



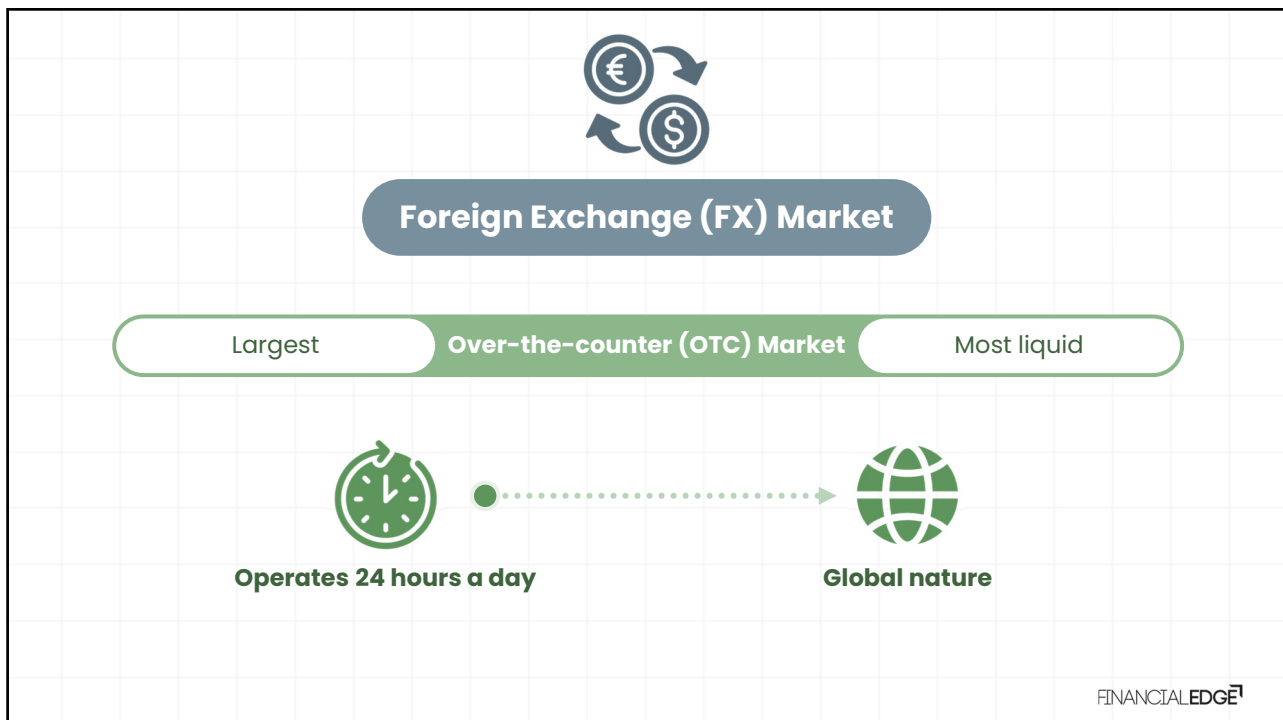
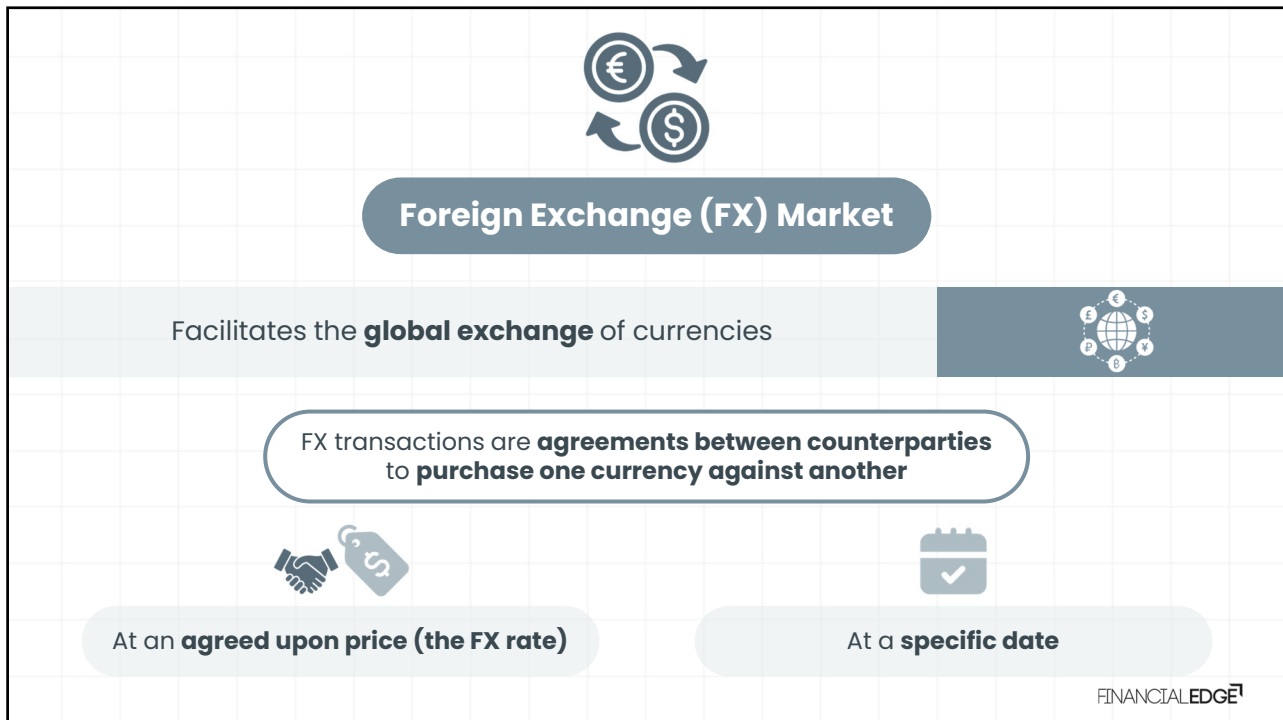
FX Spot and Forwards



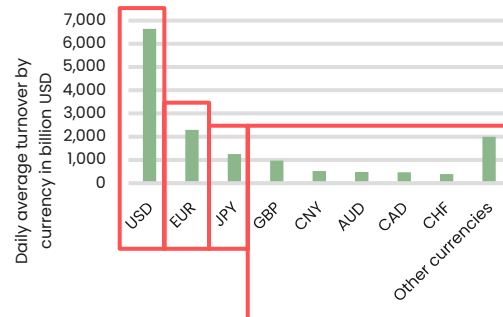
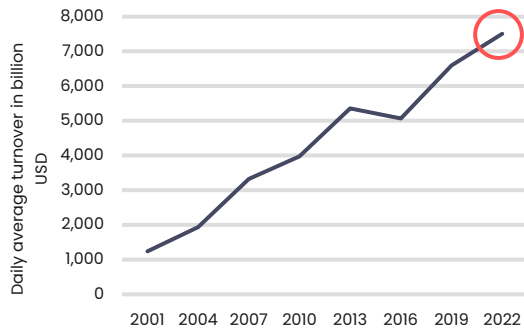
FINANCIALEDGE¹

FX Market Overview

FINANCIALEDGE¹



Foreign Exchange (FX) Market



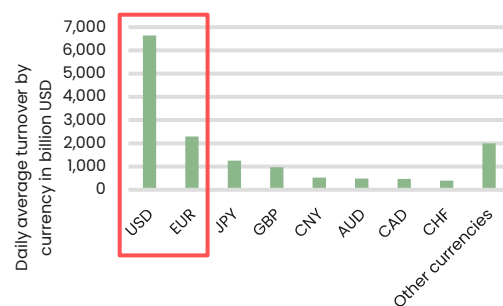
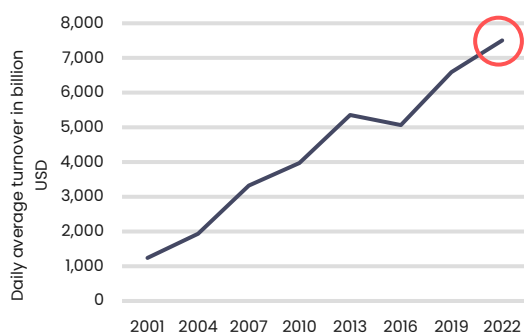
Source: BIS, Triennial Central Bank Survey

Conducted every **three years** by the
Bank for International Settlements

Detailed view of **turnover** and **trends** in
the **FX** and **OTC derivatives** market

FINANCIALEDGE⁷

Foreign Exchange (FX) Market



Source: BIS, Triennial Central Bank Survey

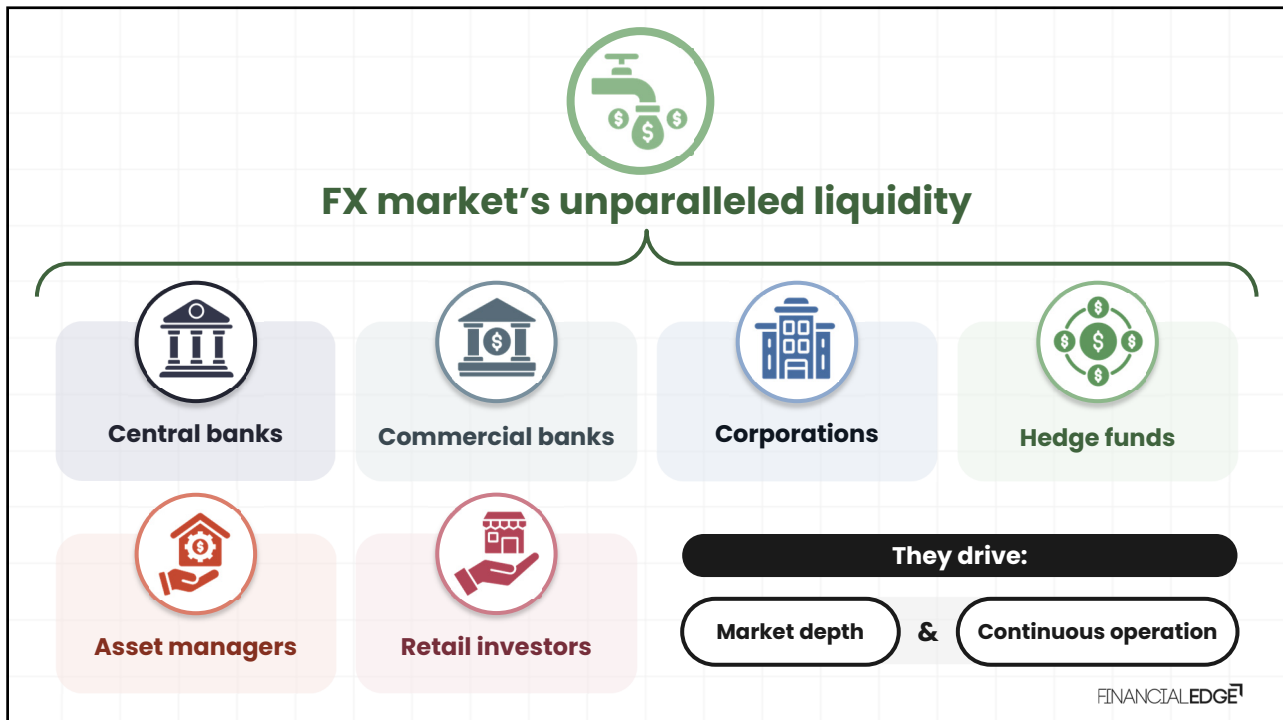
Total daily turnover > \$7 trillion



FX transactions involve
two currencies

E.g. **EUR/USD**
trade

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Why is FX Traded?

Why is FX Traded?



**PAYMENT
FACILITATION**



**RISK
MANAGEMENT**



SPECULATION



DIVERSIFICATION



**PAYMENT
FACILITATION**



**RISK
MANAGEMENT**



SPECULATION



DIVERSIFICATION

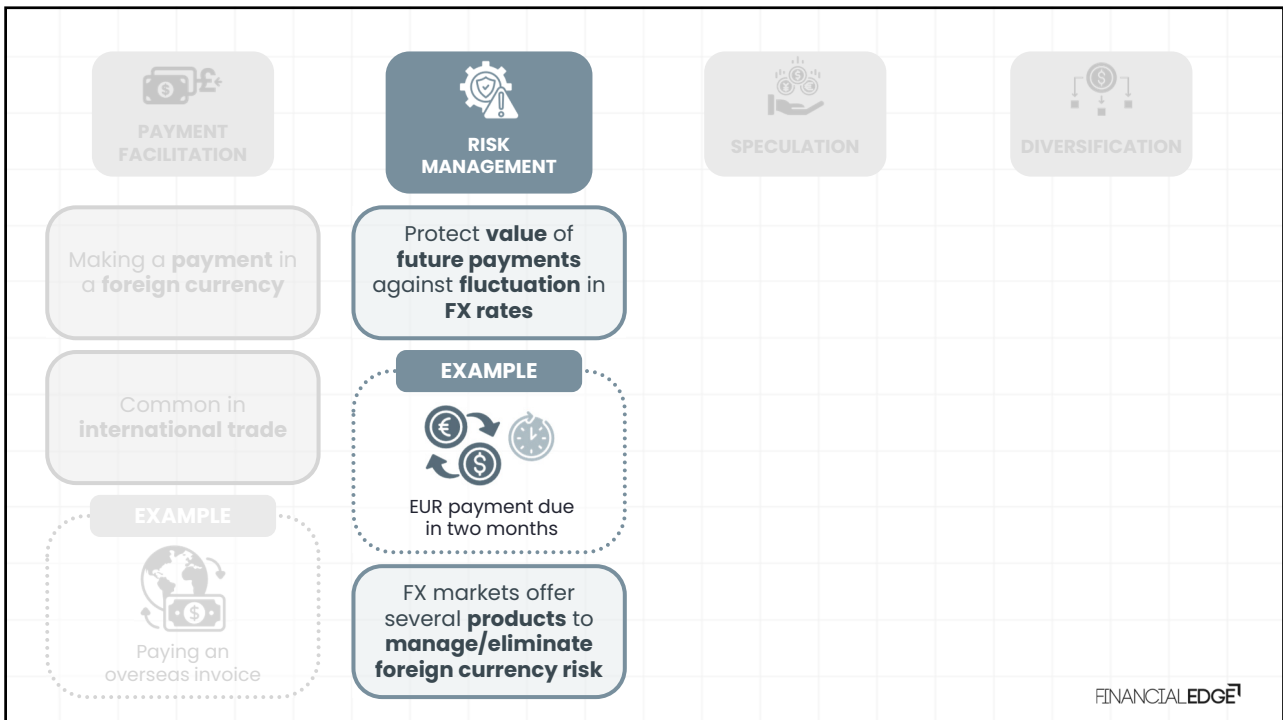
Making a **payment** in
a **foreign currency**

