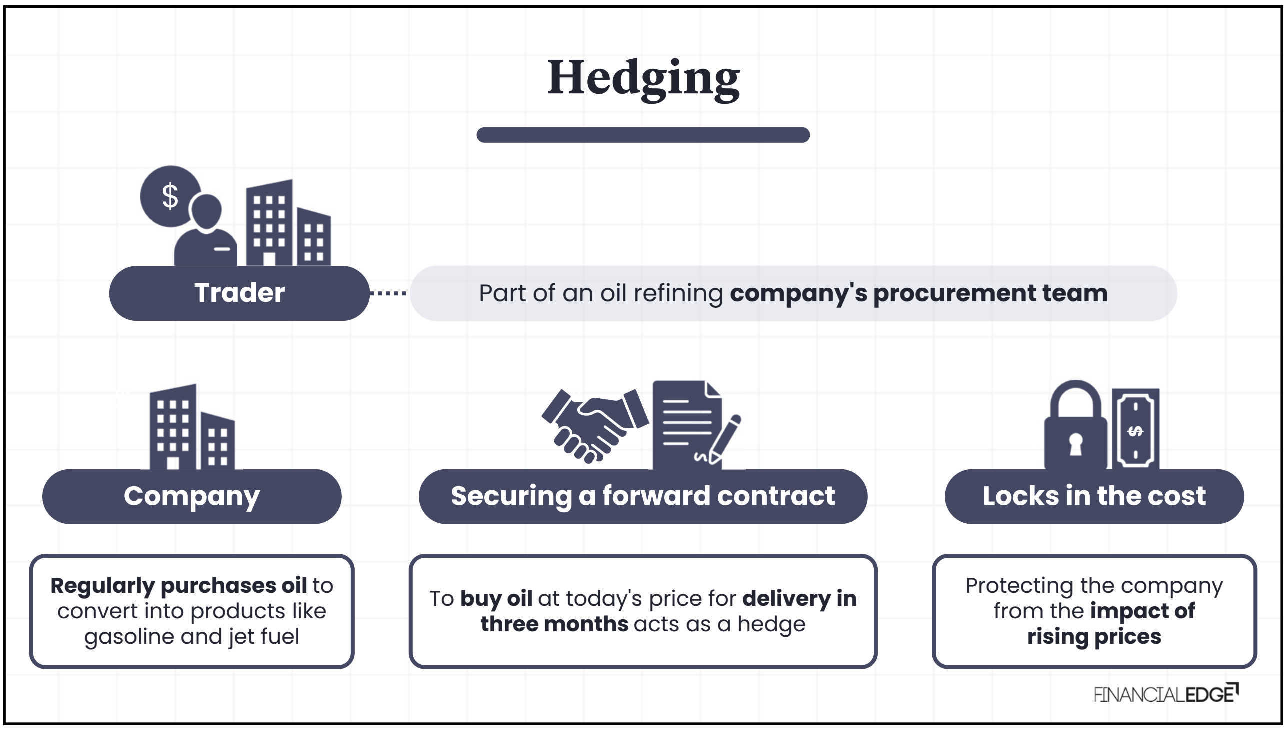

Physical Settlement
Cash Settlement
per barrel
)00 (total)
Spot Market
Buyer
$76.50 per barrel
$765,000 (total)
Seller
10,000
barrels
10,000
barrels
Pays the agreed-upon forward price
Physically delivers the underlying asset
$
$800,000
$
$765,000
$
$35,000
PROFIT
FINANCIALEDGE


Physical Settlement
Cash Settlement
No physical delivery of the underlying occurs
Net difference between the contract price and the market price
Buyer
Seller
10,000 barrels
$35,000
$3.50 per barrel
FINANCIALEDGE

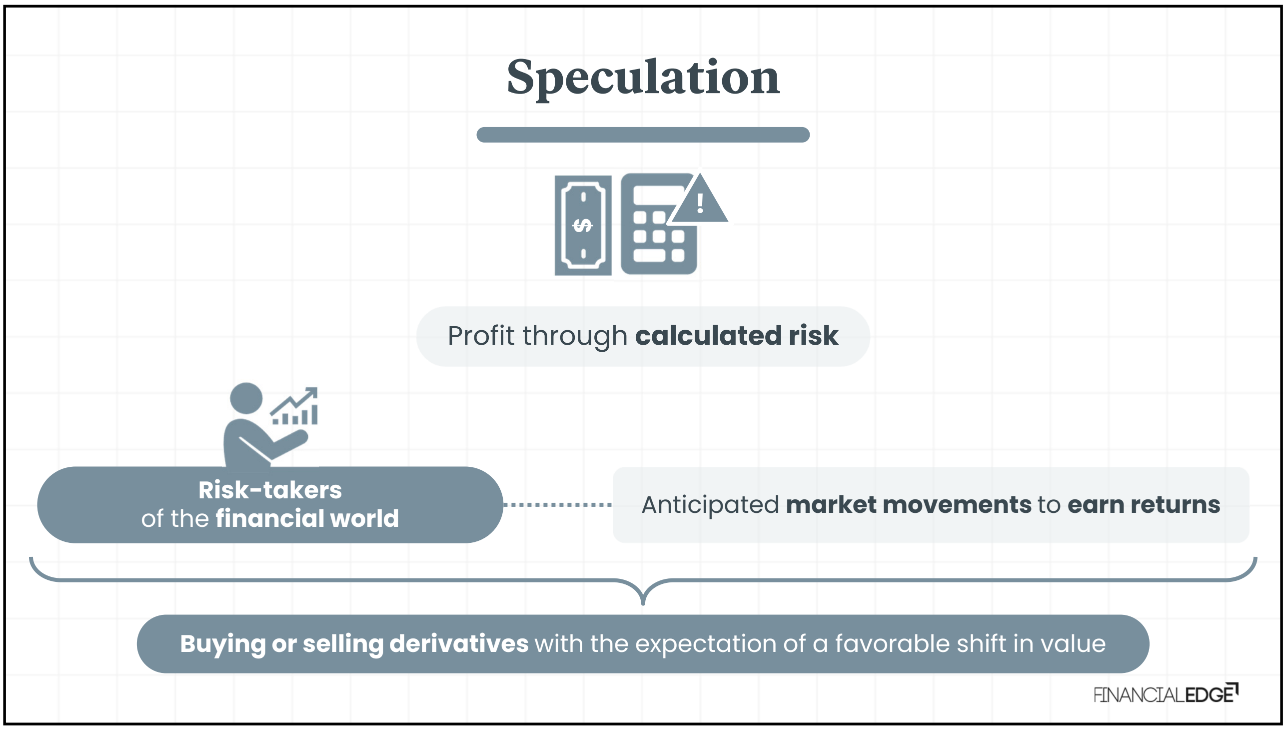

Hedging vs. Speculation
FINANCIALEDGE

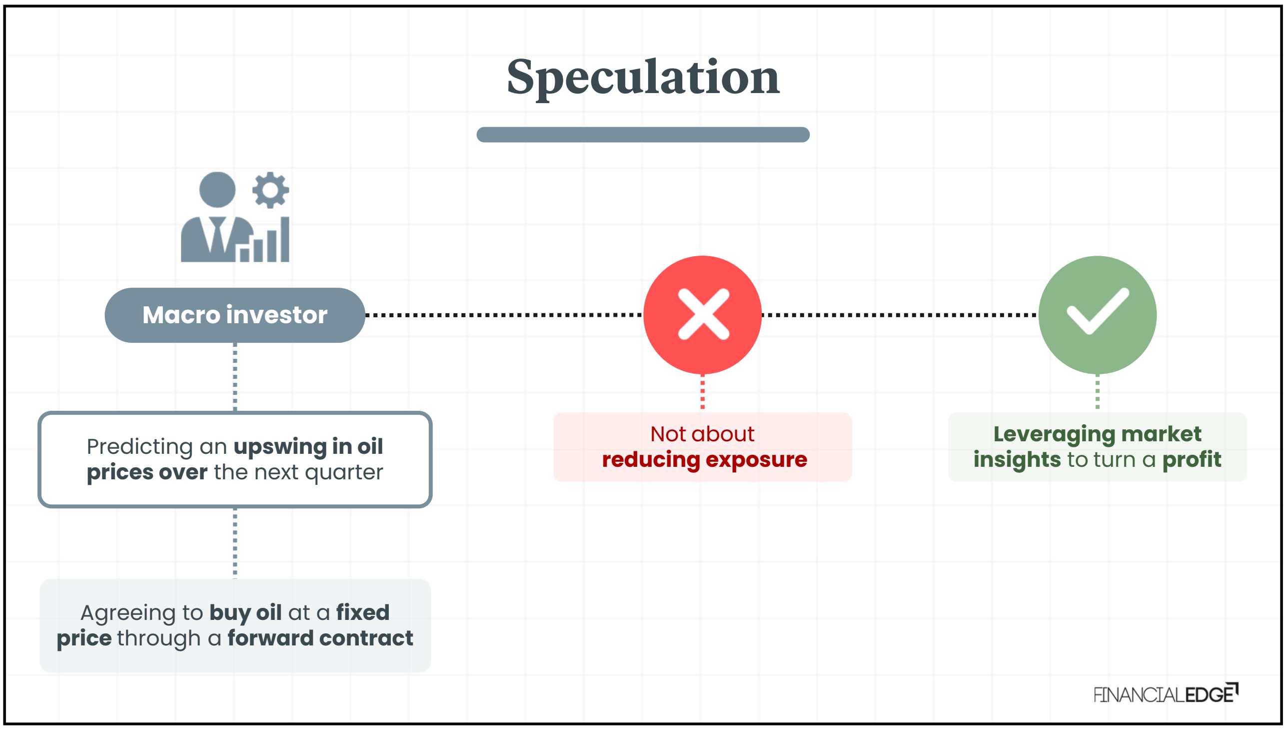

Speculation
Hedging

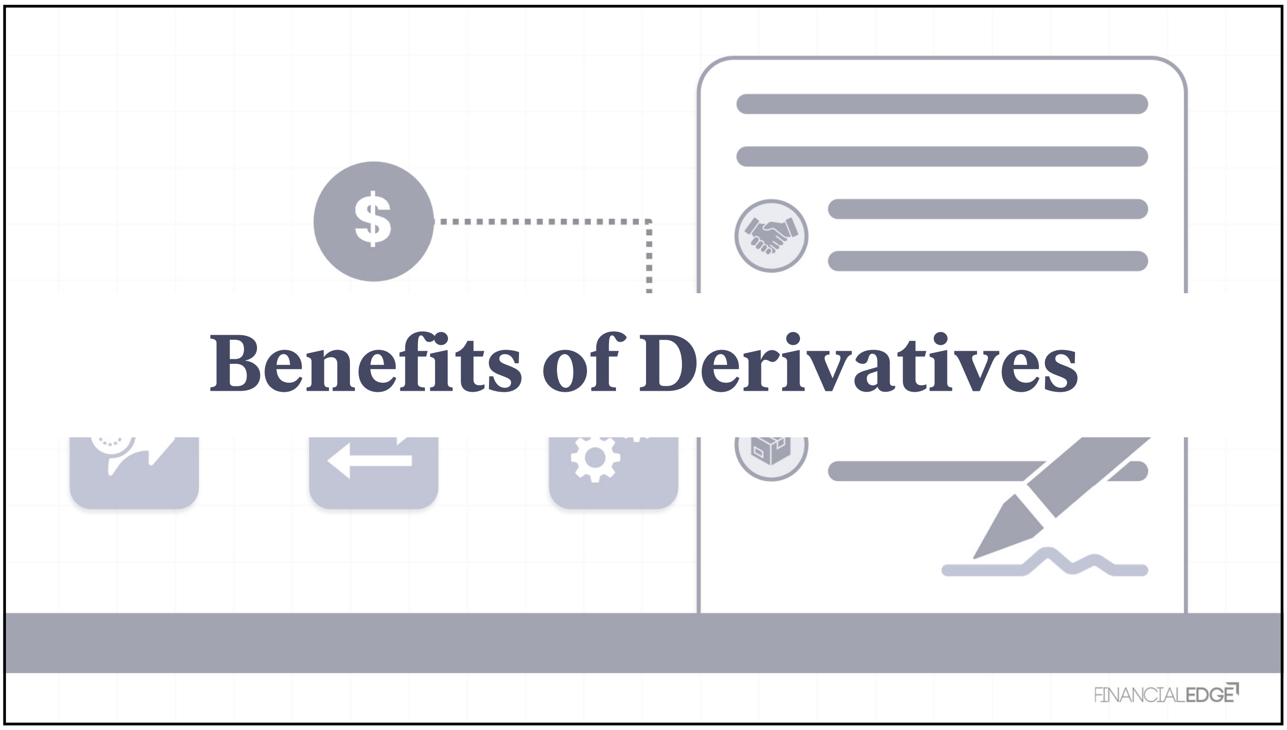

Hedging
Risk management
Form of insurance
To offset **potential losses** in an **investment**
Any adverse **price movements** in the underlying asset
are **counterbalanced by gains** in the **derivative position**

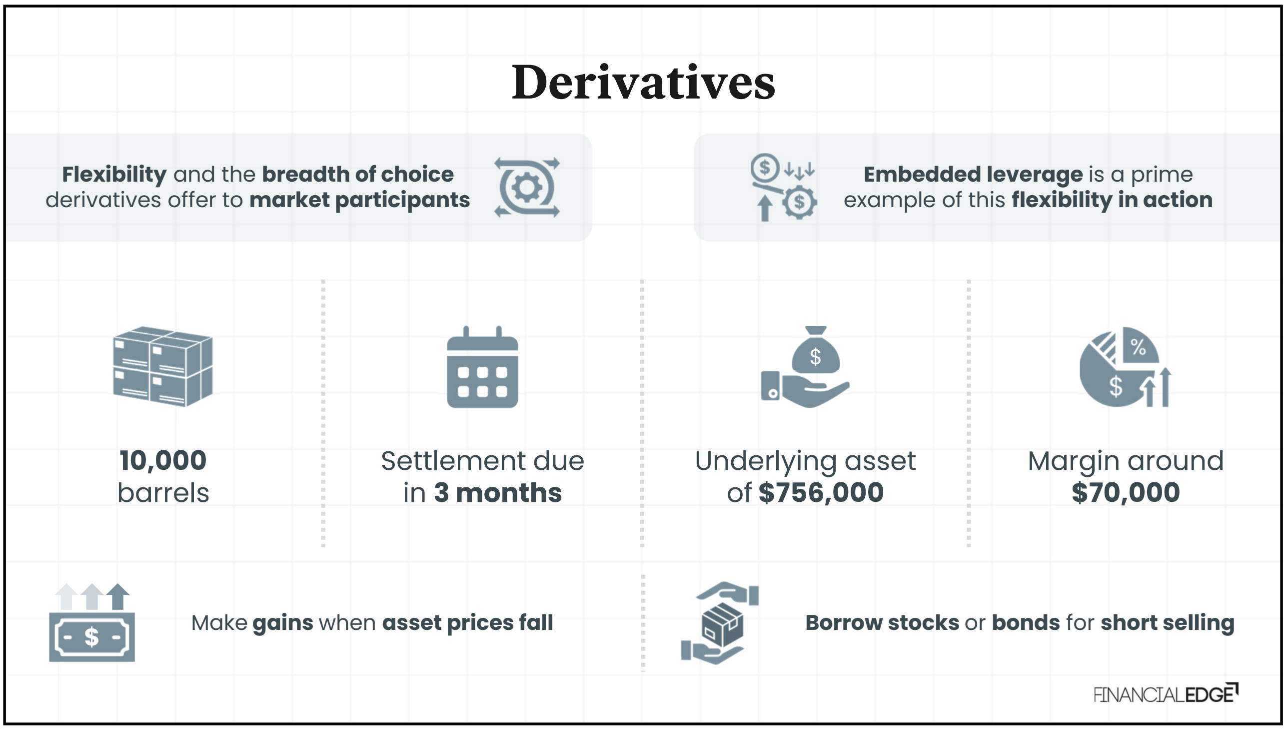

Hedging
Trader
Part of an oil refining company's procurement team
Company
Securing a forward contract
Locks in the cost
Regularly purchases oil to convert into products like gasoline and jet fuel
To buy oil at today's price for delivery in three months acts as a hedge
Protecting the company from the impact of rising prices
FINANCIALEDGE

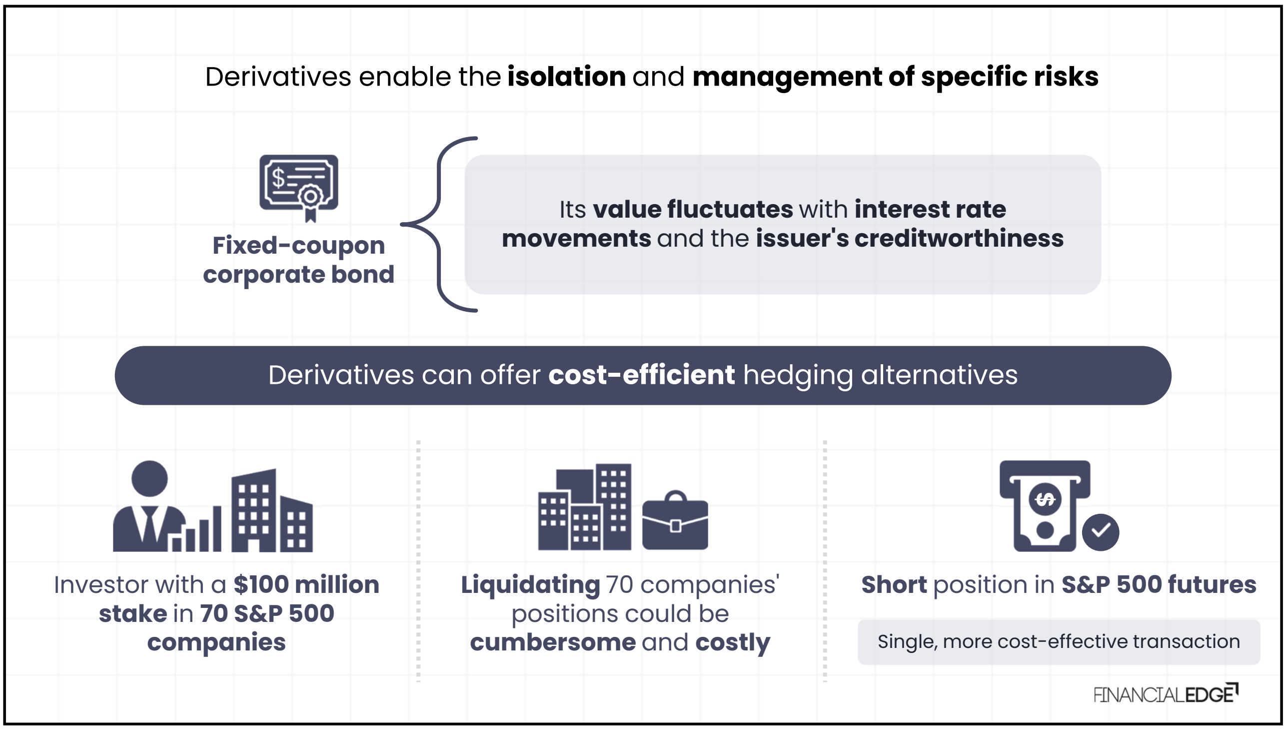

Speculation
Hedging
FINANCIALEDGE

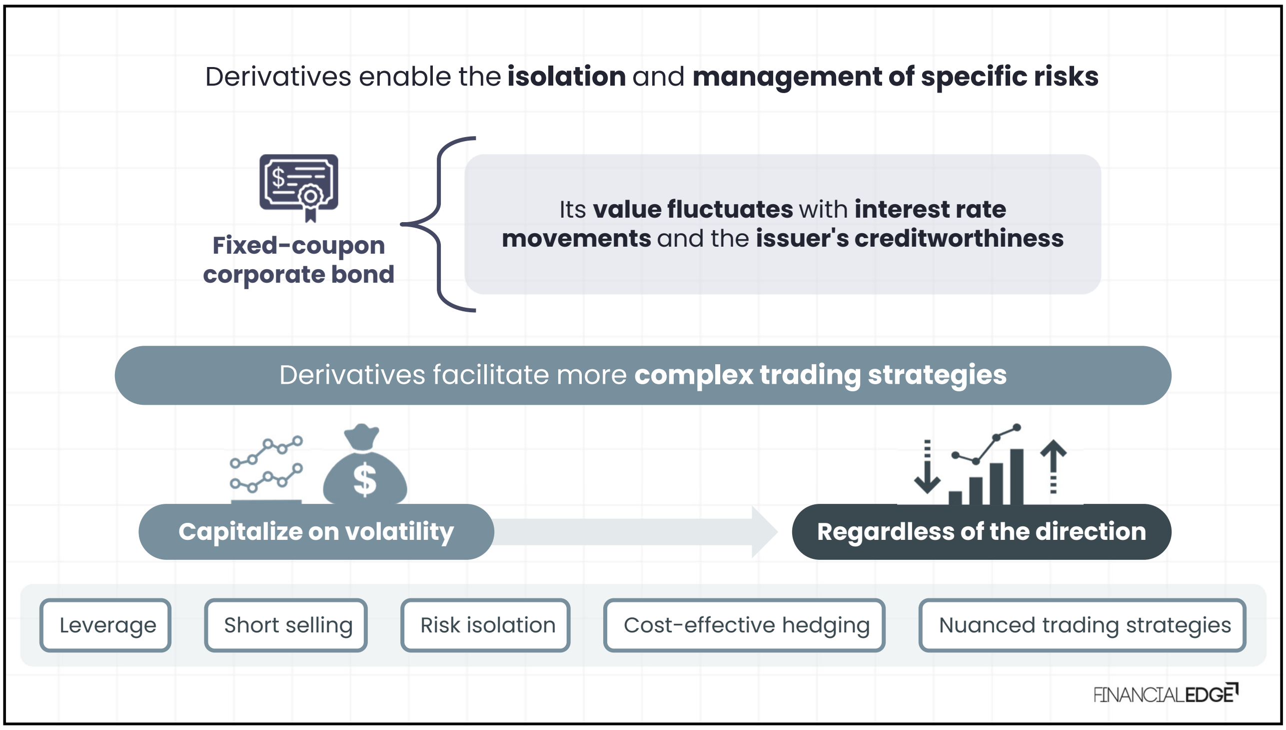

Speculation
Profit through calculated risk
Risk-takers
of the financial world
Anticipated market movements to earn returns
Buying or selling derivatives with the expectation of a favorable shift in value
FINANCIALEDGE


Speculation
Macro investor
Predicting an upswing in oil prices over the next quarter
Agreeing to buy oil at a fixed price through a forward contract
Not about
reducing exposure
Leveraging market insights to turn a profit
FINANCIALEDGE


Benefits of Derivatives
FINANCIALEDGE


Derivatives
Flexibility and the **breadth of choice** derivatives offer to **market participants**
Embedded leverage is a prime example of this **flexibility in action**
10,000 barrels
Settlement due in **3 months**
Underlying asset of **$756,000**
Margin around **$70,000**
Make **gains** when **asset prices fall**
Borrow stocks or **bonds** for **short selling**
FINANCIALEDGE


Derivatives enable the **isolation** and **management of specific risks**
Fixed-coupon corporate bond
Its **value fluctuates** with **interest rate movements** and the **issuer's creditworthiness**
Derivatives can offer **cost-efficient** hedging alternatives
Investor with a **$100 million stake** in **70 S&P 500 companies**
Liquidating 70 companies' positions could be **cumbersome** and **costly**
Short position in **S&P 500 futures**
Single, more cost-effective transaction
FINANCIALEDGE


Derivatives enable the **isolation** and **management of specific risks**
Fixed-coupon corporate bond
Its **value fluctuates** with **interest rate movements** and the **issuer's creditworthiness**
Derivatives facilitate more **complex trading strategies**
Capitalize on volatility
Regardless of the direction
Leverage
Short selling
Risk isolation
Cost-effective hedging
Nuanced trading strategies
FINANCIALEDGE

Forward Definition

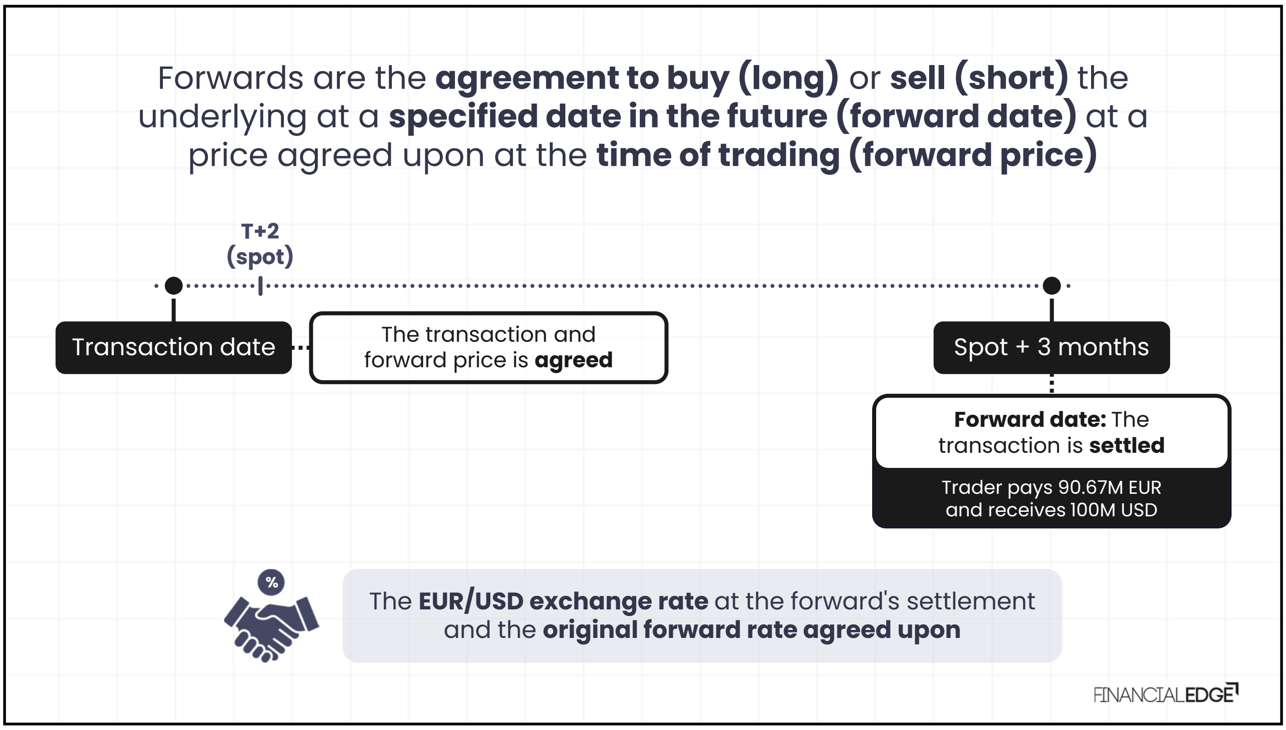
Forwards are the **agreement to buy (long)** or **sell (short)** the underlying at a **specified date in the future (forward date)** at a price agreed upon at the **time of trading (forward price)**

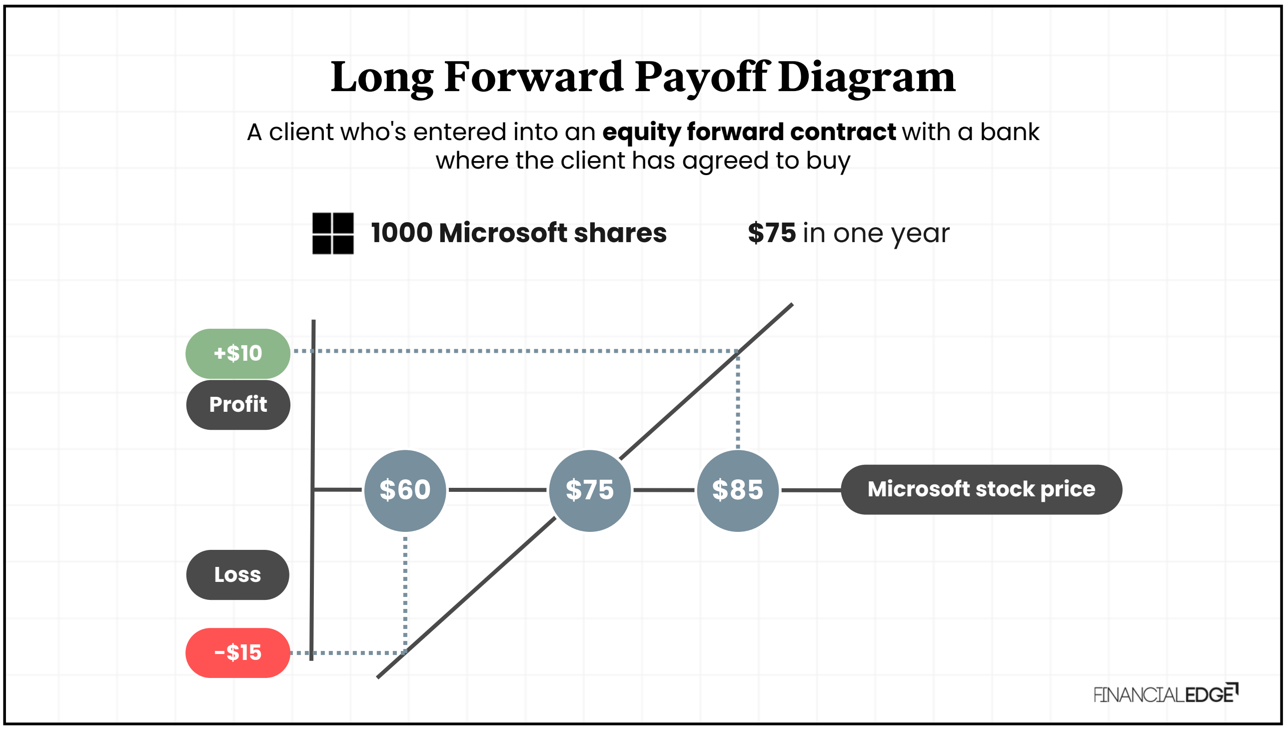
Foreign exchange market

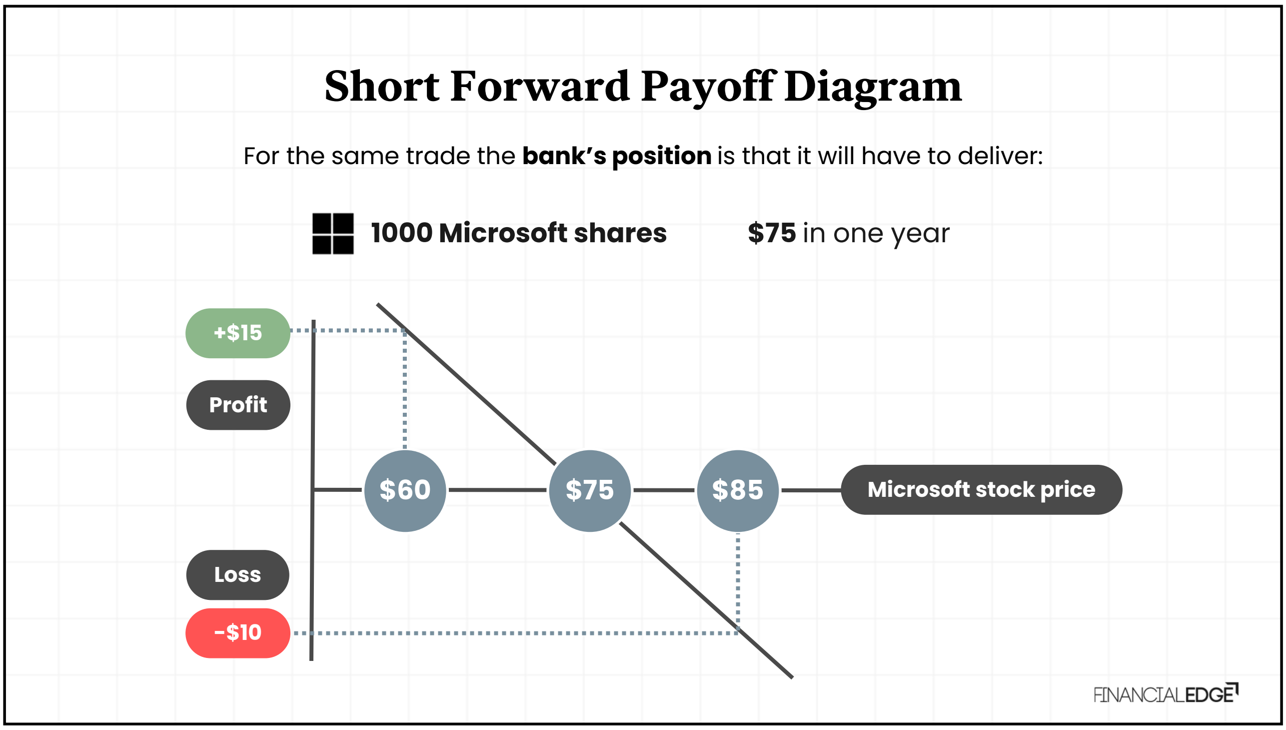
A trader agrees to buy **100M USD against EUR**

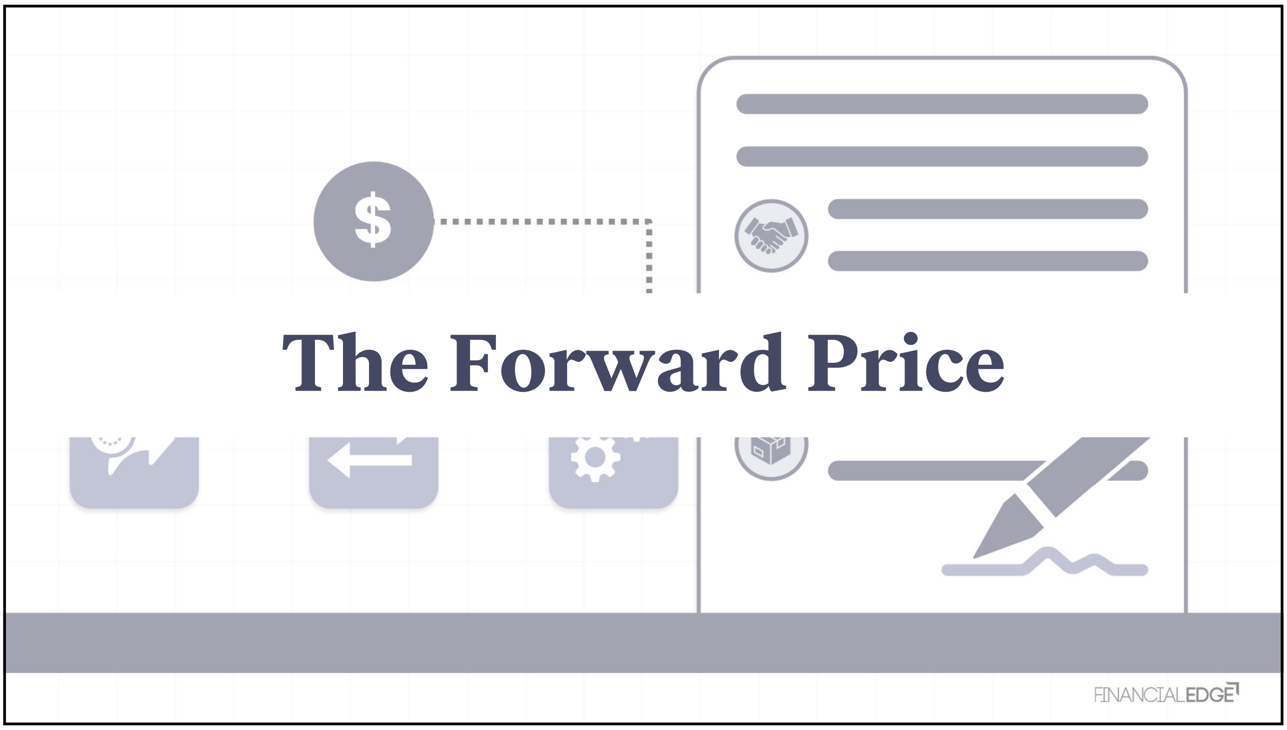
Agreed upon **price of 1.1029**

Settlement in **3 months**


Forwards are the agreement to buy (long) or sell (short) the underlying at a specified date in the future (forward date) at a price agreed upon at the time of trading (forward price)
T+2
(spot)
Transaction date
The transaction and forward price is agreed
Spot + 3 months
Forward date: The transaction is settled
Trader pays 90.67M EUR and receives 100M USD
%
The EUR/USD exchange rate at the forward's settlement and the original forward rate agreed upon
FINANCIALEDGE


Long Forward Payoff Diagram
A client who's entered into an equity forward contract with a bank where the client has agreed to buy
1000 Microsoft shares
$75 in one year
+$10
Profit
$60
$75
$85
Microsoft stock price
Loss
-$15
FINANCIALEDGE


Short Forward Payoff Diagram
For the same trade the **bank's position** is that it will have to deliver:
1000 Microsoft shares
$75 in one year
+$15
Profit
$60
$75
$85
Microsoft stock price
Loss
-$10
FINANCIALEDGE


$
The Forward Price
FINANCIALEDGE

Market maker tasked with setting a **12-month forward price** for an asset

What would be the **fair forward price?**

Spot price of the **asset:**	100
Analyst 12 months **price target:**	107
Your **own expectation** for the price of the **asset** in 12 months:	109
Client expectation for the price of the **asset** in 12 months:	115
12 months **interest rate**:	5%

The **asset** pays no **dividends**

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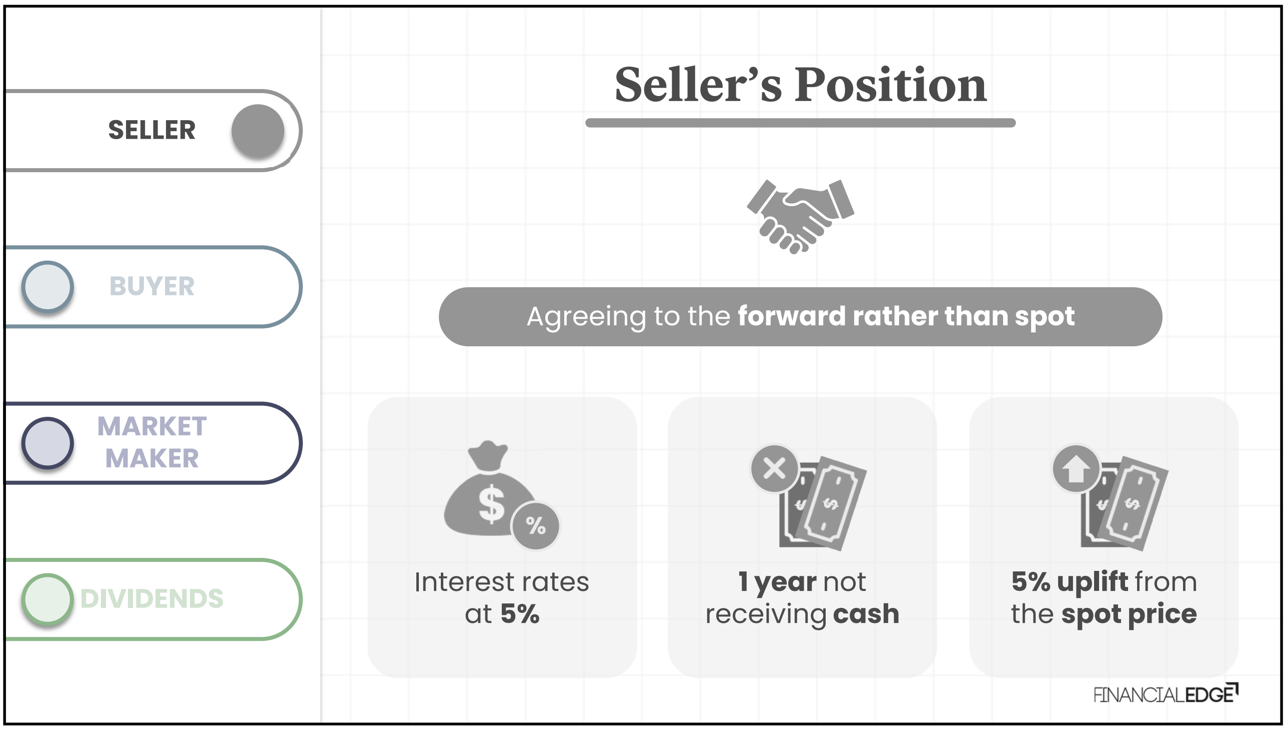
SELLER