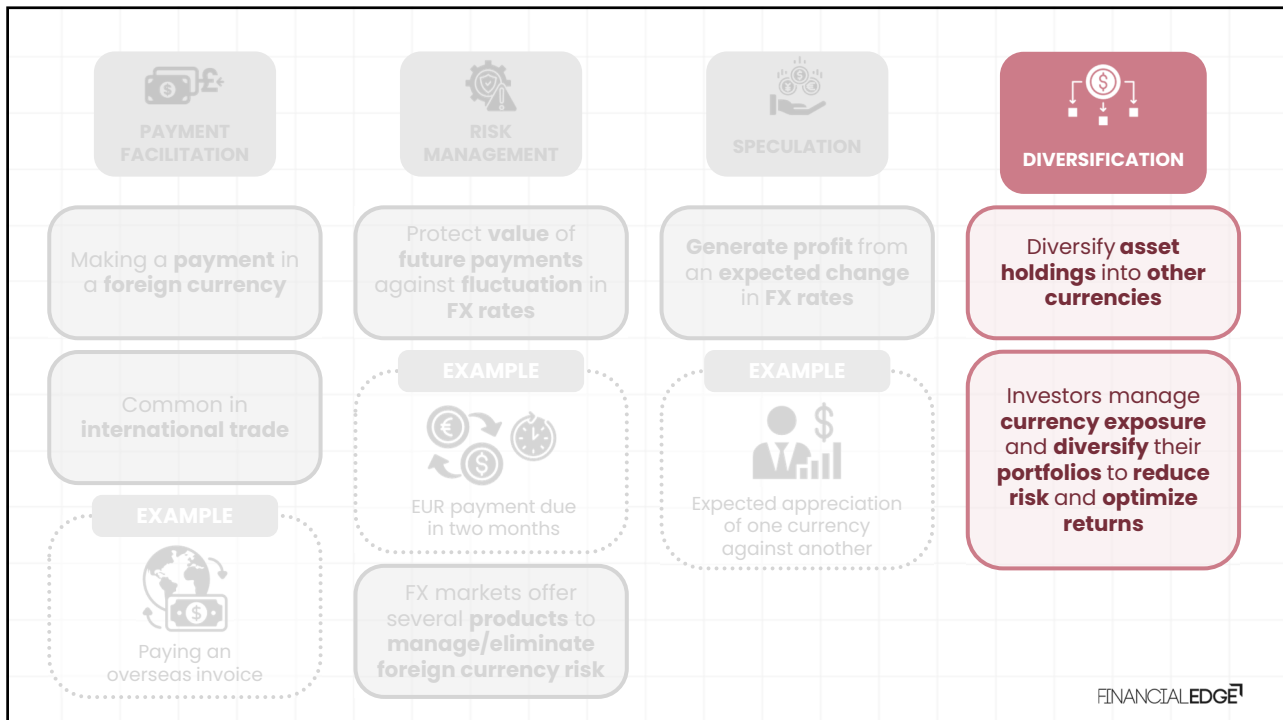
Common in
international trade

EXAMPLE

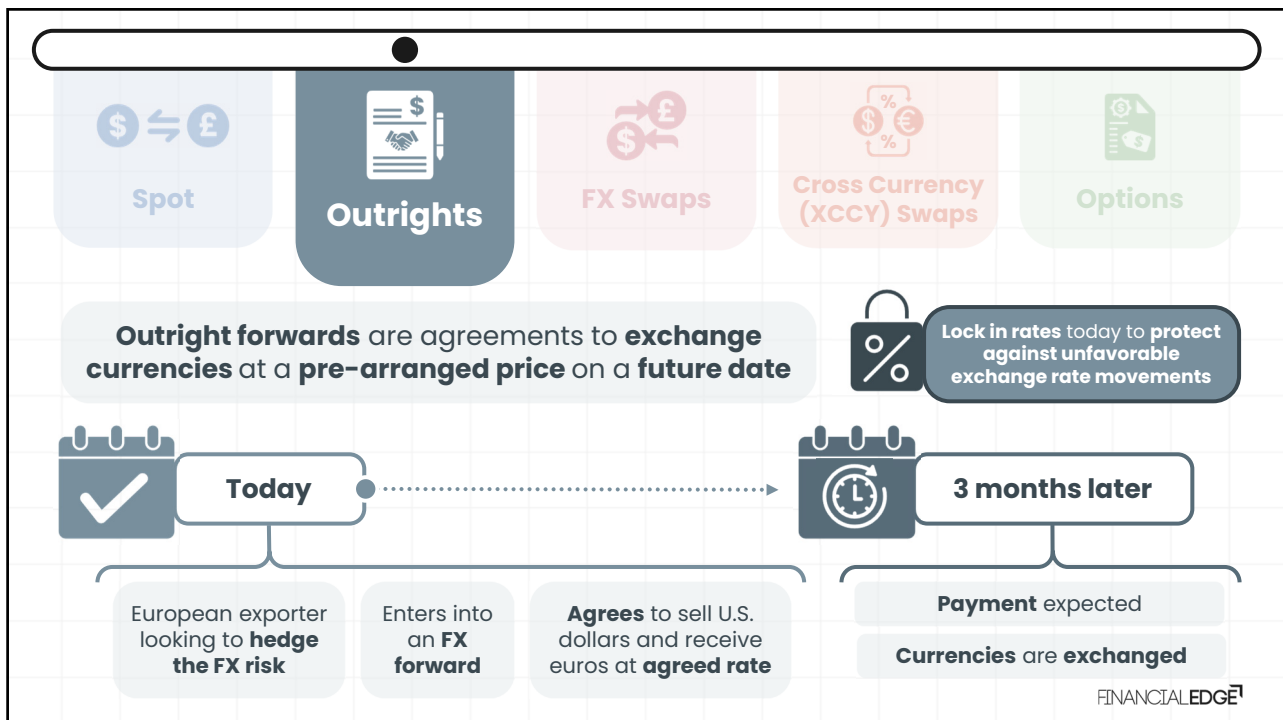
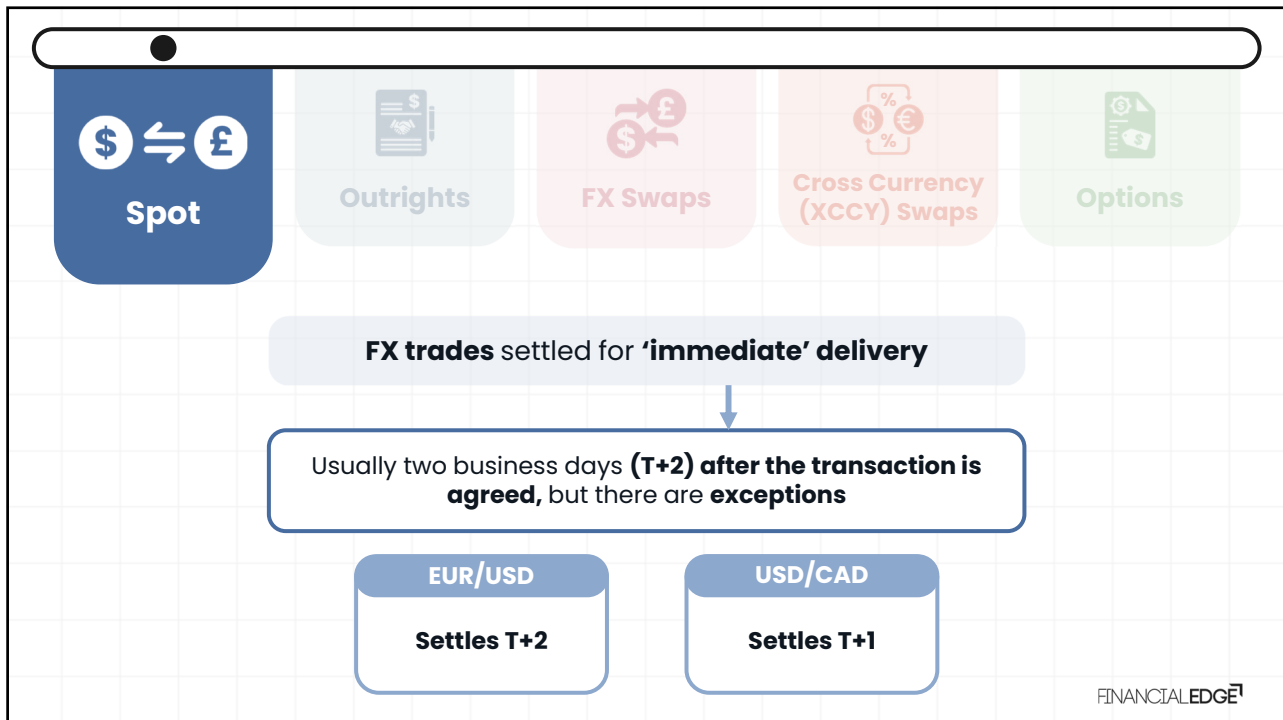


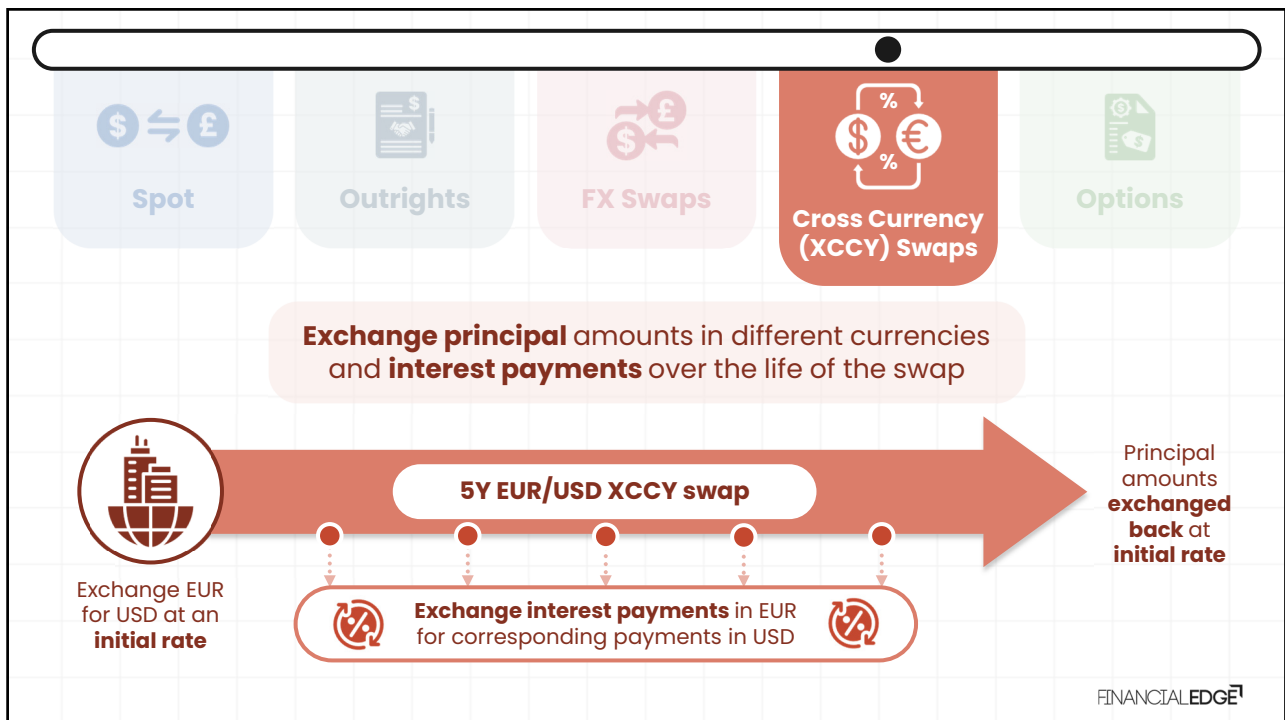
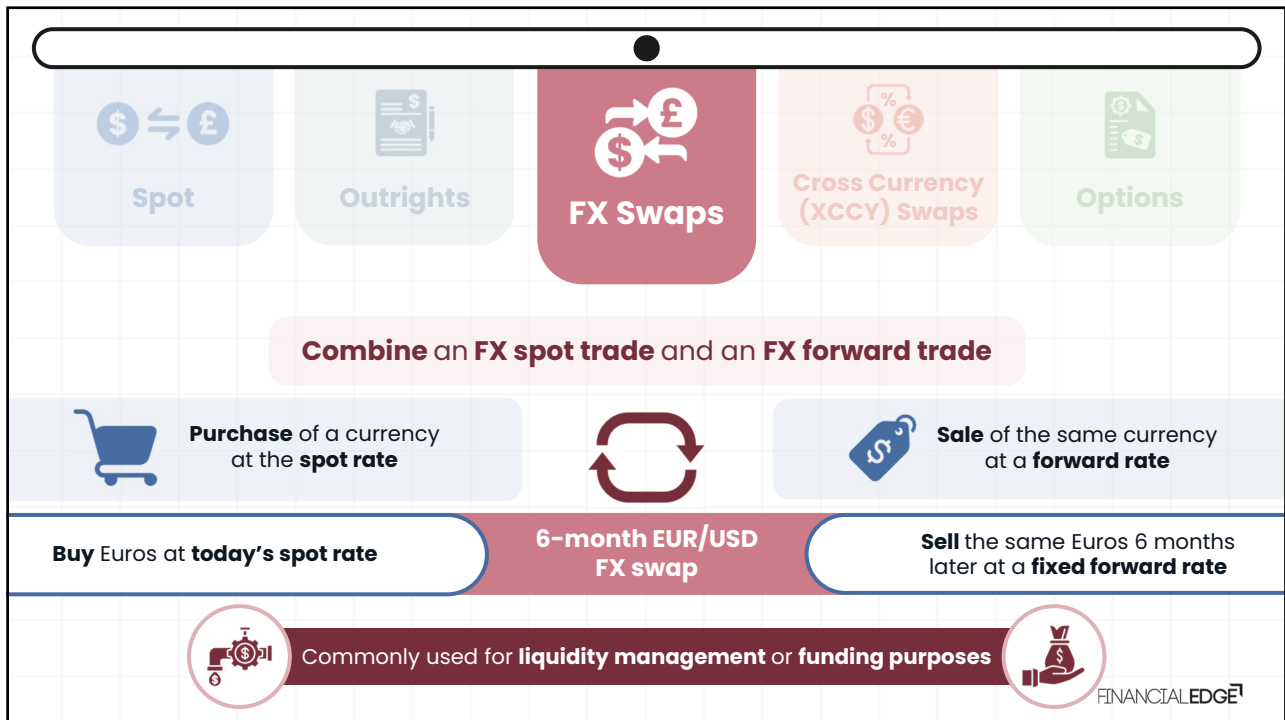
Paying an
overseas invoice

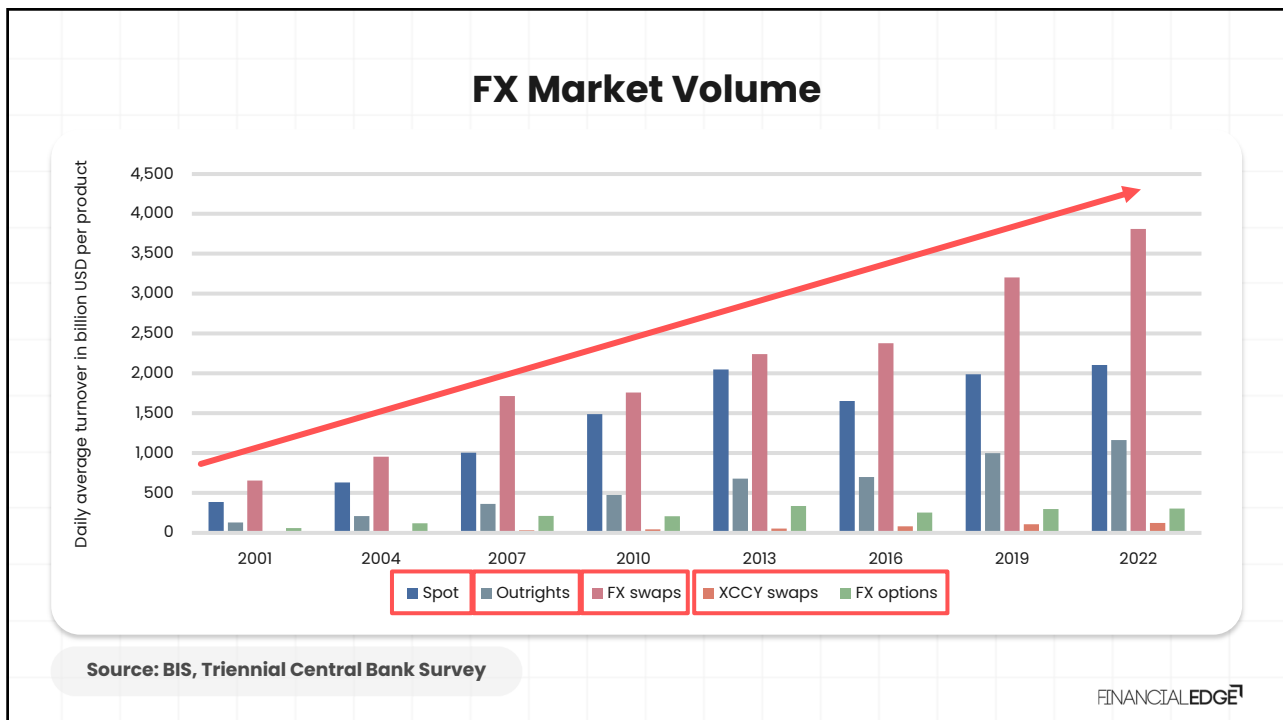
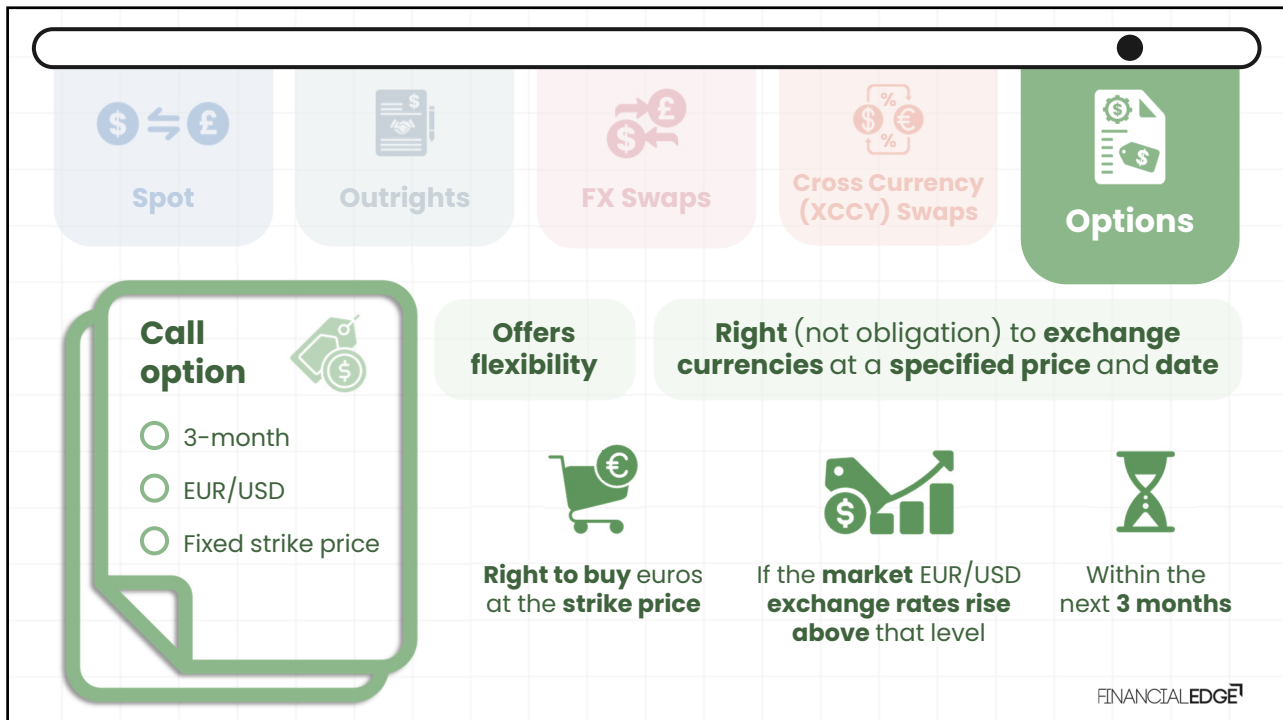




FX Product Overview







ISO Codes and Nicknames

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ISO Codes



International Organization for Standardization

Three-letter alphabetic symbols that denote
different currencies used globally

USD	U.S. Dollar
EUR	Euro
JPY	Japanese Yen
GBP	Pound Sterling
CHF	Swiss Franc
AUD	Australian Dollar
CAD	Canadian Dollar
NZD	New Zealand Dollar
ZAR	South African Rand

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ISO Codes

USD	U.S. Dollar
EUR	Euro
JPY	Japanese Yen
GBP	Pound Sterling
CHF	Swiss Franc
AUD	Australian Dollar
CAD	Canadian Dollar
NZD	New Zealand Dollar
ZAR	South African Rand



Most **widely traded** and **recognized** currencies in global financial markets

Nicknames

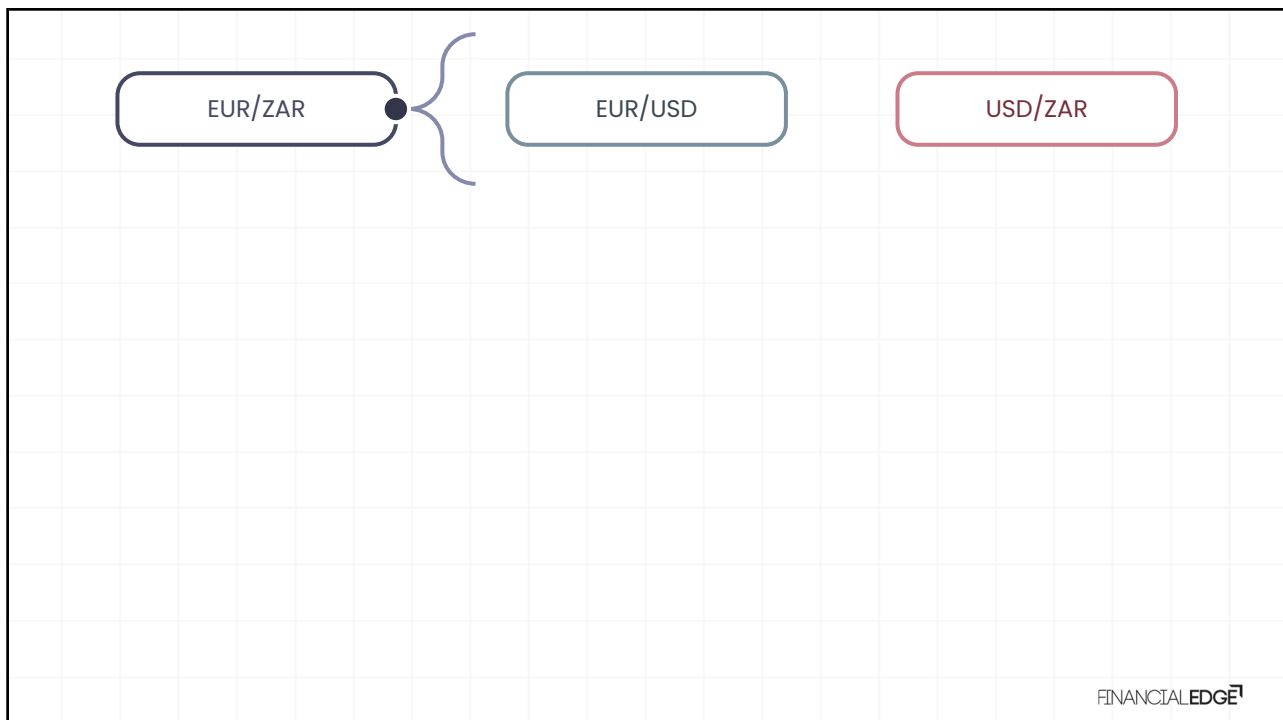
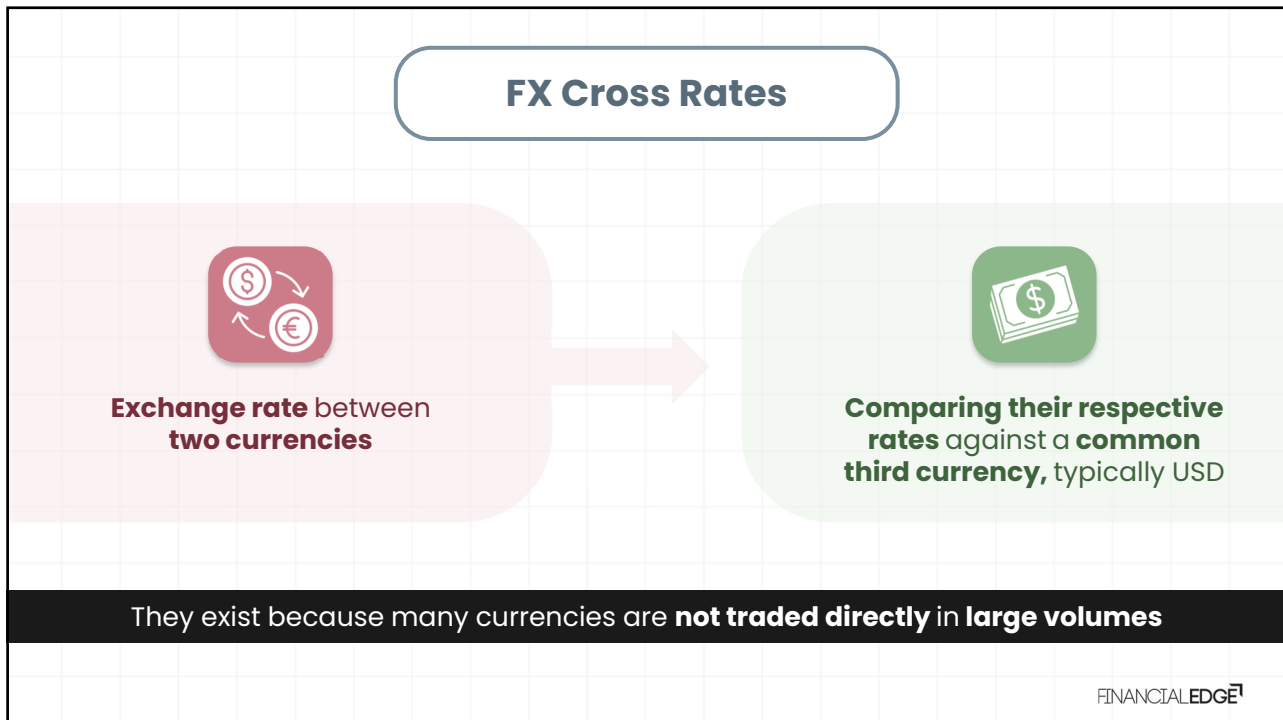


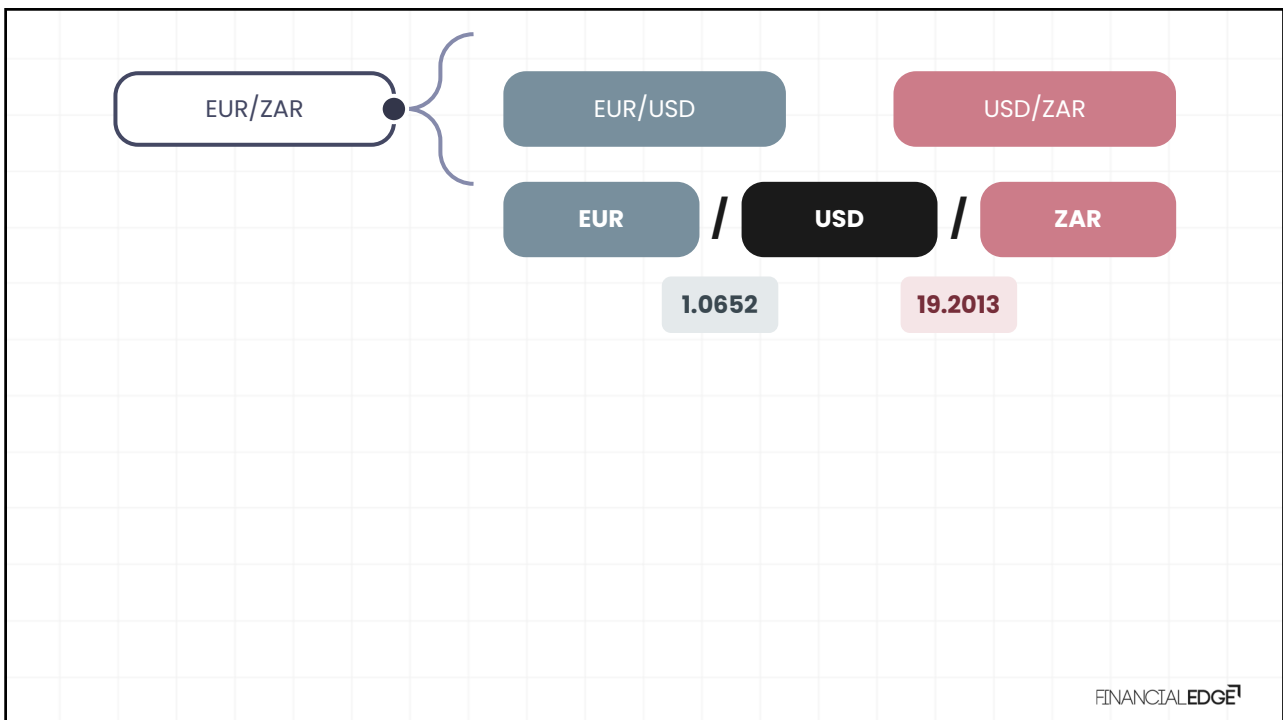
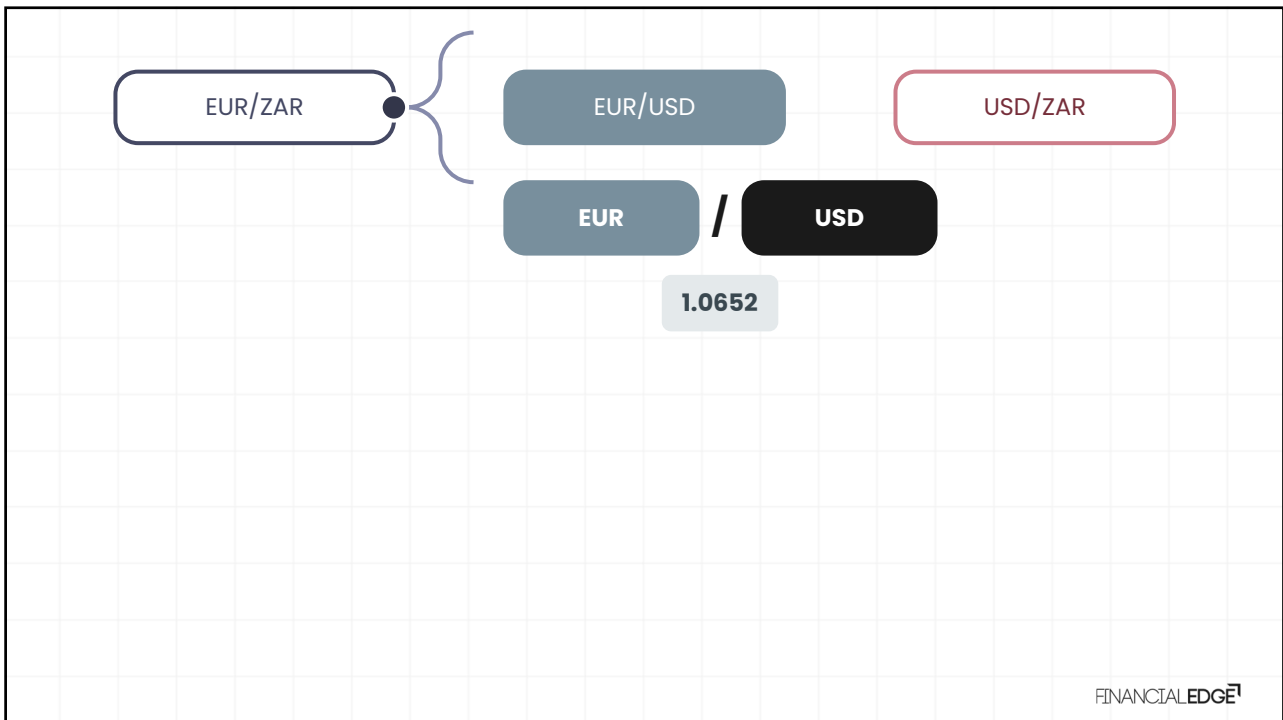
Many **currency pairs** have nicknames