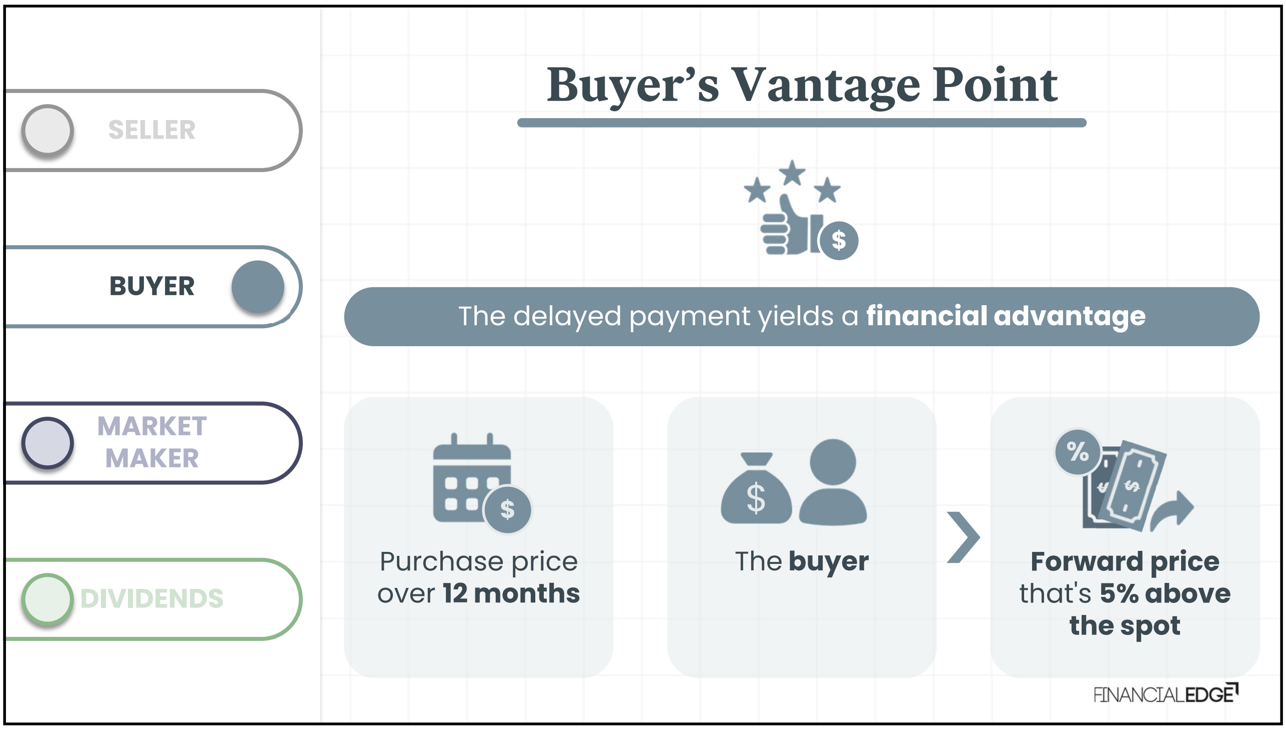
BUYER

MARKET MAKER

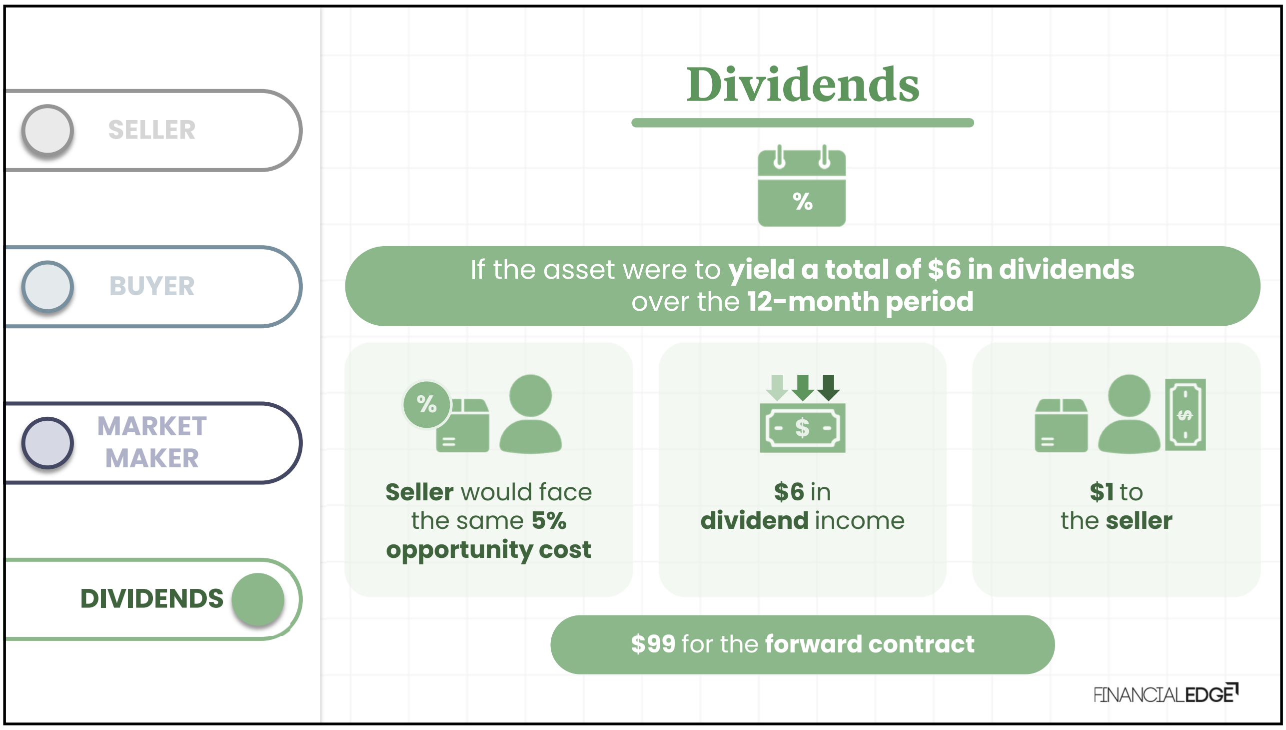
DIVIDENDS

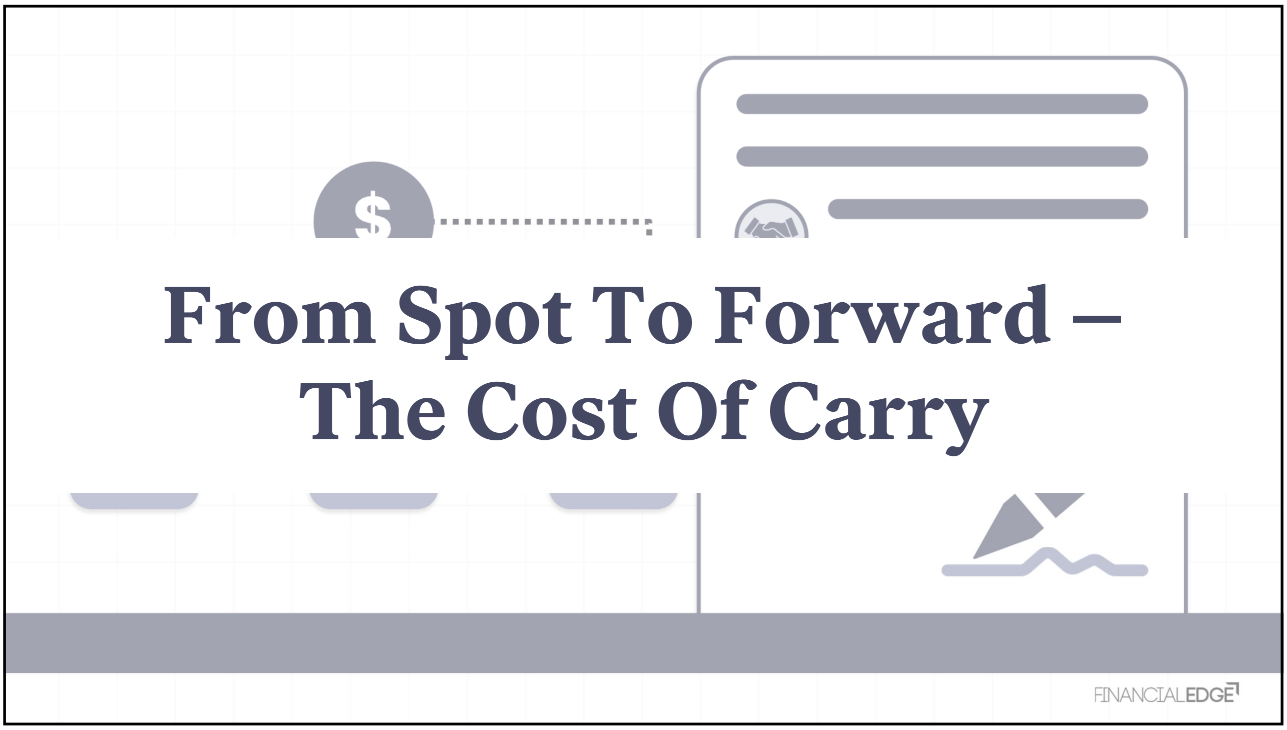
FINANCIALEDGE

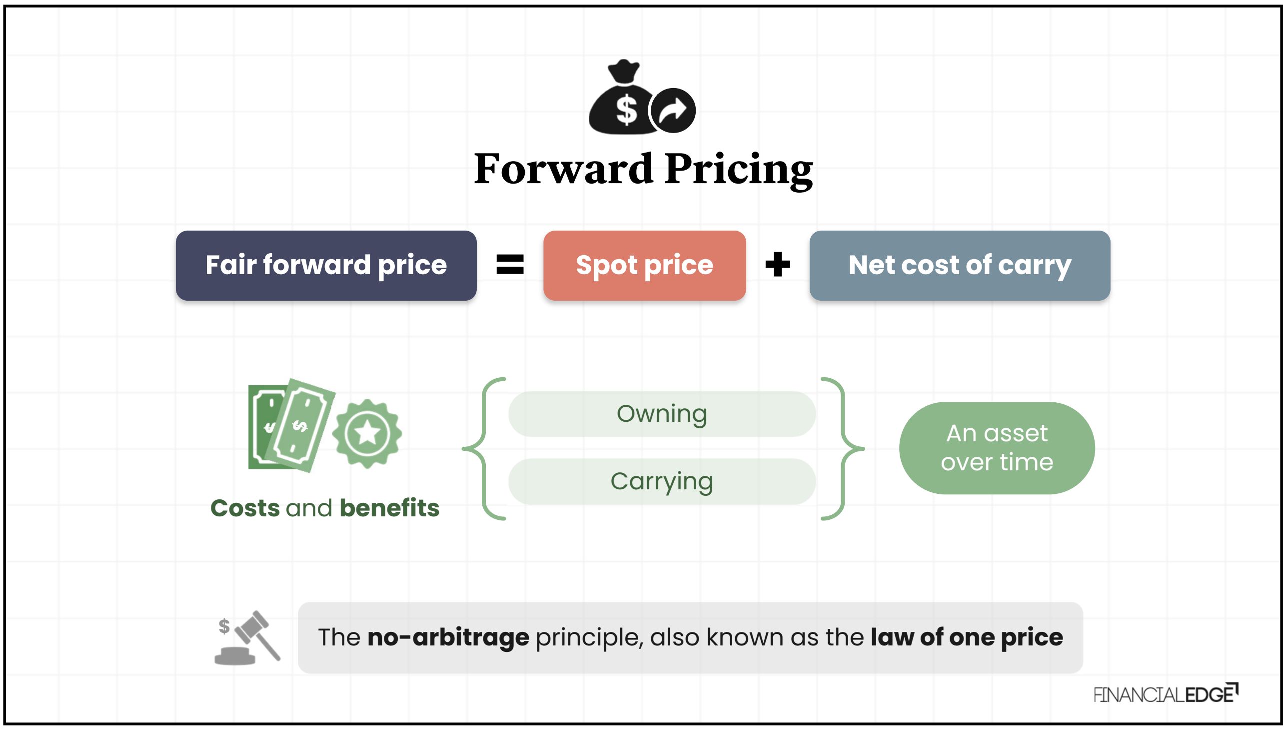

SELLER
BUYER
MARKET MAKER
DIVIDENDS
Seller's Position
Agreeing to the **forward rather than spot**
Interest rates at **5%**
1 year not receiving **cash**
5% uplift from the **spot price**
FINANCIALEDGE


SELLER
BUYER
MARKET MAKER
DIVIDENDS
Buyer's Vantage Point
The delayed payment yields a **financial advantage**
Purchase price over **12 months**
The **buyer**
Forward price that's **5% above the spot**
FINANCIALEDGE

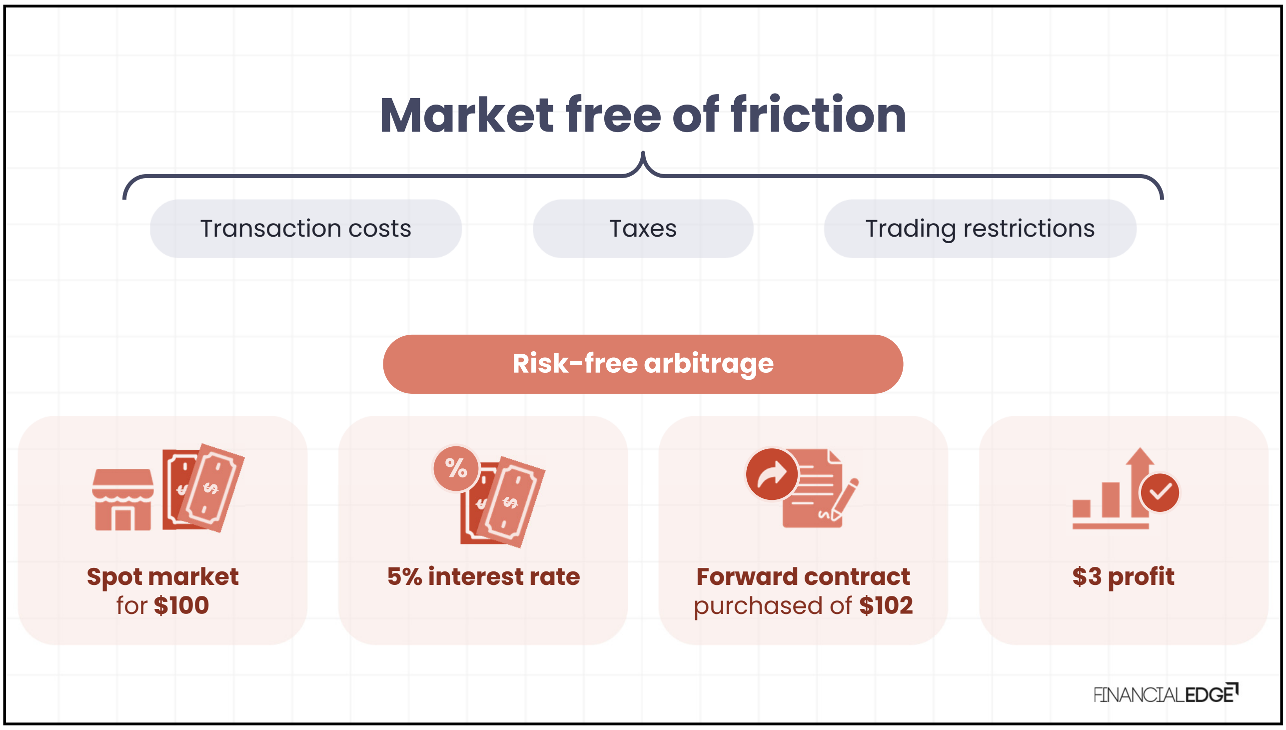

SELLER
BUYER
MARKET MAKER
DIVIDENDS
Market Maker's Shoes
Agreeing to deliver the underlying asset in the future
Lock in the cost but requires capital
Trader to agree to this trade
100 purchase price and the 5% interest on the loan
Fair forward price of 105 dollars
FINANCIALEDGE


SELLER
BUYER
MARKET MAKER
DIVIDENDS
Dividends
%
If the asset were to yield a total of $6 in dividends over the 12-month period
Seller would face the same 5% opportunity cost
$6 in dividend income
$1 to the seller
$99 for the forward contract
FINANCIALEDGE


From Spot To Forward –
The Cost Of Carry
FINANCIALEDGE


Forward Pricing
Fair forward price
=
Spot price
+
Net cost of carry
Costs and benefits
Owning
Carrying
An asset over time
The no-arbitrage principle, also known as the law of one price
FINANCIALEDGE


Market free of friction
Transaction costs
Taxes
Trading restrictions
Fair forward price to be $105
Market quotes it at $102
Buy the forward at this undervalued rate
Asset's future price fluctuations
FINANCIALEDGE


Market free of friction
Transaction costs
Taxes
Trading restrictions
Risk-free arbitrage
Spot market for $100
5% interest rate
Forward contract purchased of $102
$3 profit
FINANCIALEDGE

This principle is universally applicable **across all asset classes**, but the specific components of the **cost of carry differ:**

Underlying	Price increasing components	Price decreasing components
Equity	Funding costs	Dividend
Bond	Funding costs	Accrued interest (coupon)
Currency	Funding costs (currency sold)	Investment rate (currency bought)
Commodities	Funding cost, storage costs, insurance, transportation, etc.	None

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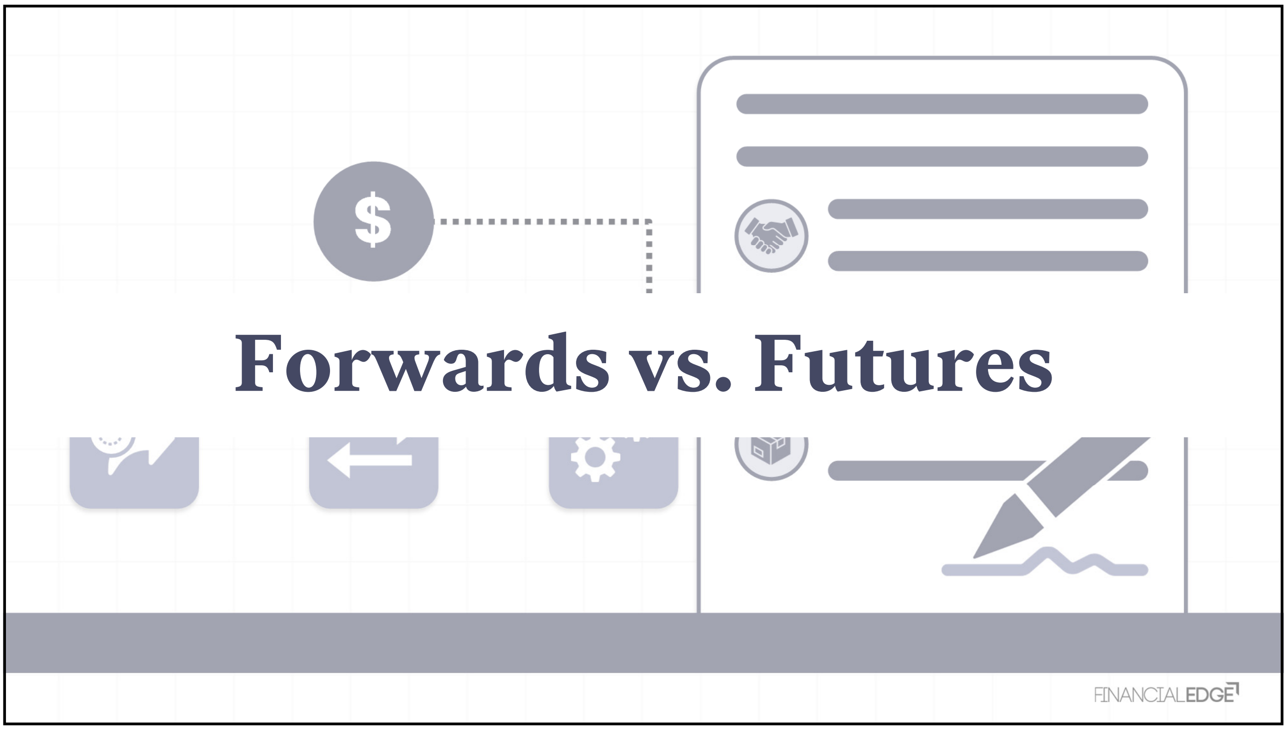
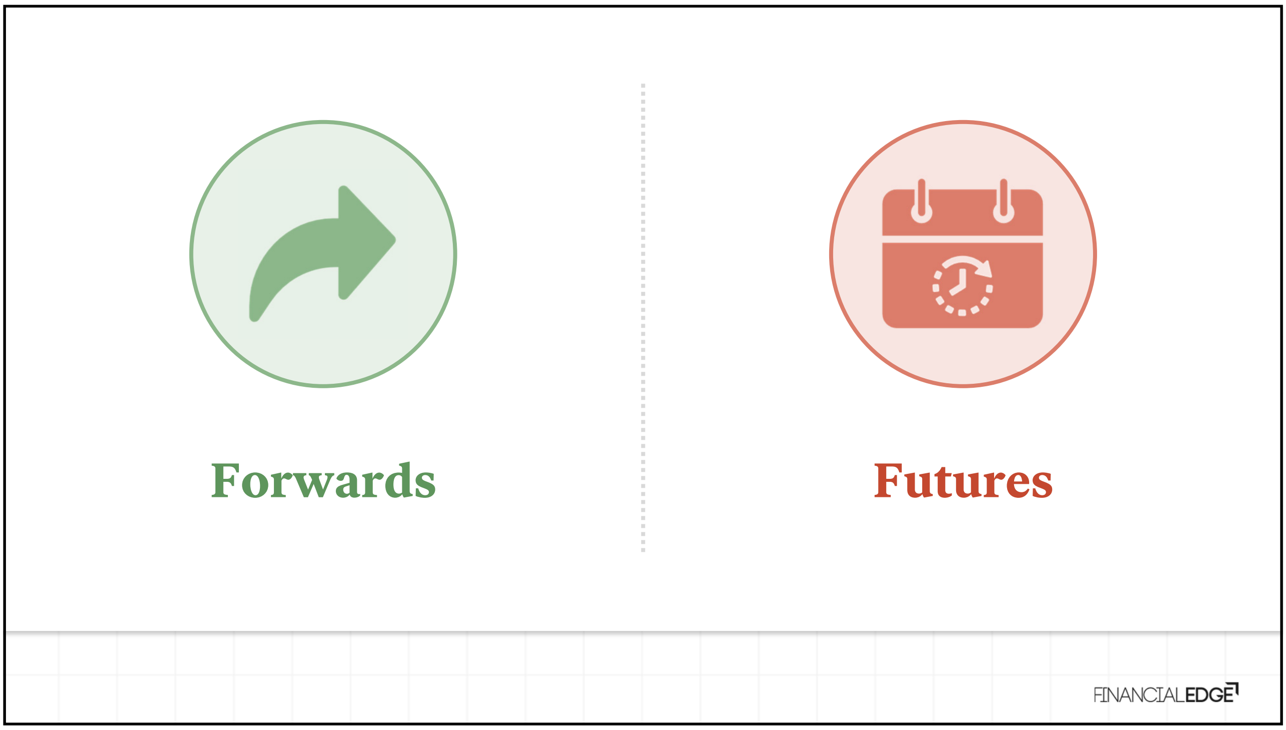
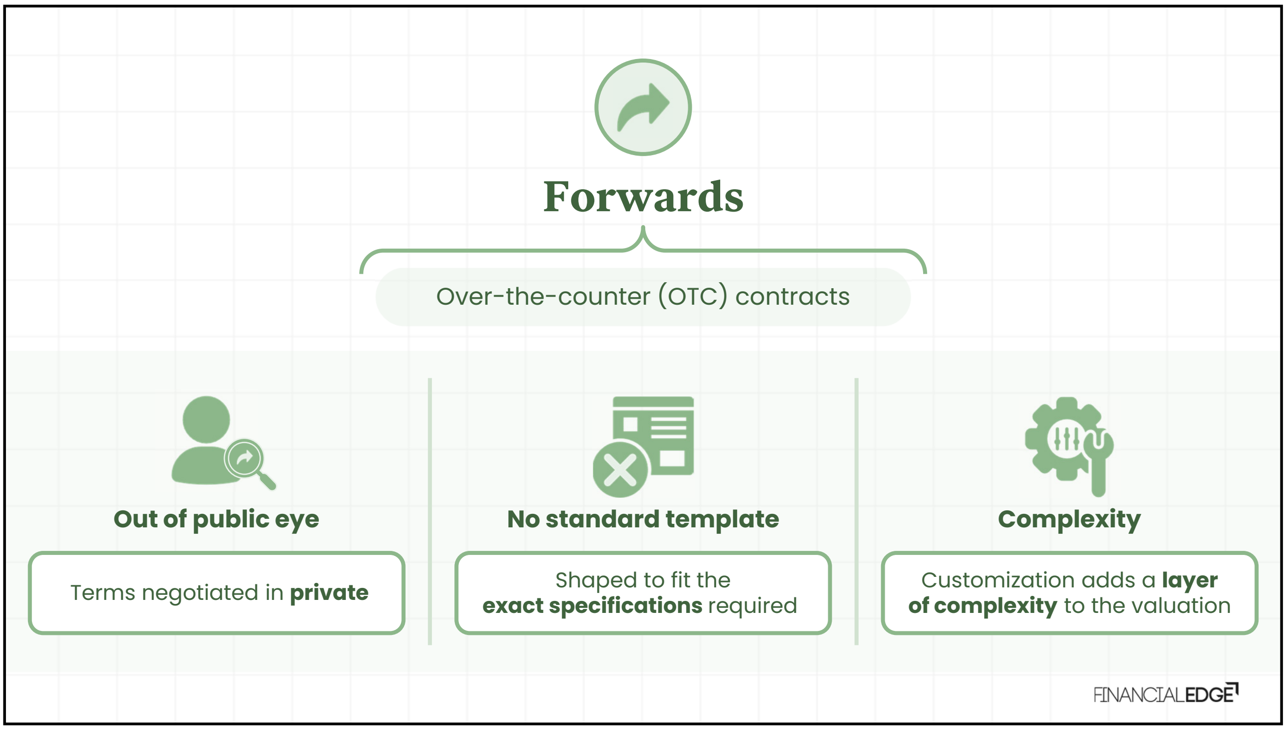
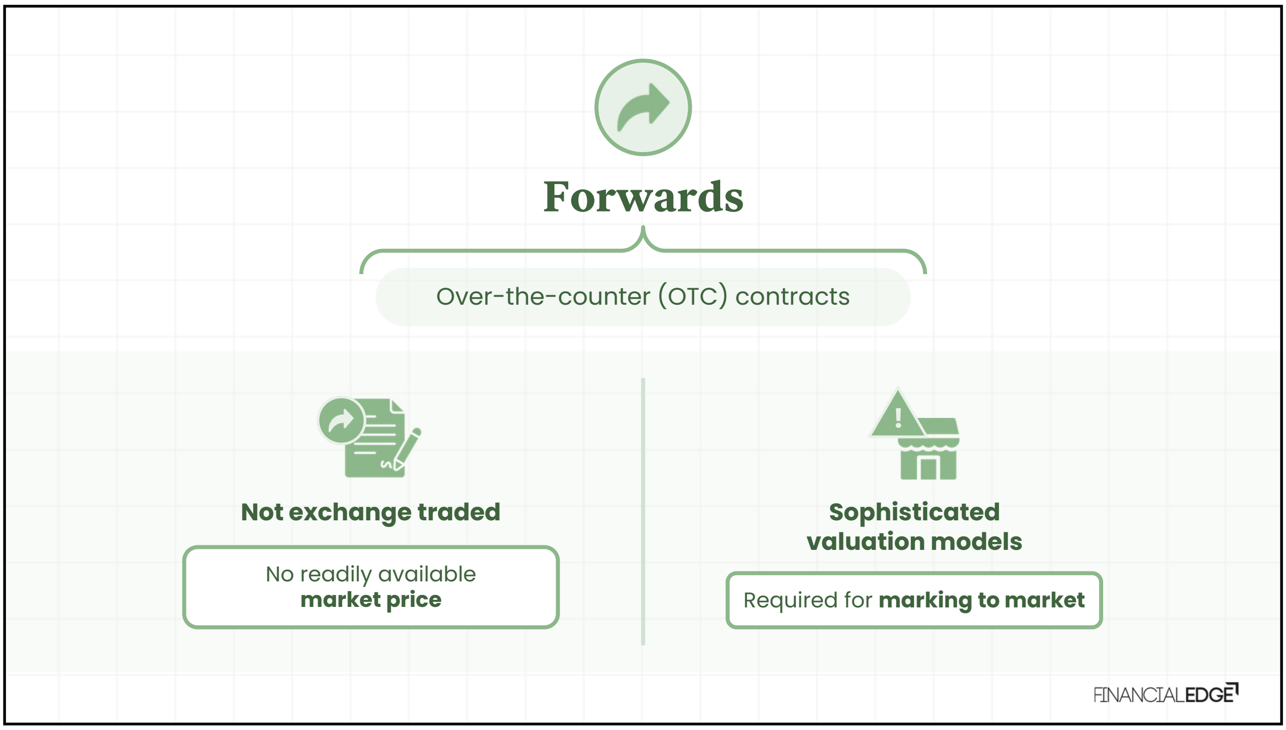
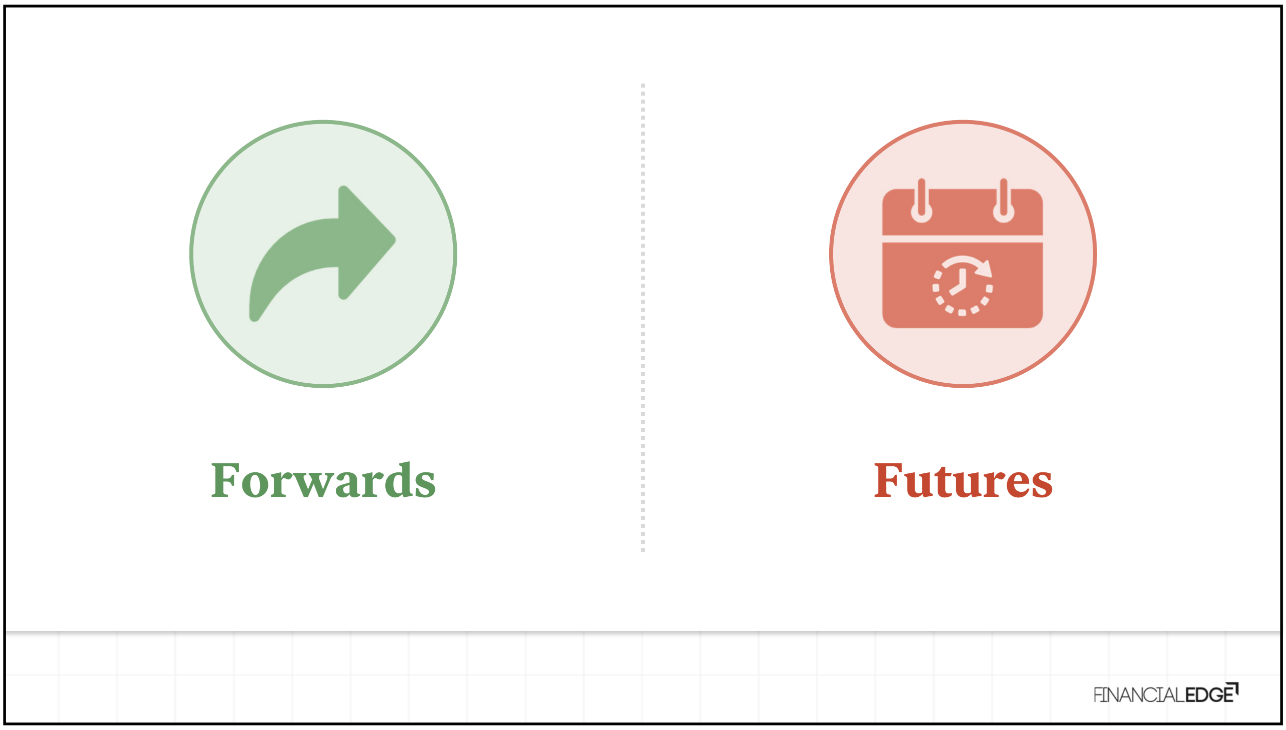
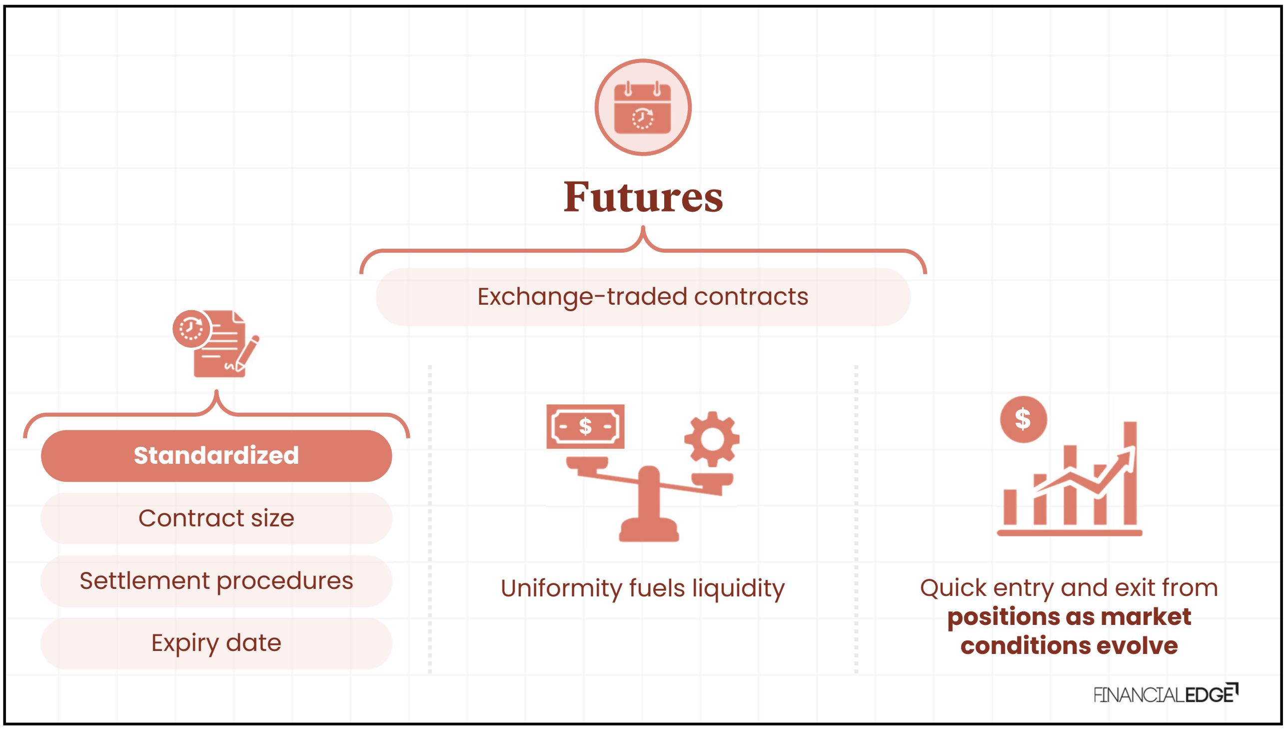


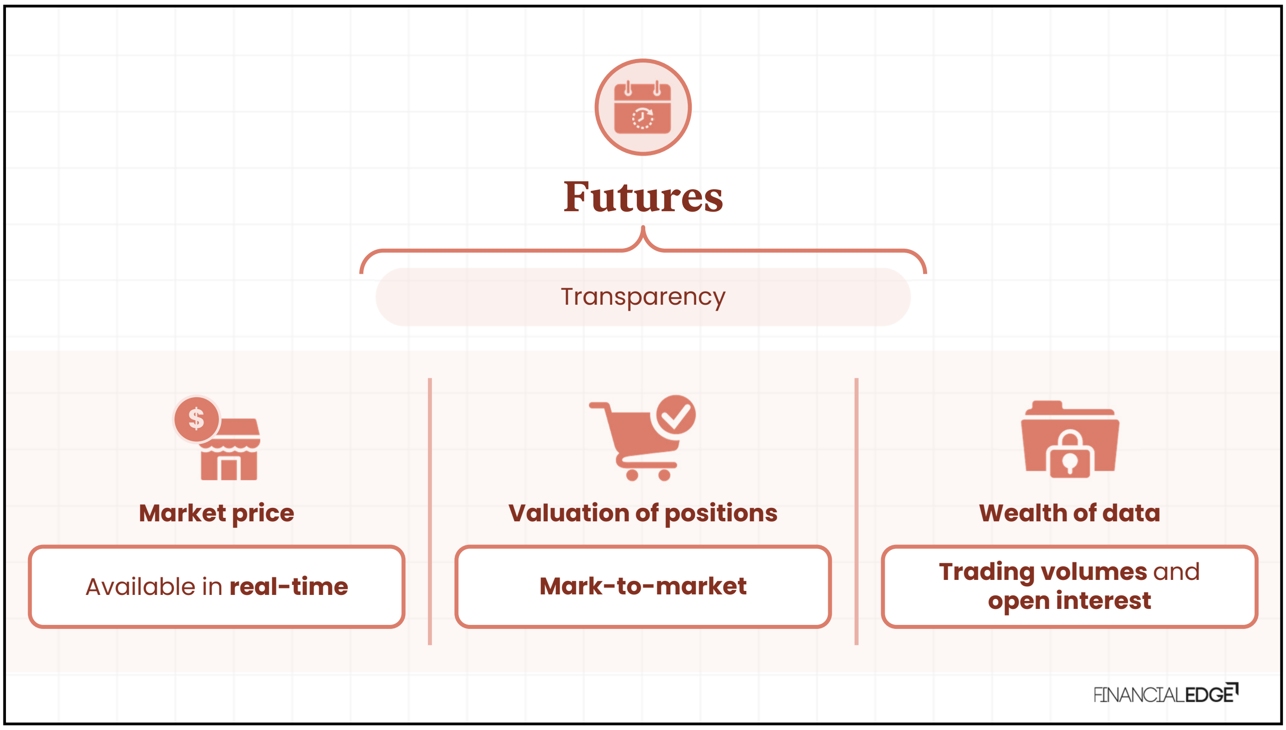

Forwards
Futures
FINANCIALEDGE

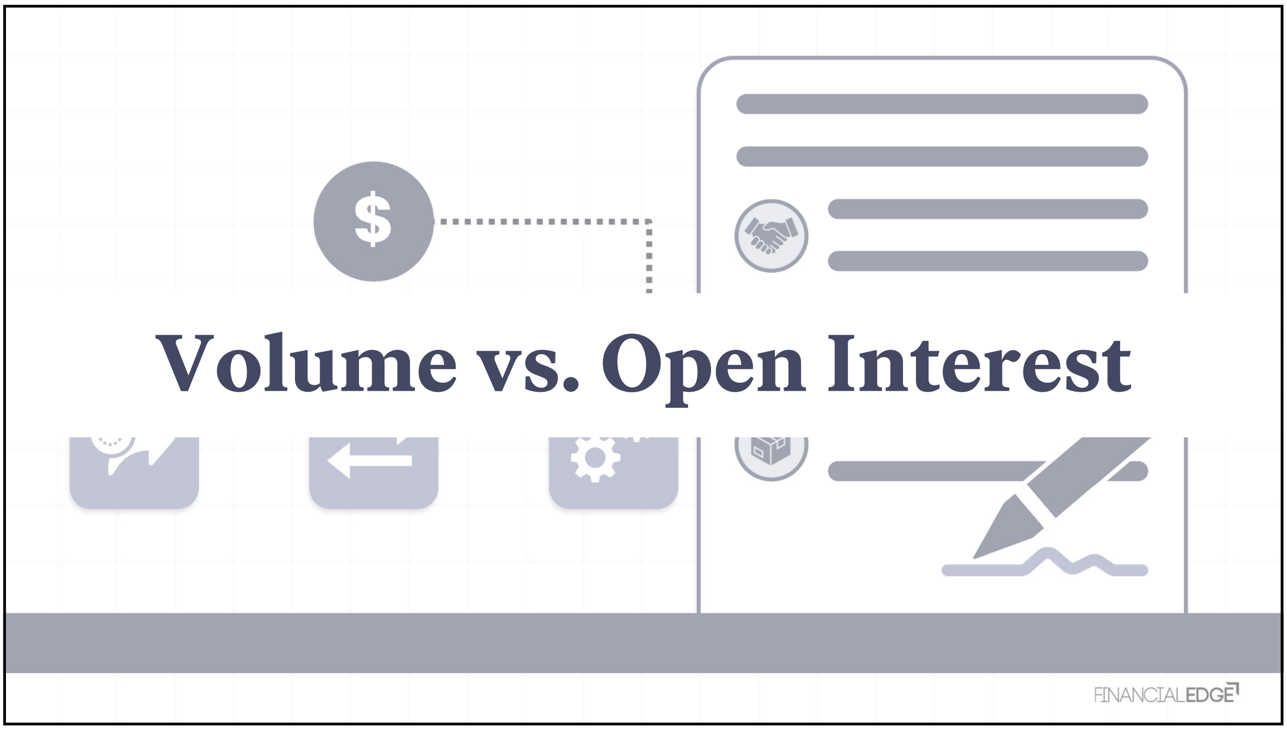

Forwards
Over-the-counter (OTC) contracts
Out of public eye
Terms negotiated in private
No standard template
Shaped to fit the exact specifications required
Complexity
Customization adds a layer of complexity to the valuation
FINANCIALEDGE

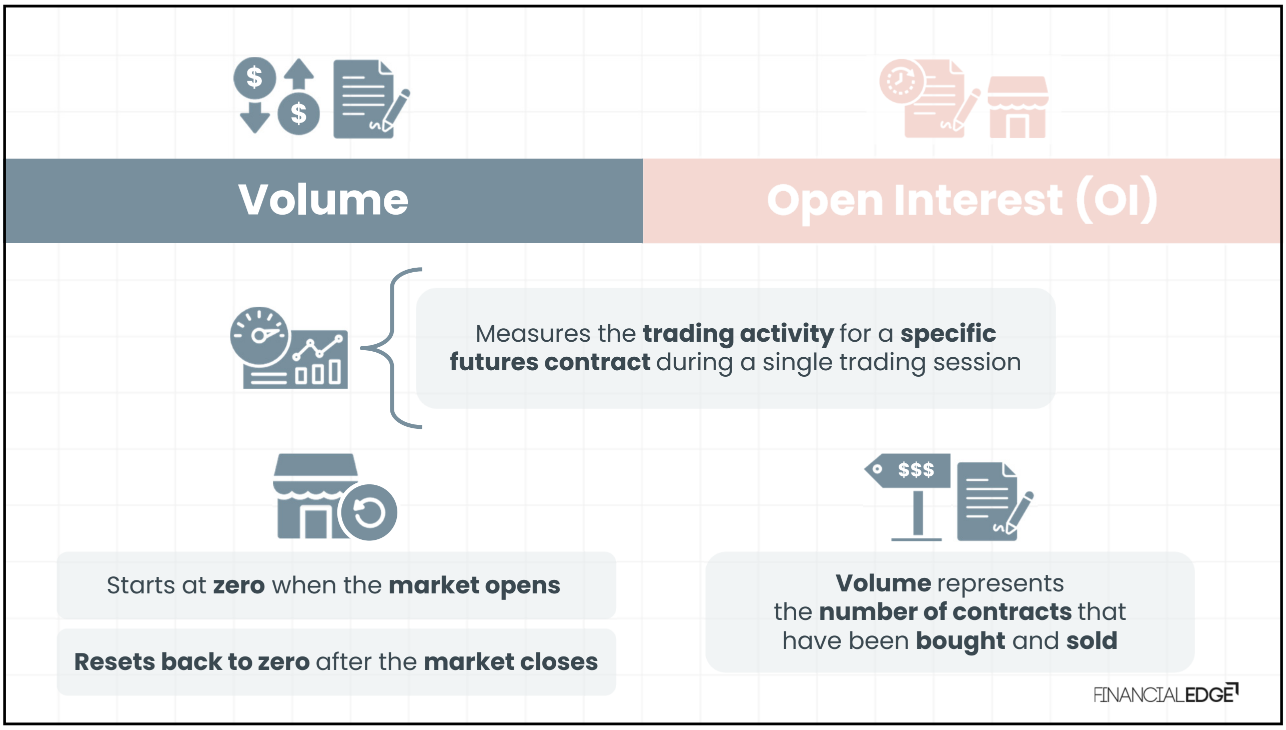

Forwards
Over-the-counter (OTC) contracts
Not exchange traded
No readily available market price
Sophisticated valuation models
Required for marking to market
FINANCIALEDGE

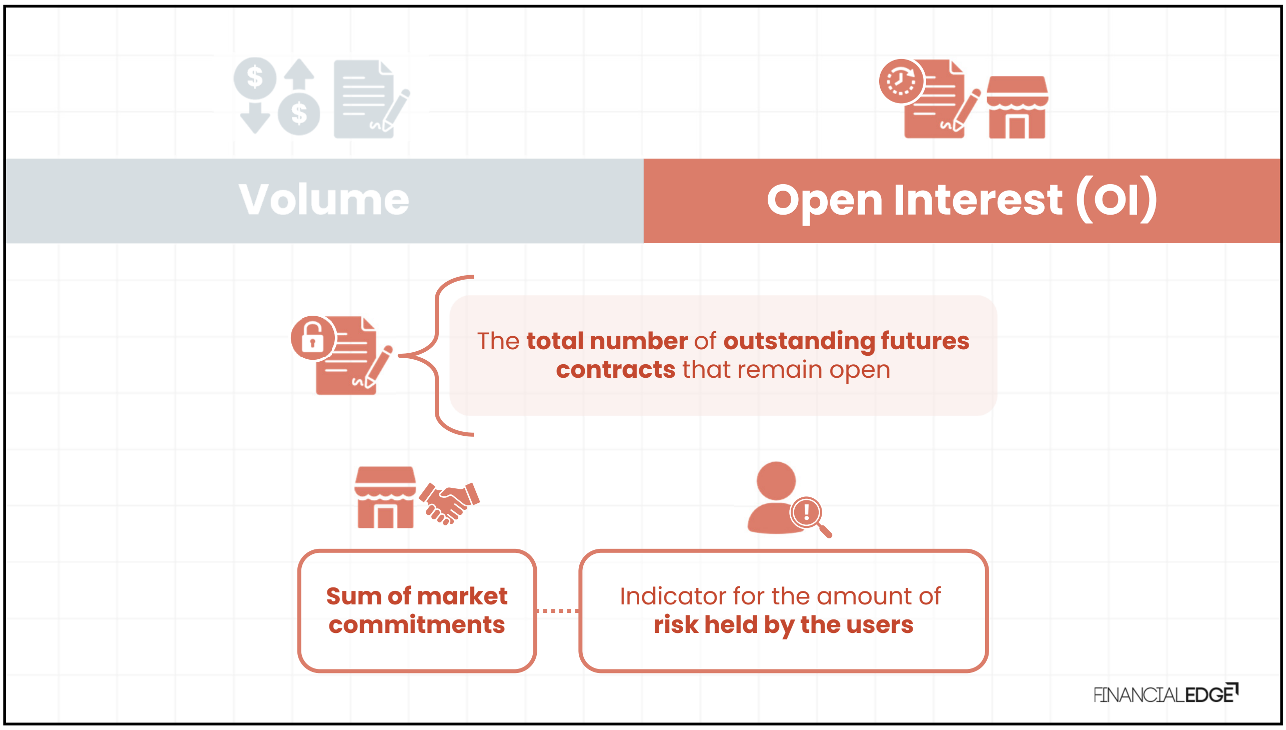

Forwards
Futures
FINANCIALEDGE

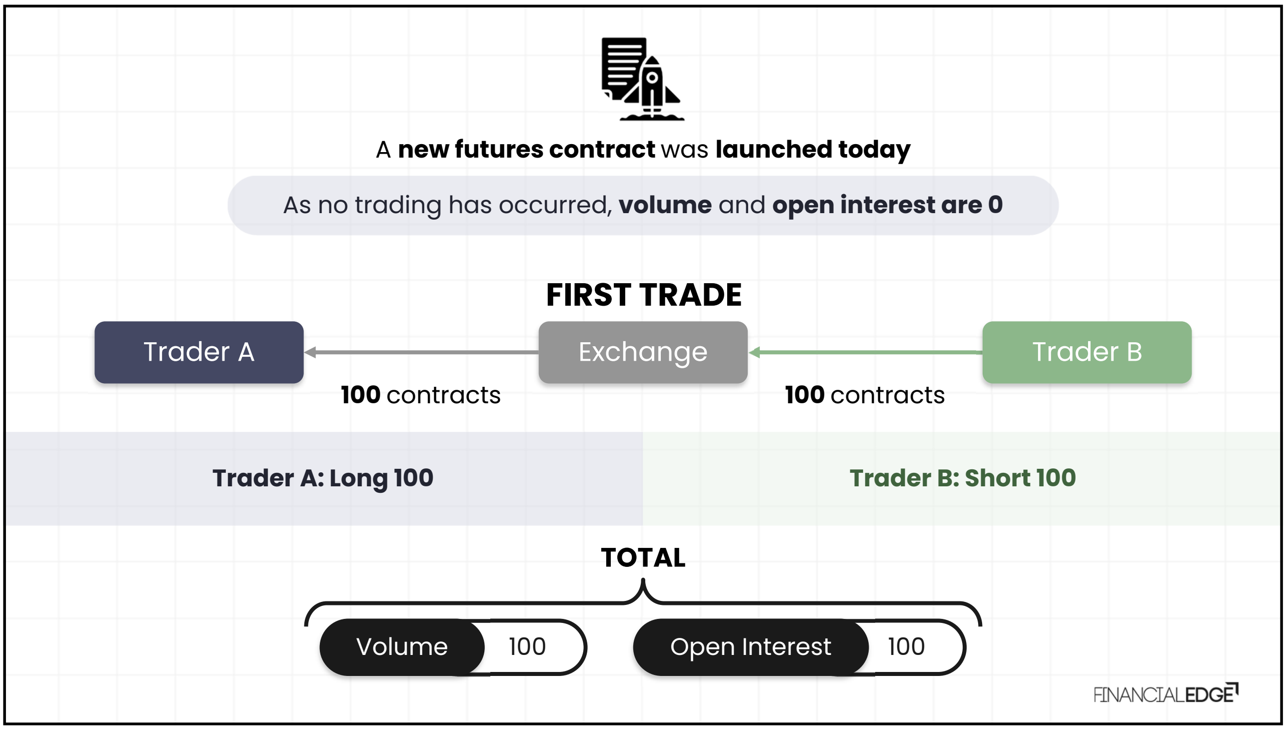

Futures
Exchange-traded contracts
Standardized
Contract size
Settlement procedures
Expiry date
Uniformity fuels liquidity
Quick entry and exit from positions as market conditions evolve
FINANCIALEDGE

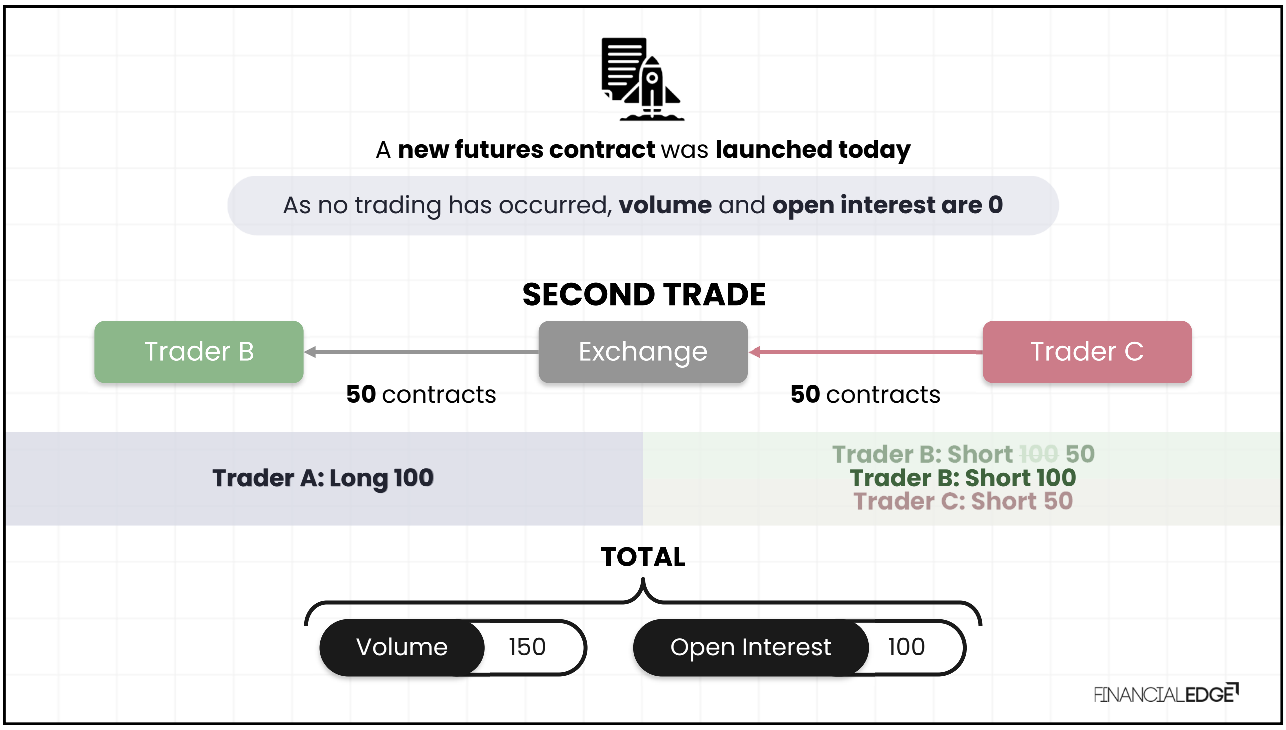

Futures
Transparency
Market price
Available in real-time
Valuation of positions
Mark-to-market
Wealth of data
Trading volumes and open interest
FINANCIALEDGE

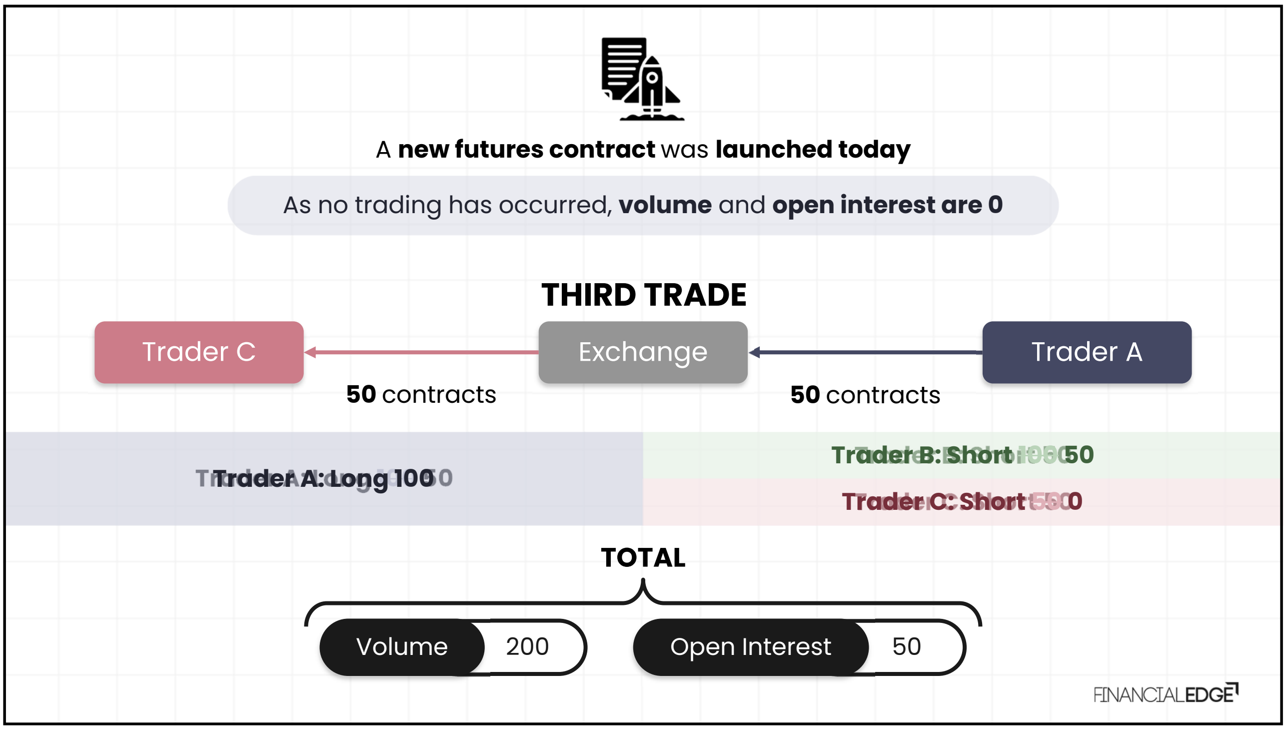

Volume vs. Open Interest
FINANCIALEDGE

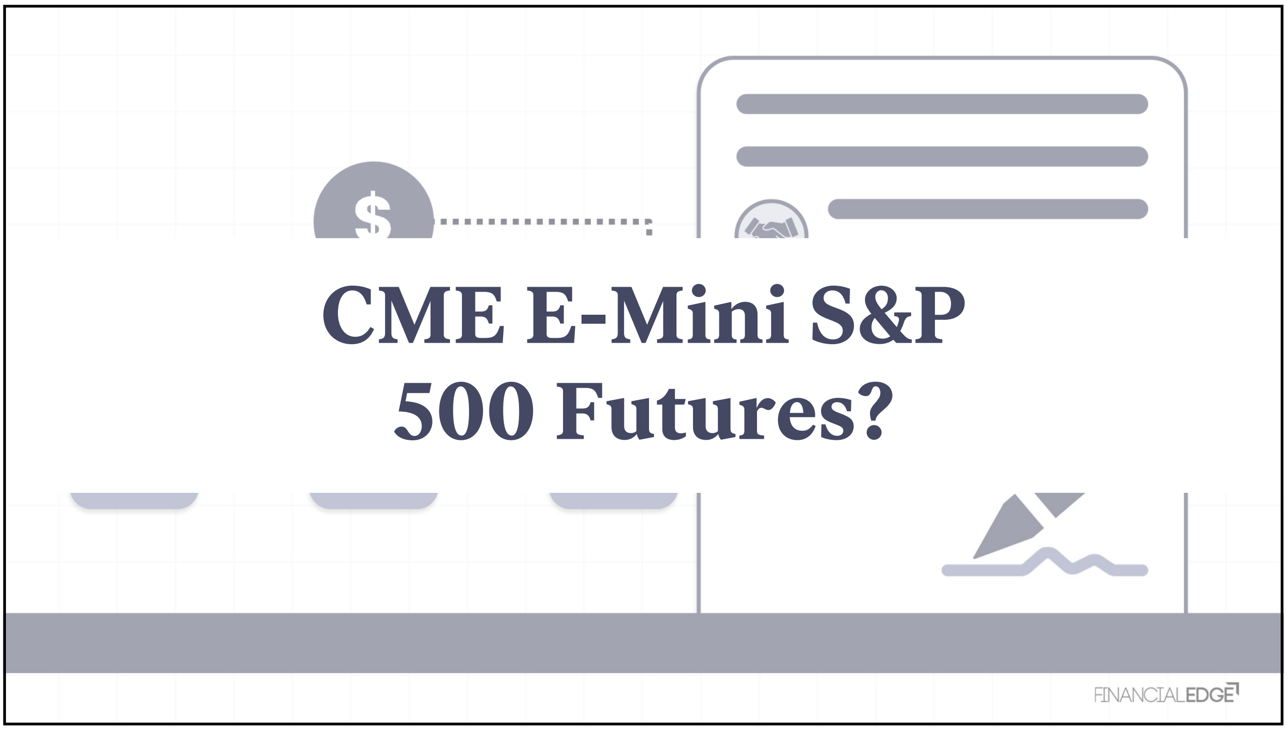

Volume
Open Interest (OI)
Measures the **trading activity** for a **specific futures contract** during a single trading session
Starts at **zero** when the **market opens**
Resets back to zero after the **market closes**
Volume represents the **number of contracts** that have been **bought** and **sold**
$$$
FINANCIALEDGE

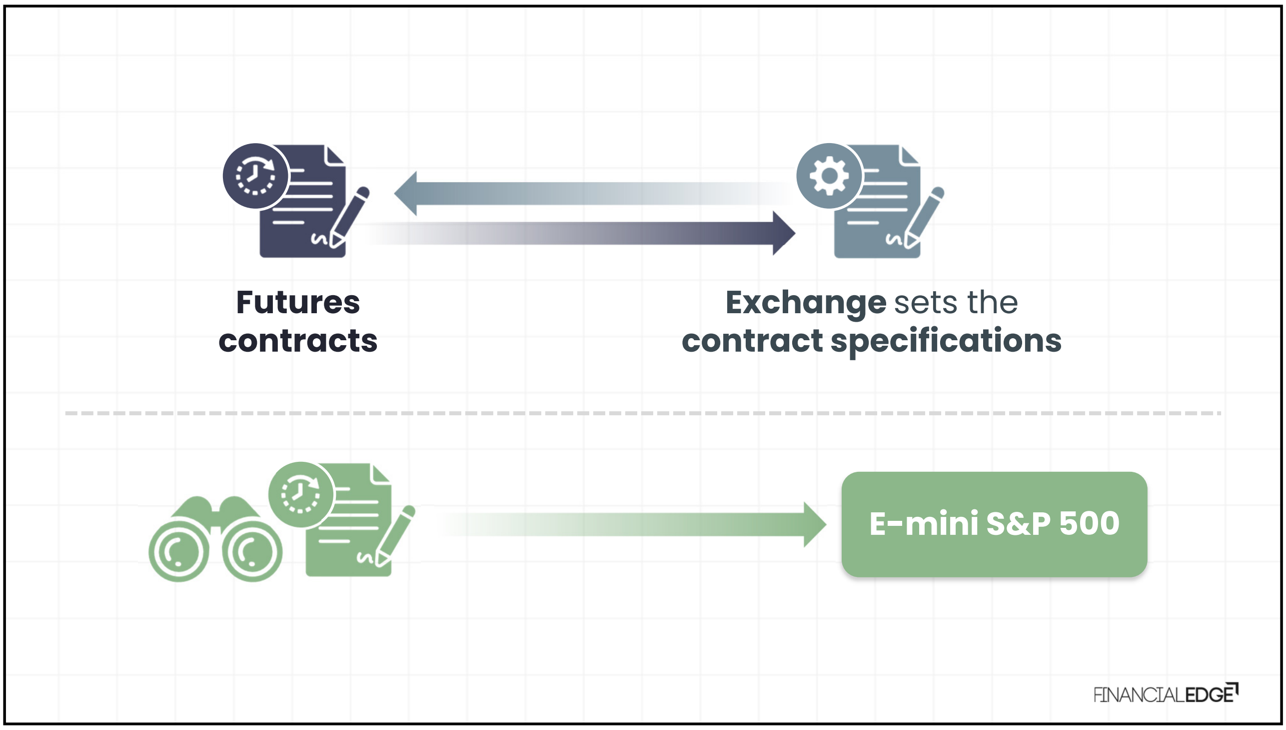

Volume
Open Interest (OI)
The total number of outstanding futures contracts that remain open
Sum of market commitments
Indicator for the amount of risk held by the users
FINANCIALEDGE


A new futures contract was launched today
As no trading has occurred, volume and open interest are 0
FIRST TRADE
Trader A
Exchange
Trader B
100 contracts
100 contracts
Trader A: Long 100
Trader B: Short 100
TOTAL
Volume
100
Open Interest
100
FINANCIALEDGE


A new futures contract was launched today
As no trading has occurred, volume and open interest are 0
SECOND TRADE
Trader B
Exchange
Trader C
50 contracts
50 contracts
Trader A: Long 100
Trader B: Short 100 50
Trader B: Short 100
Trader C: Short 50
TOTAL
Volume 150
Open Interest 100
FINANCIALEDGE


A new futures contract was launched today
As no trading has occurred, volume and open interest are 0
THIRD TRADE
Trader C
Exchange
Trader A
50 contracts
50 contracts
Trader A: Long 100
Trader B: Short 50
Trader C: Short 0
TOTAL
Volume 200
Open Interest 50
FINANCIALEDGE


CME E-Mini S&P
500 Futures?
FINANCIALEDGE


Futures
contracts
Exchange sets the
contract specifications
E-mini S&P 500
FINANCIALEDGE

Contract Specifications

Product code	**ES**
Contract size	**$50 x S&P 500** index
Tick size	**0.25** index points
Tick value	**$12.50**
Expiry	**3rd Friday** of the contract month**, trading terminates 9:30 AM ET that day**
Contract months	**Contracts** listed for **21 consecutive quarters** in the cycle **Mar, Jun, Sep, Dec**
Settlement	**Cash**

Data as of 22/11/2023. Source: CME

FINANCIALEDGE

Contract example

Contract code	**ESZ3**
Expiry	**15 Dec 2023**
Last price	**4565.75**
Contract value	**$228,287.50**
Open interest	**2,195,765 contracts**