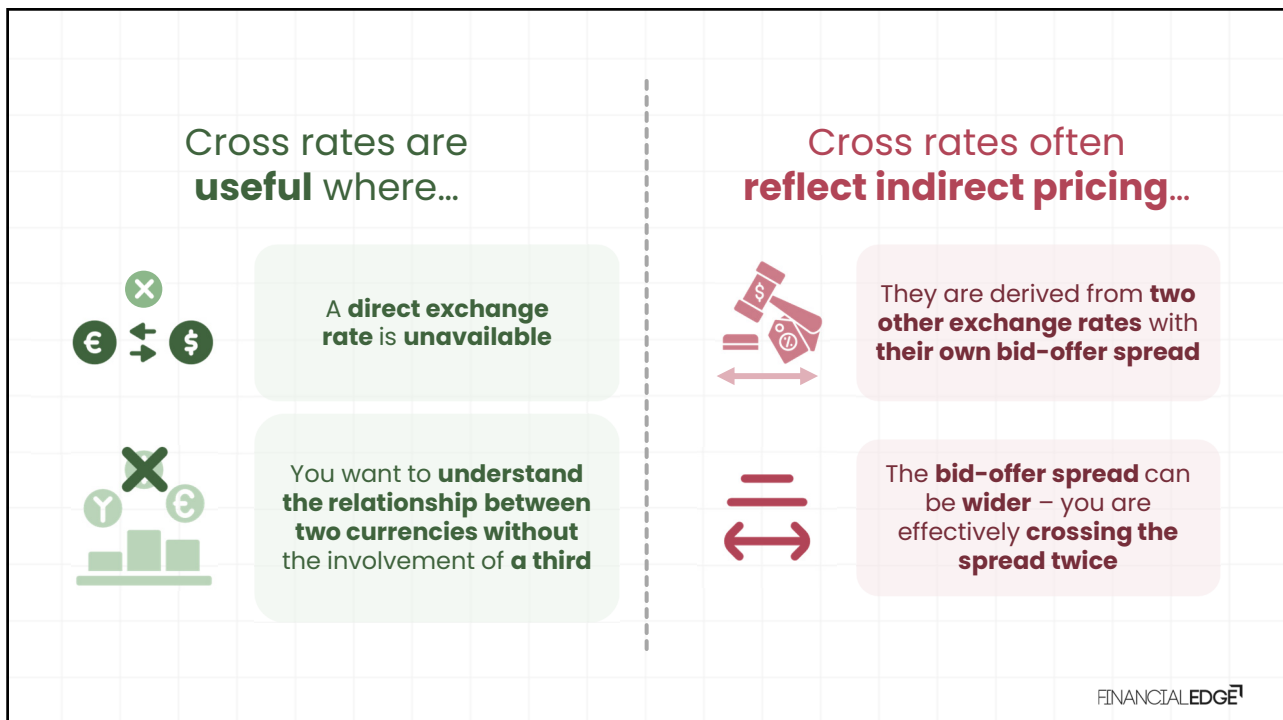
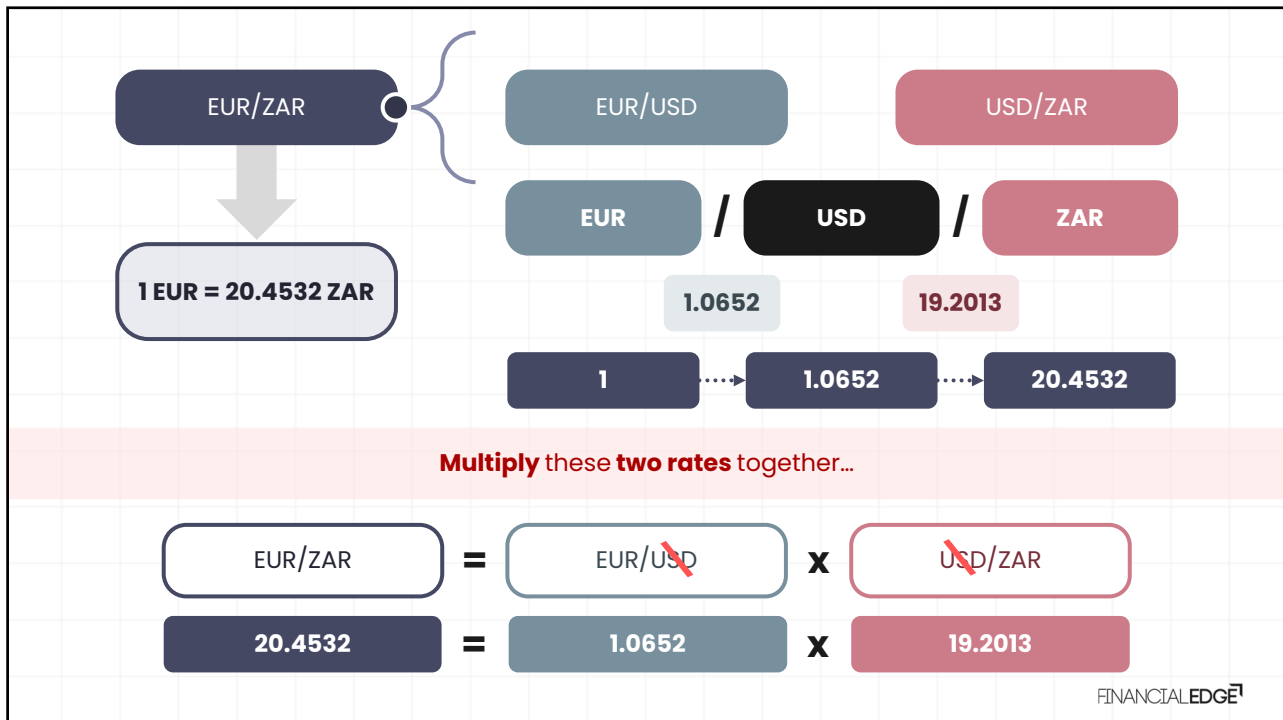
These make **communication more concise** and are often **rooted in history** or **cultural references**

FX pair	Nickname
AUD/USD	Aussie
GBP/USD	Cable
NZD/USD	Kiwi
USD/CAD	Loonie
USD/CHF	Swissie

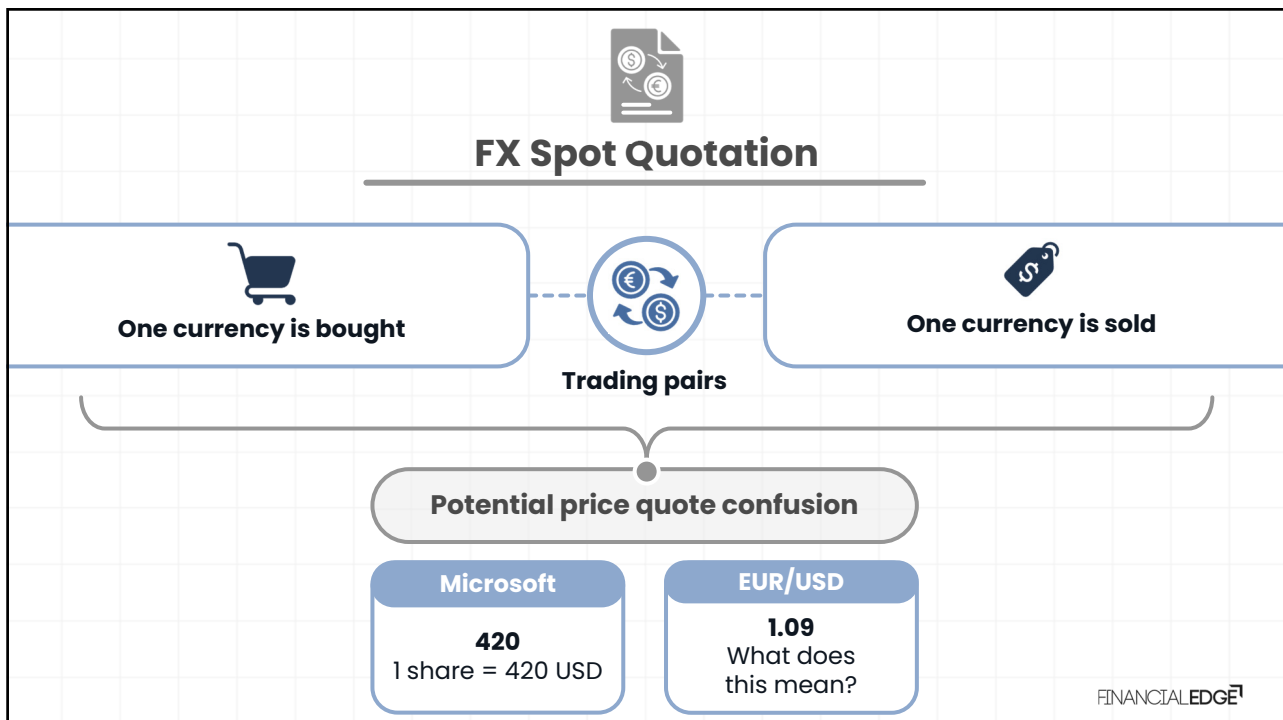
FX Cross Rates



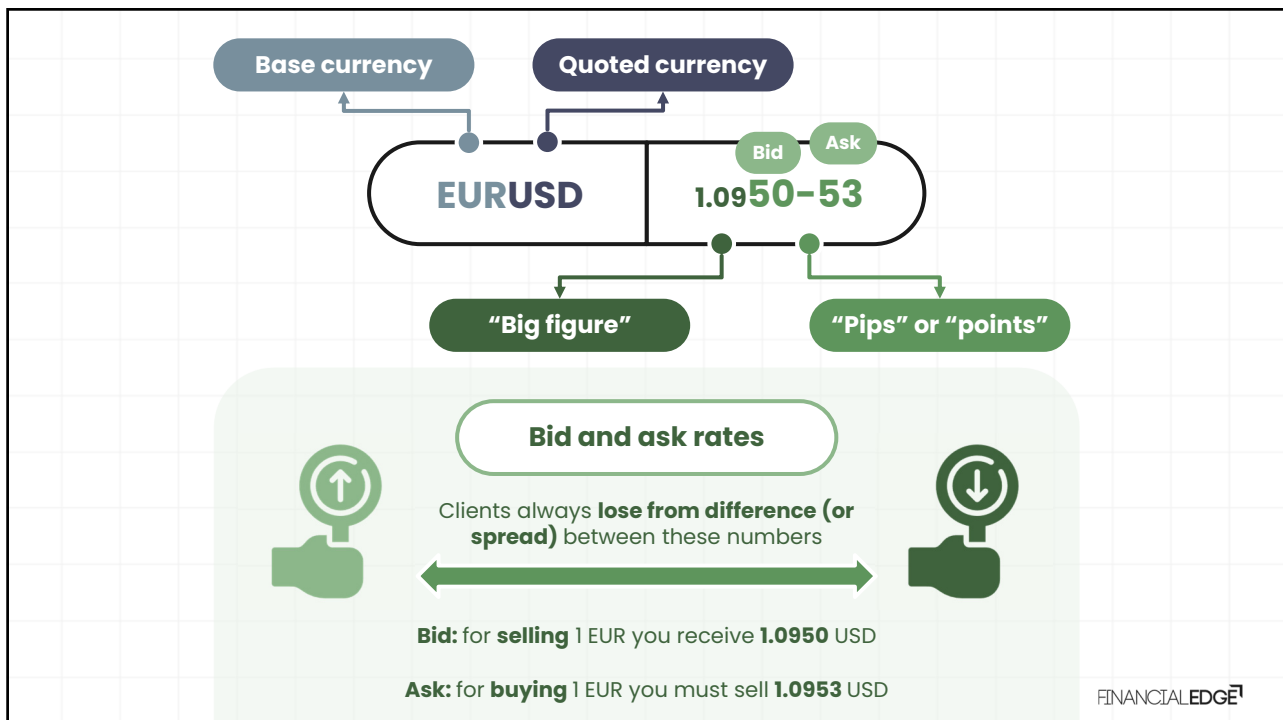
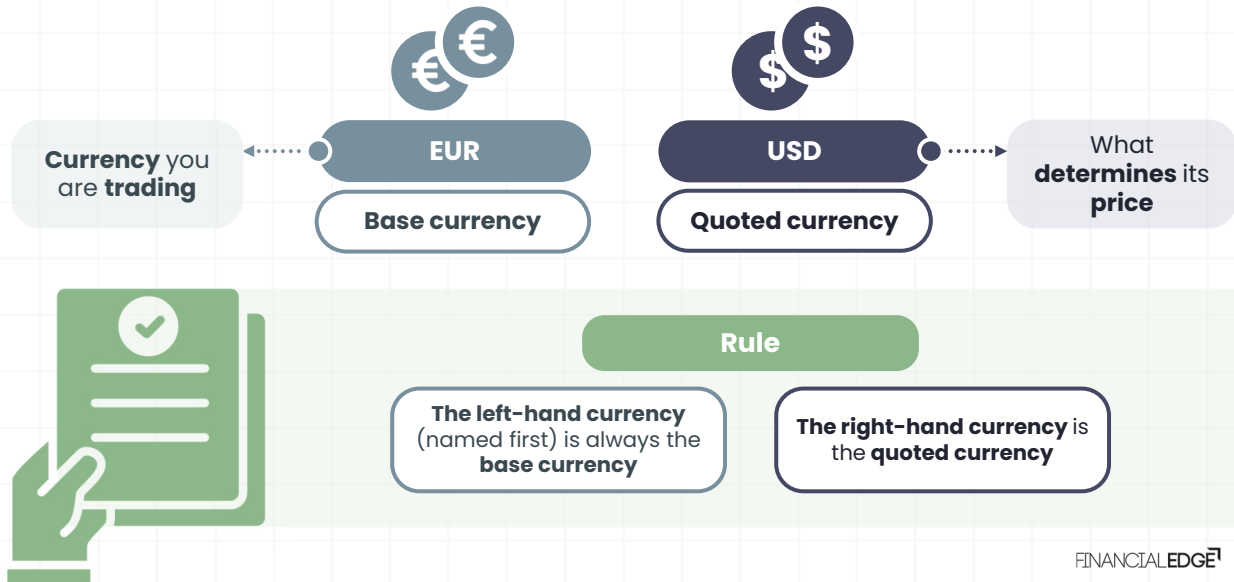