Data as of 22/11/2023. Source: CME

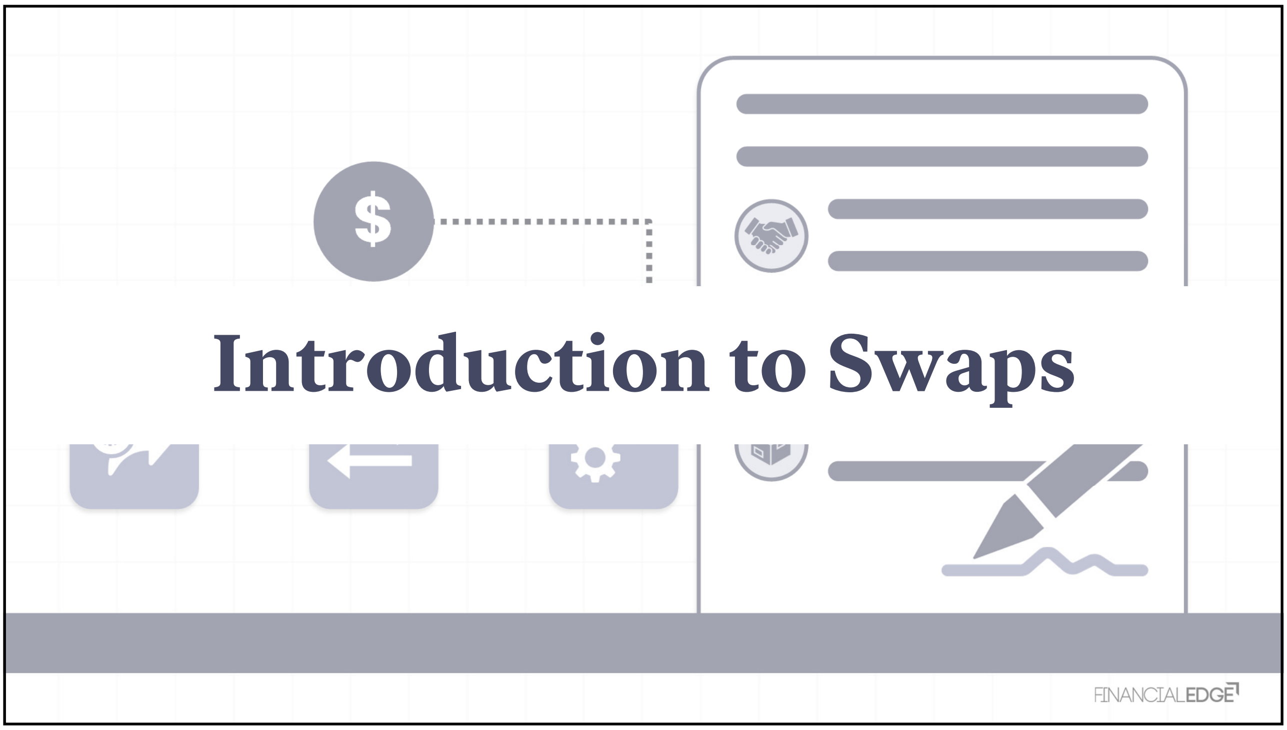
100 ESZ3 contracts

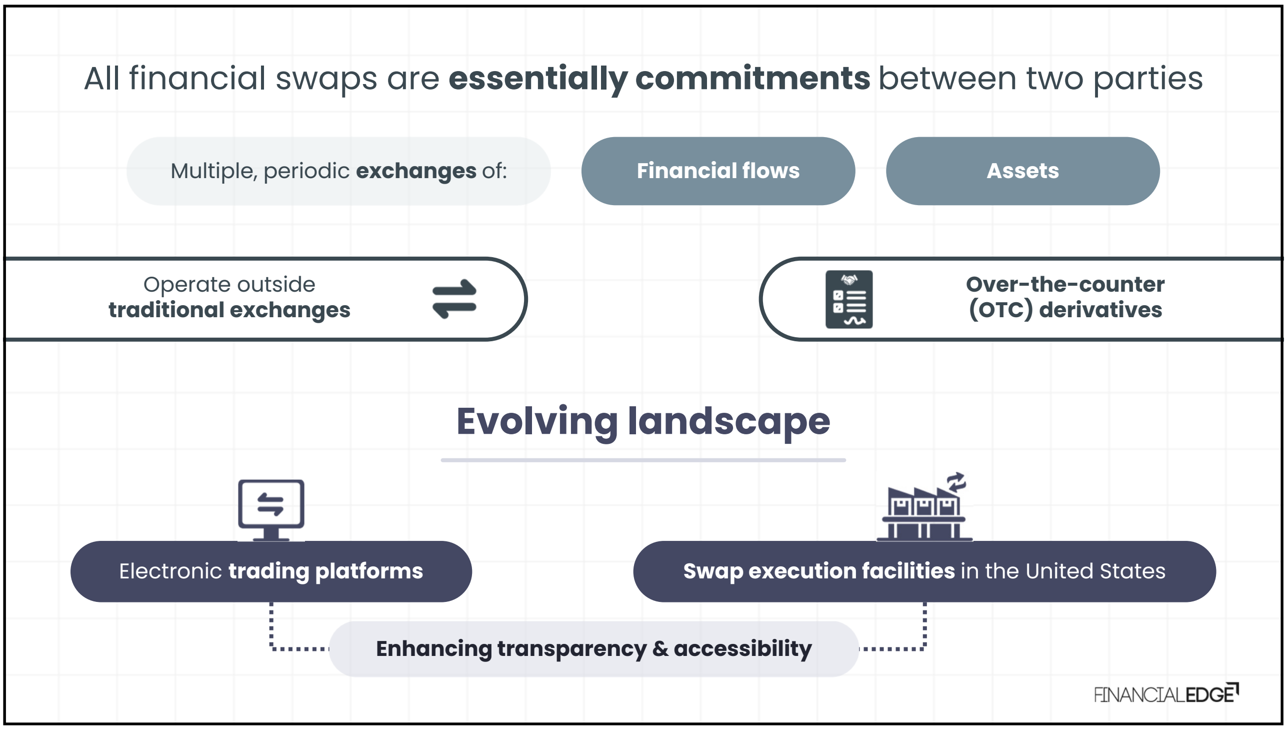
Each **index point's value** at **$50**

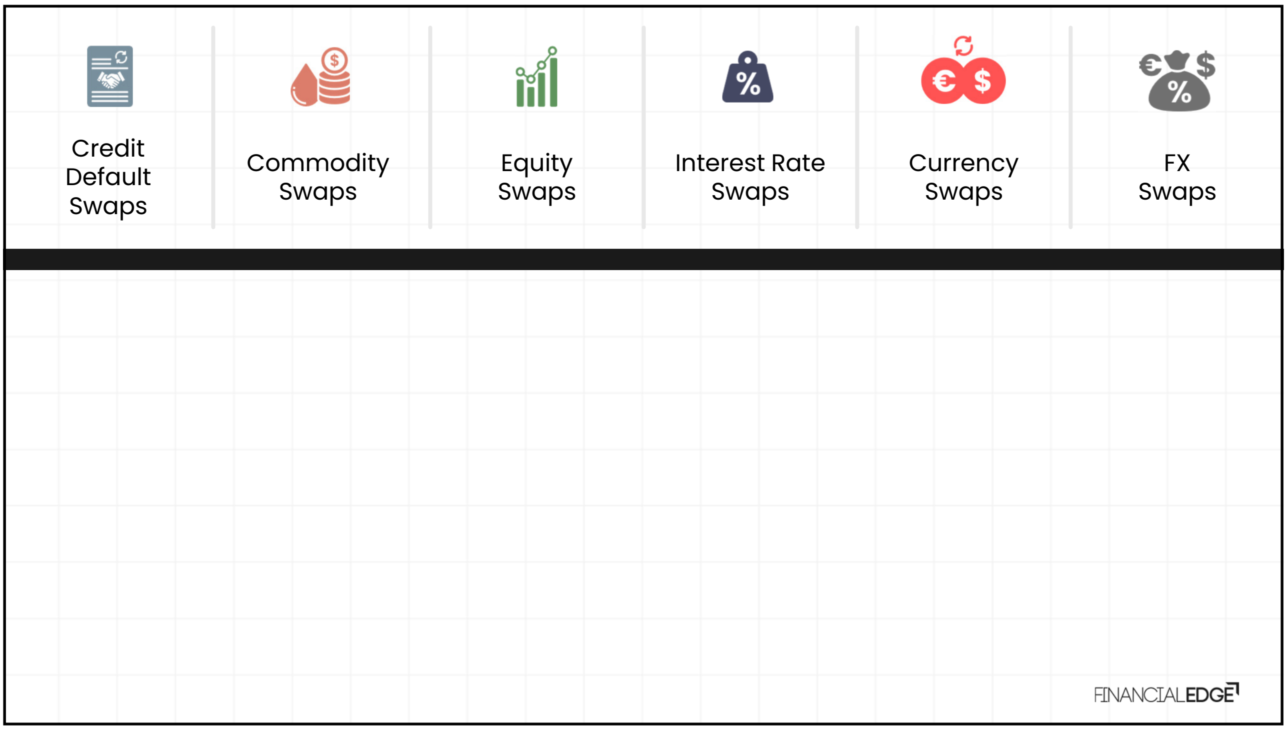
Quantity of **contracts at 100**

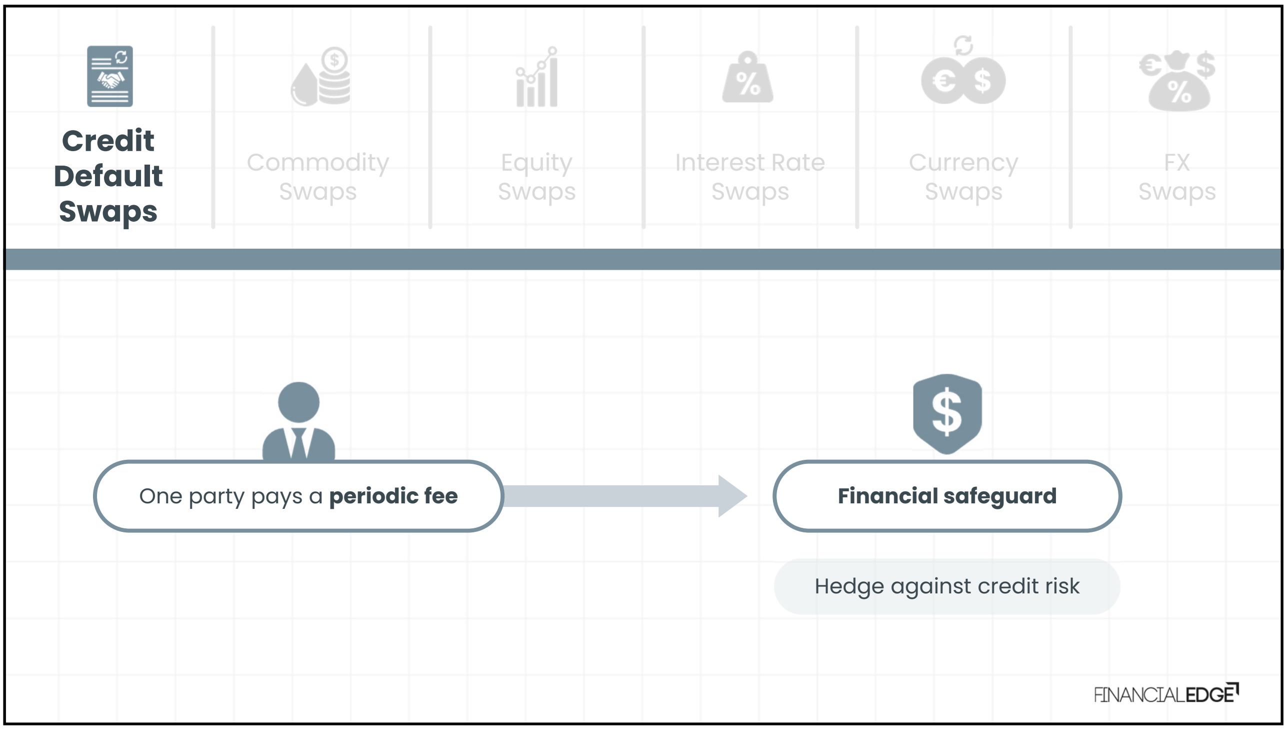
$50,000

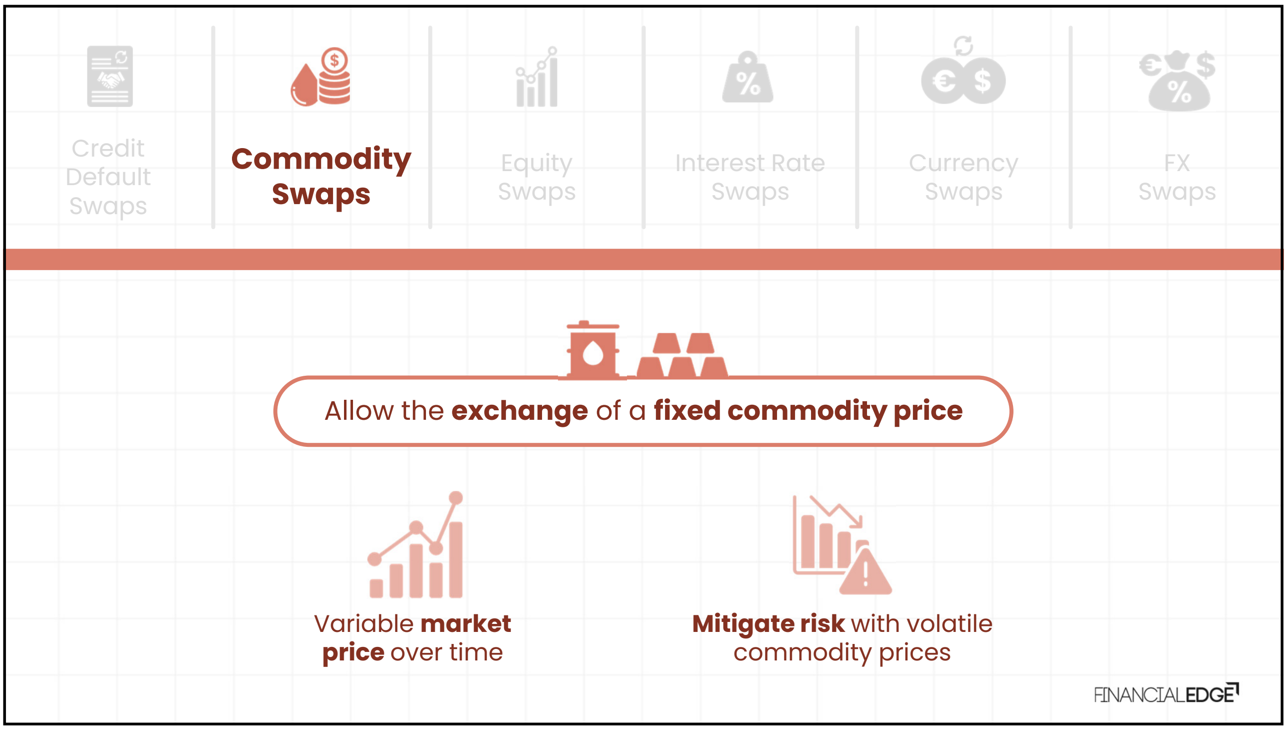
FINANCIALEDGE

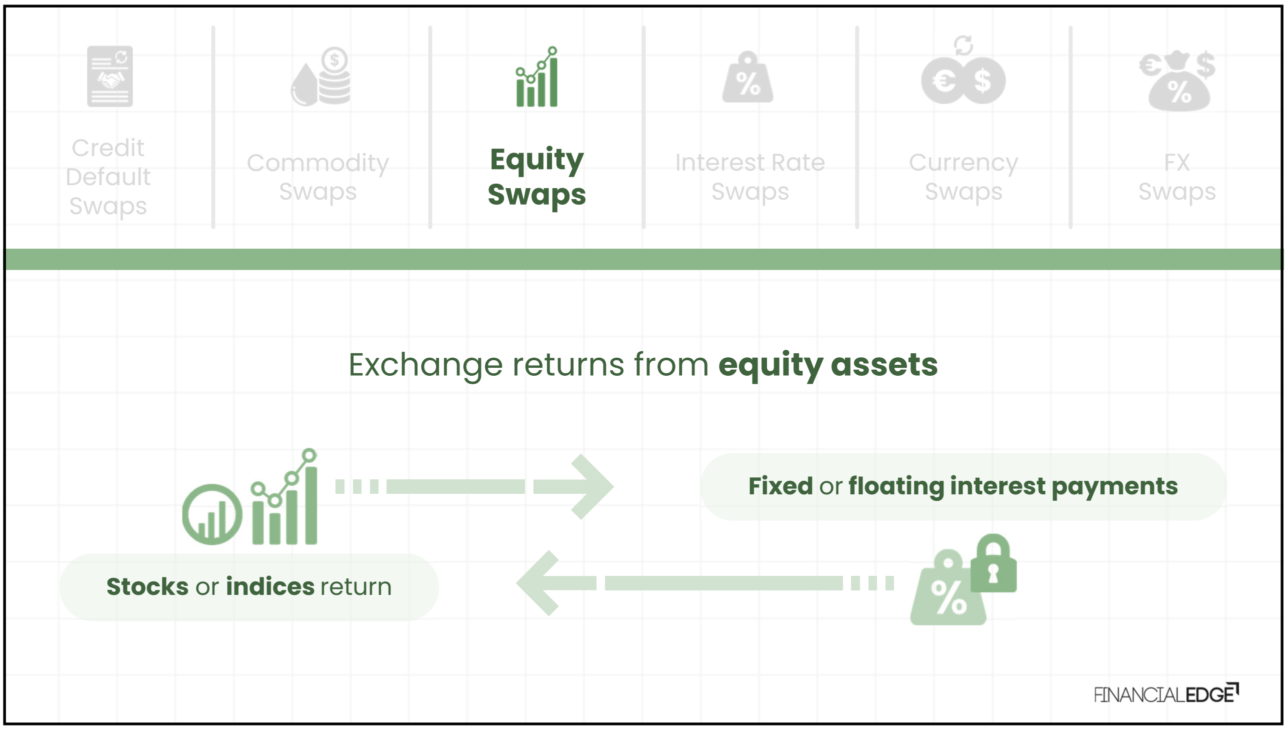

Introduction to Swaps
FINANCIALEDGE

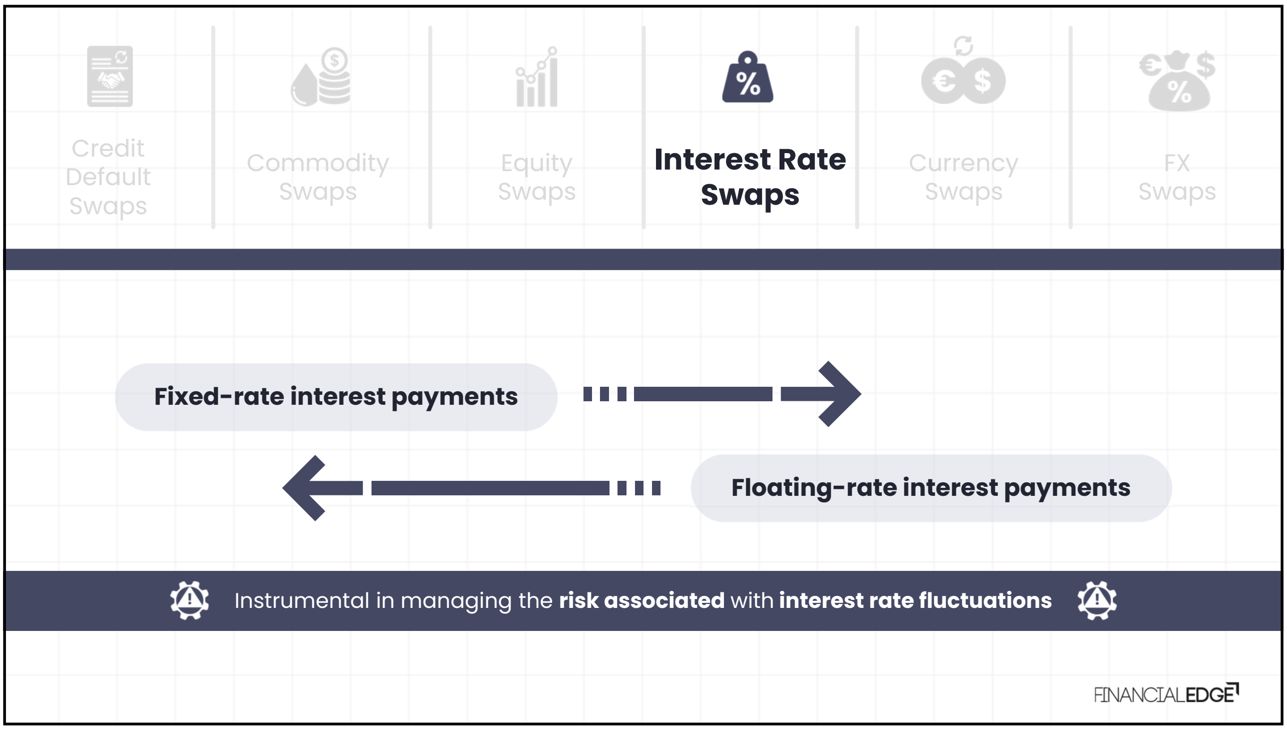

All financial swaps are **essentially commitments** between two parties
Multiple, periodic **exchanges** of:
Financial flows
Assets
Operate outside **traditional exchanges**
Over-the-counter (OTC) derivatives
Evolving landscape
Electronic **trading platforms**
Swap execution facilities in the United States
Enhancing transparency & accessibility
FINANCIALEDGE

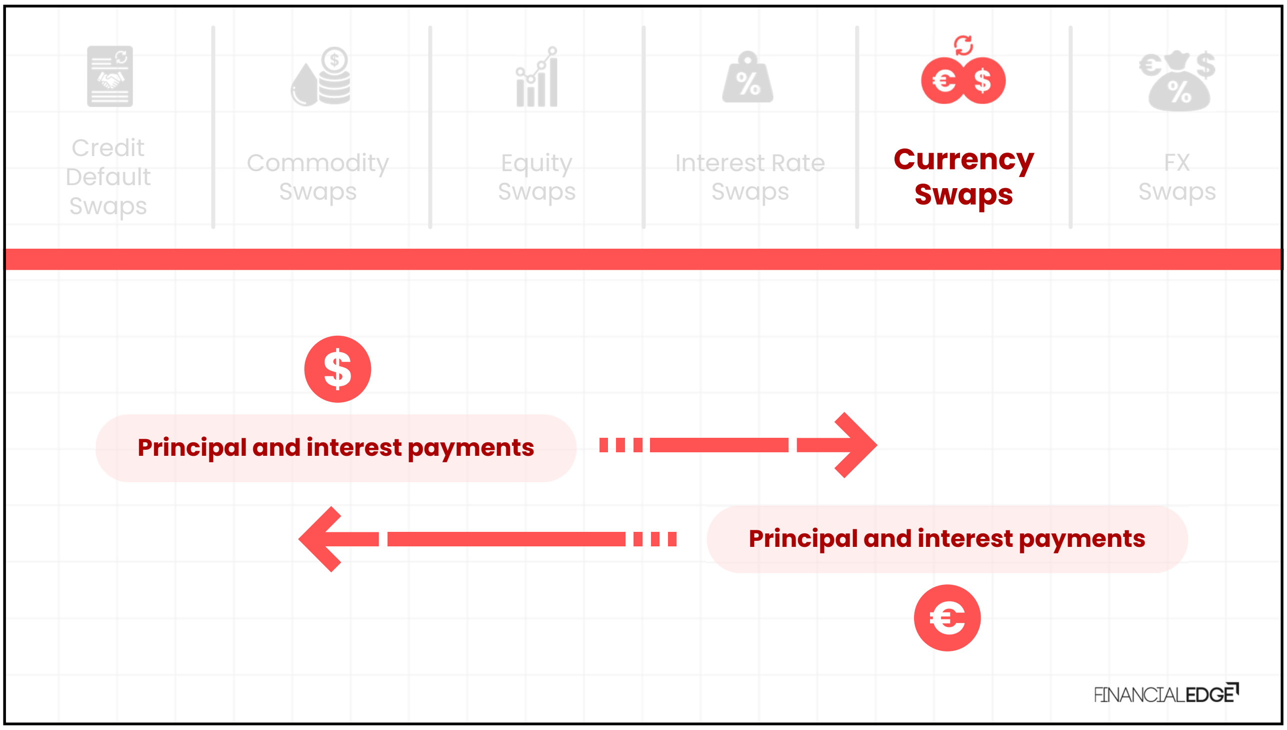

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
FINANCIALEDGE

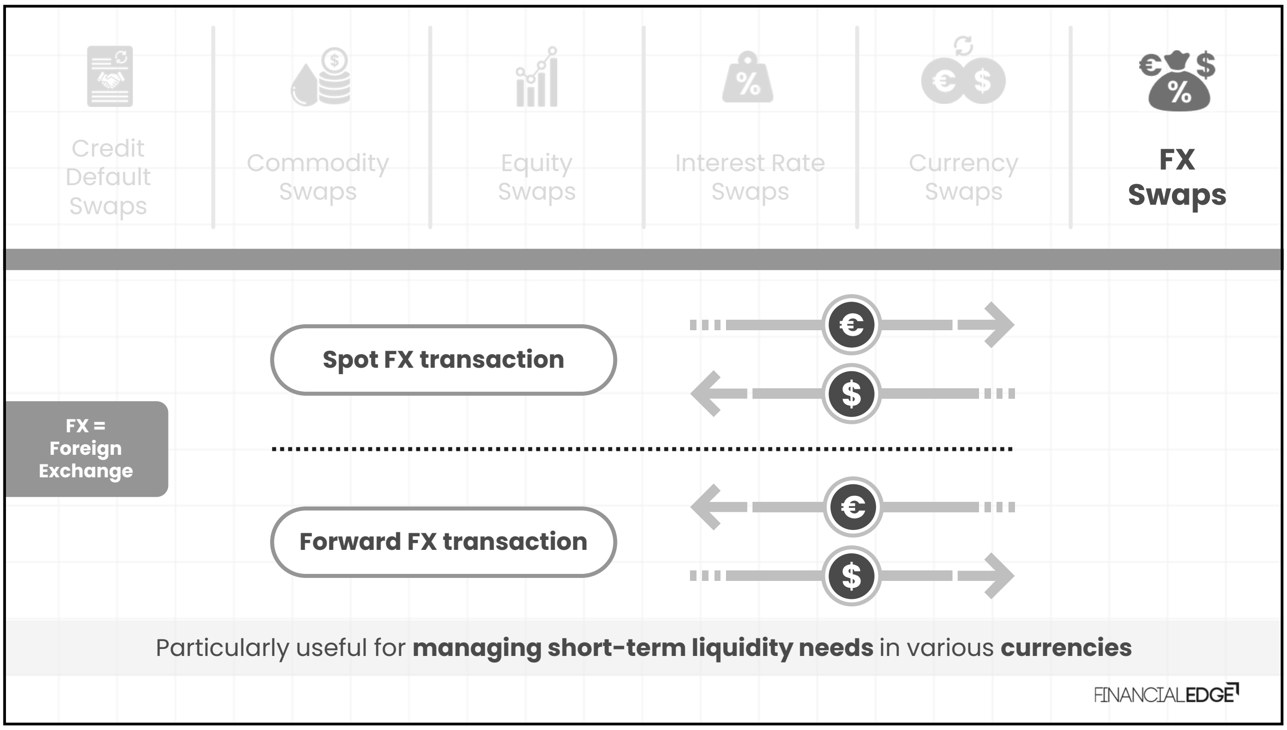

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
One party pays a periodic fee
Financial safeguard
Hedge against credit risk
FINANCIALEDGE

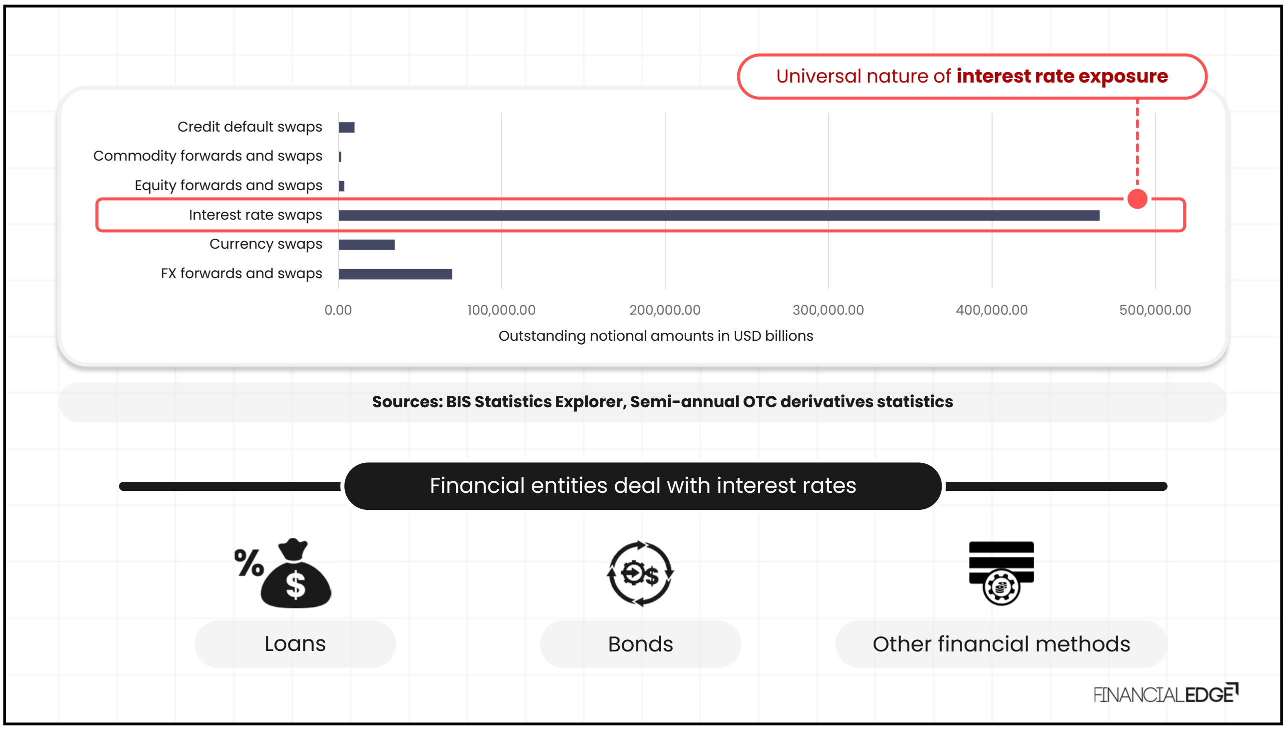

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
Allow the **exchange** of a **fixed commodity price**
Variable **market price** over time
Mitigate risk with volatile commodity prices
FINANCIALEDGE

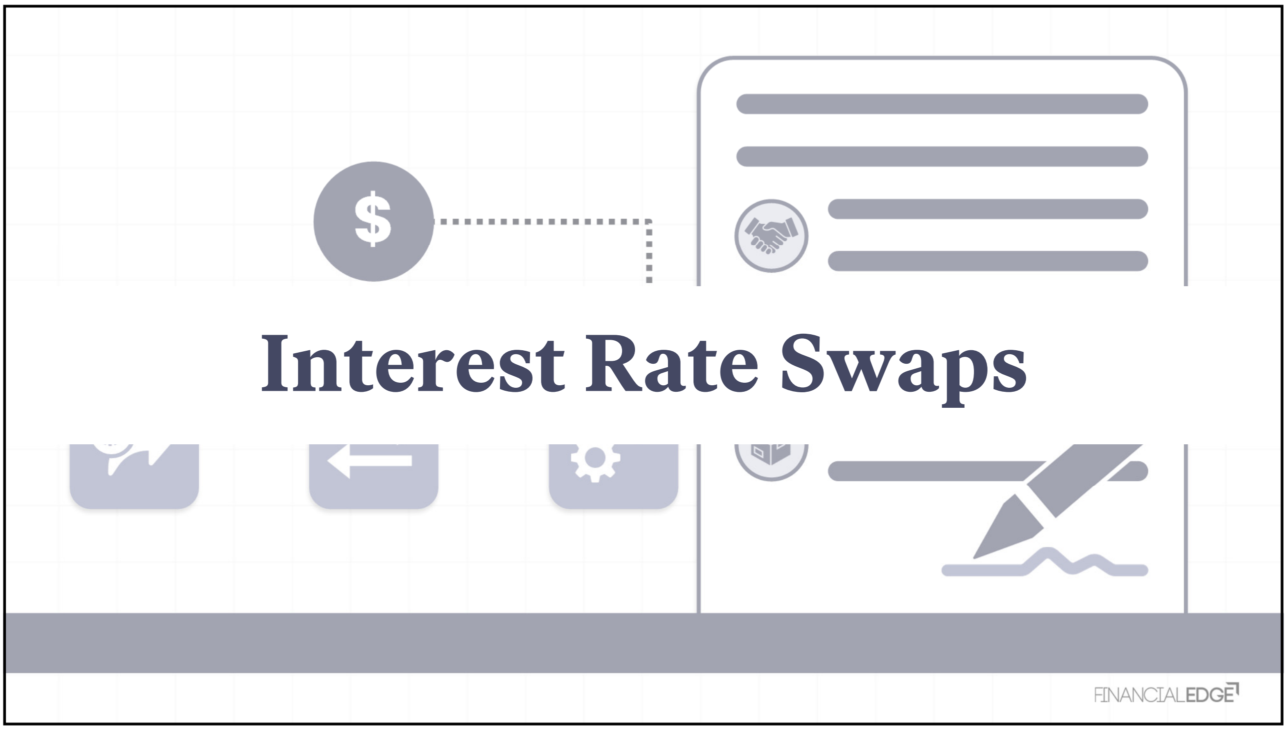

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
Exchange returns from **equity assets**
Fixed or **floating interest payments**
Stocks or **indices** return
FINANCIALEDGE

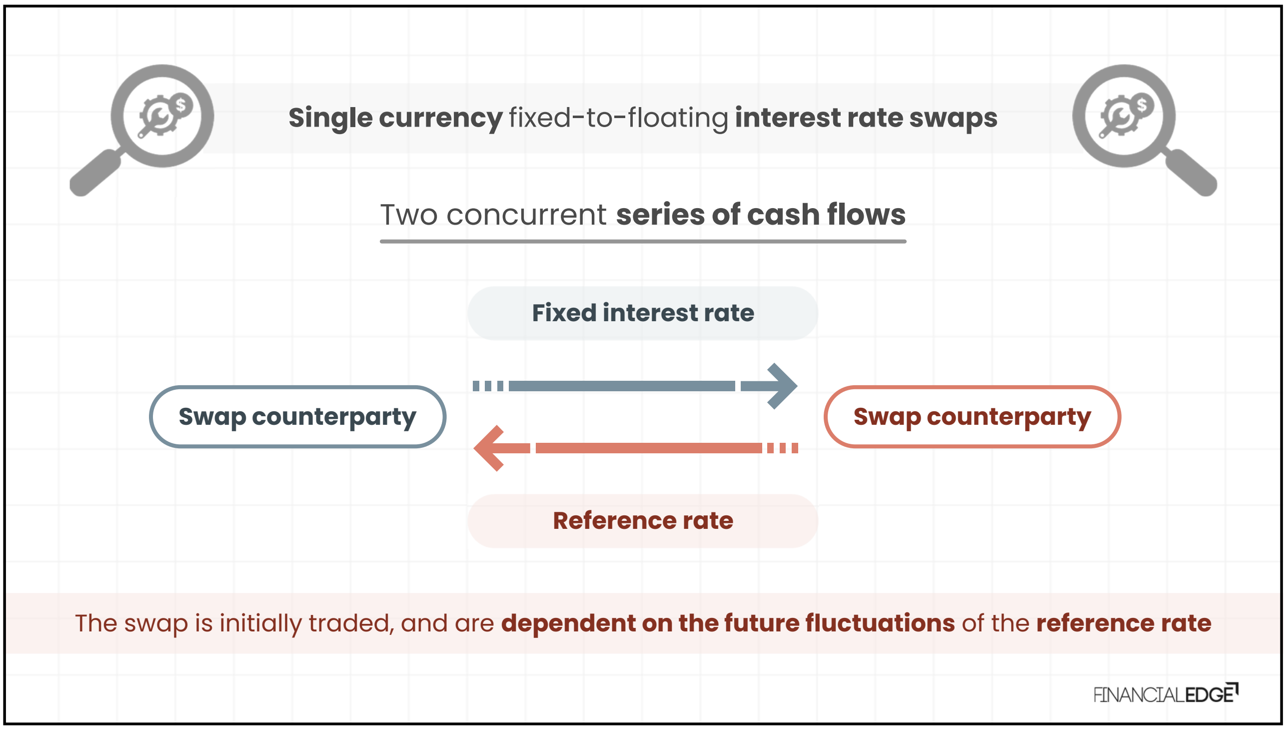

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
Fixed-rate interest payments
Floating-rate interest payments
Instrumental in managing the risk associated with interest rate fluctuations
FINANCIALEDGE

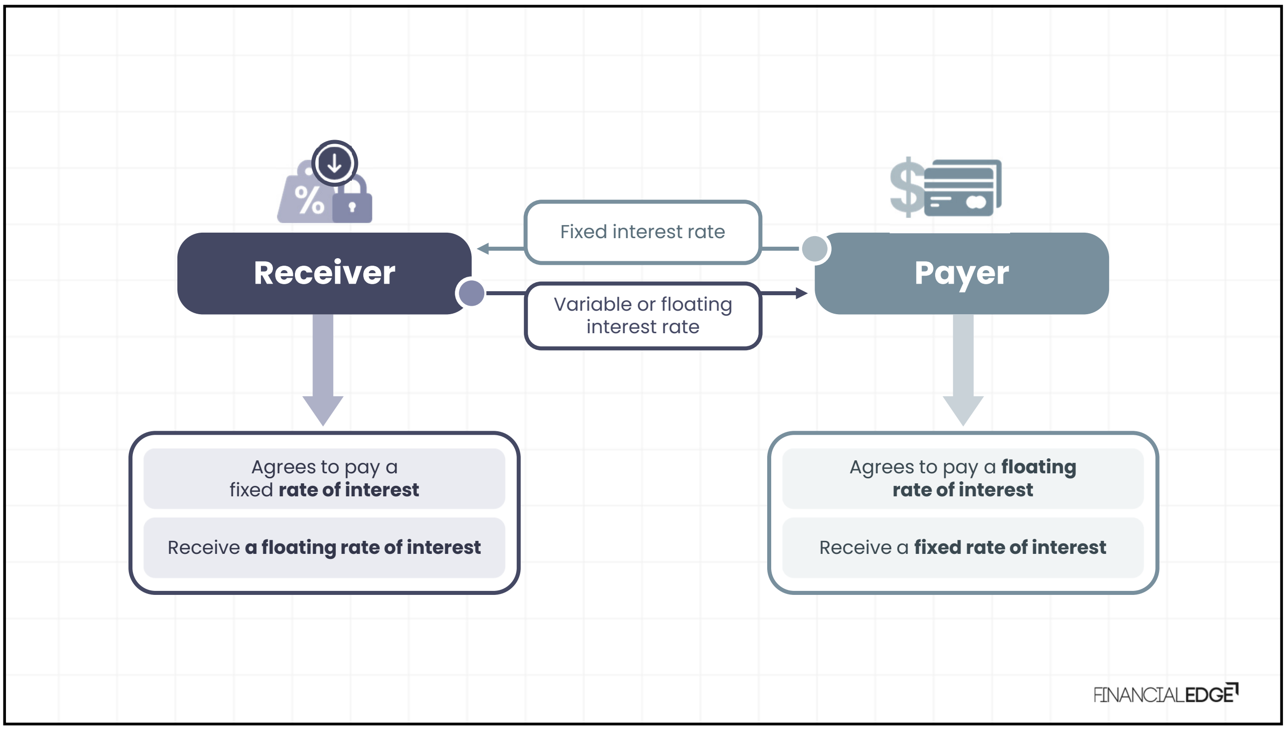

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
Principal and interest payments
Principal and interest payments
FINANCIALEDGE

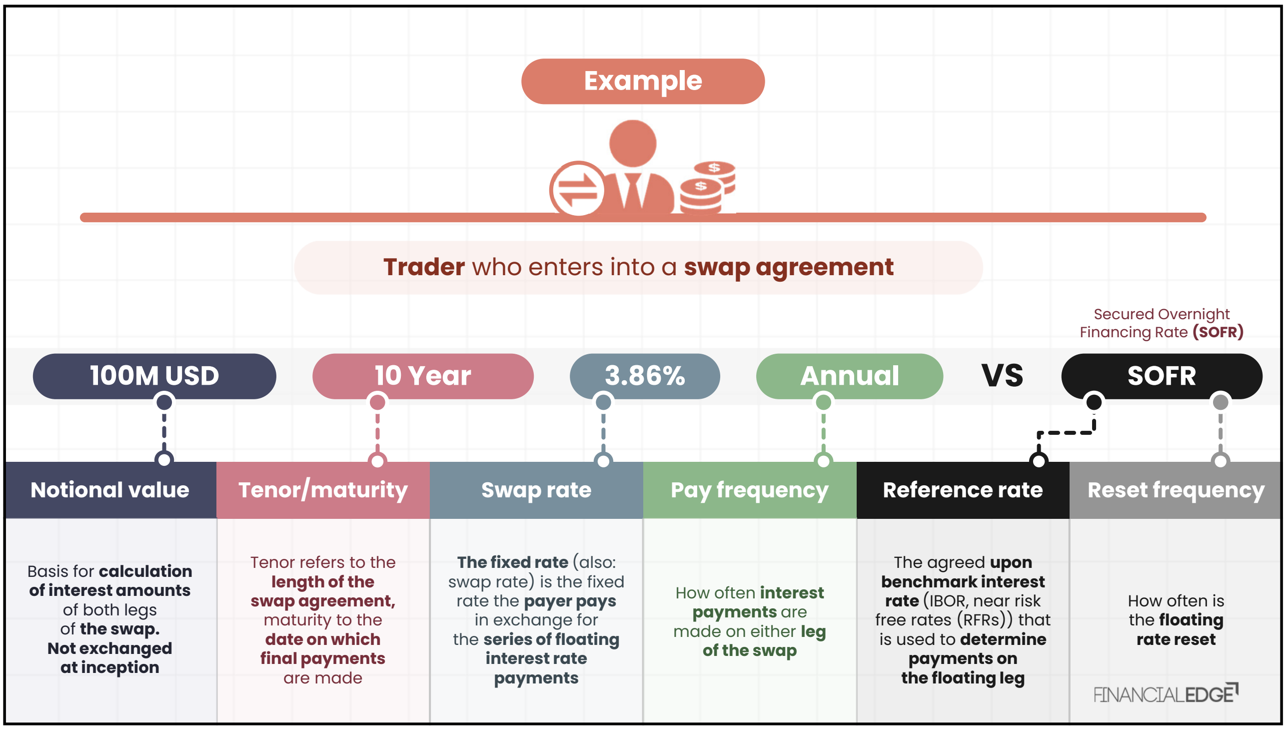

Credit Default Swaps
Commodity Swaps
Equity Swaps
Interest Rate Swaps
Currency Swaps
FX Swaps
FX = Foreign Exchange
Spot FX transaction
Forward FX transaction
Particularly useful for managing short-term liquidity needs in various currencies
FINANCIALEDGE

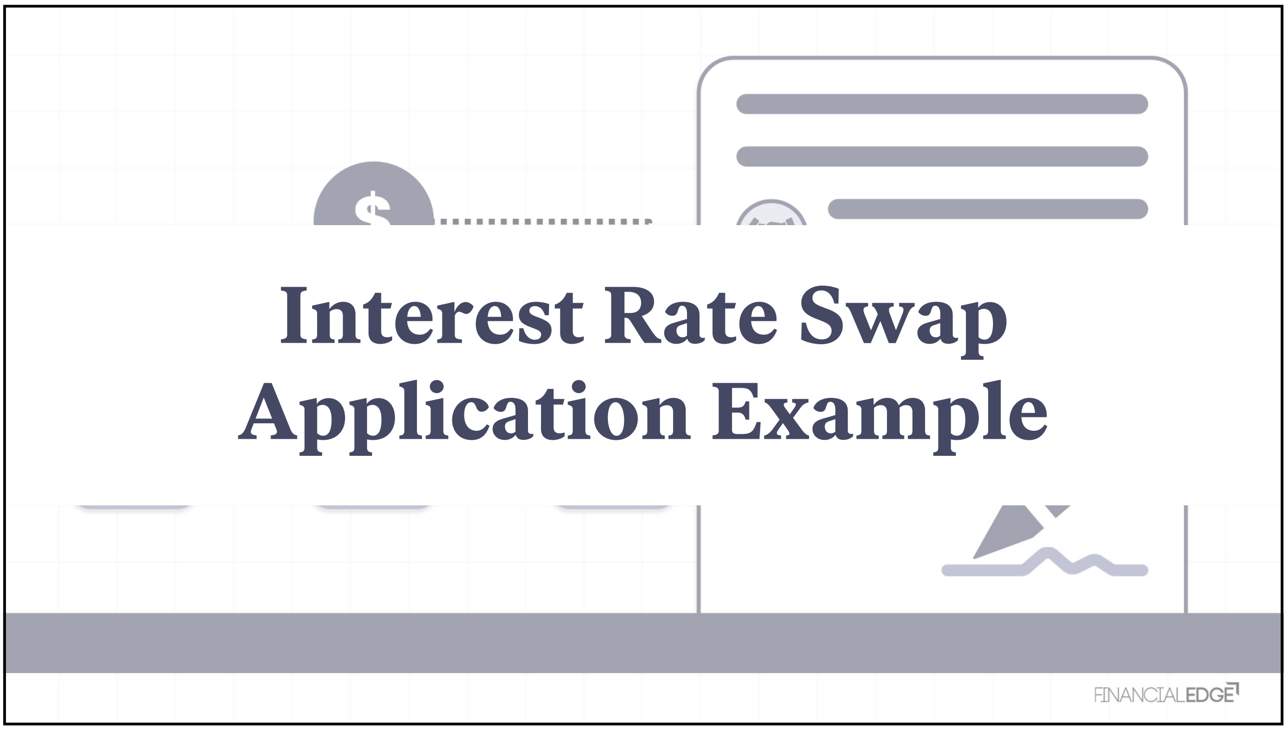

Universal nature of interest rate exposure
Credit default swaps
Commodity forwards and swaps
Equity forwards and swaps
Interest rate swaps
Currency swaps
FX forwards and swaps
0.00
100,000.00
200,000.00
300,000.00
400,000.00
500,000.00
Outstanding notional amounts in USD billions
Sources: BIS Statistics Explorer, Semi-annual OTC derivatives statistics
Financial entities deal with interest rates
Loans
Bonds
Other financial methods
FINANCIALEDGE

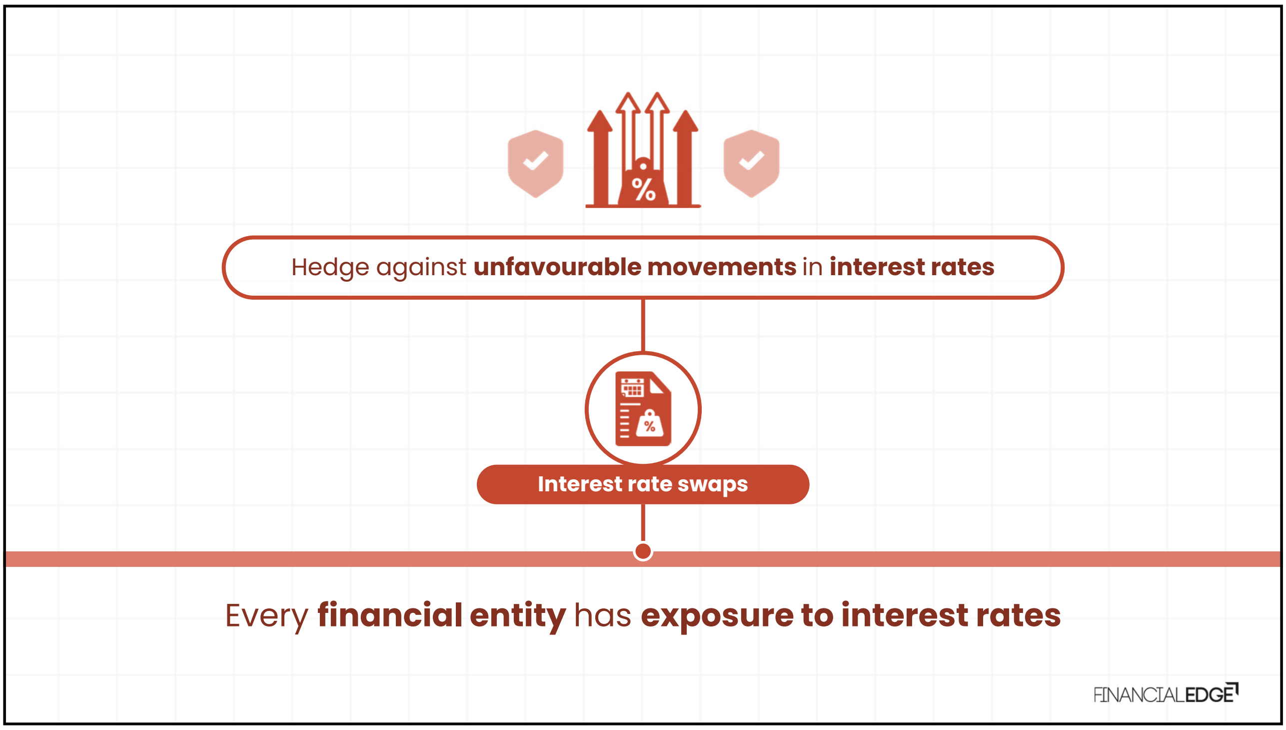

Interest Rate Swaps
$
FINANCIALEDGE

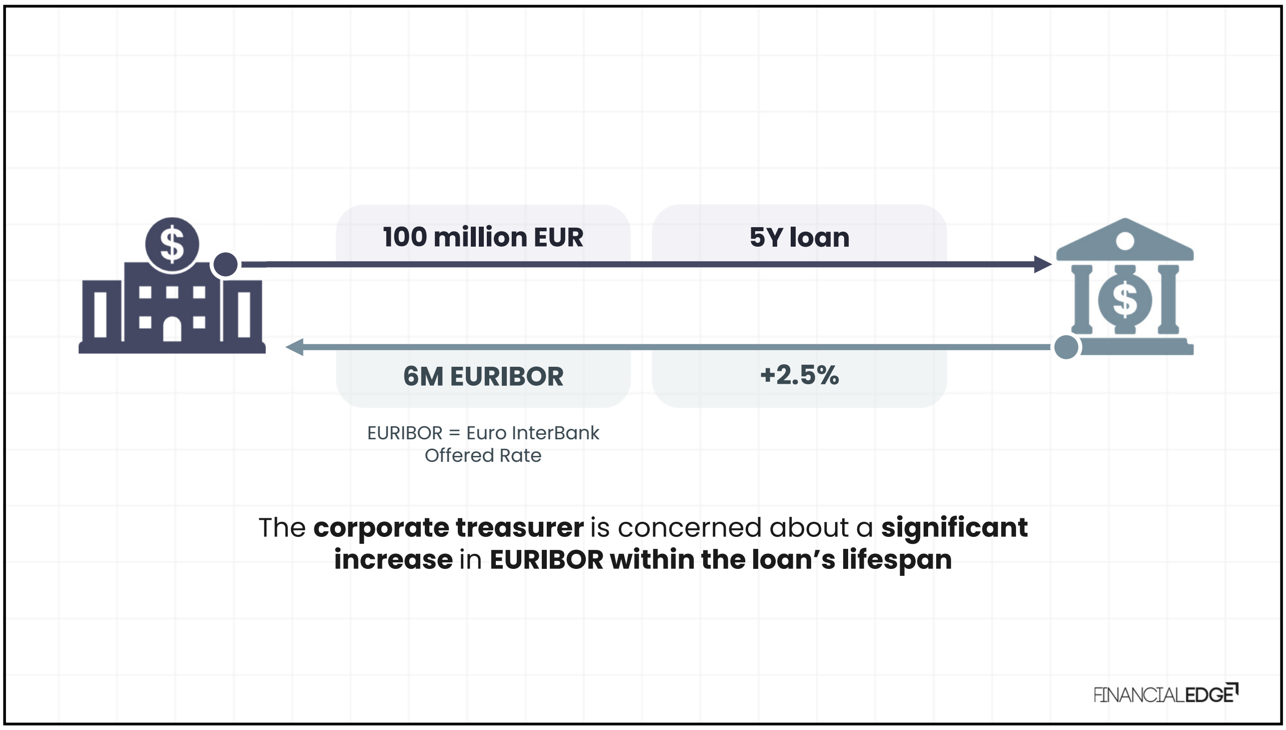

Single currency fixed-to-floating interest rate swaps
Two concurrent series of cash flows
Fixed interest rate
Swap counterparty
Swap counterparty
Reference rate
The swap is initially traded, and are dependent on the future fluctuations of the reference rate
FINANCIALEDGE

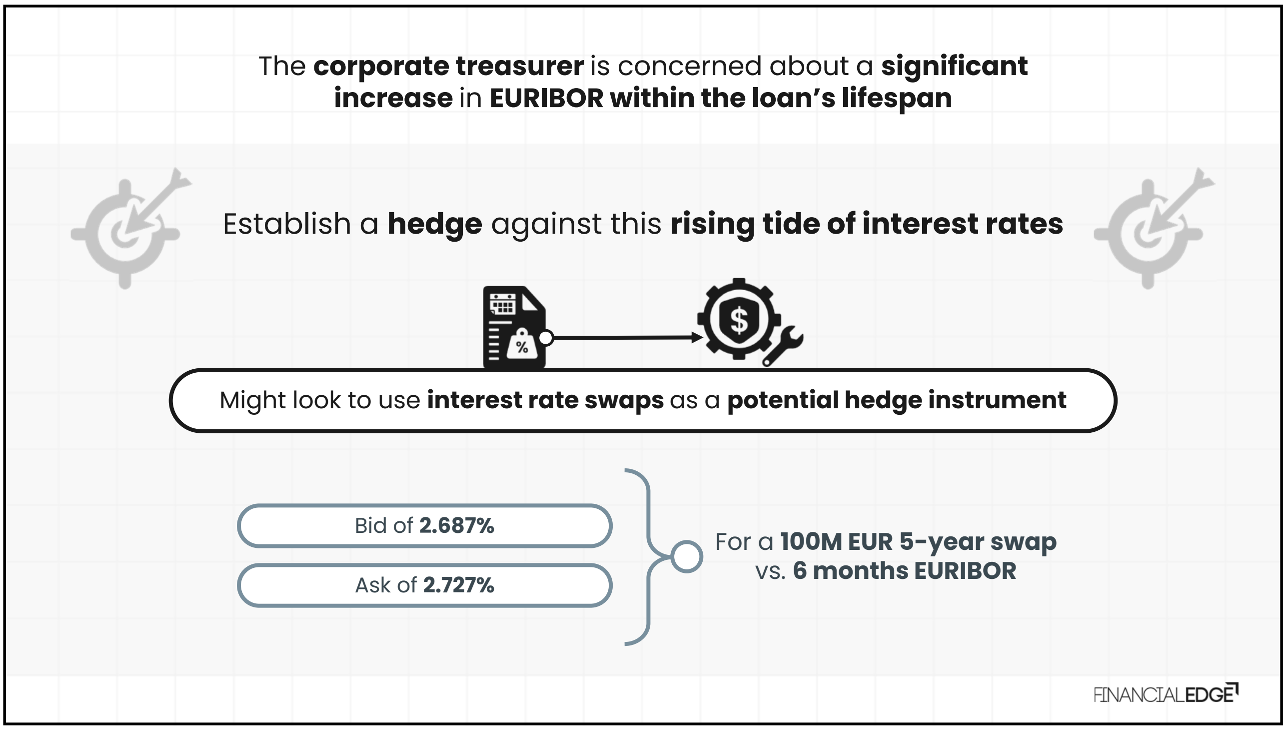

Fixed interest rate
Receiver
Payer
Variable or floating interest rate
Agrees to pay a fixed rate of interest
Receive a floating rate of interest
Agrees to pay a floating rate of interest
Receive a fixed rate of interest
FINANCIALEDGE

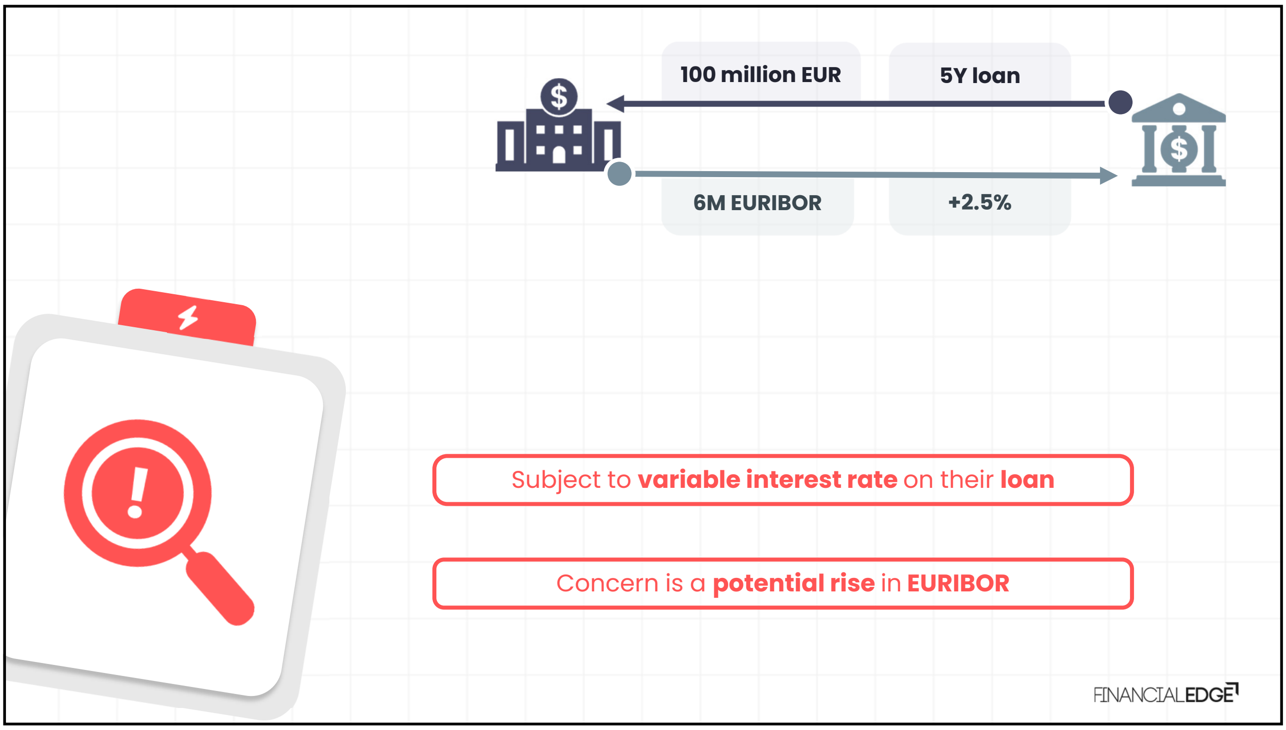

Example
Trader who enters into a swap agreement
Secured Overnight Financing Rate (SOFR)
100M USD
10 Year
3.86%
Annual
VS
SOFR
Notional value
Tenor/maturity
Swap rate
Pay frequency
Reference rate
Reset frequency
Basis for calculation of interest amounts of both legs of the swap. Not exchanged at inception
Tenor refers to the length of the swap agreement, maturity to the date on which final payments are made
The fixed rate (also: swap rate) is the fixed rate the payer pays in exchange for the series of floating interest rate payments
How often interest payments are made on either leg of the swap
The agreed upon benchmark interest rate (IBOR, near risk free rates (RFRs)) that is used to determine payments on the floating leg
How often is the floating rate reset
FINANCIALEDGE

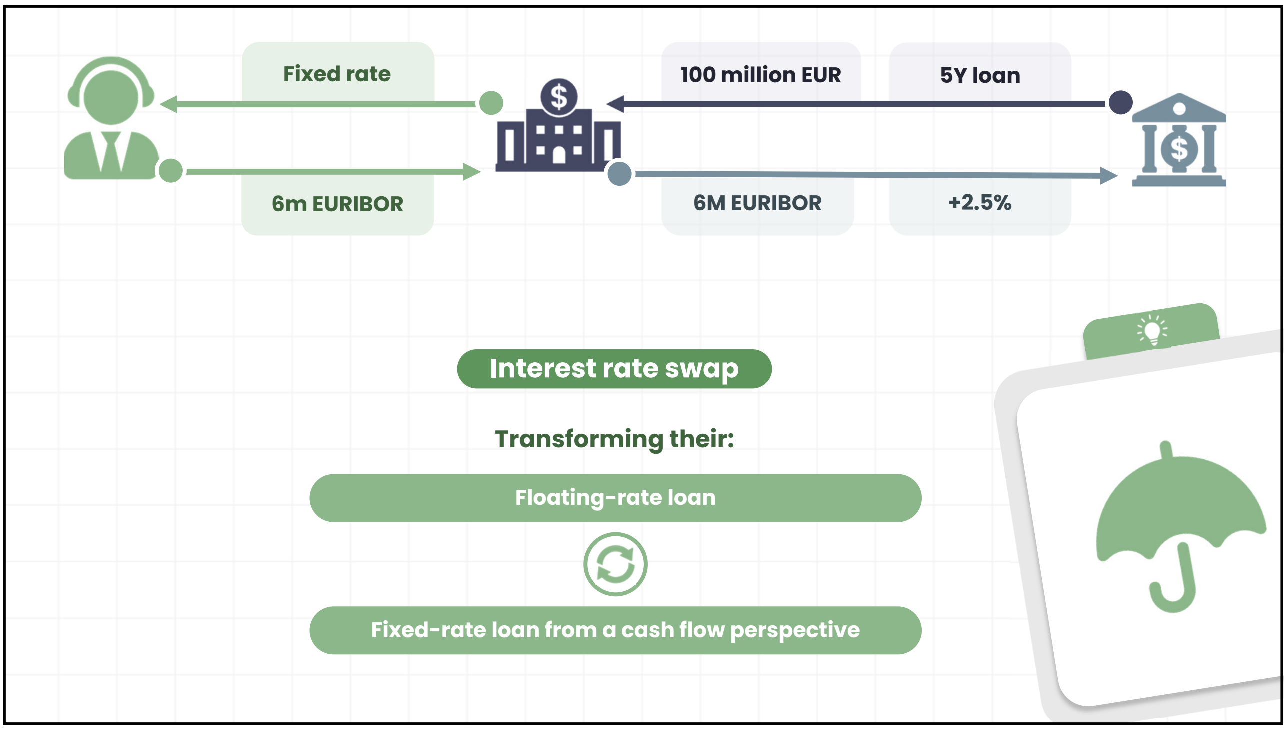

Interest Rate Swap
Application Example
FINANCIALEDGE

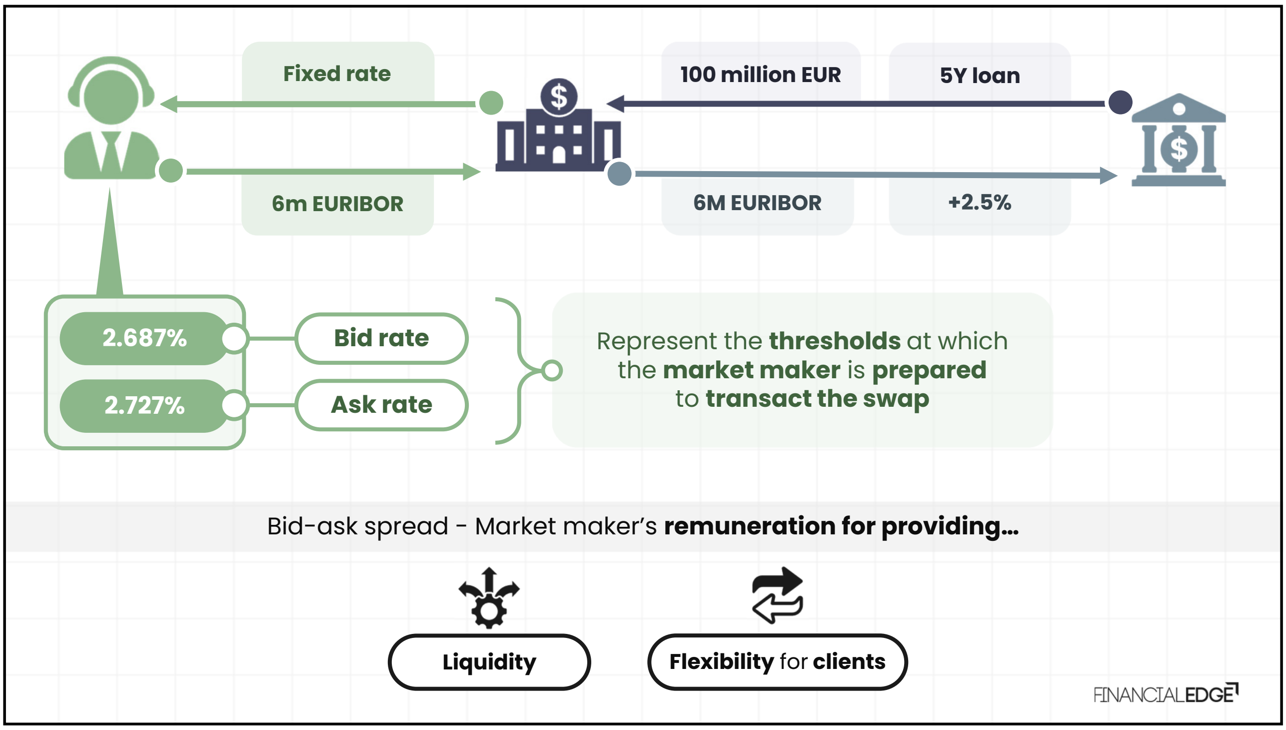

Hedge against unfavourable movements in interest rates
Interest rate swaps
Every financial entity has exposure to interest rates
FINANCIALEDGE

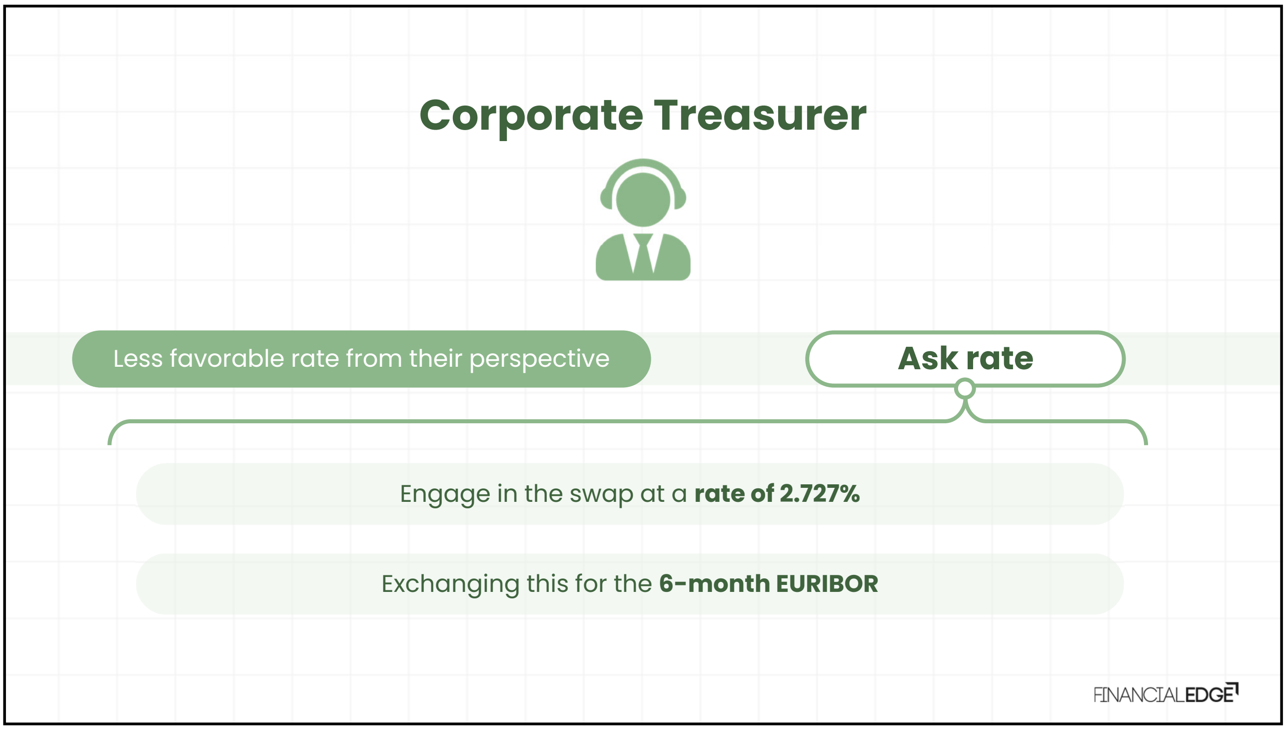

100 million EUR
5Y loan
6M EURIBOR
+2.5%
EURIBOR = Euro InterBank Offered Rate
The **corporate treasurer** is concerned about a **significant increase** in **EURIBOR within the loan's lifespan**
FINANCIALEDGE


The **corporate treasurer** is concerned about a **significant increase** in **EURIBOR within the loan's lifespan**
Establish a **hedge** against this **rising tide of interest rates**
%
$
Might look to use **interest rate swaps** as a **potential hedge instrument**
Bid of **2.687%**
Ask of **2.727%**
For a **100M EUR 5-year swap** vs. **6 months EURIBOR**
FINANCIALEDGE


100 million EUR
5Y loan
6M EURIBOR
+2.5%
Subject to **variable interest rate** on their **loan**
Concern is a **potential rise** in **EURIBOR**
FINANCIALEDGE


Fixed rate
6m EURIBOR
100 million EUR
5Y loan
6M EURIBOR
+2.5%
Interest rate swap
Transforming their:
Floating-rate loan
Fixed-rate loan from a cash flow perspective


Fixed rate
6m EURIBOR
100 million EUR
5Y loan
6M EURIBOR
+2.5%
2.687%
2.727%
Bid rate
Ask rate
Represent the thresholds at which the market maker is prepared to transact the swap
Bid-ask spread - Market maker's remuneration for providing...
Liquidity
Flexibility for clients
FINANCIALEDGE


Corporate Treasurer
Less favorable rate from their perspective
Ask rate
Engage in the swap at a rate of 2.727%
Exchanging this for the 6-month EURIBOR
FINANCIALEDGE

The Corporation

Continue to **pay** the **loan's floating rate of 6M EURIBOR plus 2.5%**

Receive **6M EURIBOR** through the **swap**

Pay out a **fixed rate of 2.727%** to the **swap counterparty**

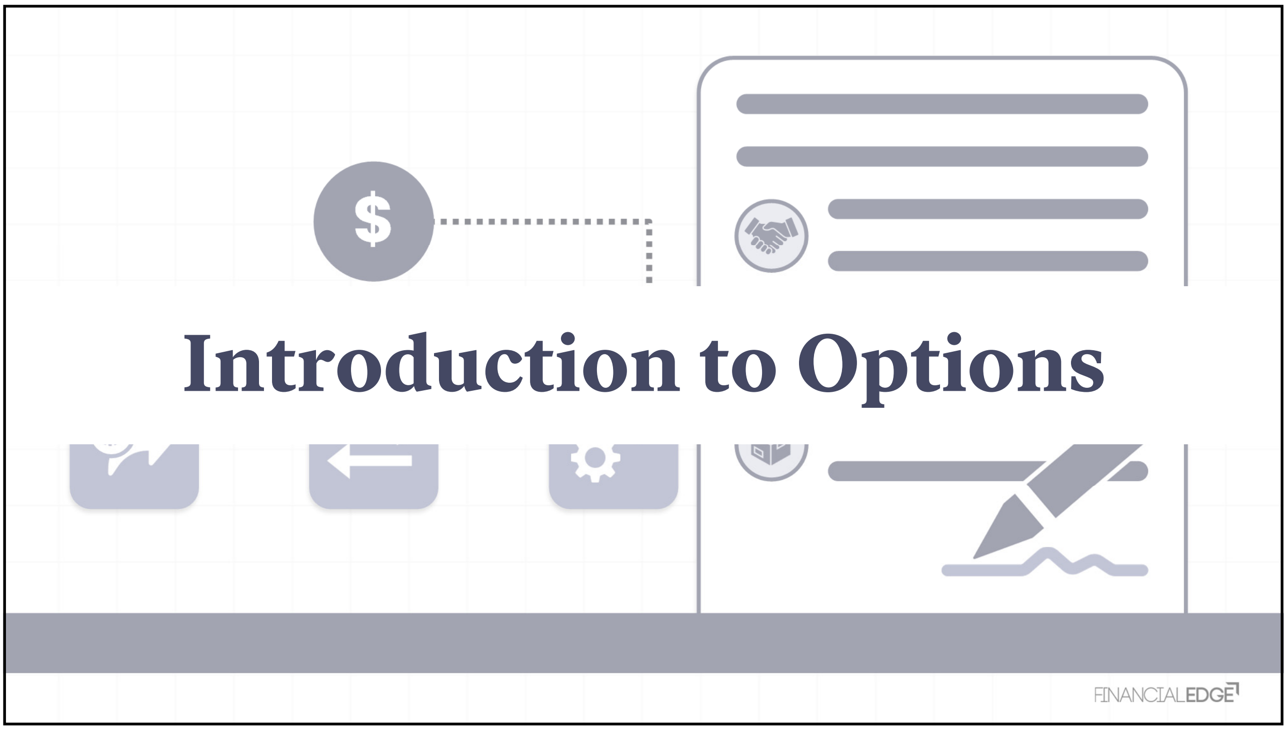
Synthetic fixed rate for the **corporation**

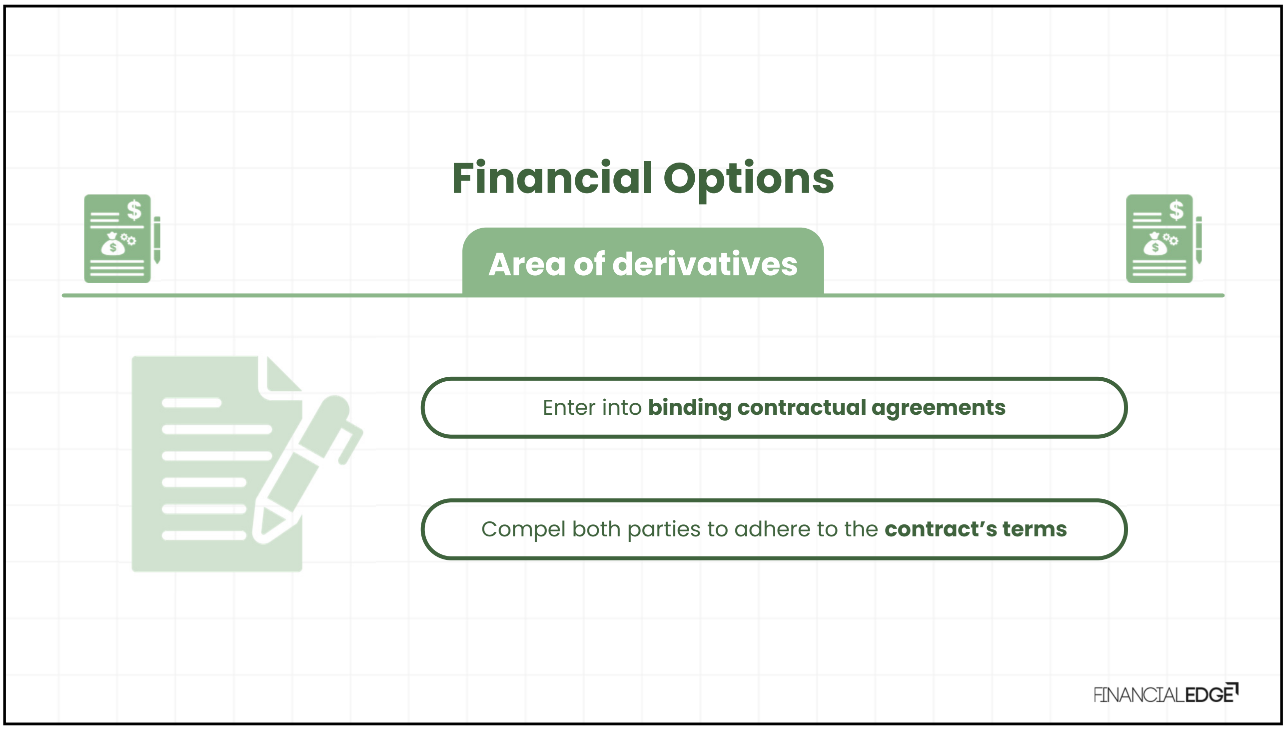
Irrespective of where the **6-month EURIBOR fluctuates** over the following **five years**

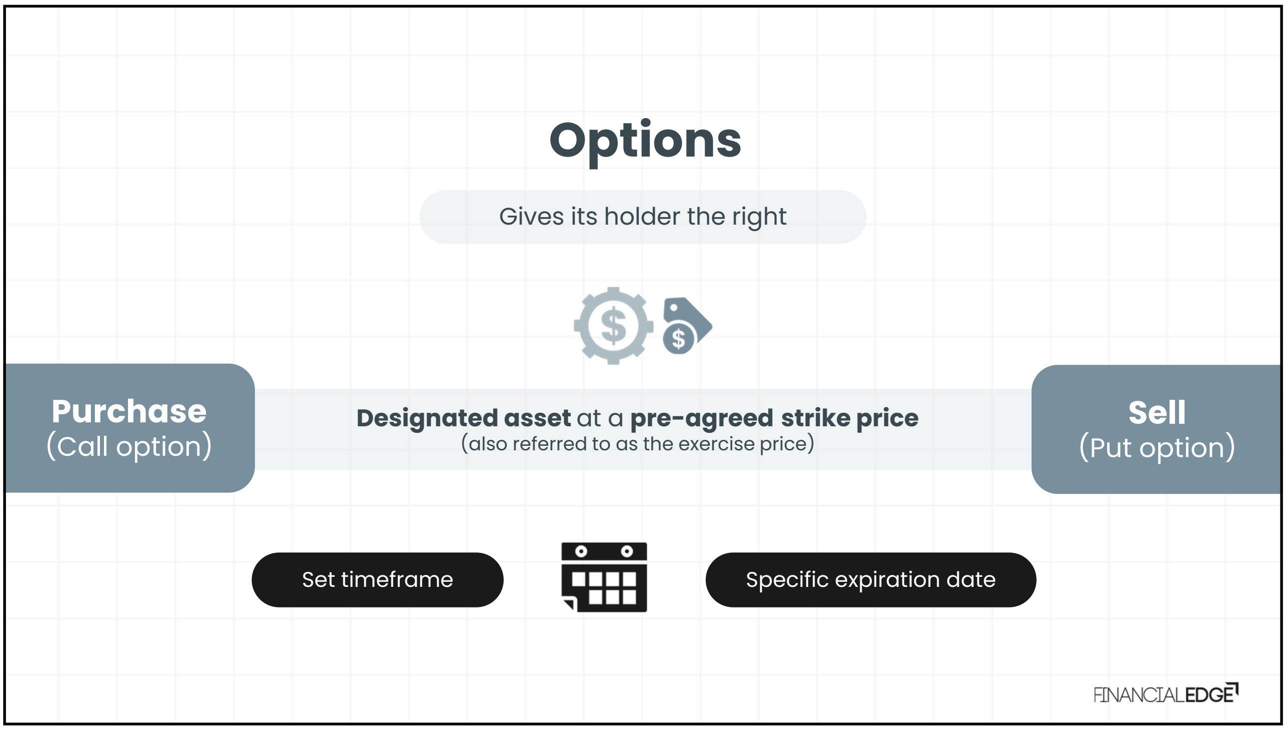
Corporation's net interest payment on the **borrowed sum**

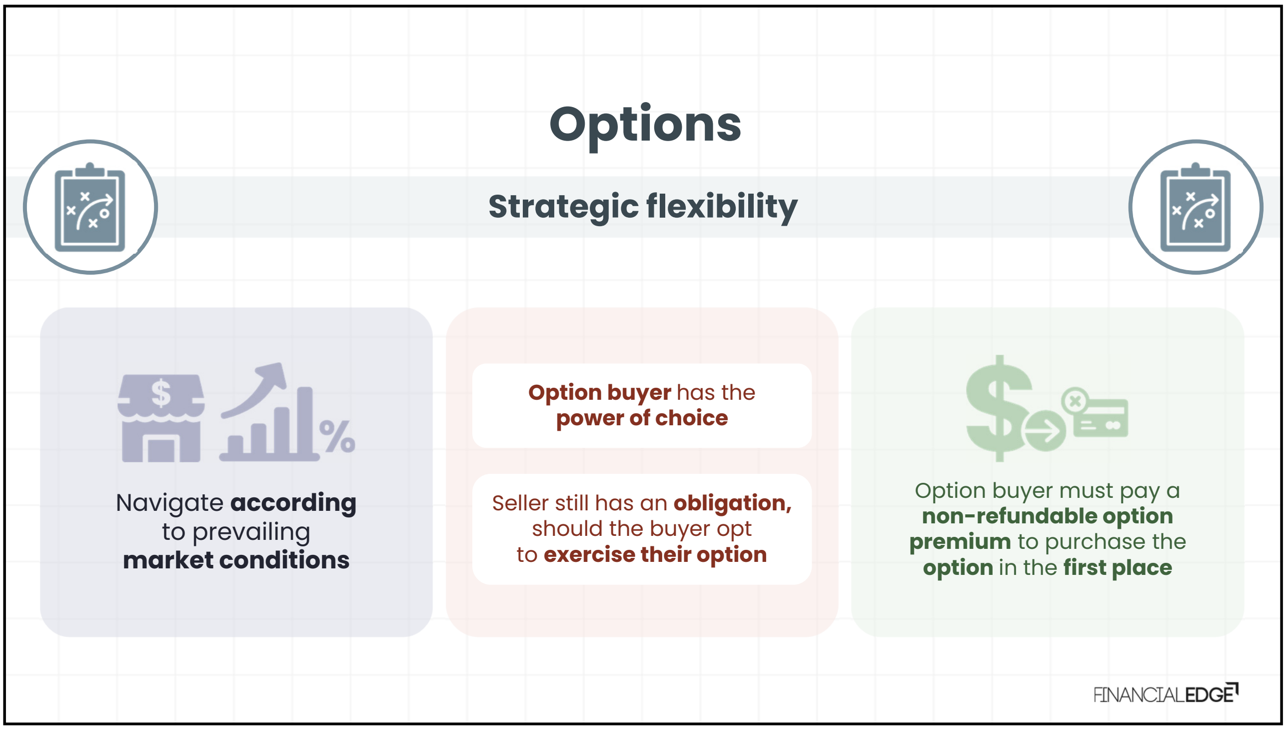
5.227%

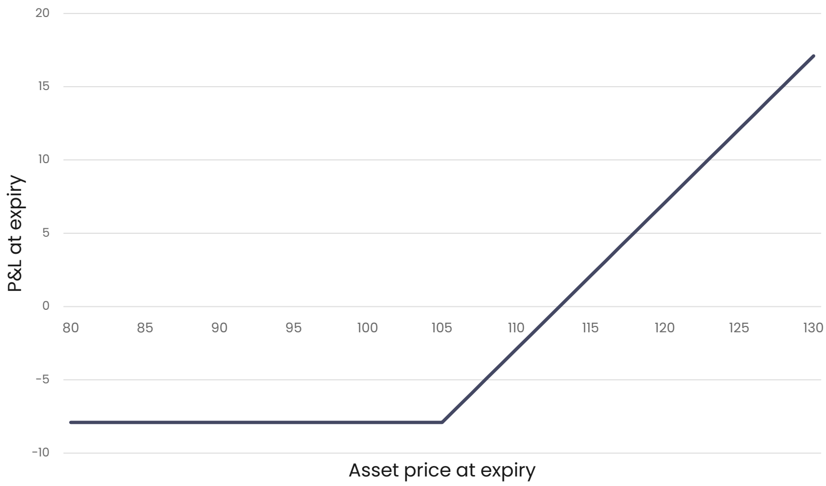
2.727%	**2.5%**
Fixed swap rate	**Loan's margin**


Introduction to Options
FINANCIALEDGE


Financial Options
Area of derivatives
Enter into **binding contractual agreements**
Compel both parties to adhere to the **contract's terms**
FINANCIALEDGE


Options
Gives its holder the right
Purchase
(Call option)
Designated asset at a pre-agreed strike price
(also referred to as the exercise price)
Sell
(Put option)
Set timeframe
Specific expiration date
FINANCIALEDGE


Options
Strategic flexibility
Navigate according to prevailing market conditions
Option buyer has the power of choice
Seller still has an obligation, should the buyer opt to exercise their option
Option buyer must pay a non-refundable option premium to purchase the option in the first place
FINANCIALEDGE



12-month call option

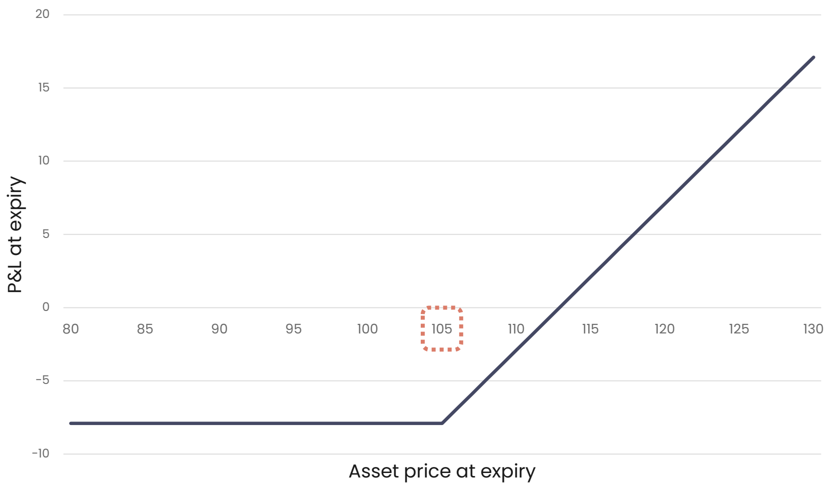
$105

$105 strike price

$7.90

Premium of $7.90

Long call option position is where the term long relates to **purchasing the option**



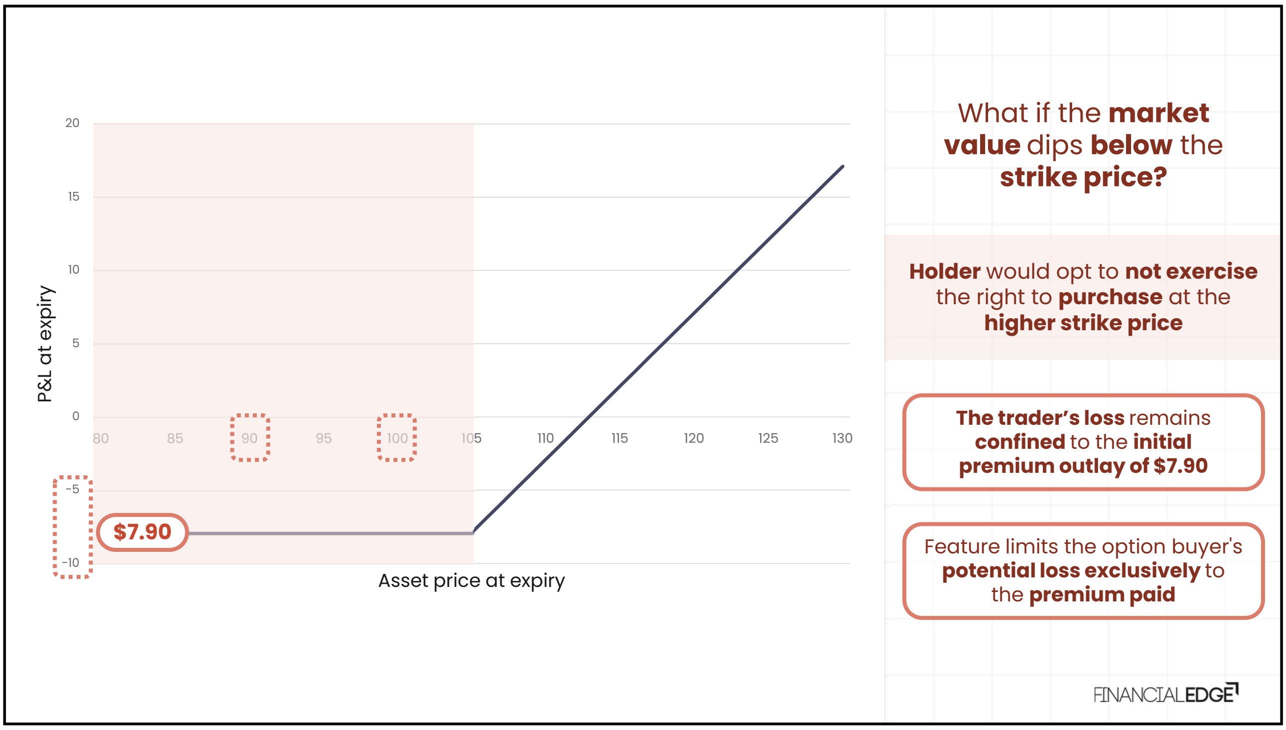
Trader's profit and loss (P&L)

Cash-settled option

Does not offer **economic value** to the holder

Doesn't translate to a **zero P&L for our trader**


P&L at expiry
20
15
10
5
0
-5
-10
80
85
90
95
100
105
110
115
120
125
130
$7.90
Asset price at expiry
Trader
Loss equal to the premium paid
FINANCIALEDGE

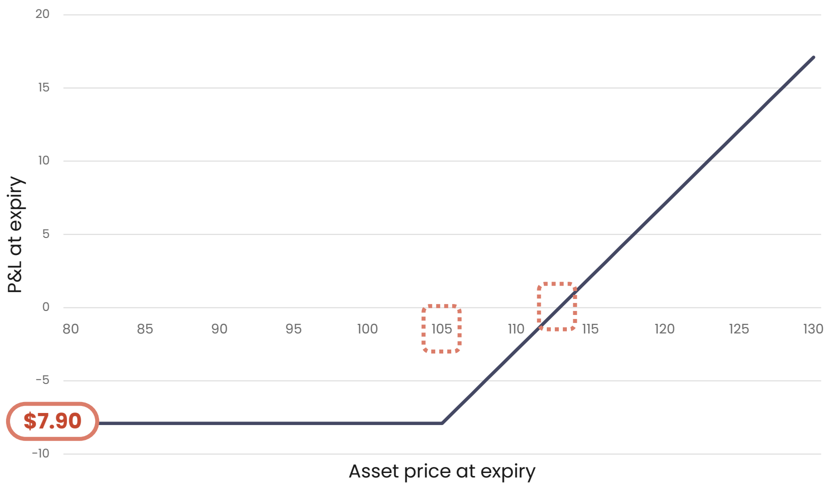

P&L at expiry
20
15
10
5
0
-5
-10
80
85
90
95
100
105
110
115
120
125
130
$7.90
Asset price at expiry
What if the market value dips below the strike price?
Holder would opt to not exercise the right to purchase at the higher strike price
The trader's loss remains confined to the initial premium outlay of $7.90
Feature limits the option buyer's potential loss exclusively to the premium paid
FINANCIALEDGE

Underlying asset's price might **increase** and **end up above** the **above** the **strike price at expiration**