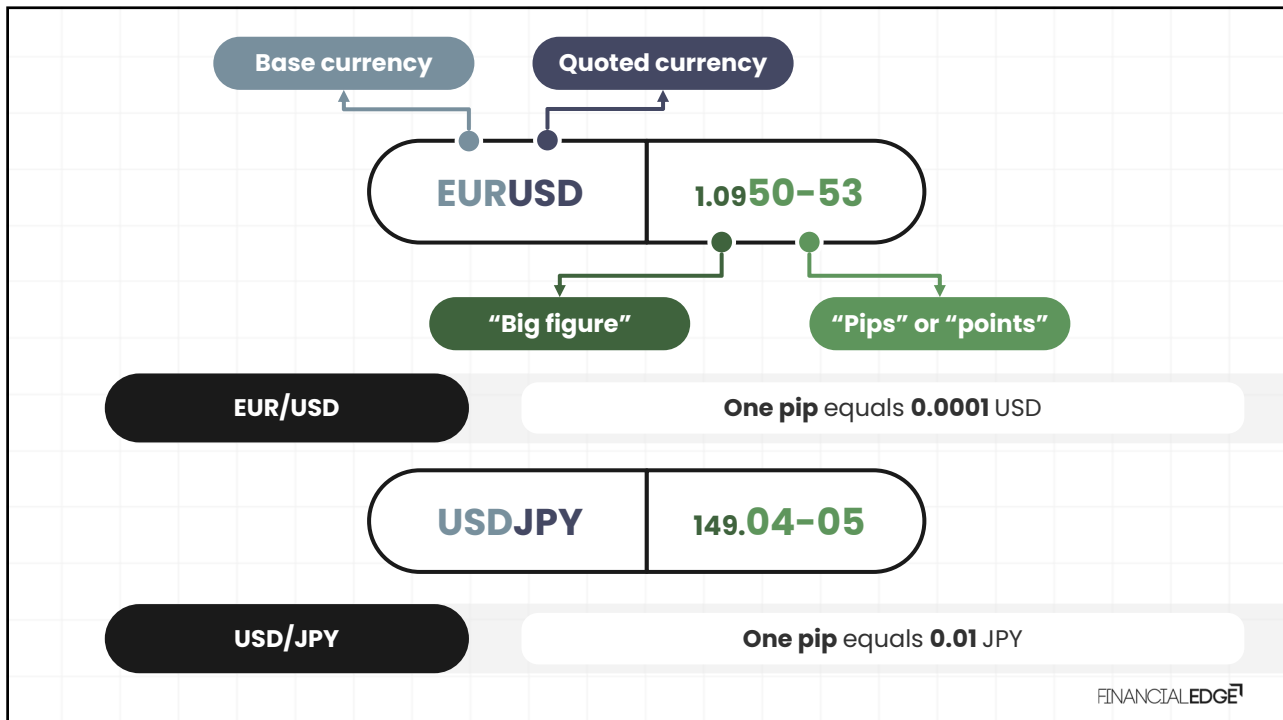


FX Spot Quotation

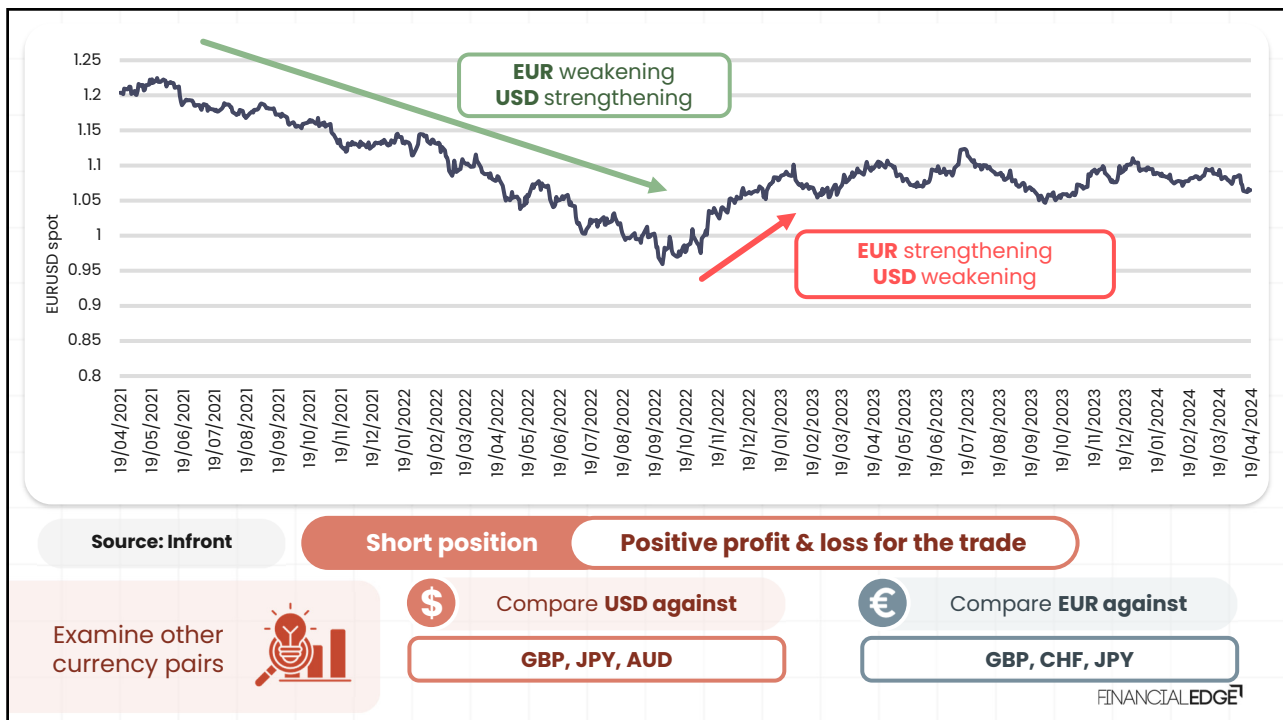
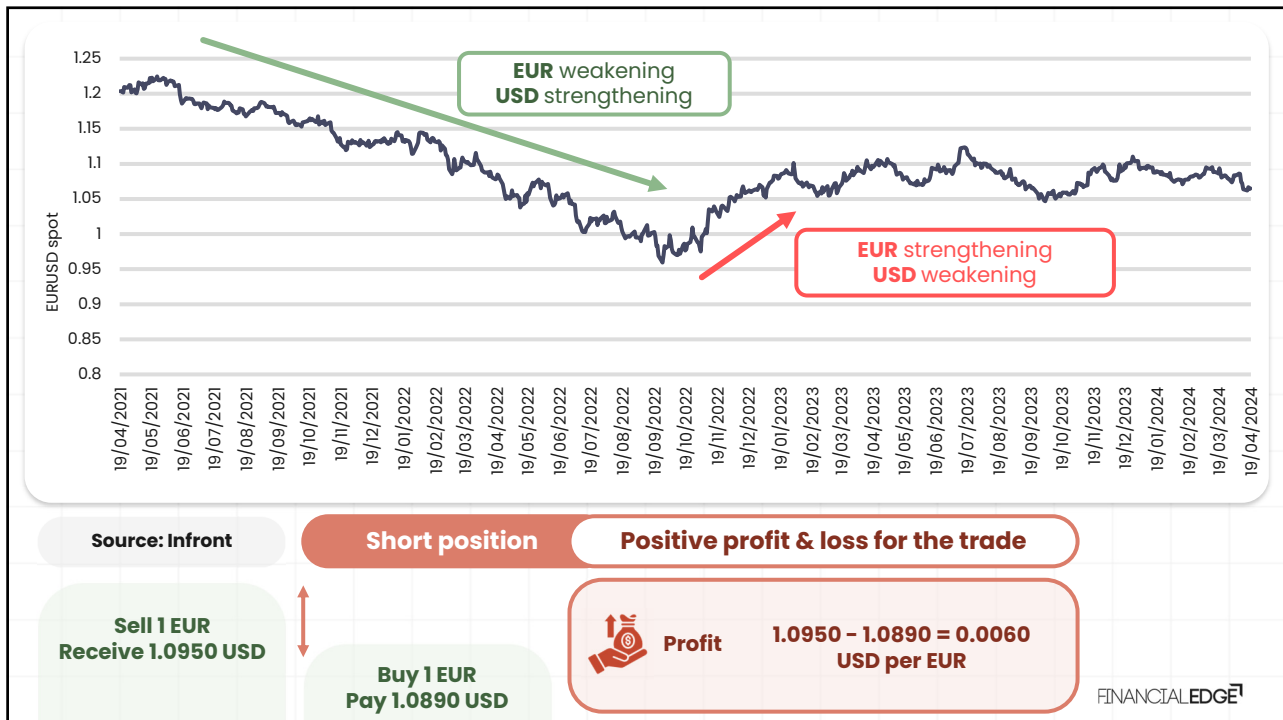
FINANCIALEDGE¹

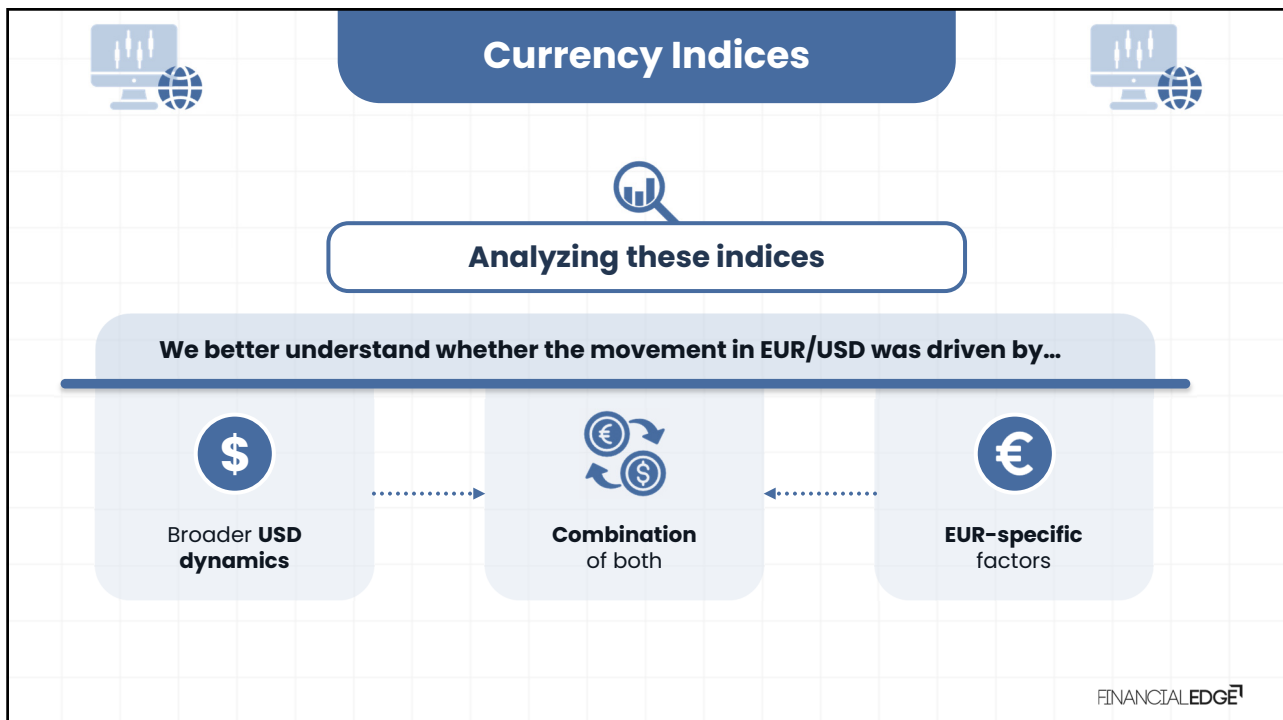
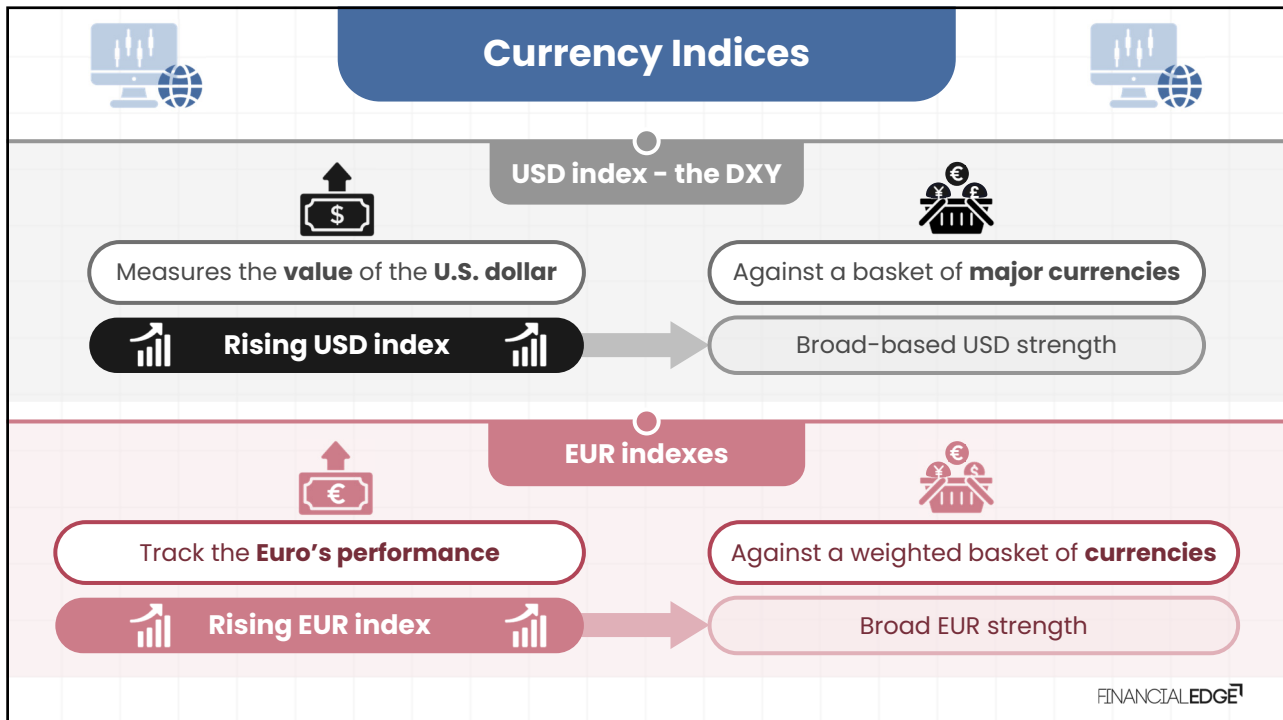
A **currency quote** is the number of **units of the quoted currency per one unit of the base currency**





Strengthening vs. Weakening





The FX Quote Waterfall

FINANCIALEDGE¹

A **currency quote** is given as the number of units of the **quoted currency per one unit of the base currency**

Which currency is the **base currency**?



Which currency is the **quoted currency**?



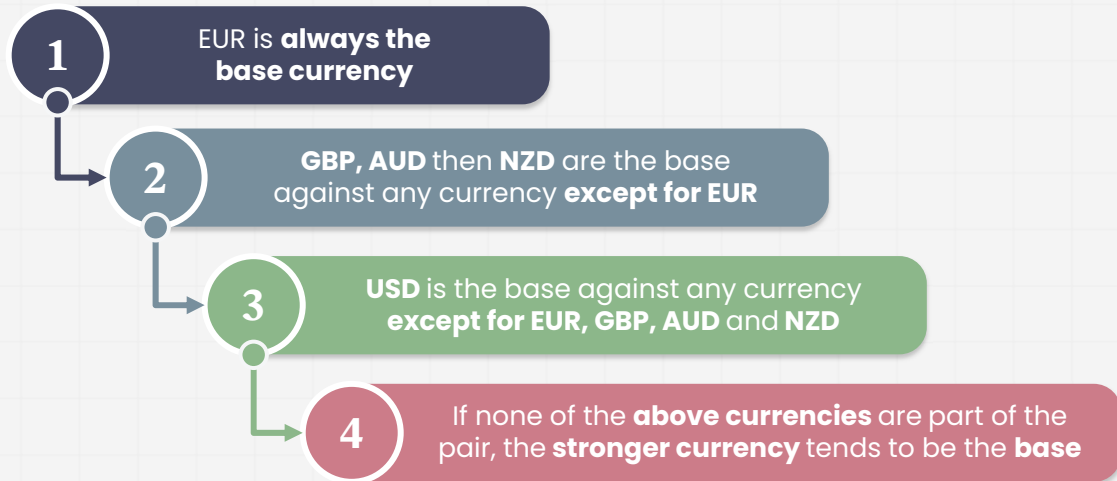
We can't know **all currency pair conventions** offhand



There are a **few rules** that will help

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The FX Quote Waterfall

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FX Spot Drivers

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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



Inflation
Differentials



Economic
Developments



Monetary
Policy



Political
Stability



Purchasing
Power Parity
(PPP)

FINANCIALEDGE¹

Key Factors that Drive FX Spot Rates



**Interest Rate
Differentials**



Inflation
Differentials



Economic
Developments



Monetary
Policy



Political
Stability



Purchasing
Power Parity
(PPP)



Difference in **interest rates** between **two economies**

Higher interest rates



Strengthen that currency relative to others

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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



**Inflation
Differentials**



Economic
Developments



Monetary
Policy



Political
Stability



Purchasing
Power Parity
(PPP)



Differences in **inflation rates** drive currency movements



**Lower
inflation
countries**

Currencies tend
to **appreciate**
over time



They maintain
**purchasing
power**

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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



Inflation
Differentials



**Economic
Developments**



Monetary
Policy



Political
Stability



Purchasing
Power Parity
(PPP)



GDP growth



Employment data



Trade balances



Provide insights into an **economy's health**



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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



Inflation
Differentials



Economic
Developments



**Monetary
Policy**



Political
Stability



Purchasing
Power Parity
(PPP)

Actions



Guidance

Rate hikes

Rate cuts

Quantitative easing

Shift expectations and influence currency values

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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



Inflation
Differentials



Economic
Developments



Monetary
Policy



**Political
Stability**



Purchasing
Power Parity
(PPP)

Political uncertainty



Deter investment



Weaken a currency

Political stability



Currencies act as safe havens

USD, CHF, JPY strengthen during
periods of global uncertainty

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Key Factors that Drive FX Spot Rates



Interest Rate
Differentials



Inflation
Differentials



Economic
Developments



Monetary
Policy



Political
Stability



**Purchasing
Power Parity
(PPP)**



**Currency values should
adjust to equalize the
cost of goods between
countries**



Useful **benchmark** for
evaluating whether a
**currency is overvalued
or undervalued**

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**Interest Rate
Differentials**



Inflation
Differentials



Economic
Developments



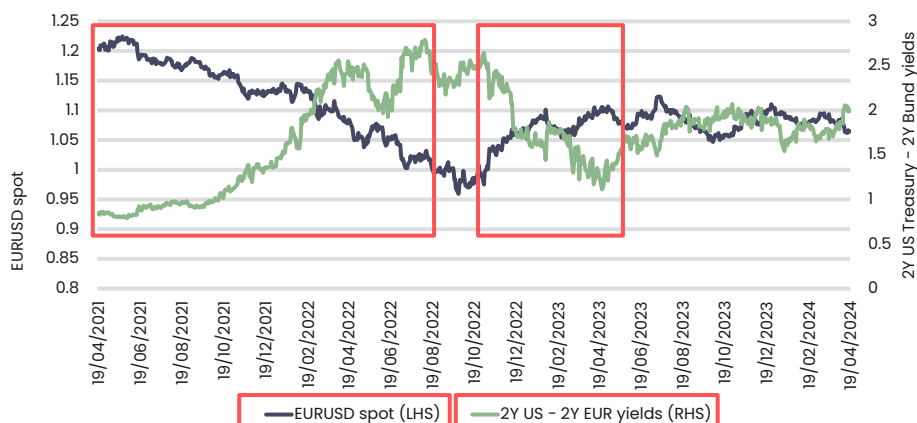
Monetary
Policy



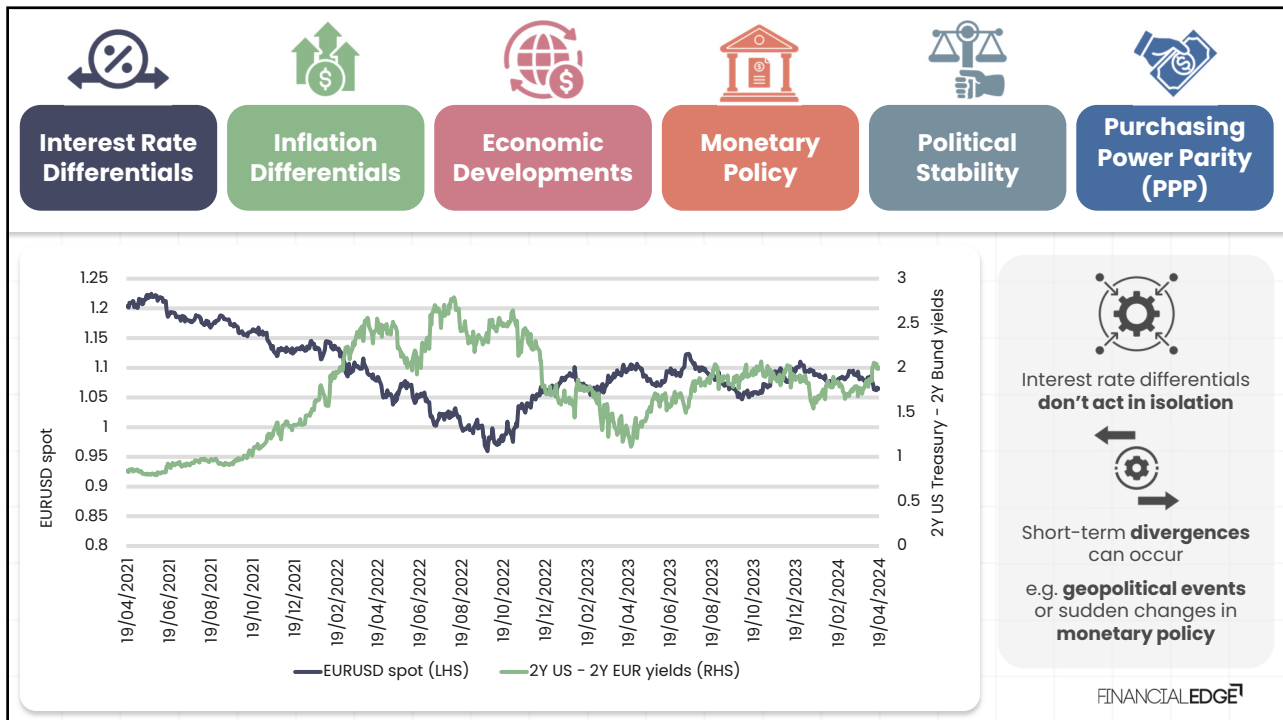
Political
Stability



Purchasing
Power Parity
(PPP)



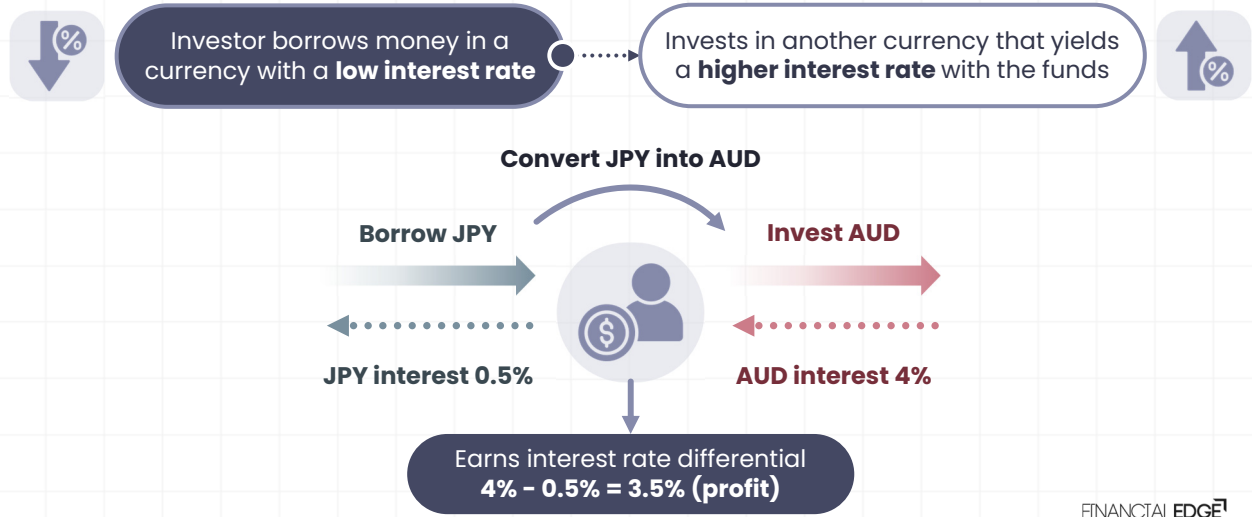
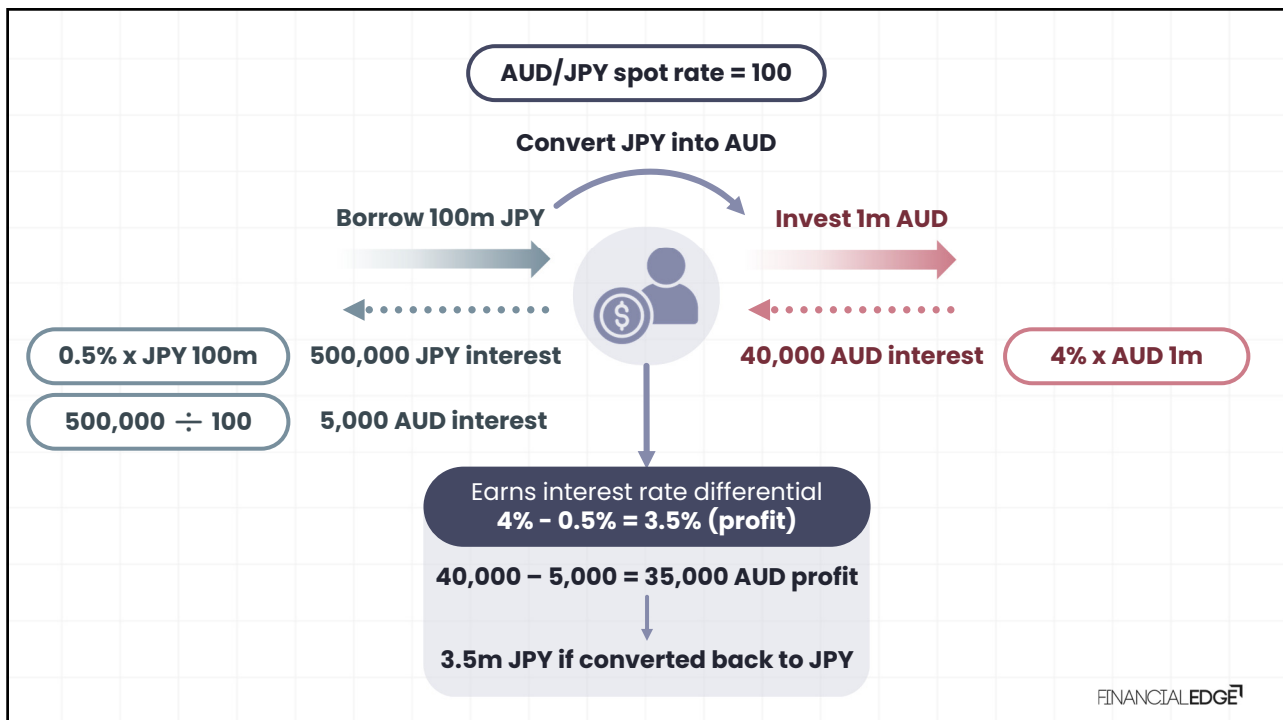
FINANCIALEDGE⁷