Exercise the **right to buy** the underlying asset for **$105**

Despite the asset being **worth $110**

FINANCIALEDGE



Break-even Point

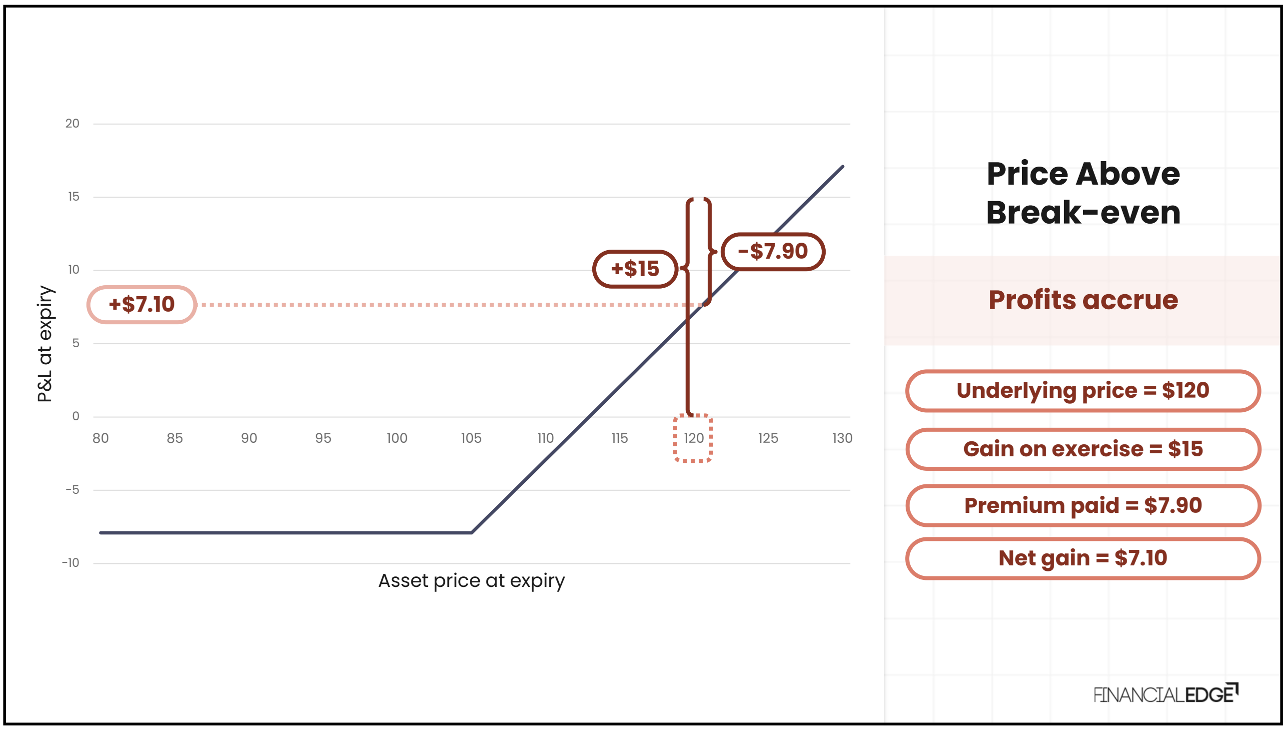
Make no gain and no loss

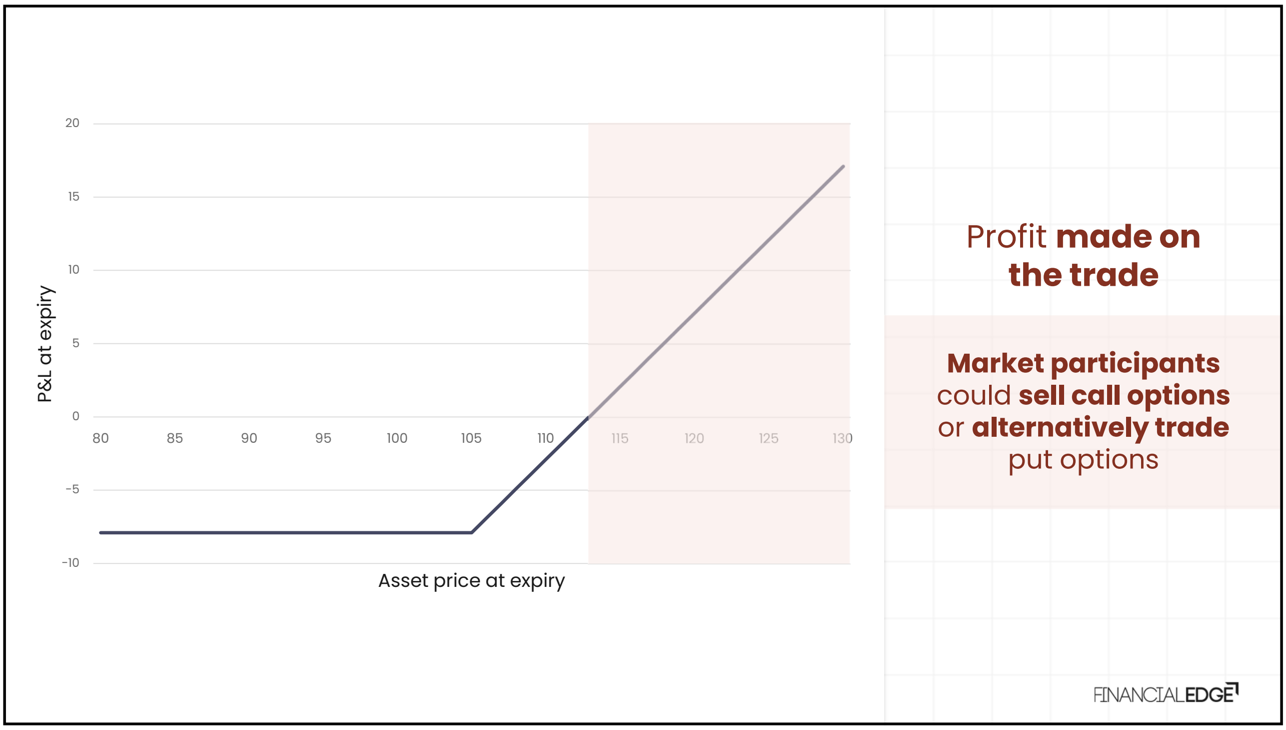
Asset price at **expiry** is **$112.90**

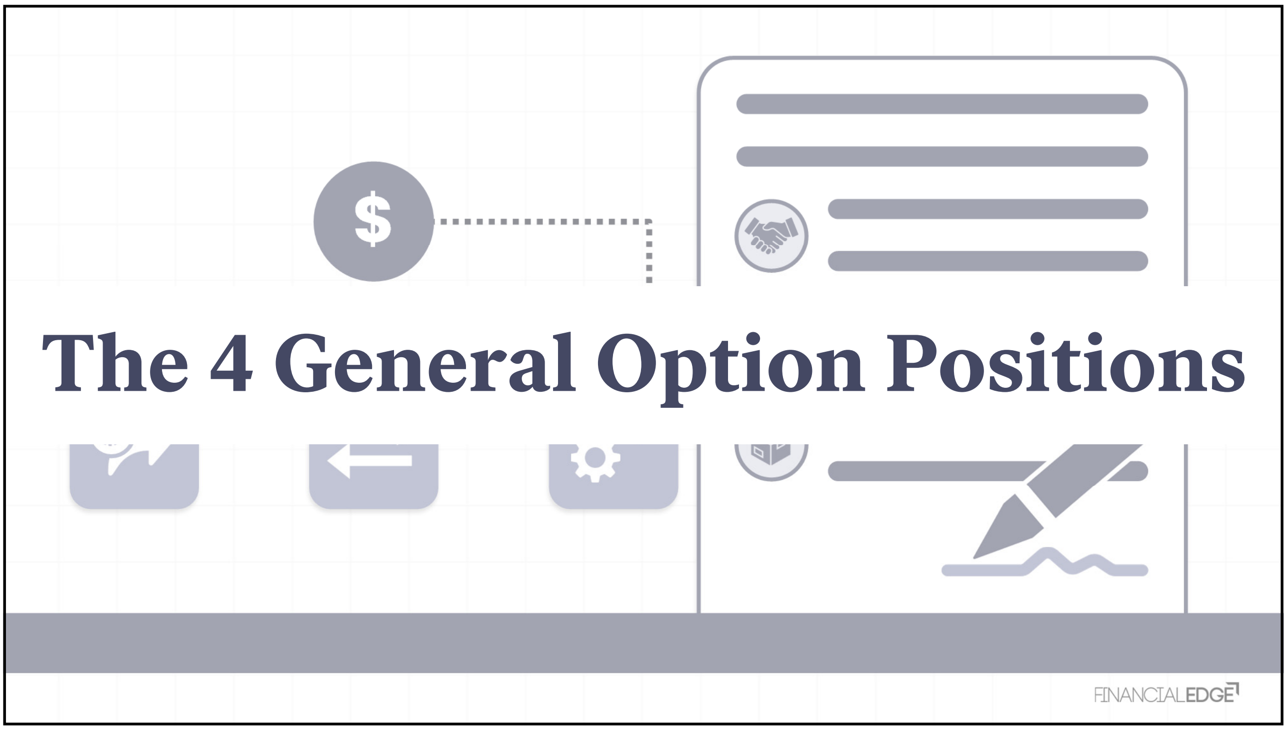
Strike price + premium

105 + 7.90

FINANCIALEDGE


Price Above Break-even
Profits accrue
Underlying price = $120
Gain on exercise = $15
Premium paid = $7.90
Net gain = $7.10
+$7.10
+$15
-$7.90
P&L at expiry
Asset price at expiry
20
15
10
5
0
-5
-10
80
85
90
95
100
105
110
115
120
125
130
FINANCIALEDGE

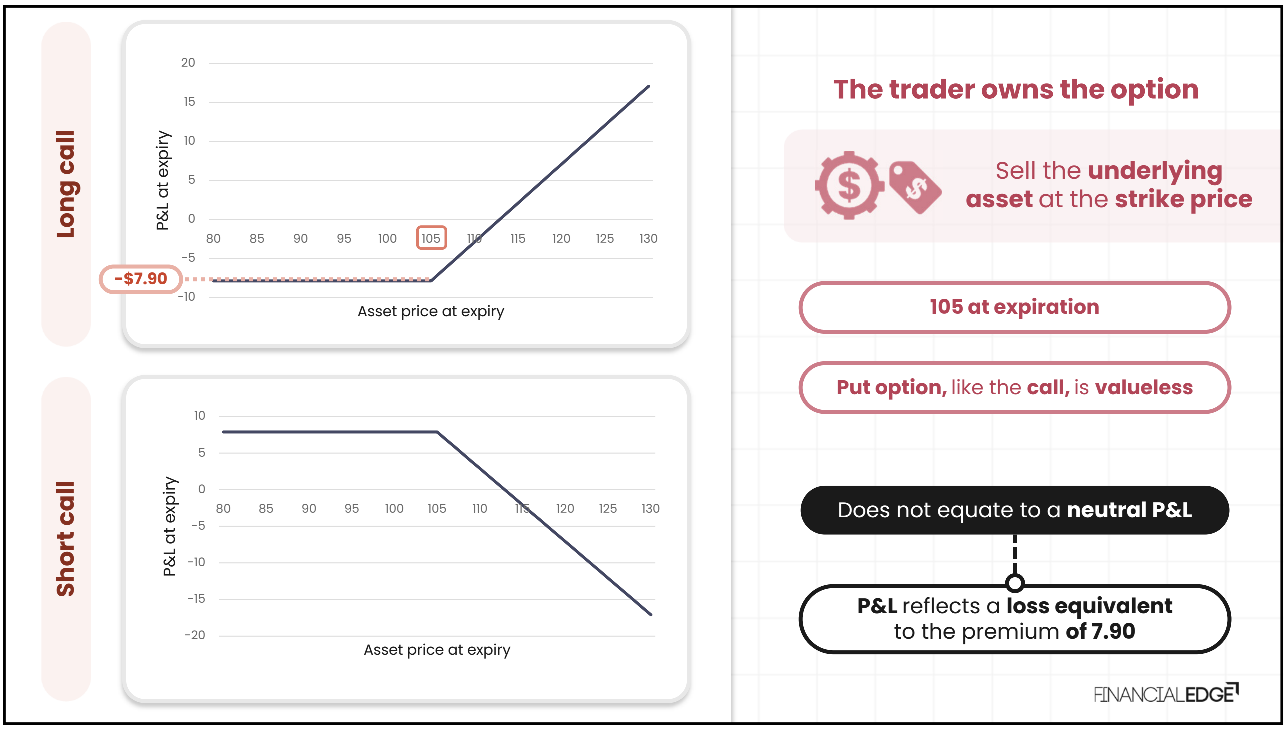

Profit made on the trade
Market participants could sell call options or alternatively trade put options
P&L at expiry
Asset price at expiry
20
15
10
5
0
-5
-10
80
85
90
95
100
105
110
115
120
125
130
FINANCIALEDGE



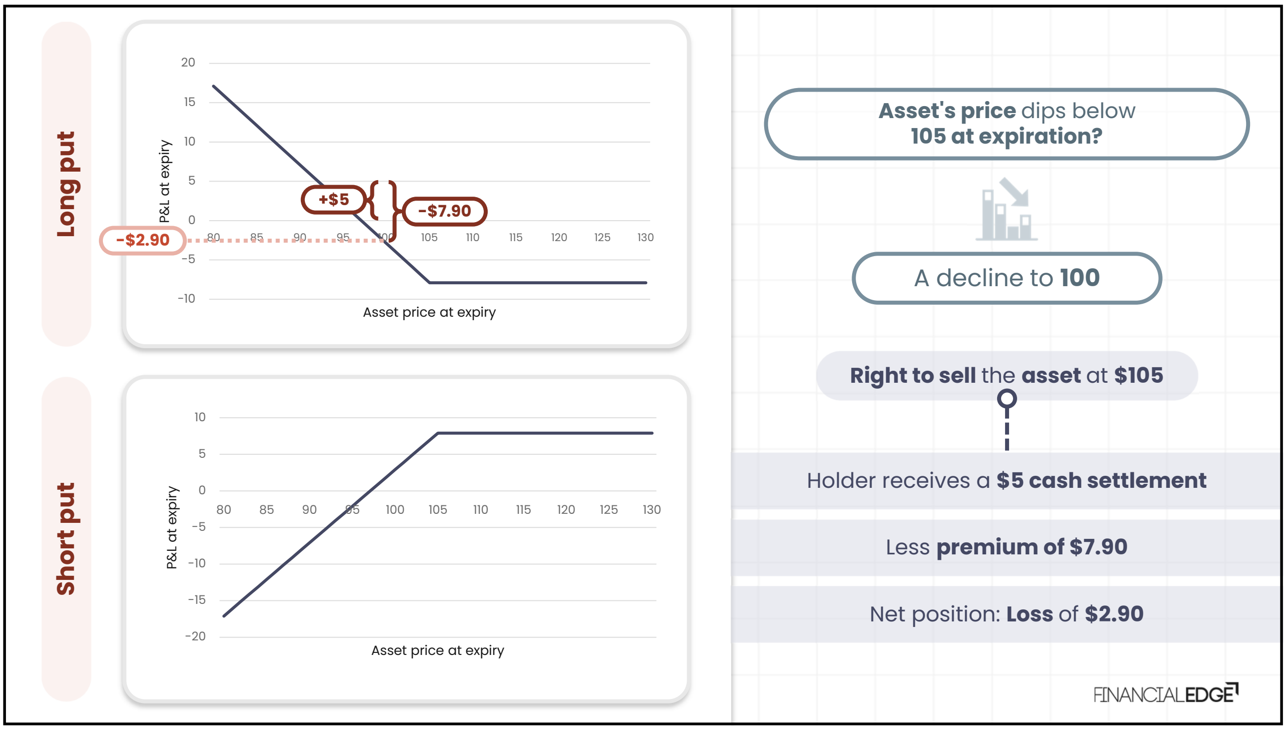
The 4 General Option Positions
FINANCIALEDGE

Long call
P&L at expiry
Option not exercised
-$7.90
Asset price at expiry
Short call
+$7.90
Seller retains premium
Asset price at expiry
Position of long and short side are the two sides of one contract
Where one is winning
The other must be losing
FINANCIALEDGE

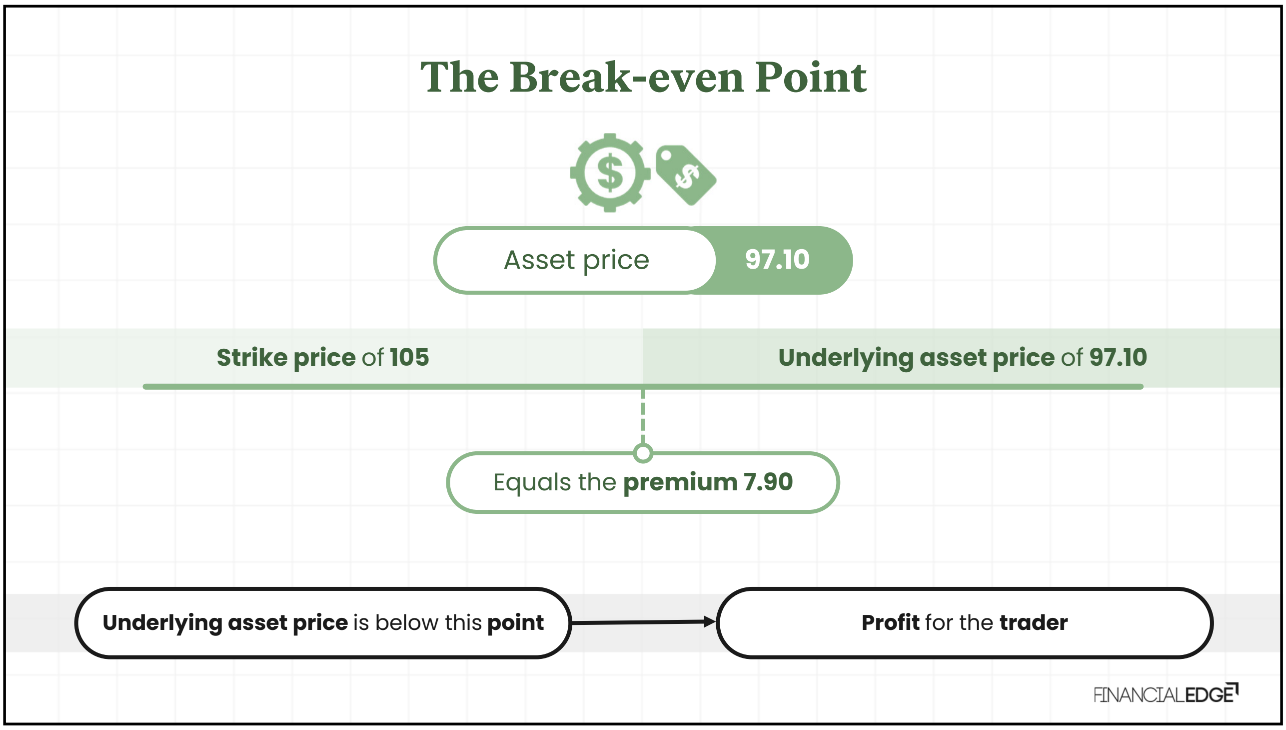

Long call
P&L at expiry
Option exercised
Asset price at expiry
Short call
P&L at expiry
Premium offset by cash settlement
Asset price at expiry
The **asset's price exceeds** the **break-even point**
112.90
FINANCIALEDGE

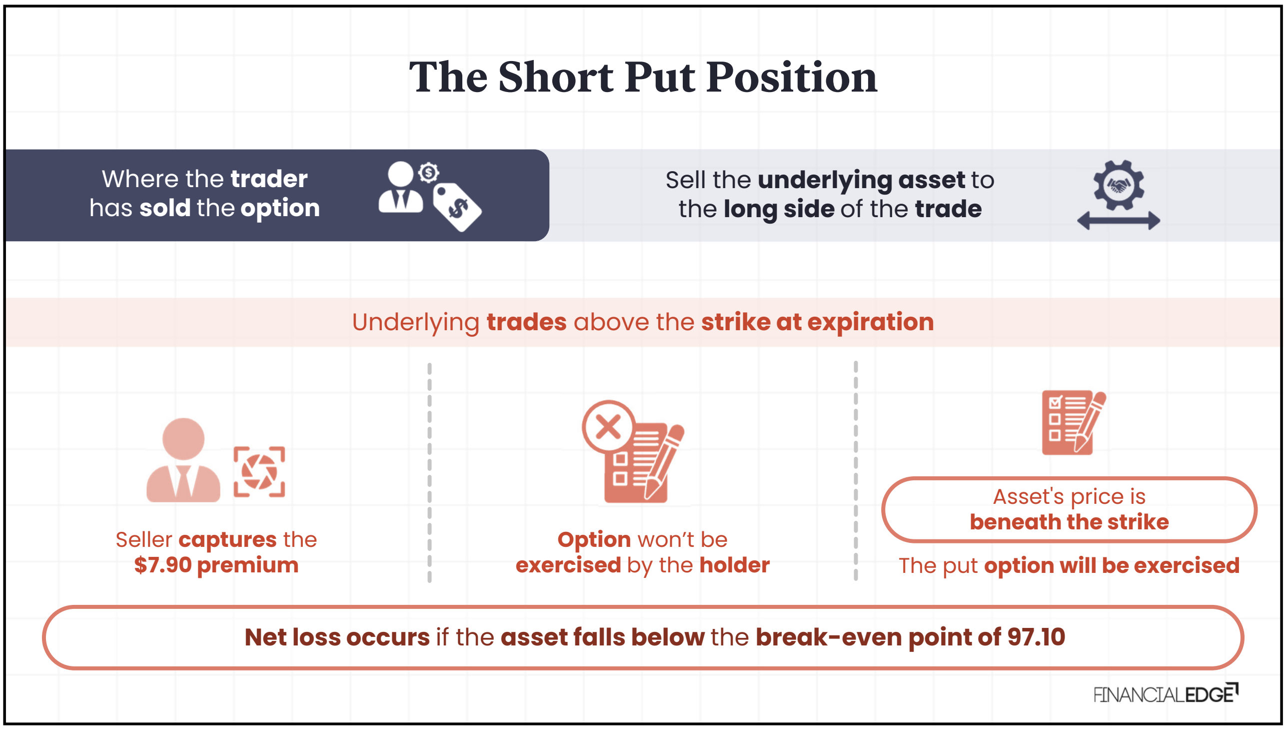

Long call
P&L at expiry
-$7.90
105
Asset price at expiry
Short call
P&L at expiry
Asset price at expiry
The trader owns the option
Sell the **underlying asset** at the **strike price**
105 at expiration
Put option, like the **call,** is **valueless**
Does not equate to a **neutral P&L**
P&L reflects a **loss equivalent** to the premium **of 7.90**
FINANCIALEDGE

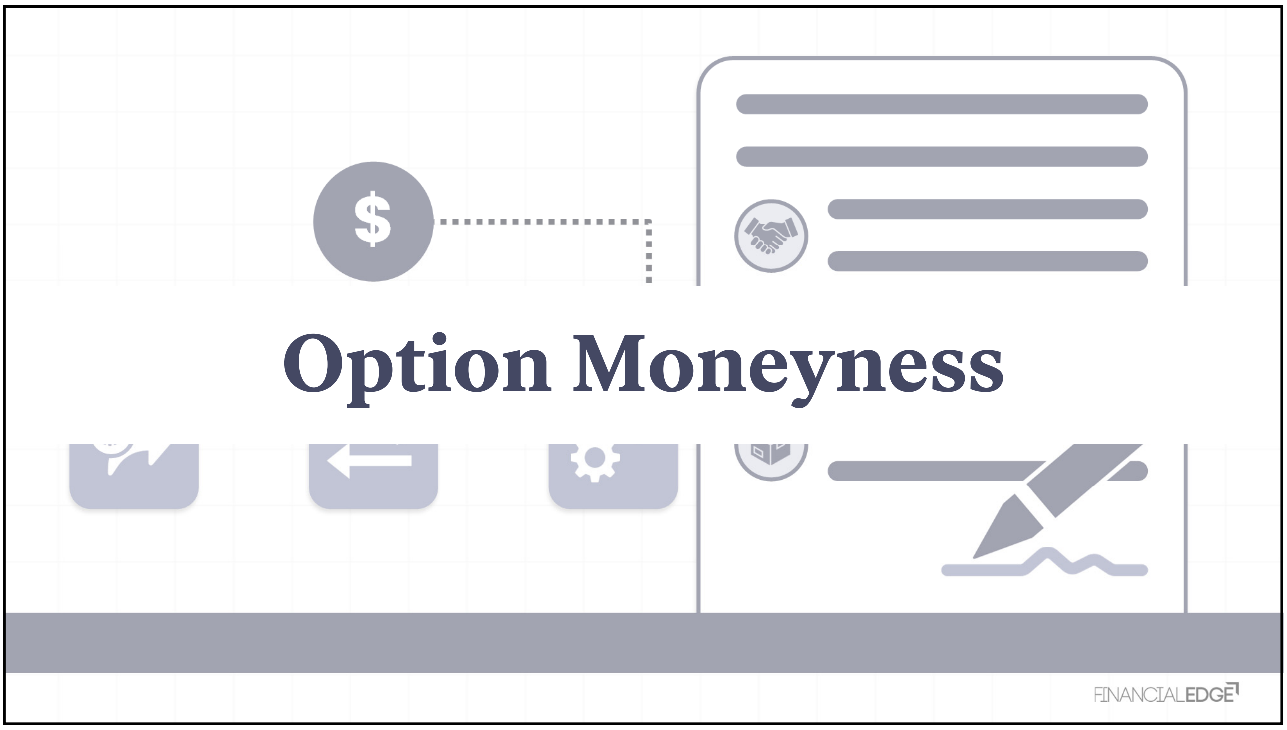
Long put
20
15
10
5
0
-5
-10
80 85 90 95 100 105 110 115 120 125 130
P&L at expiry
Asset price at expiry
Option not exercised
-$7.90
Short put
10
5
0
-5
-10
-15
-20
Premium offset by cash settlement
Asset's price is above the strike at expiry
Optionality becomes advantageous
Avoiding the sale of the asset at $105
Worth more, the 115, in the market
Caps the potential loss at $7.90
FINANCIALEDGE

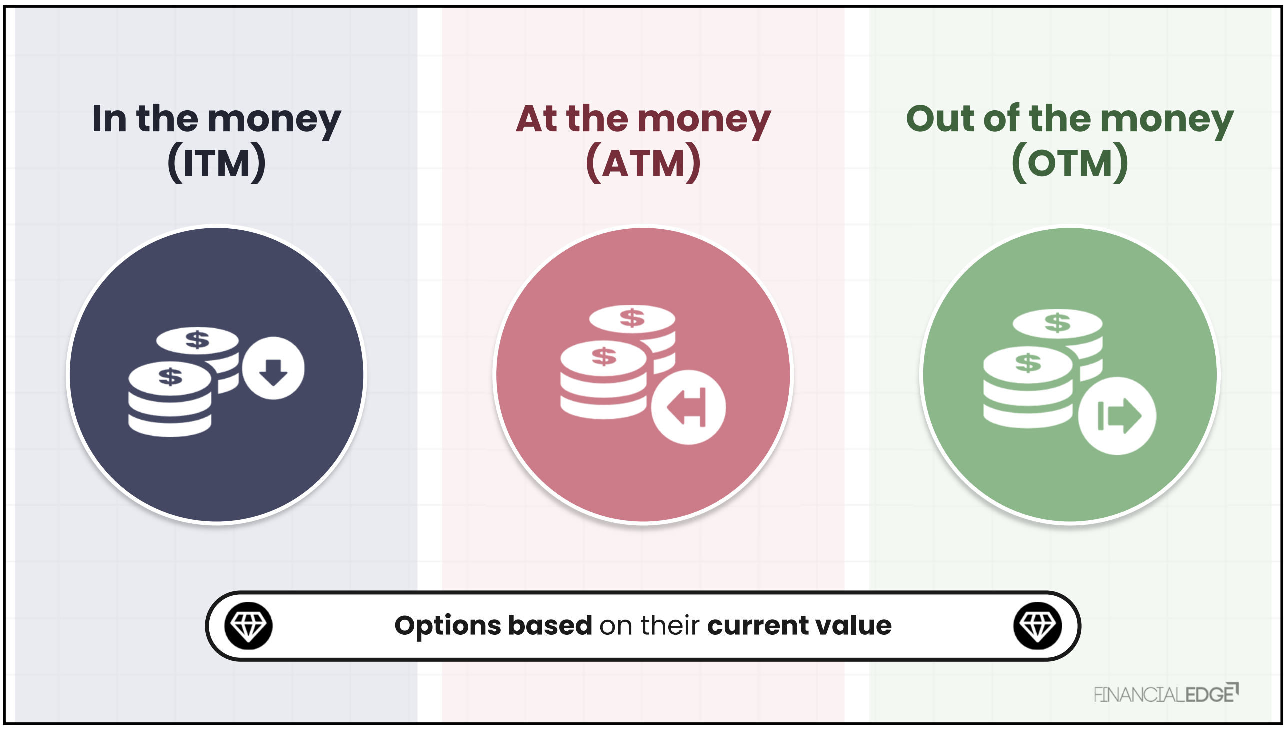


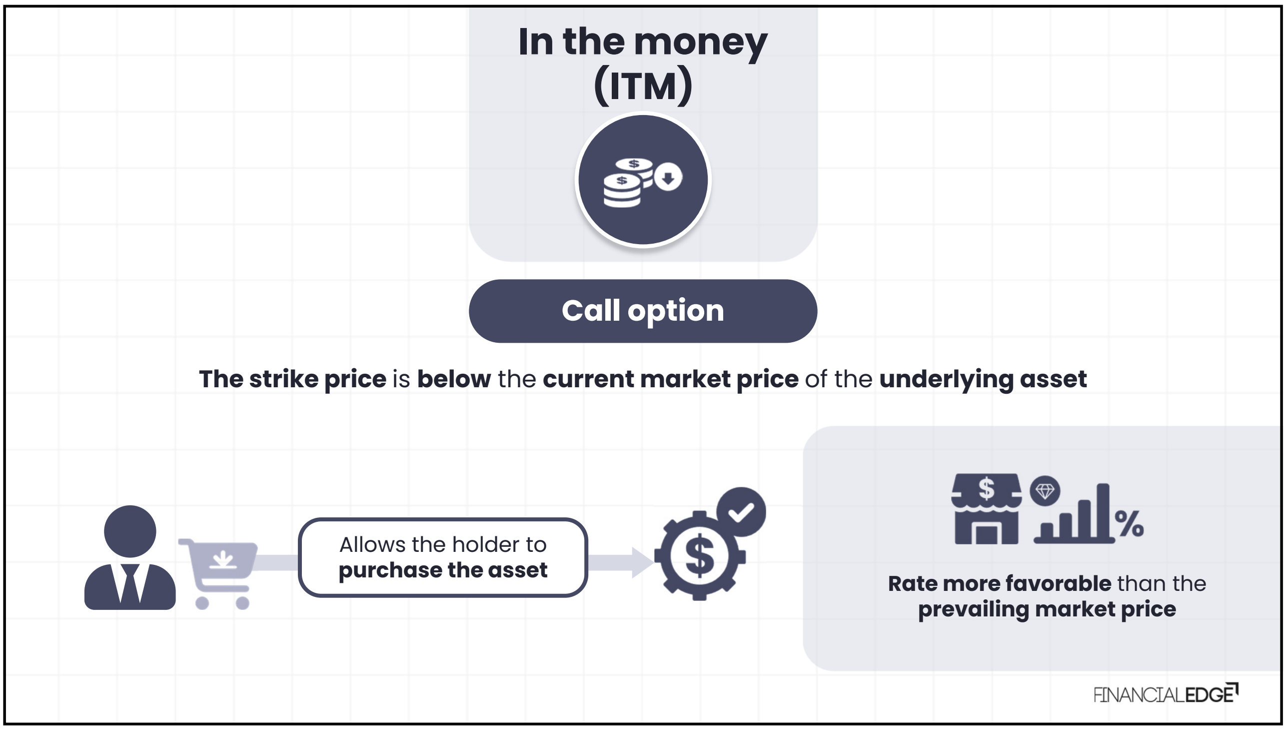
Long put
P&L at expiry
Asset price at expiry
+$5
-$7.90
-$2.90
Short put
Asset's price dips below 105 at expiration?
A decline to 100
Right to sell the asset at $105
Holder receives a $5 cash settlement
Less premium of $7.90
Net position: Loss of $2.90
FINANCIALEDGE

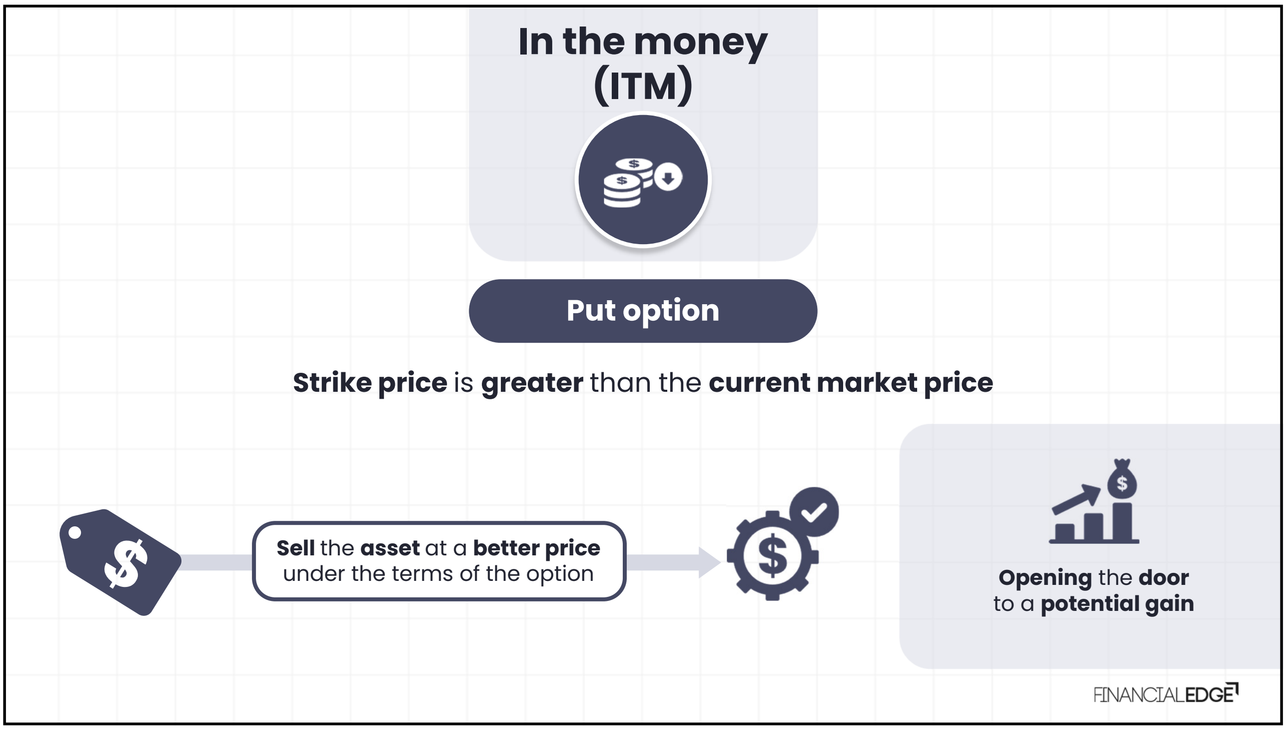

The Break-even Point
Asset price
97.10
Strike price of 105
Underlying asset price of 97.10
Equals the premium 7.90
Underlying asset price is below this point
Profit for the trader
FINANCIALEDGE

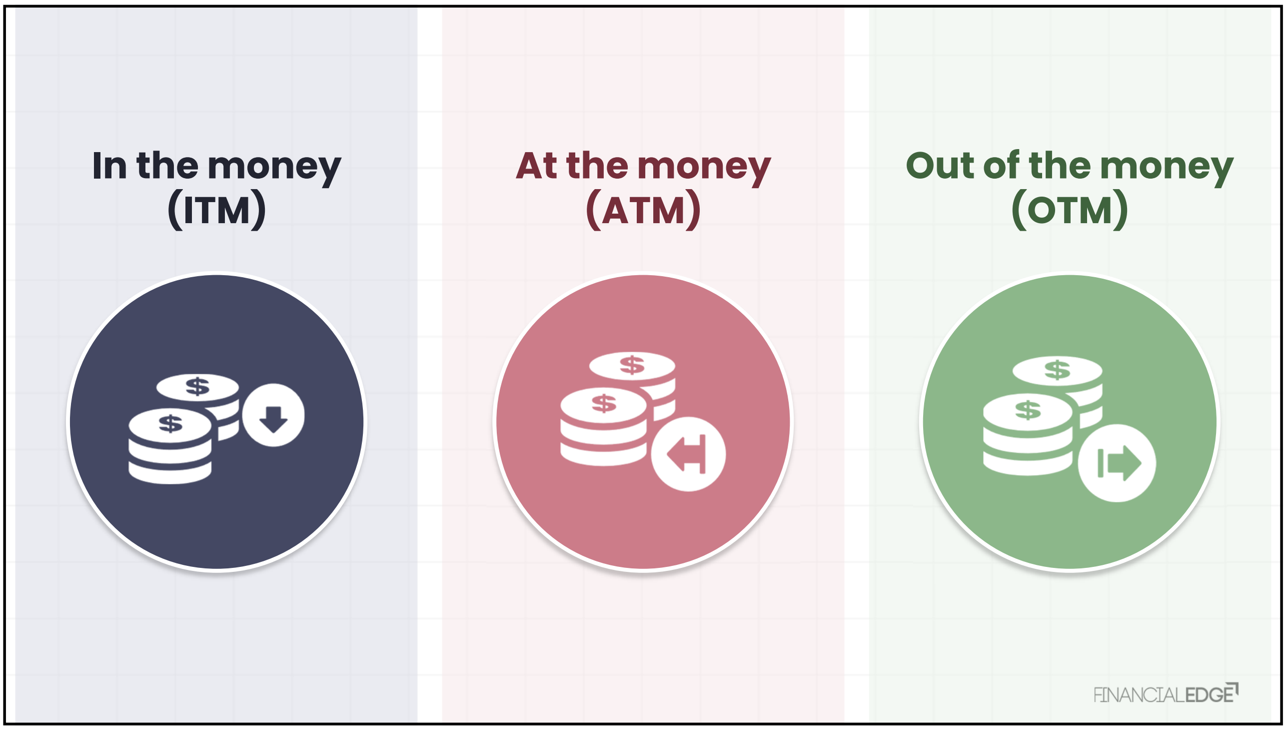

The Short Put Position
Where the trader has sold the option
Sell the underlying asset to the long side of the trade
Underlying trades above the strike at expiration
Seller captures the $7.90 premium
Option won't be exercised by the holder
Asset's price is beneath the strike
The put option will be exercised
Net loss occurs if the asset falls below the break-even point of 97.10
FINANCIALEDGE

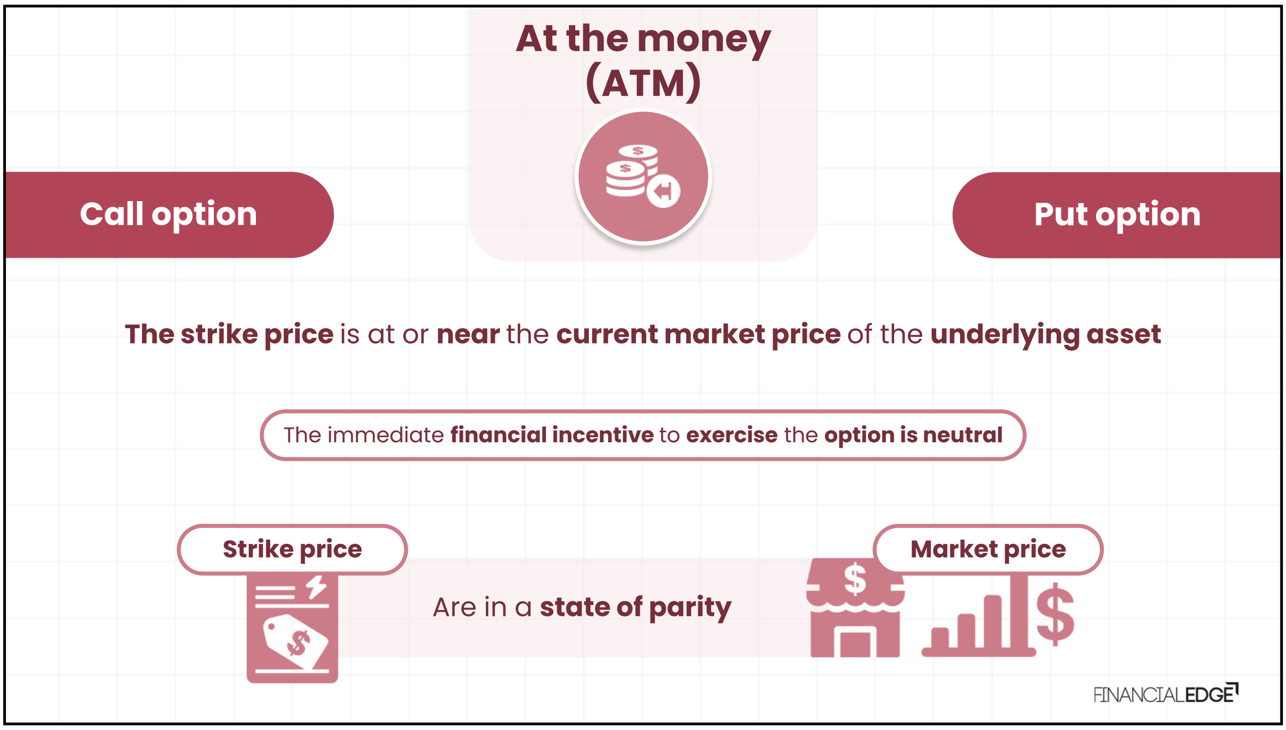

Option Moneyness

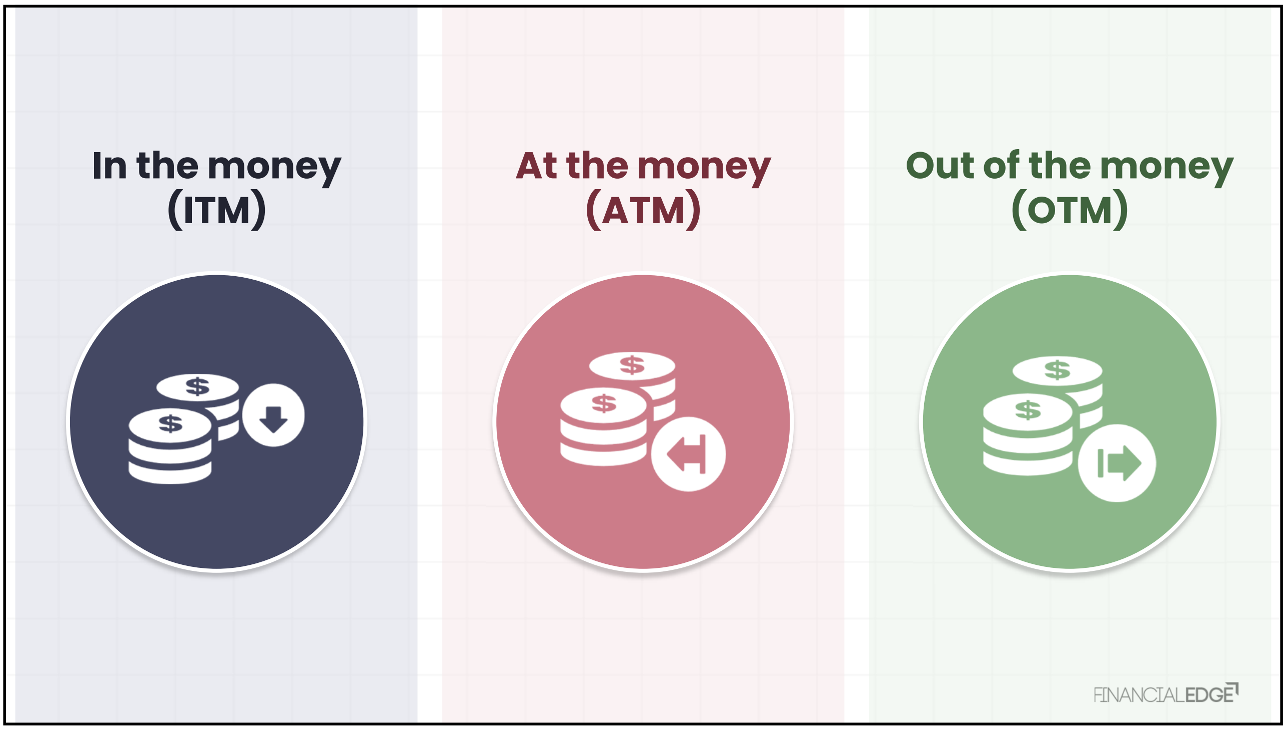

In the money (ITM)
At the money (ATM)
Out of the money (OTM)
Options based on their current value

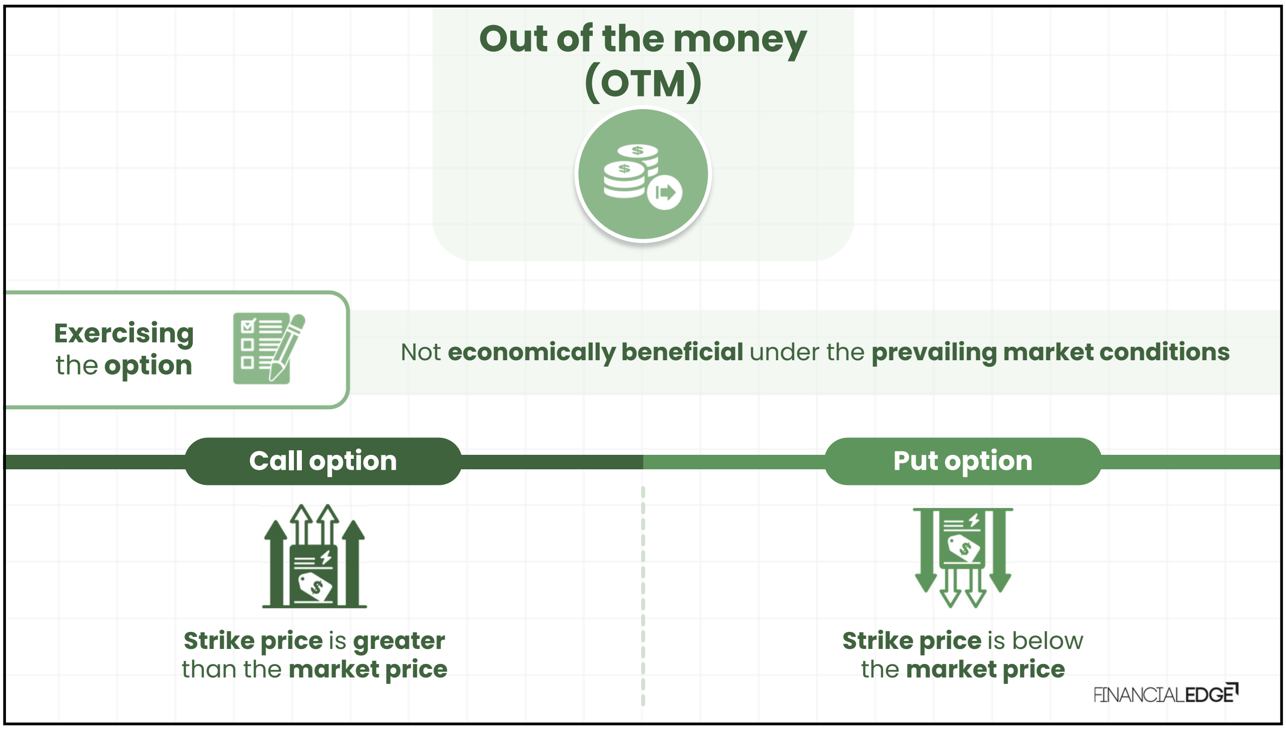

In the money (ITM)
Call option
The strike price is below the current market price of the underlying asset
Allows the holder to purchase the asset
Rate more favorable than the prevailing market price
FINANCIALEDGE

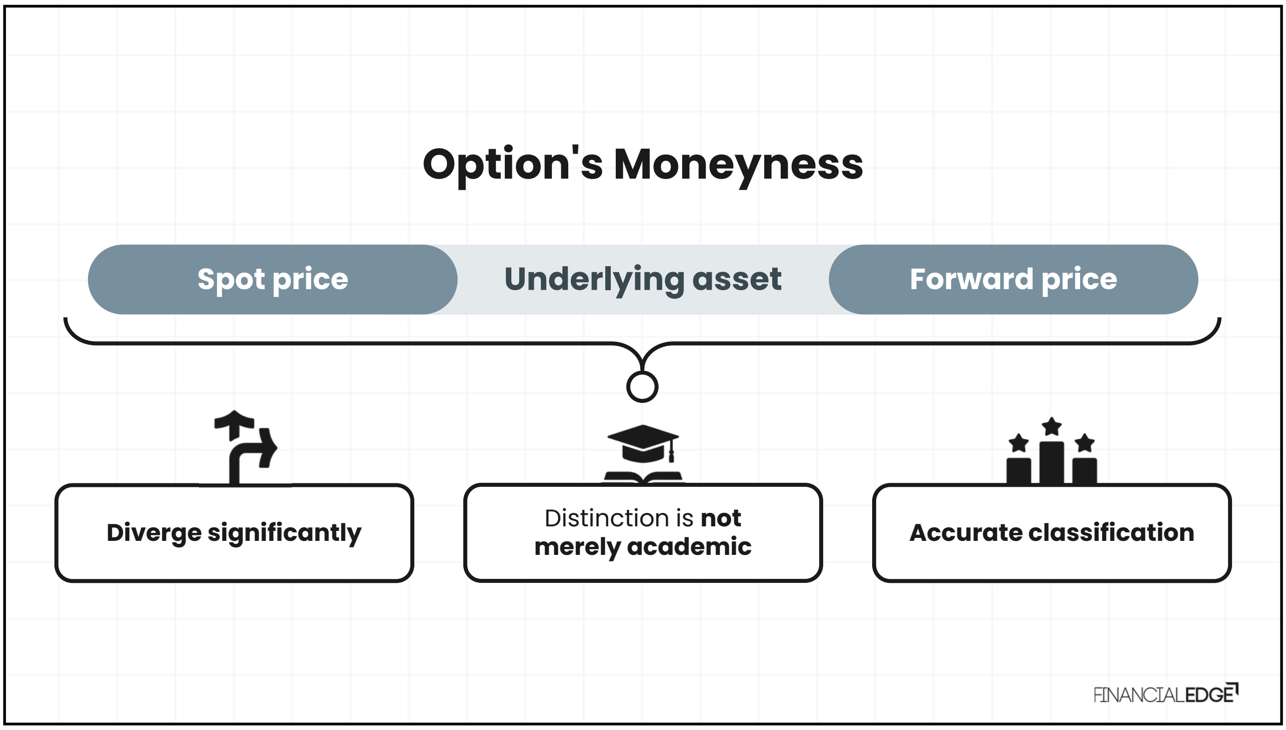

In the money (ITM)
Put option
Strike price is greater than the current market price
Sell the asset at a better price under the terms of the option
Opening the door to a potential gain
FINANCIALEDGE

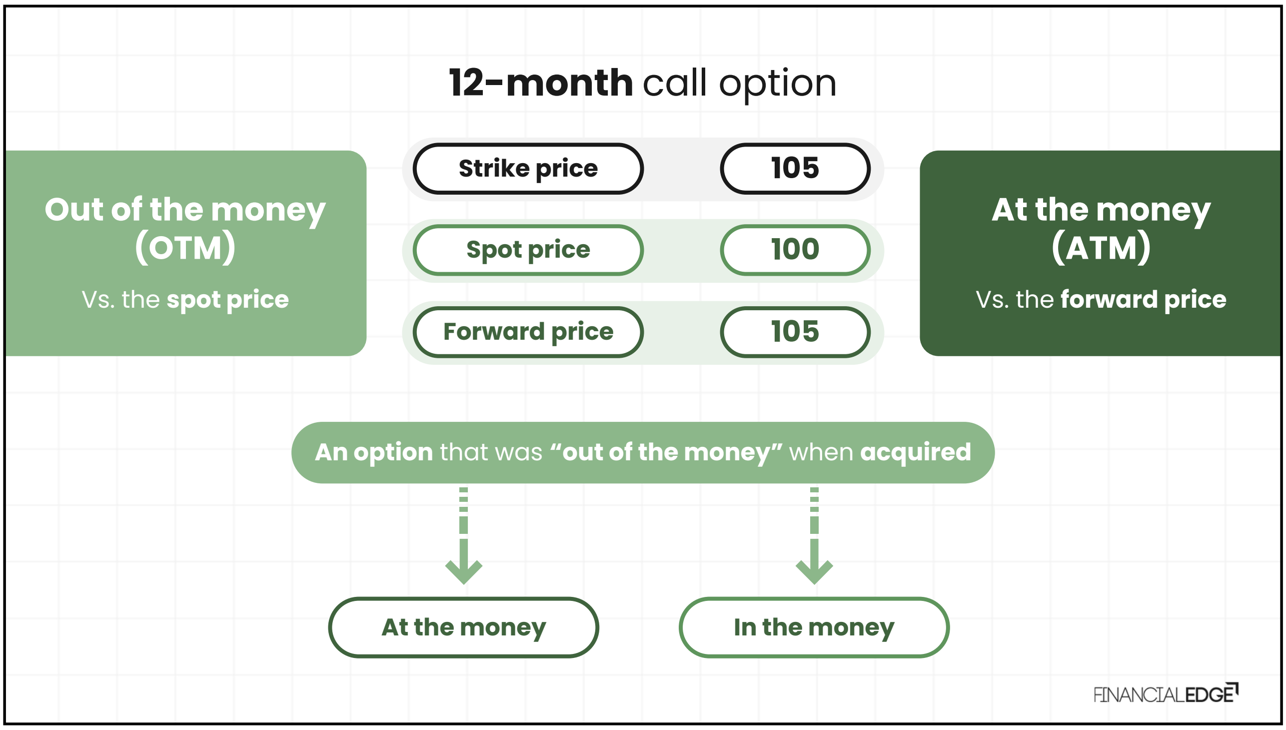

In the money (ITM)
At the money (ATM)
Out of the money (OTM)
FINANCIALEDGE


At the money (ATM)
Call option
Put option
The strike price is at or near the current market price of the underlying asset
The immediate financial incentive to exercise the option is neutral
Strike price
Are in a state of parity
Market price
FINANCIALEDGE

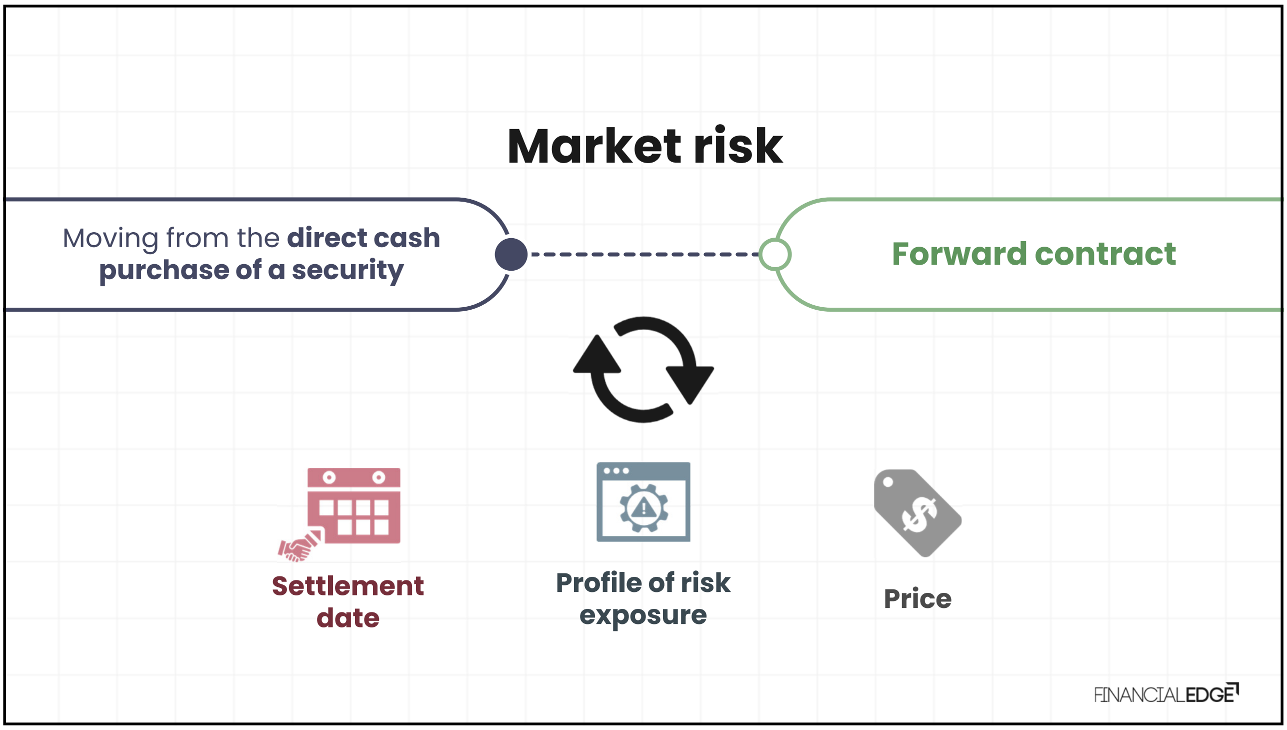

In the money
(ITM)
At the money
(ATM)
Out of the money
(OTM)
$
FINANCIALEDGE


Out of the money
(OTM)
Exercising
the option
Not economically beneficial under the prevailing market conditions
Call option
Put option
Strike price is greater
than the market price
Strike price is below
the market price
FINANCIALEDGE


Option's Moneyness
Spot price
Underlying asset
Forward price
Diverge significantly
Distinction is not merely academic
Accurate classification
FINANCIALEDGE


12-month call option
Out of the money (OTM)
Vs. the spot price
Strike price
105
Spot price
100
Forward price
105
At the money (ATM)
Vs. the forward price
An option that was "out of the money" when acquired
At the money
In the money
FINANCIALEDGE

Market and Counterparty
Risk in Derivatives



Market risk
Moving from the direct cash purchase of a security
Forward contract
Settlement date
Profile of risk exposure
Price

The fair forward price of a **12-month forward contract** under different scenarios

- Initial position
- Spot price increased
- Interest increased
- Dividend increased
- 3 months have passed

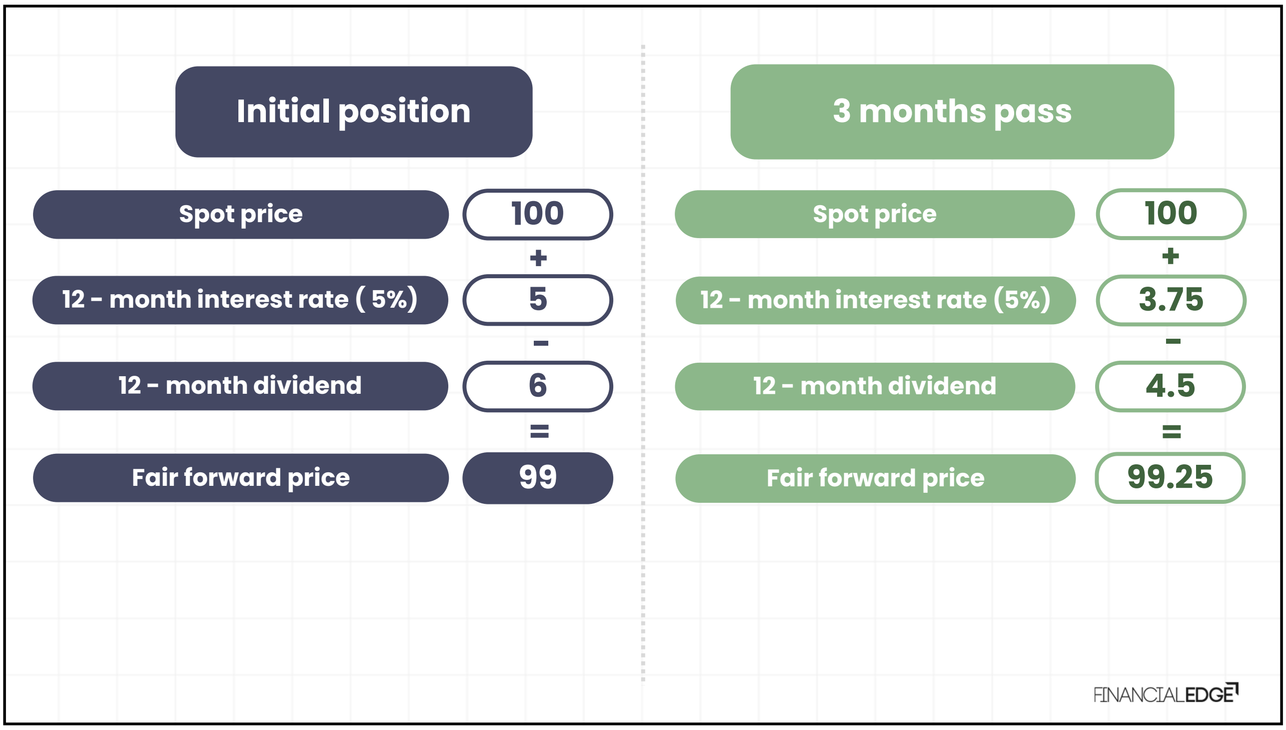
Initial position

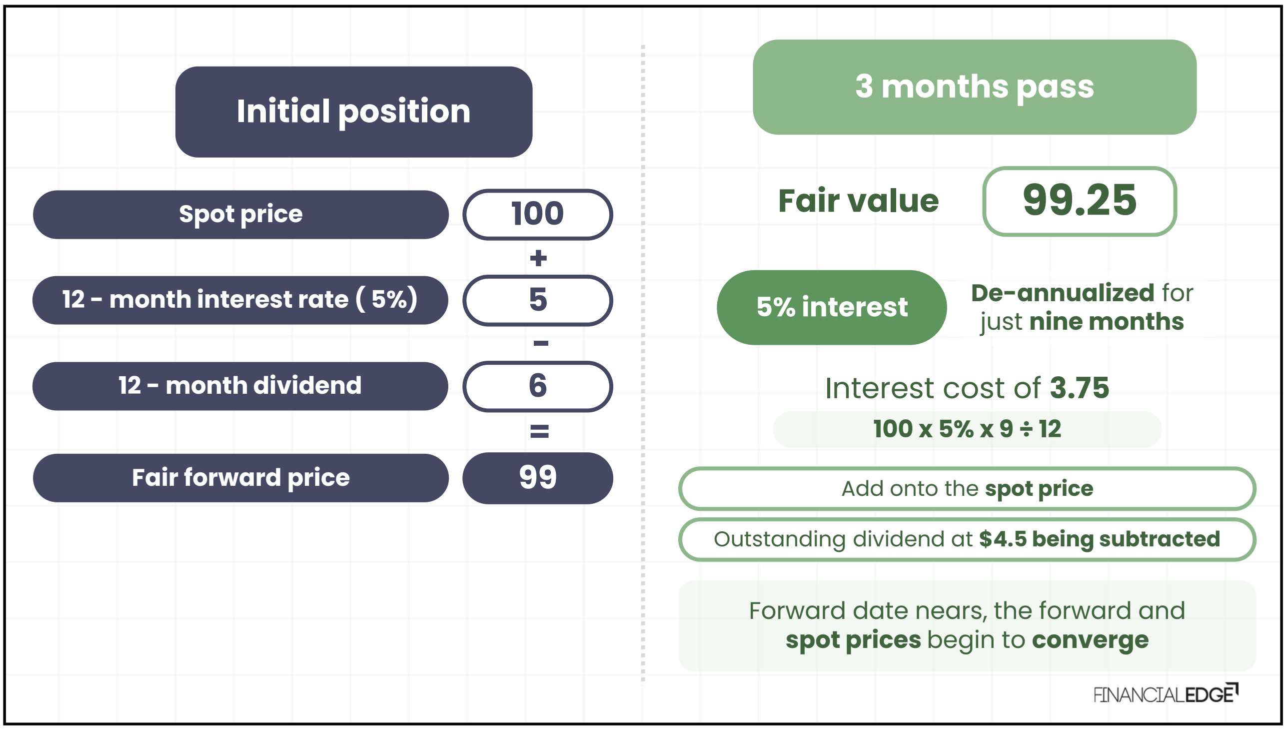
Spot price	100
+	
12 - month interest rate (5%)	5
-	
12 - month dividend	6
=	
Fair forward price	99

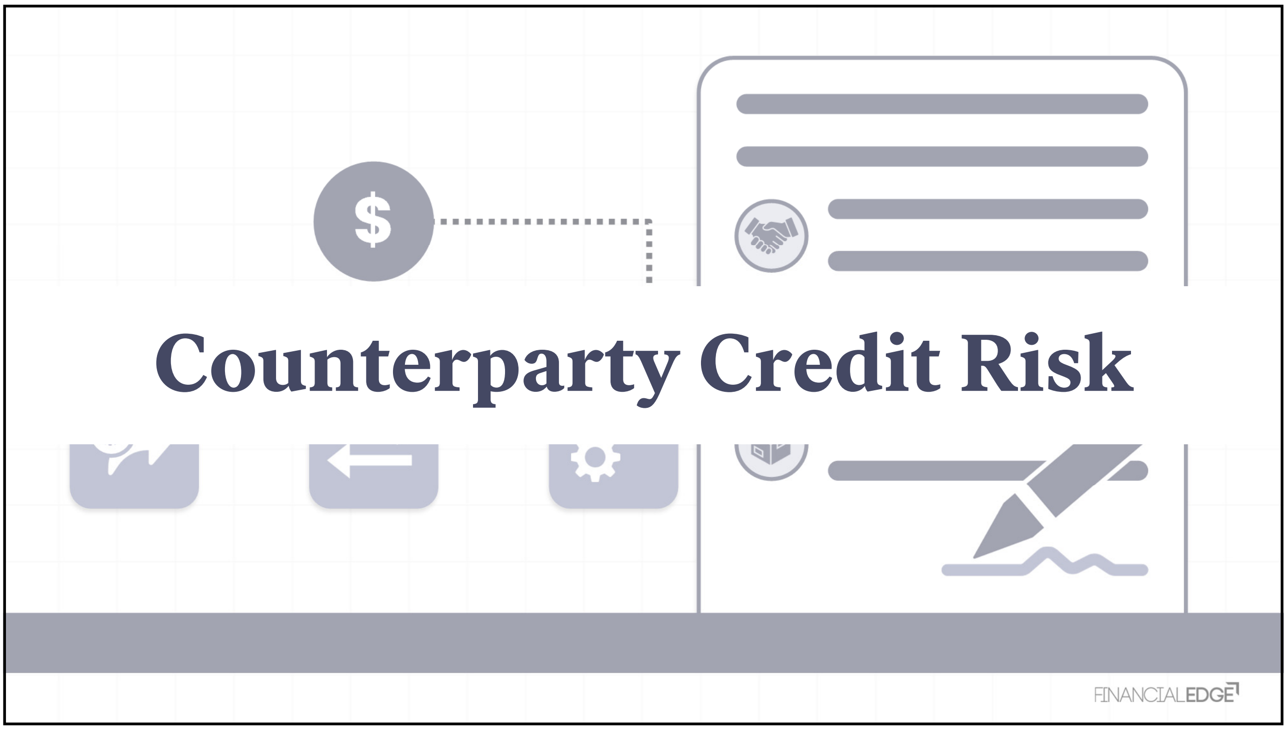

Initial position
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
6
=
Fair forward price
99
Spot price increase
Spot price
101
+
12 - month interest rate (5%)
5.05
-
12 - month dividend
6
=
Fair forward price
100.05
Increase in the **spot price** will typically result in an **elevated forward price**
FINANCIALEDGE

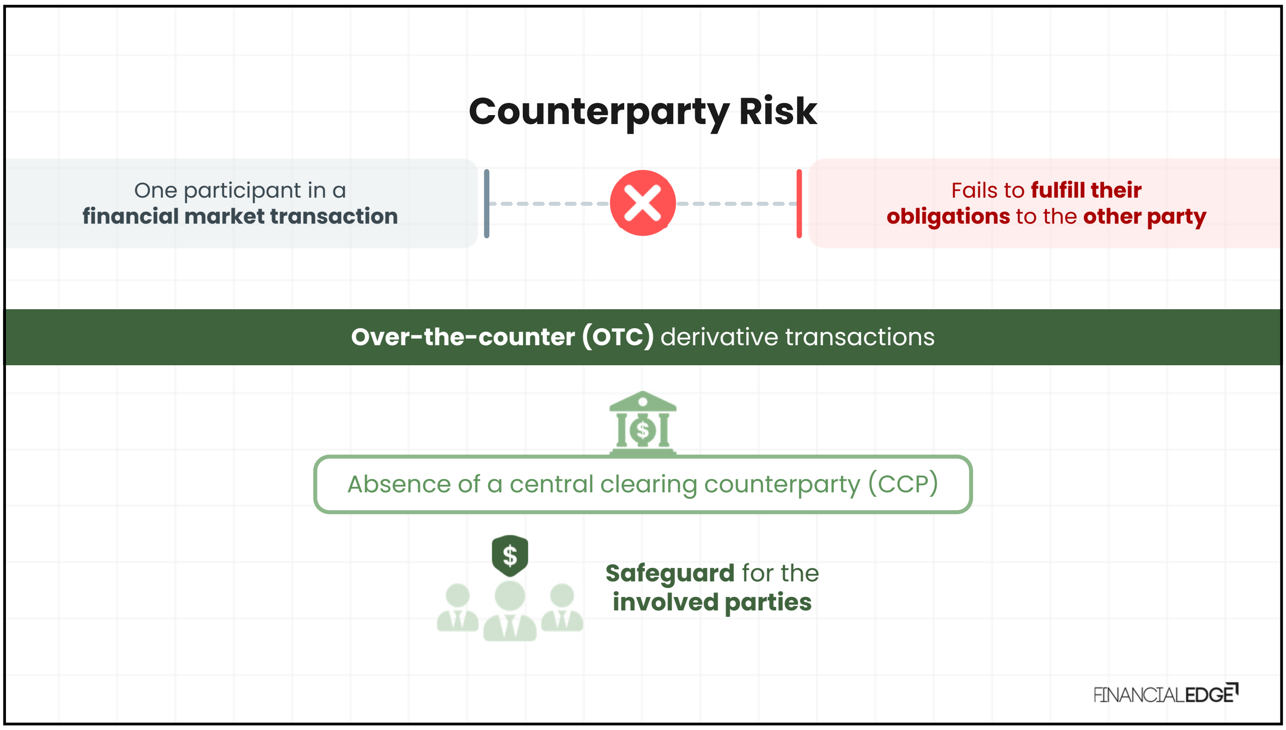

Initial position
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
6
=
Fair forward price
99
Interest increase
Spot price
100
+
12 - month interest rate (6%)
6
-
12 - month dividend
6
=
Fair forward price
100
With an increase in **interest rates**, the **fair forward** price will also **increase**
FINANCIALEDGE

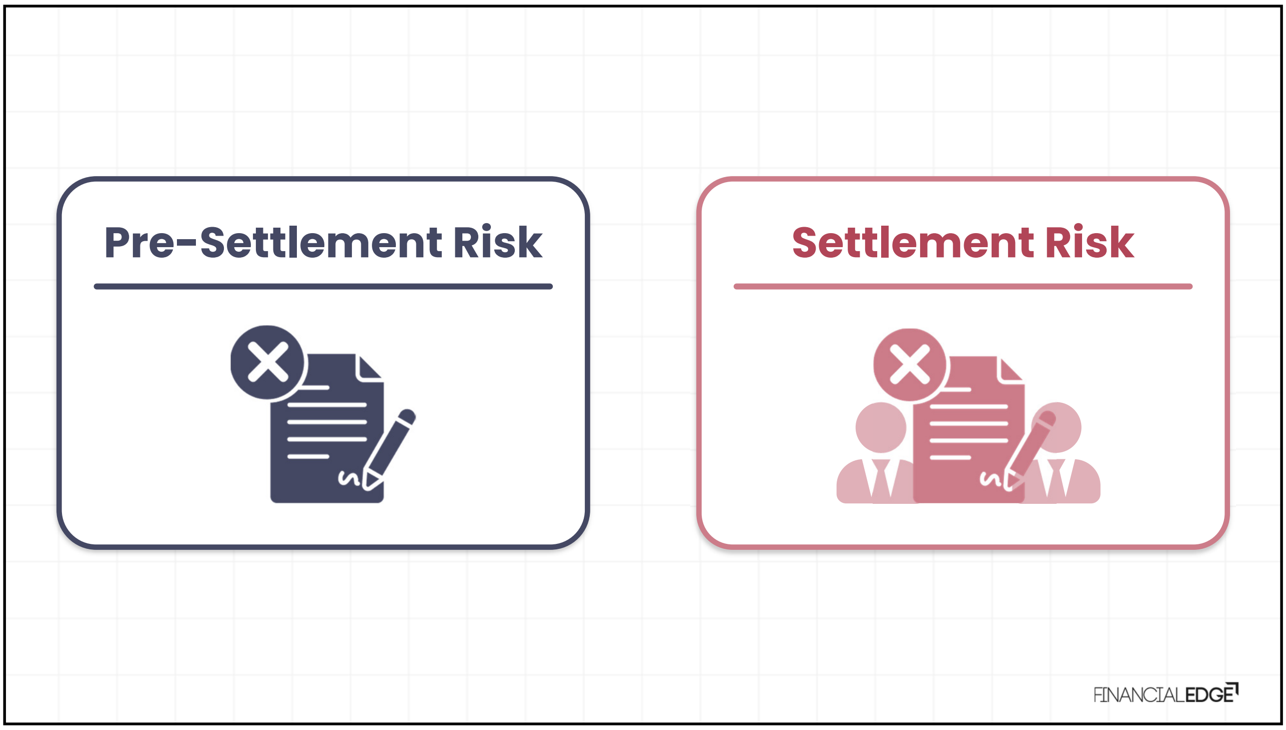

Initial position
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
6
=
Fair forward price
99
Expected dividend increase
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
7
=
Fair forward price
98
Higher expected dividends lead to lower forward price
FINANCIALEDGE

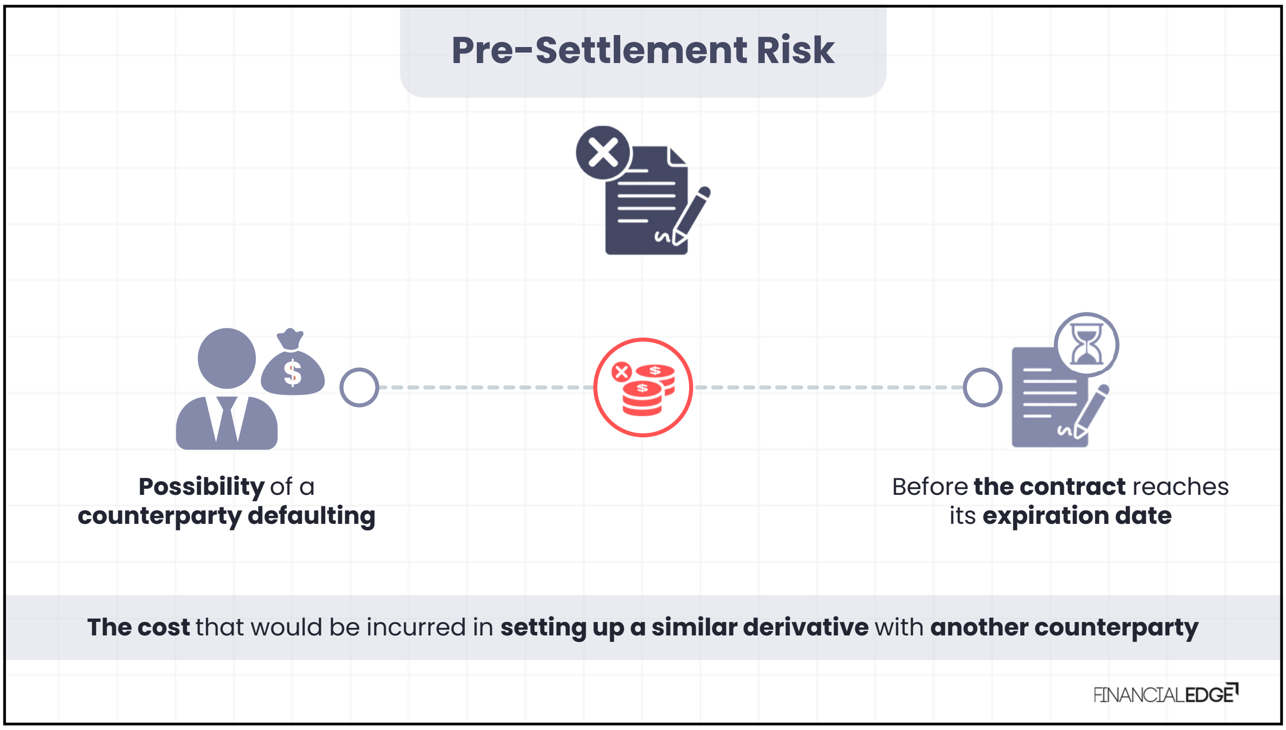

Initial position
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
6
=
Fair forward price
99
3 months pass
Spot price
100
+
12 - month interest rate (5%)
3.75
-
12 - month dividend
4.5
=
Fair forward price
99.25
FINANCIALEDGE

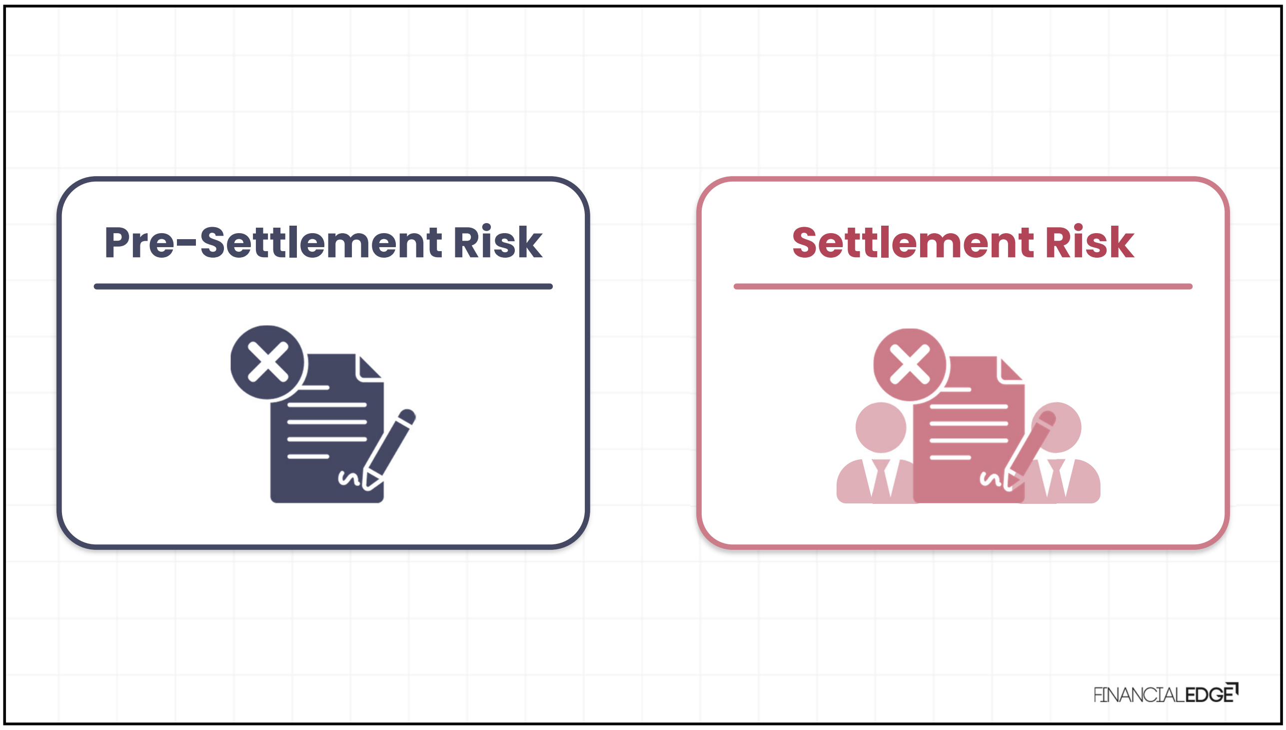

Initial position
Spot price
100
+
12 - month interest rate (5%)
5
-
12 - month dividend
6
=
Fair forward price
99
3 months pass
Fair value
99.25
5% interest
De-annualized for just nine months
Interest cost of 3.75
100 x 5% x 9 ÷ 12
Add onto the spot price
Outstanding dividend at $4.5 being subtracted
Forward date nears, the forward and spot prices begin to converge