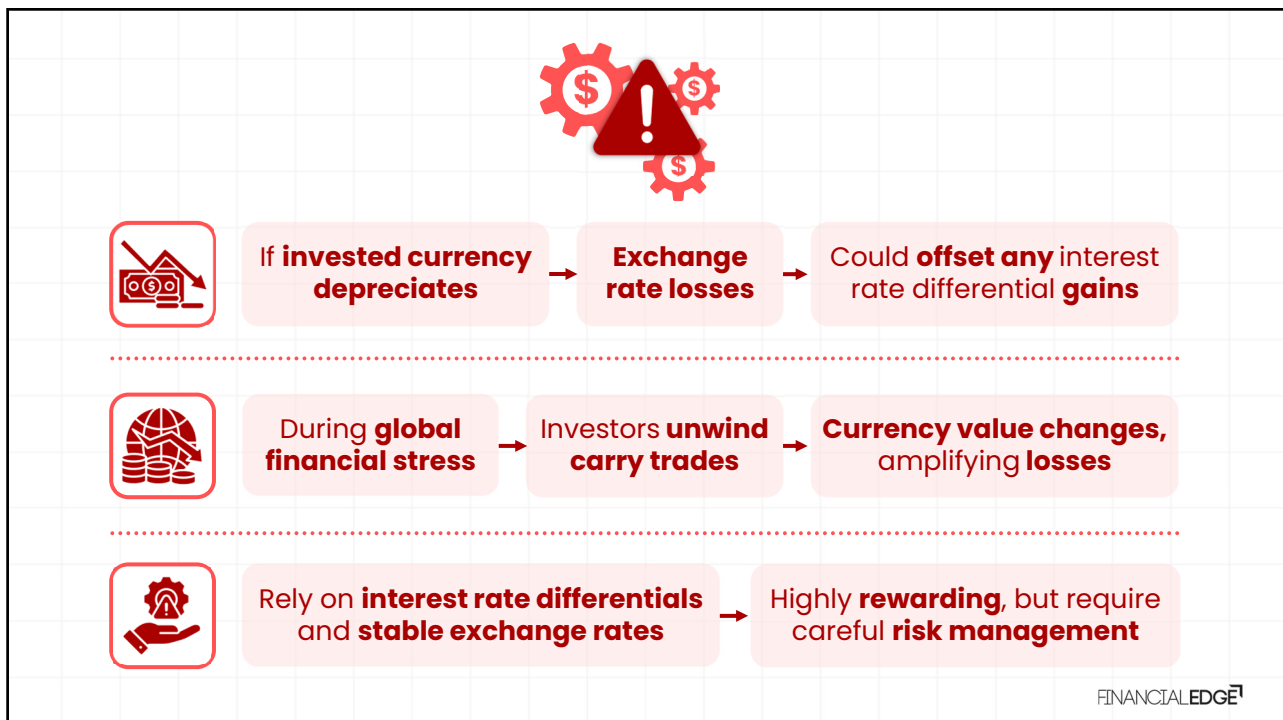
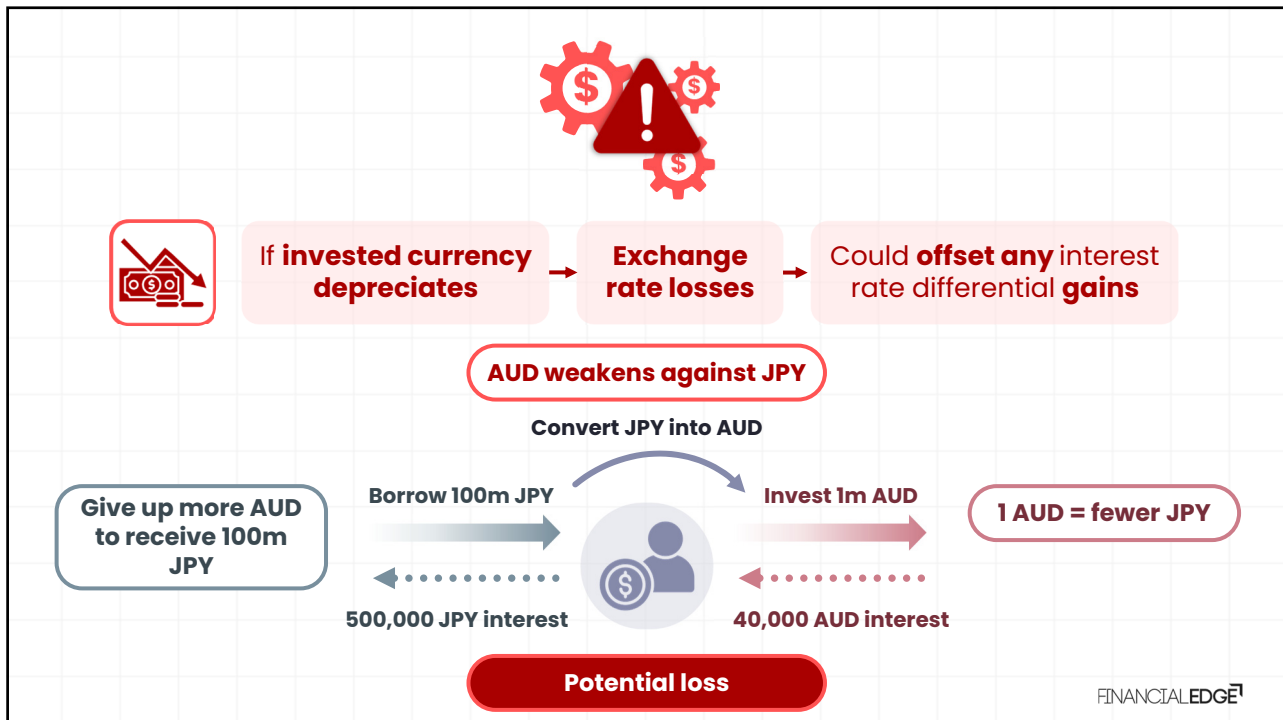


Carry Trade

Carry Trade

A common **strategy** in **FX** markets

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Herstatt Risk and Continuous Linked Settlement (CLS)

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Herstatt Risk (settlement risk)

One party will **pay the currency it sold** but **not receive the currency it bought**

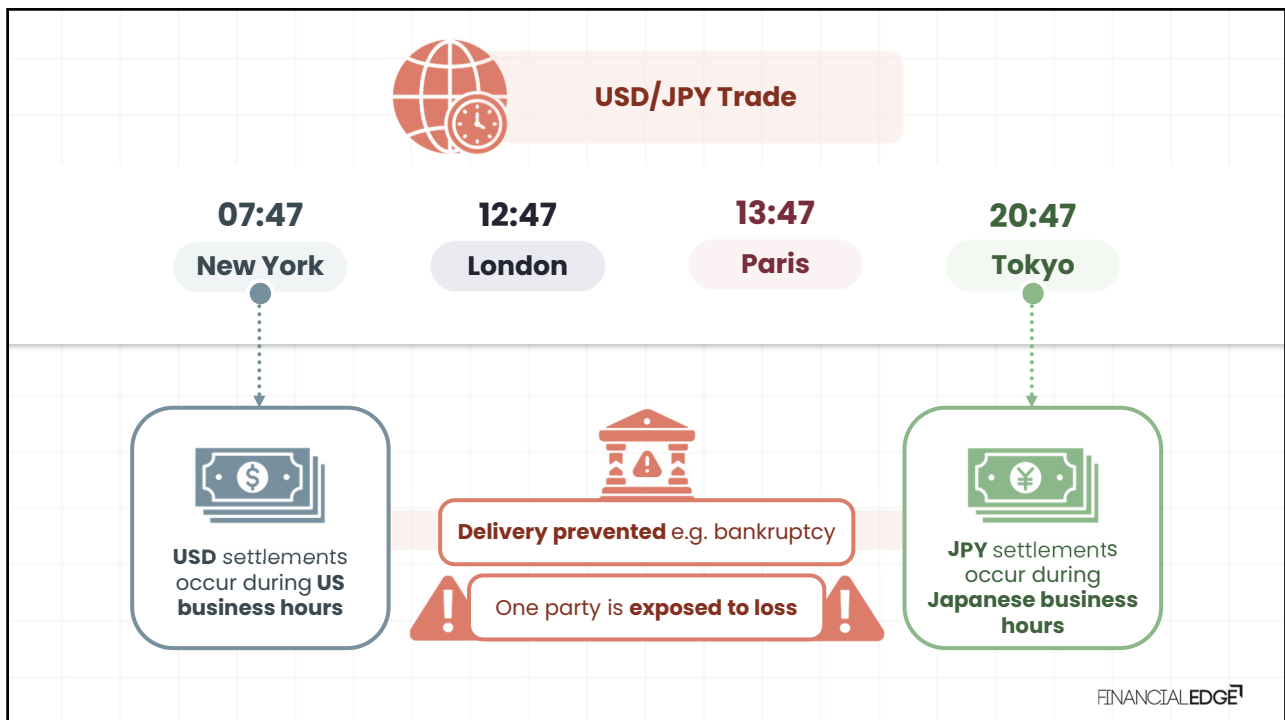
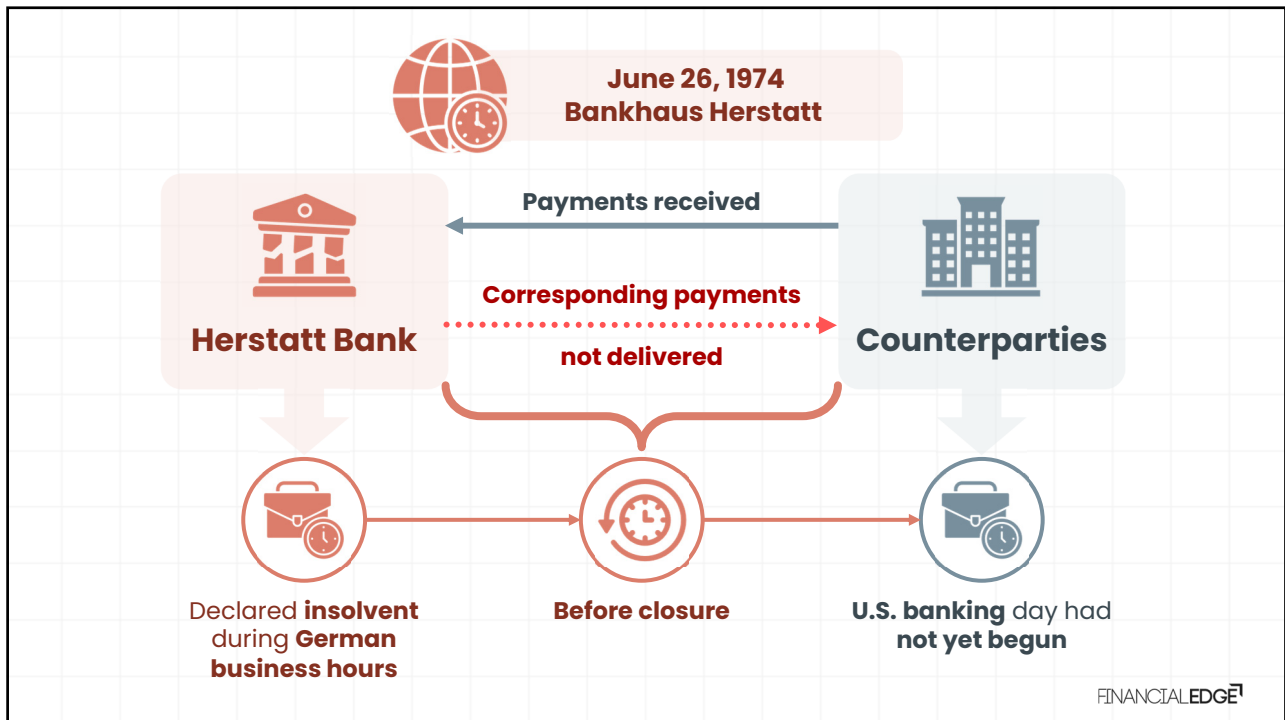
Time zone differences