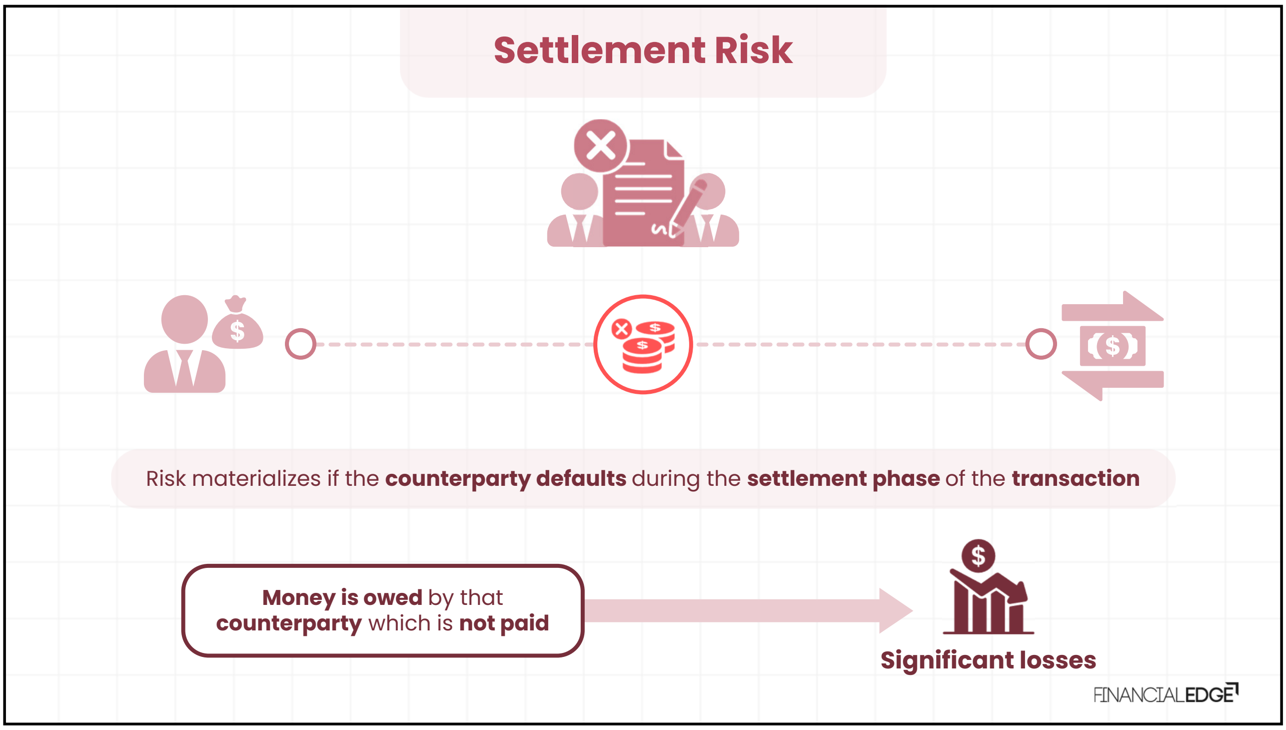

$
Counterparty Credit Risk

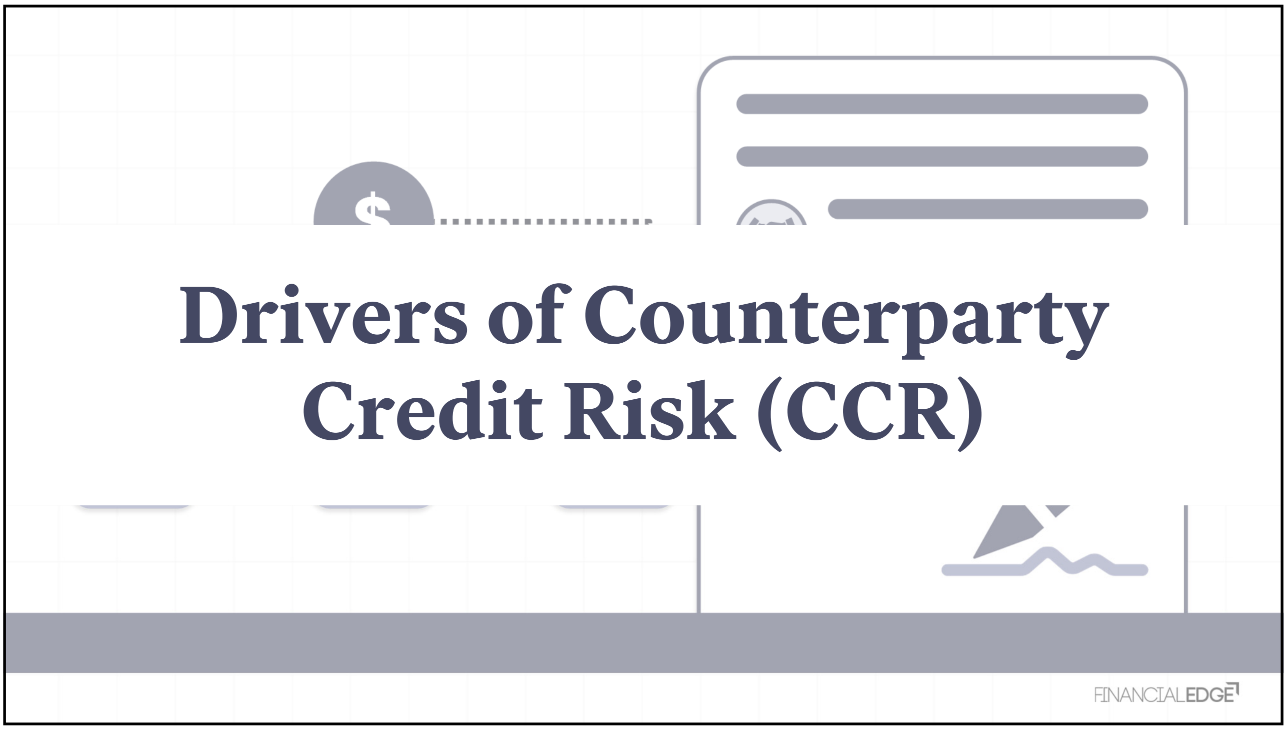

Counterparty Risk
One participant in a
financial market transaction
Fails to fulfill their
obligations to the other party
Over-the-counter (OTC) derivative transactions
Absence of a central clearing counterparty (CCP)
$
Safeguard for the
involved parties
FINANCIALEDGE

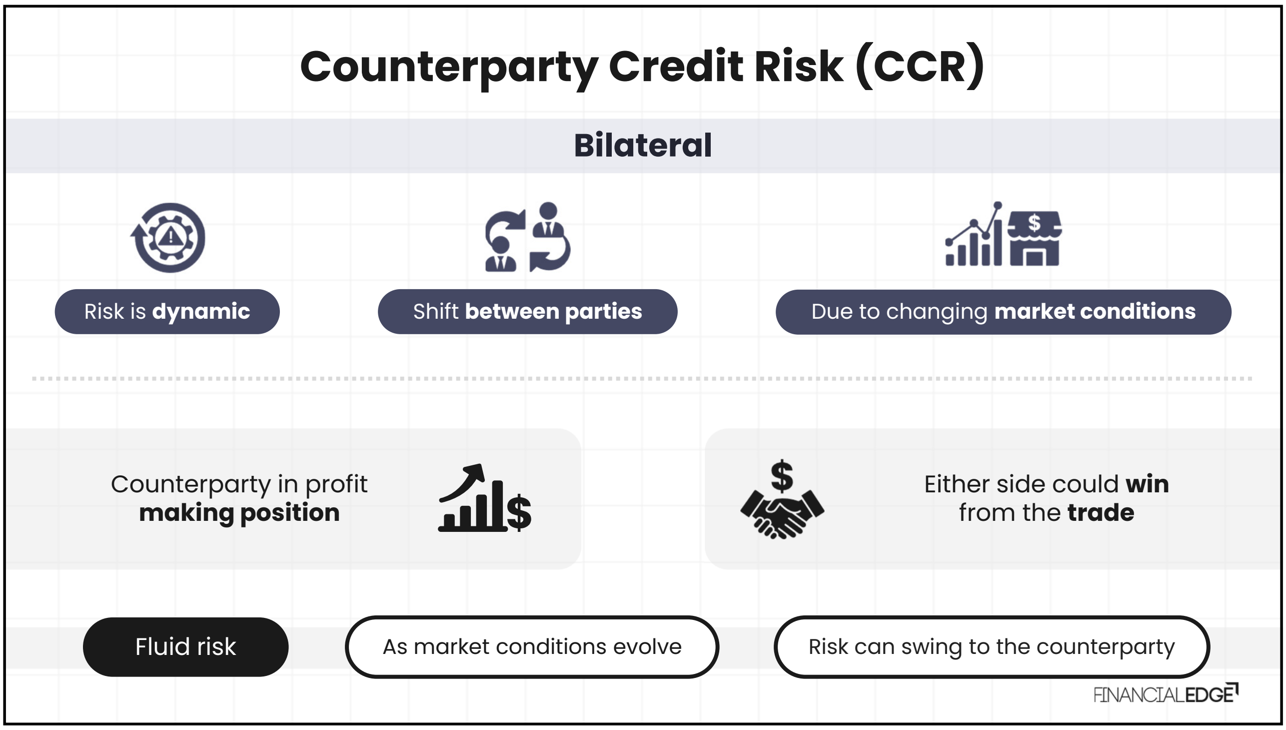

Pre-Settlement Risk
Settlement Risk
FINANCIALEDGE

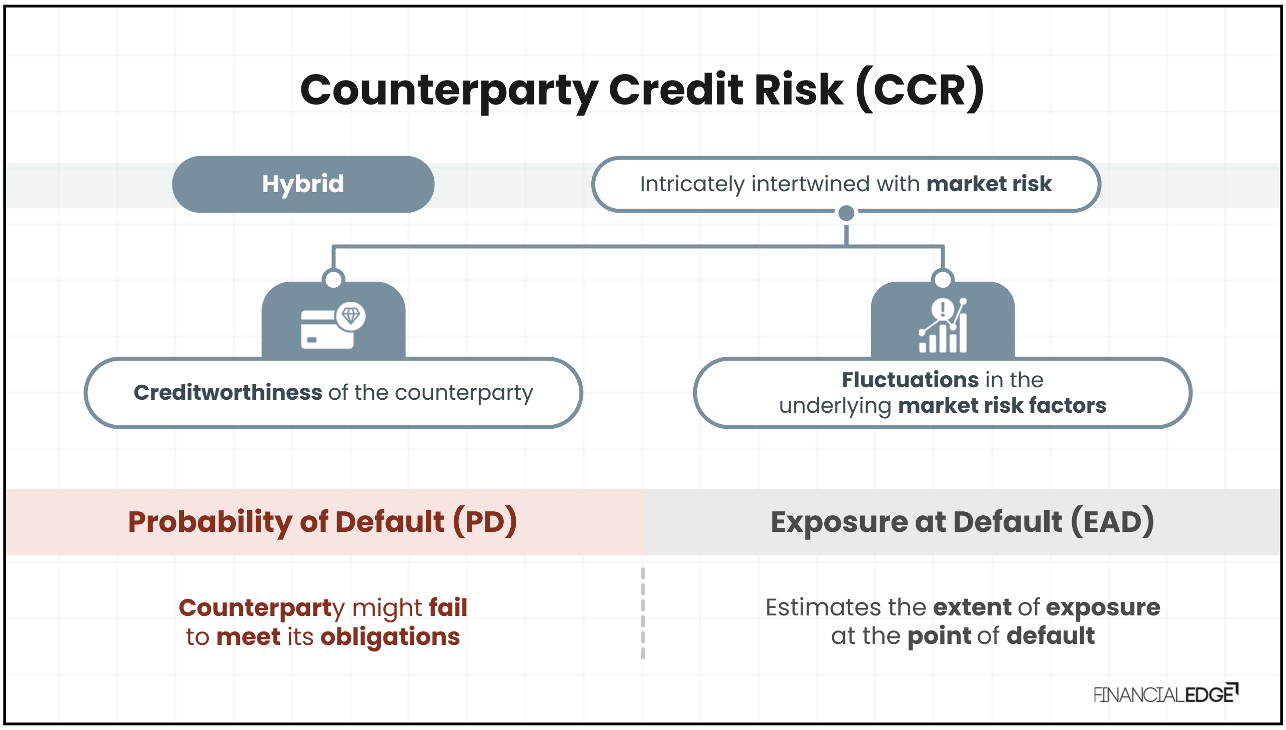

Pre-Settlement Risk
Possibility of a **counterparty defaulting**
Before **the contract** reaches its **expiration date**
The cost that would be incurred in **setting up a similar derivative** with **another counterparty**
FINANCIALEDGE

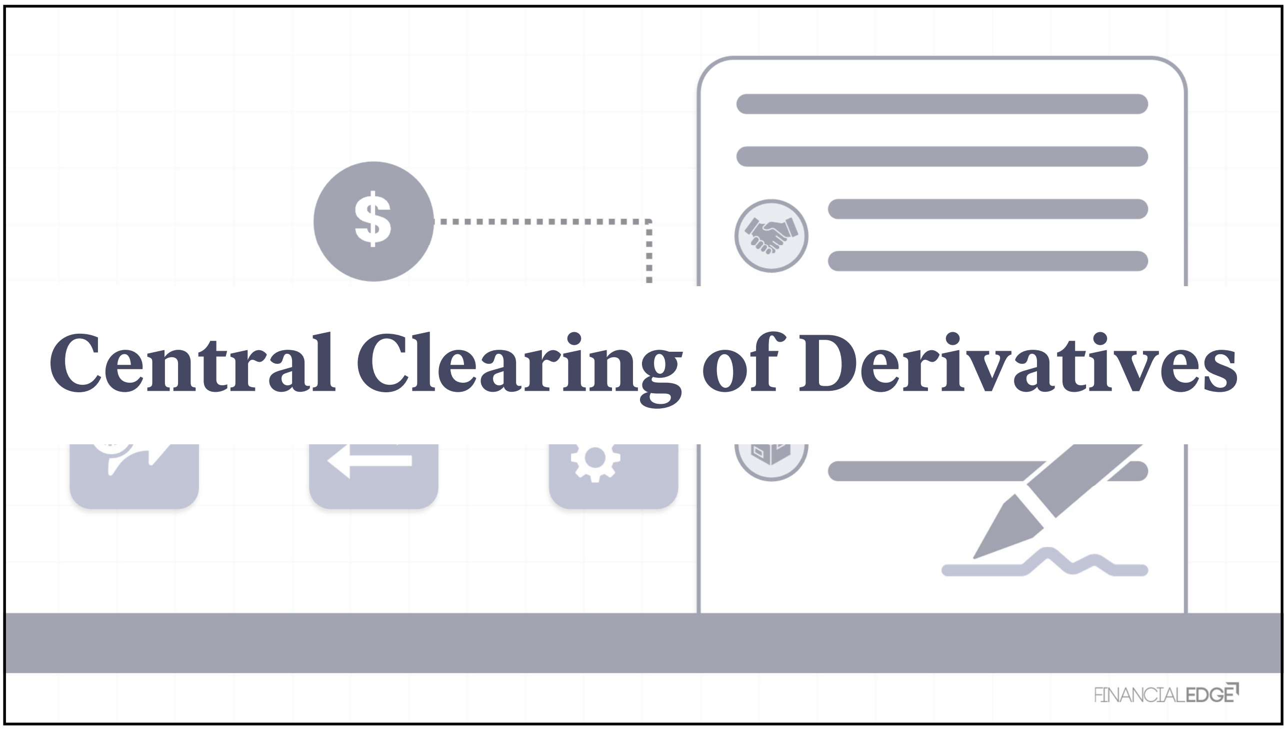

Pre-Settlement Risk
Settlement Risk
FINANCIALEDGE

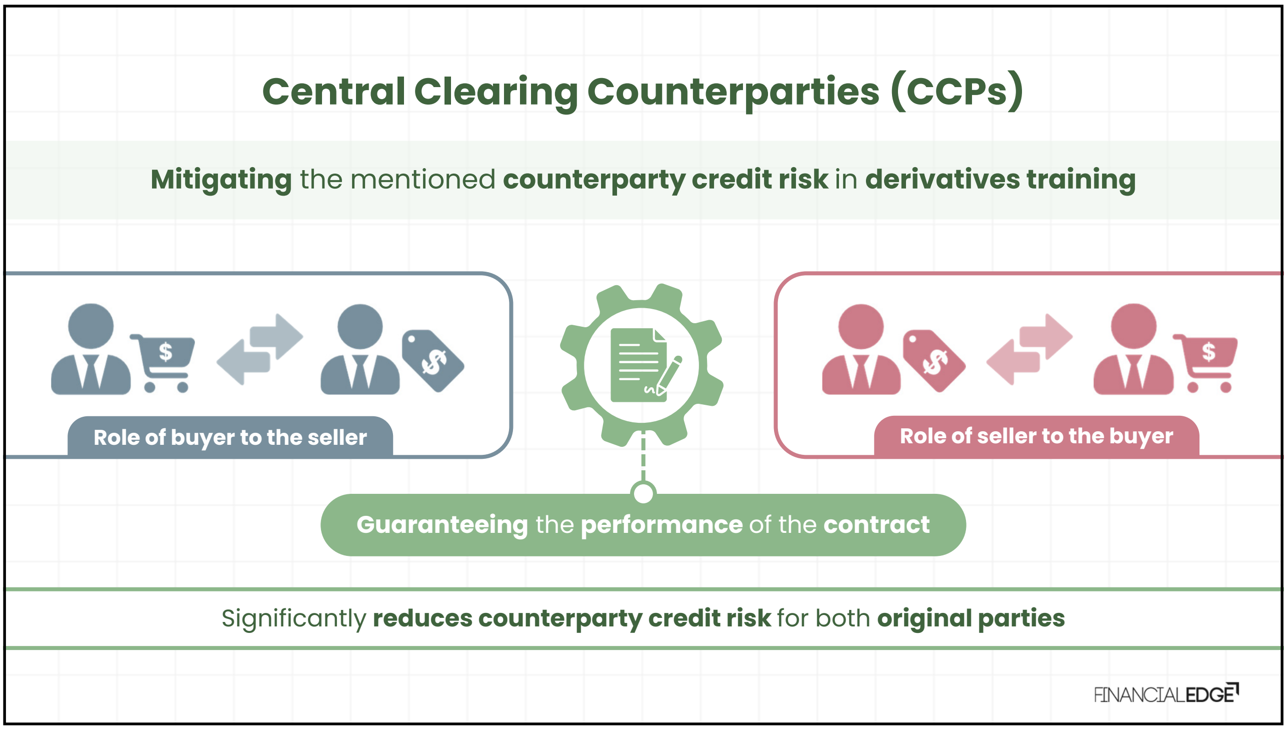

Settlement Risk
Risk materializes if the **counterparty defaults** during the **settlement phase** of the **transaction**
Money is owed by that **counterparty** which is **not paid**
Significant losses
FINANCIALEDGE

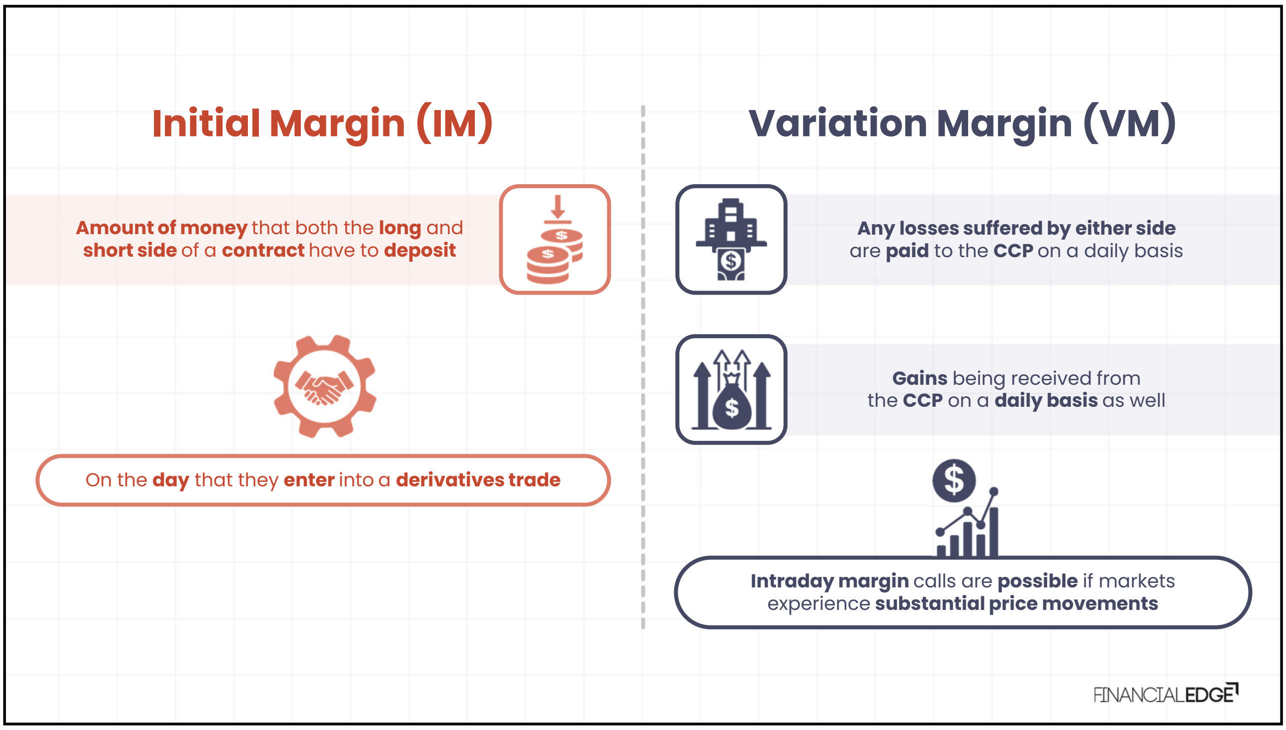

Drivers of Counterparty Credit Risk (CCR)
FINANCIALEDGE

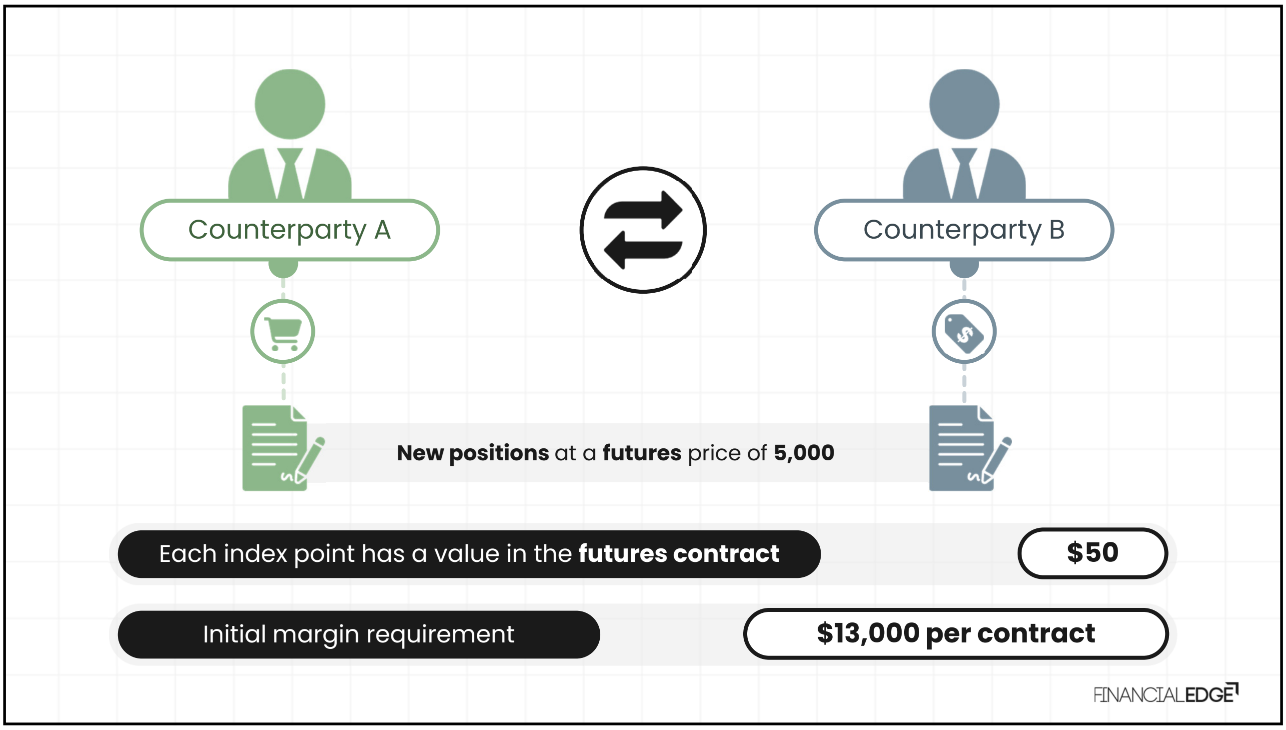

Counterparty Credit Risk (CCR)
Bilateral
Risk is dynamic
Shift between parties
Due to changing market conditions
Counterparty in profit making position
Either side could win from the trade
Fluid risk
As market conditions evolve
Risk can swing to the counterparty
FINANCIALEDGE

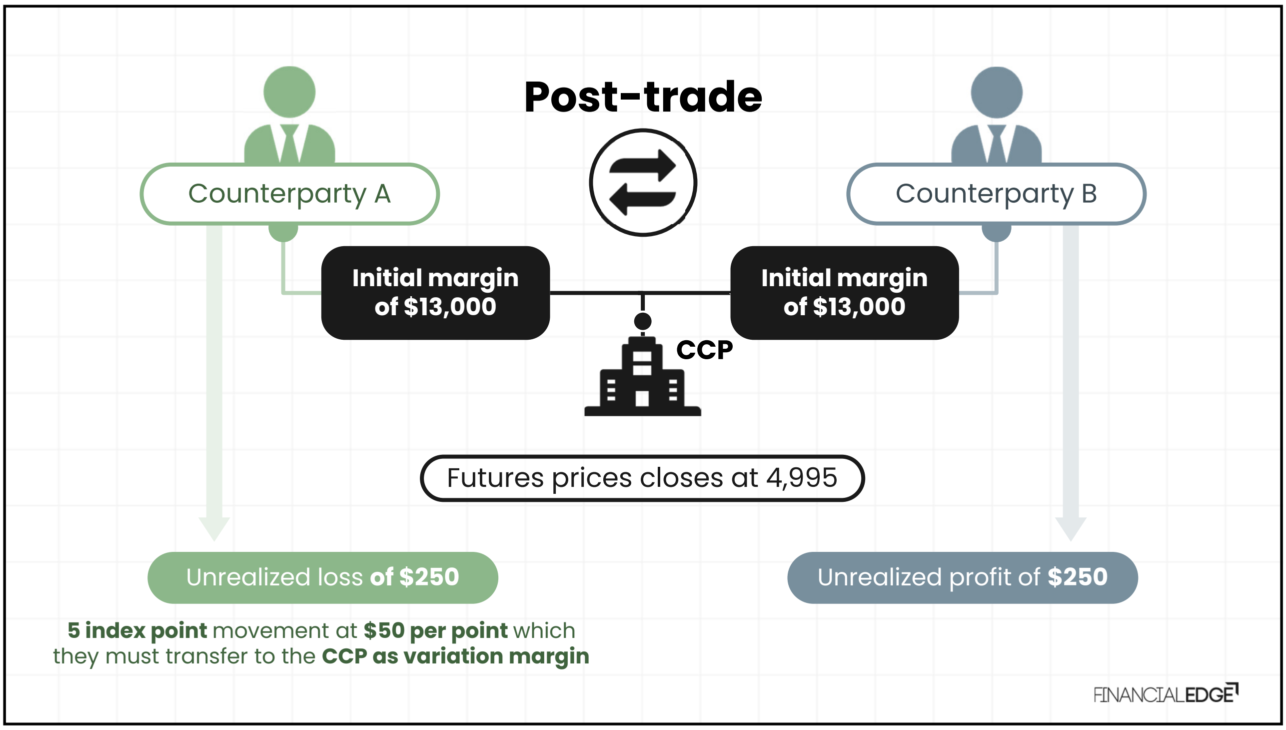

Counterparty Credit Risk (CCR)
Hybrid
Intricately intertwined with market risk
Creditworthiness of the counterparty
Fluctuations in the underlying market risk factors
Probability of Default (PD)
Exposure at Default (EAD)
Counterparty might fail to meet its obligations
Estimates the extent of exposure at the point of default
FINANCIALEDGE

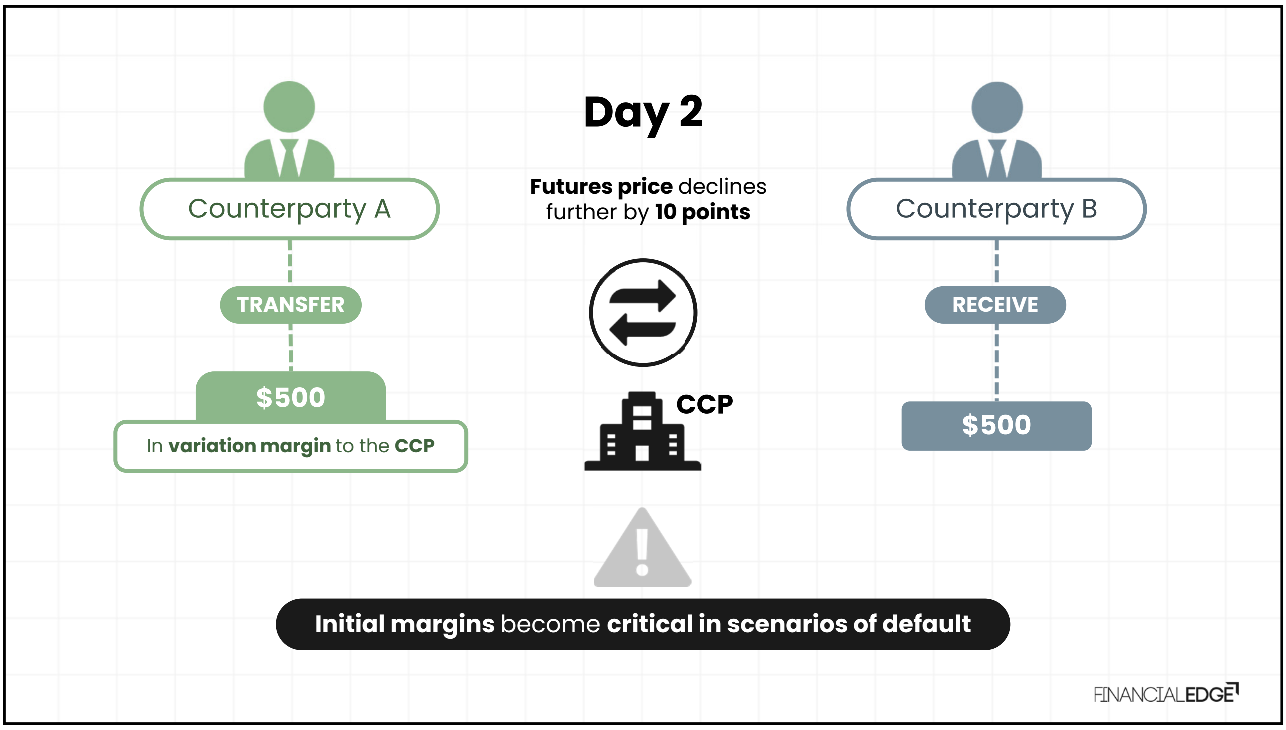

Central Clearing of Derivatives
FINANCIALEDGE

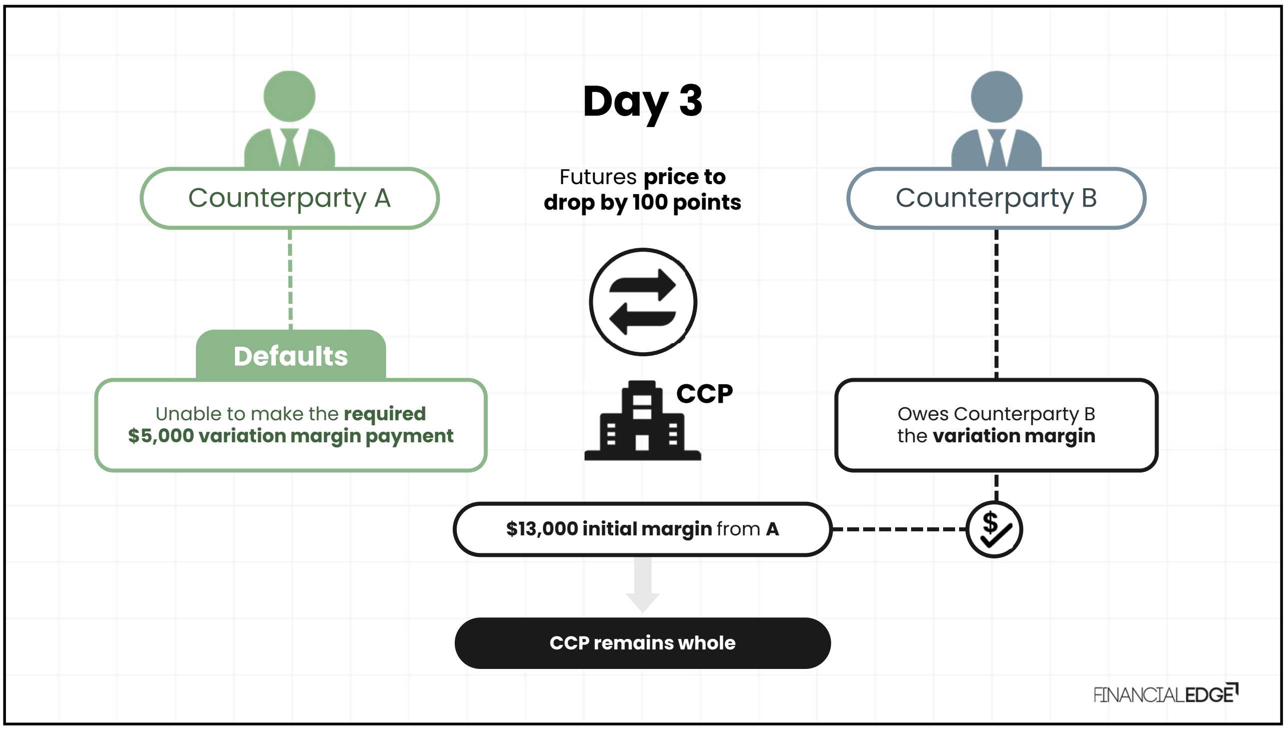

Central Clearing Counterparties (CCPs)
Mitigating the mentioned counterparty credit risk in derivatives training
Role of buyer to the seller
Role of seller to the buyer
Guaranteeing the performance of the contract
Significantly reduces counterparty credit risk for both original parties
FINANCIALEDGE


Initial Margin (IM)
Amount of money that both the long and short side of a contract have to deposit
On the day that they enter into a derivatives trade
Variation Margin (VM)
Any losses suffered by either side are paid to the CCP on a daily basis
Gains being received from the CCP on a daily basis as well
Intraday margin calls are possible if markets experience substantial price movements
FINANCIALEDGE


Counterparty A
Counterparty B
New positions at a futures price of 5,000
Each index point has a value in the futures contract
$50
Initial margin requirement
$13,000 per contract
FINANCIALEDGE


Post-trade
Counterparty A
Counterparty B
Initial margin of $13,000
Initial margin of $13,000
CCP
Futures prices closes at 4,995
Unrealized loss of $250
Unrealized profit of $250
5 index point movement at $50 per point which they must transfer to the CCP as variation margin
FINANCIALEDGE


Day 2
Futures price declines further by 10 points
Counterparty A
Counterparty B
TRANSFER
$500
In variation margin to the CCP
CCP
RECEIVE
$500
Initial margins become critical in scenarios of default
FINANCIALEDGE


Day 3
Counterparty A
Futures price to drop by 100 points
Counterparty B
Defaults
Unable to make the required $5,000 variation margin payment
CCP
Owes Counterparty B the variation margin
$13,000 initial margin from A
CCP remains whole
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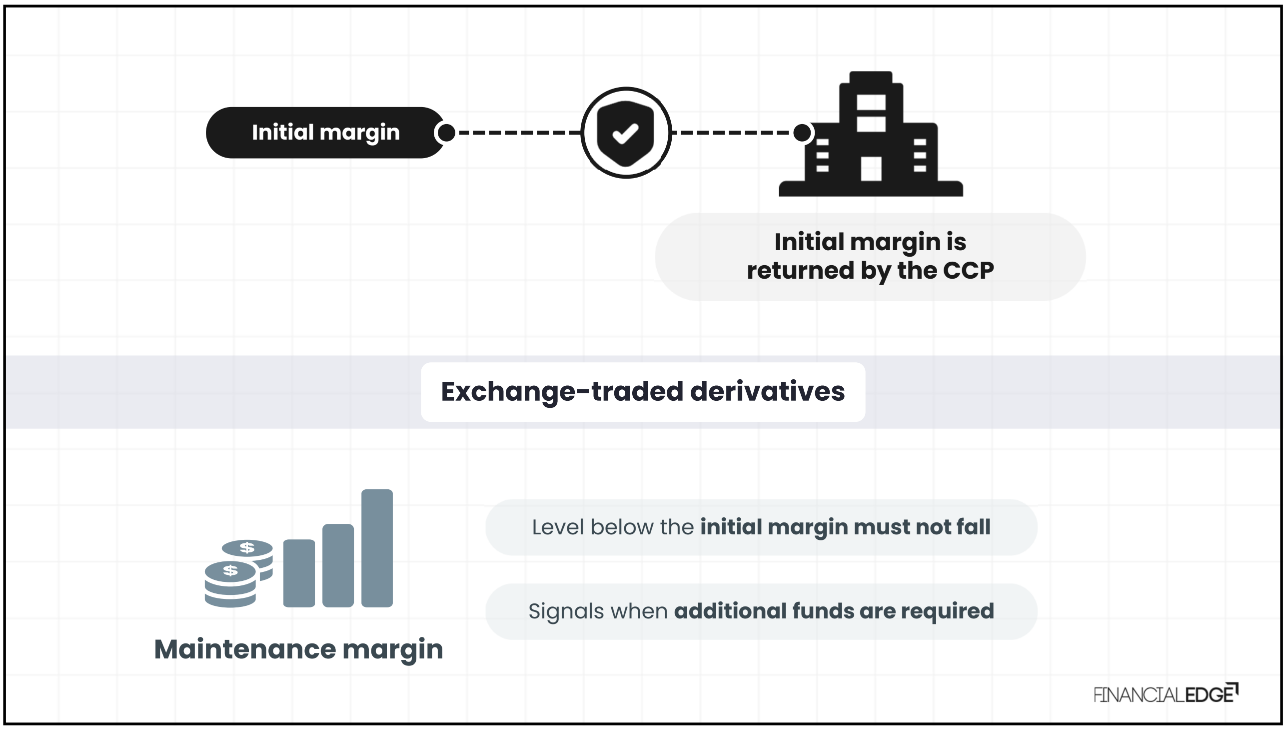
Initial margin
Initial margin is returned by the CCP
Exchange-traded derivatives
Level below the initial margin must not fall
Signals when additional funds are required
Maintenance margin
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