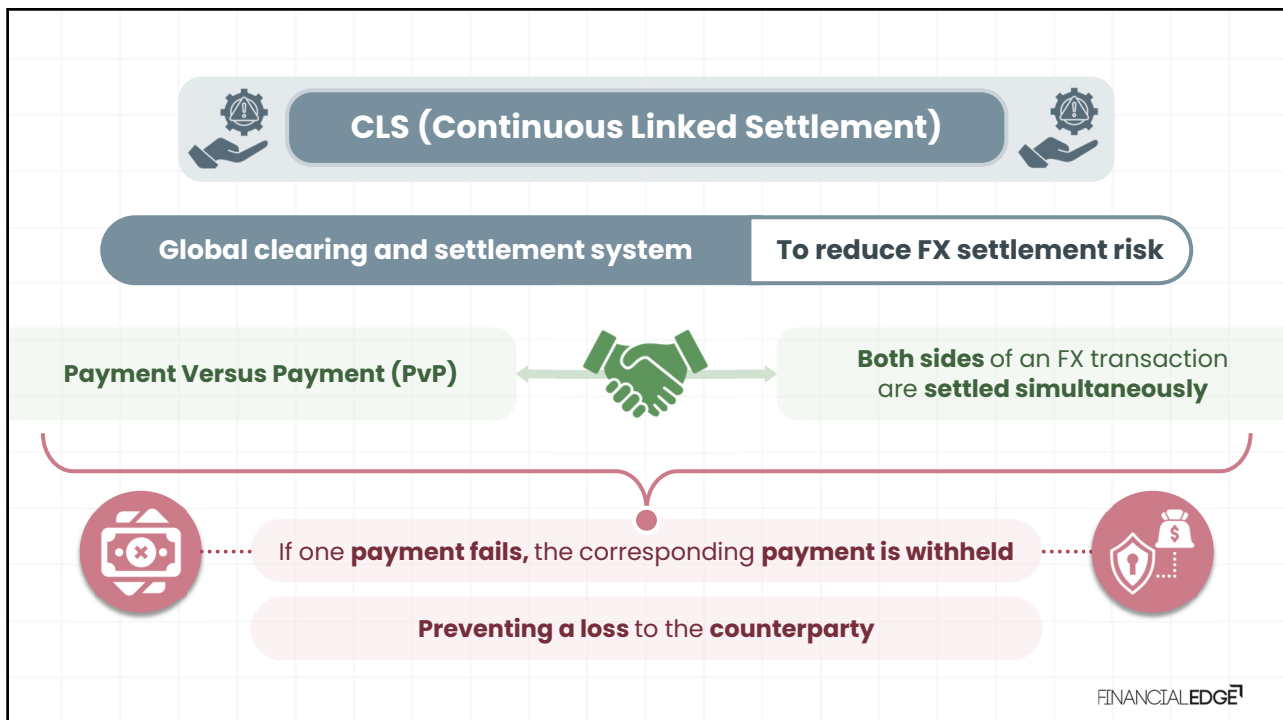
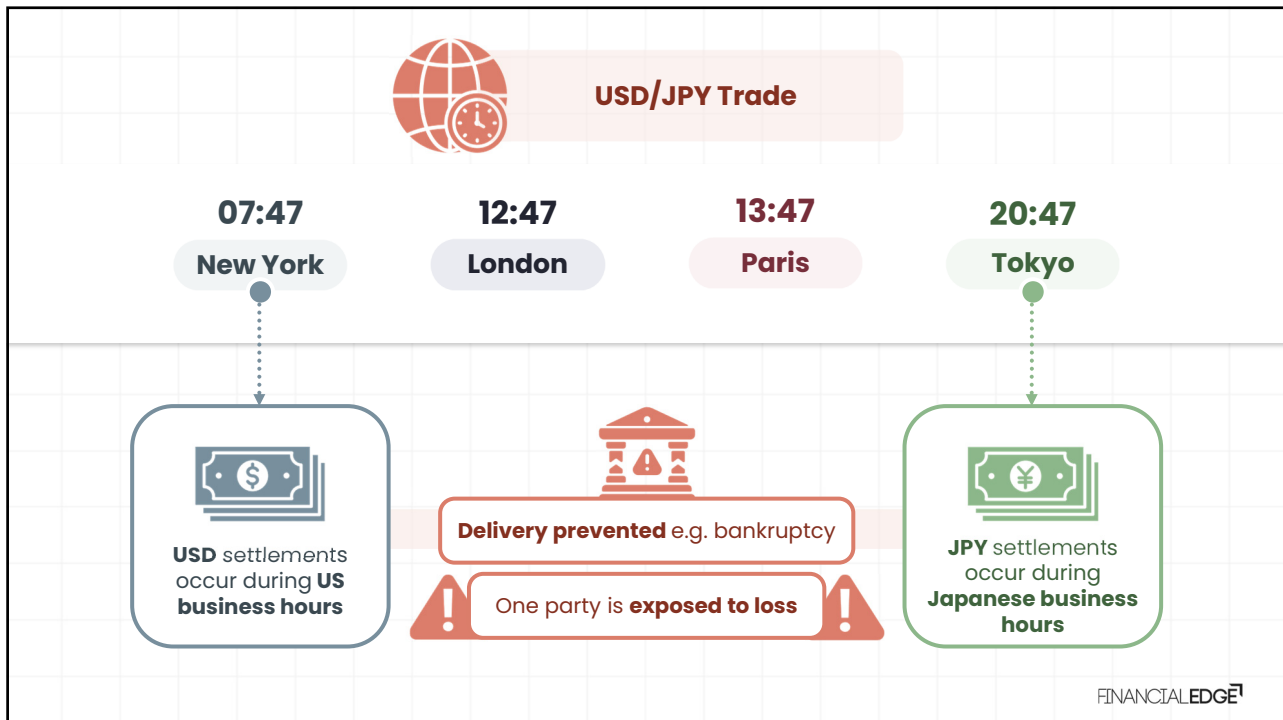
Amplify Herstatt risk
in FX markets

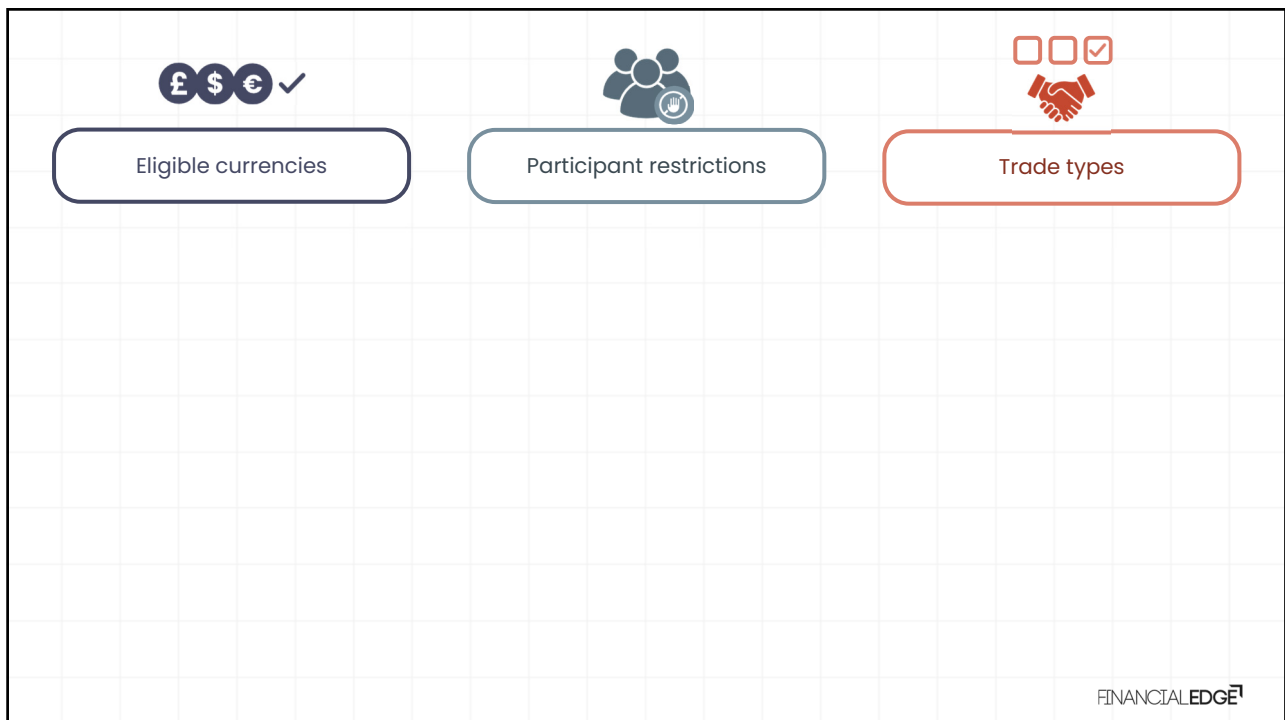
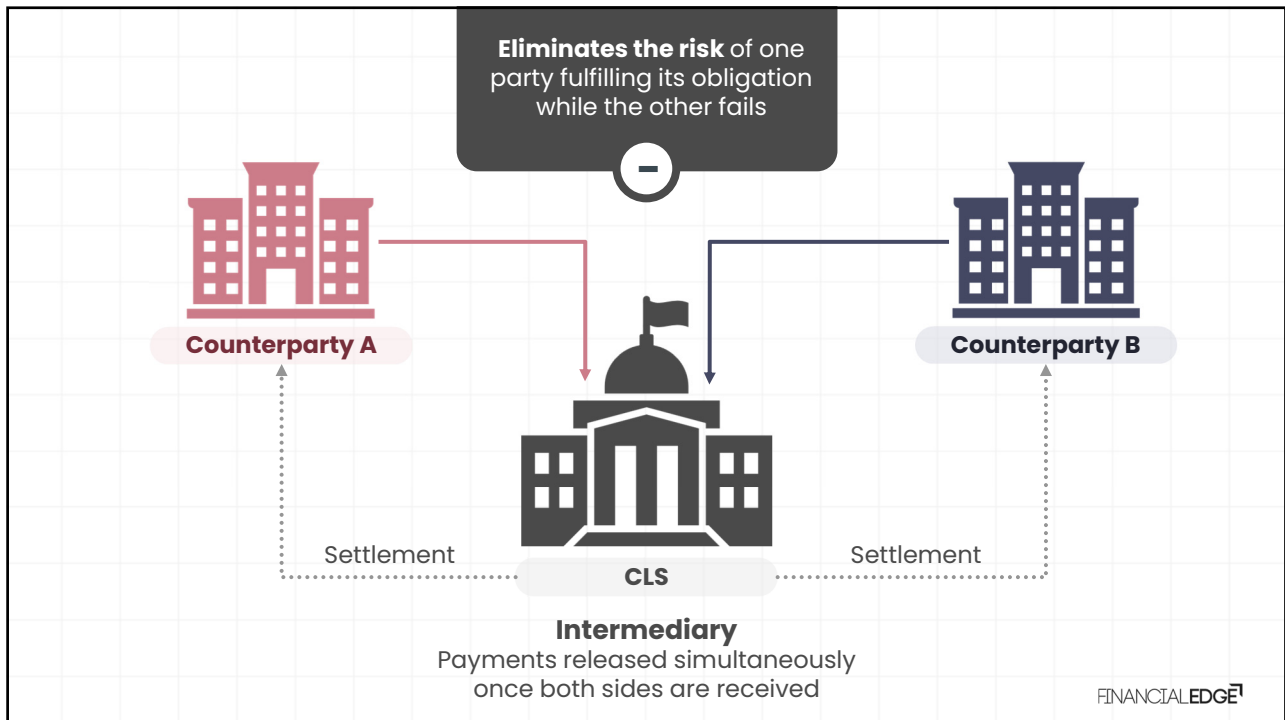


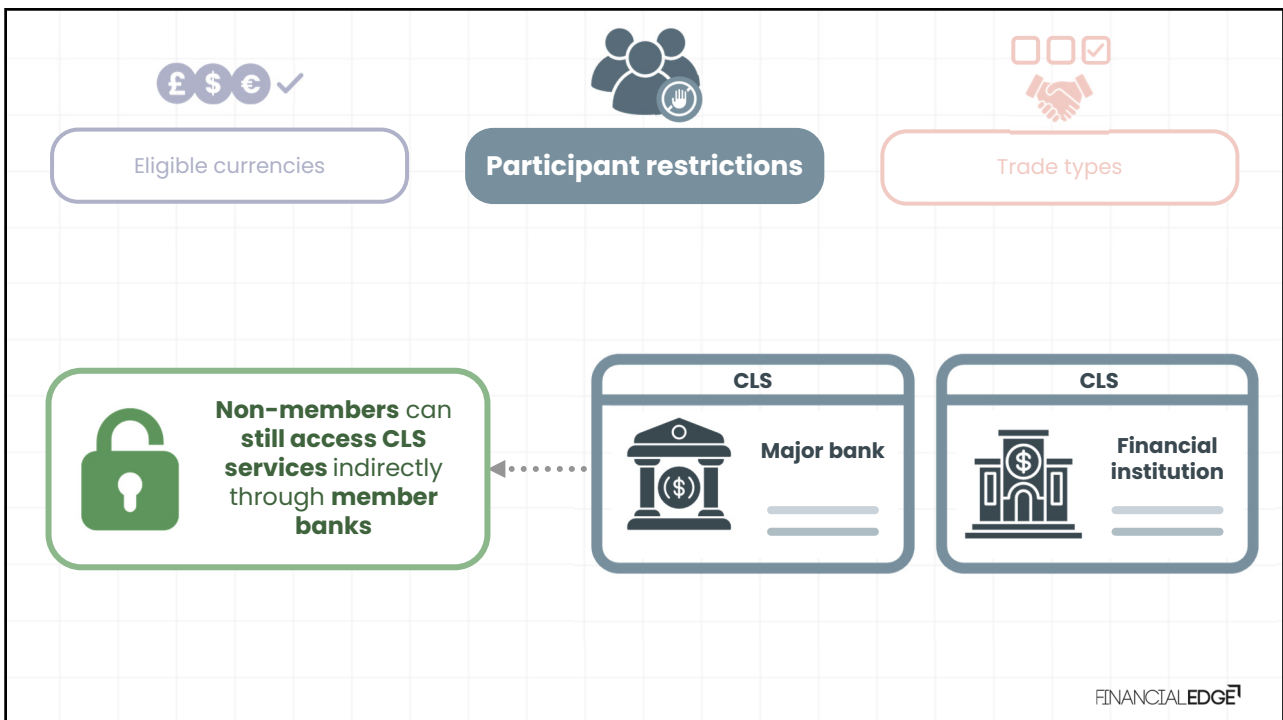
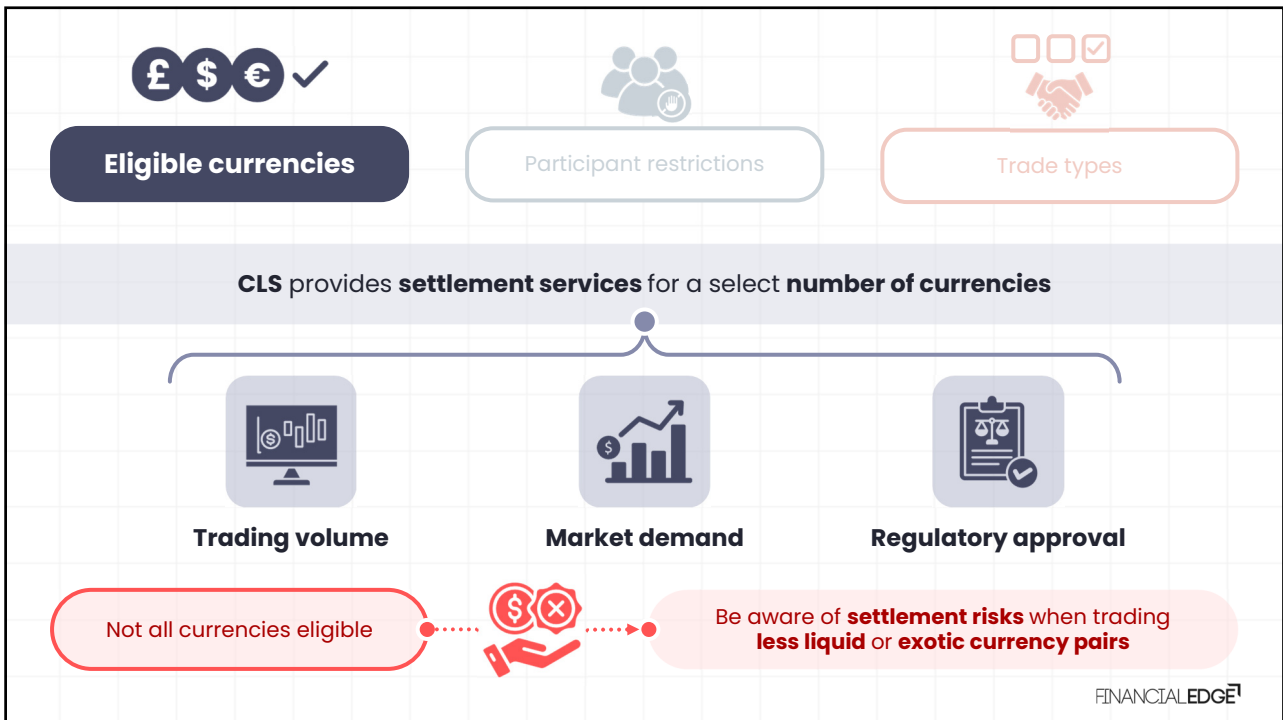
Currencies are settled in
their respective **domestic
markets**, operating on
different business hours

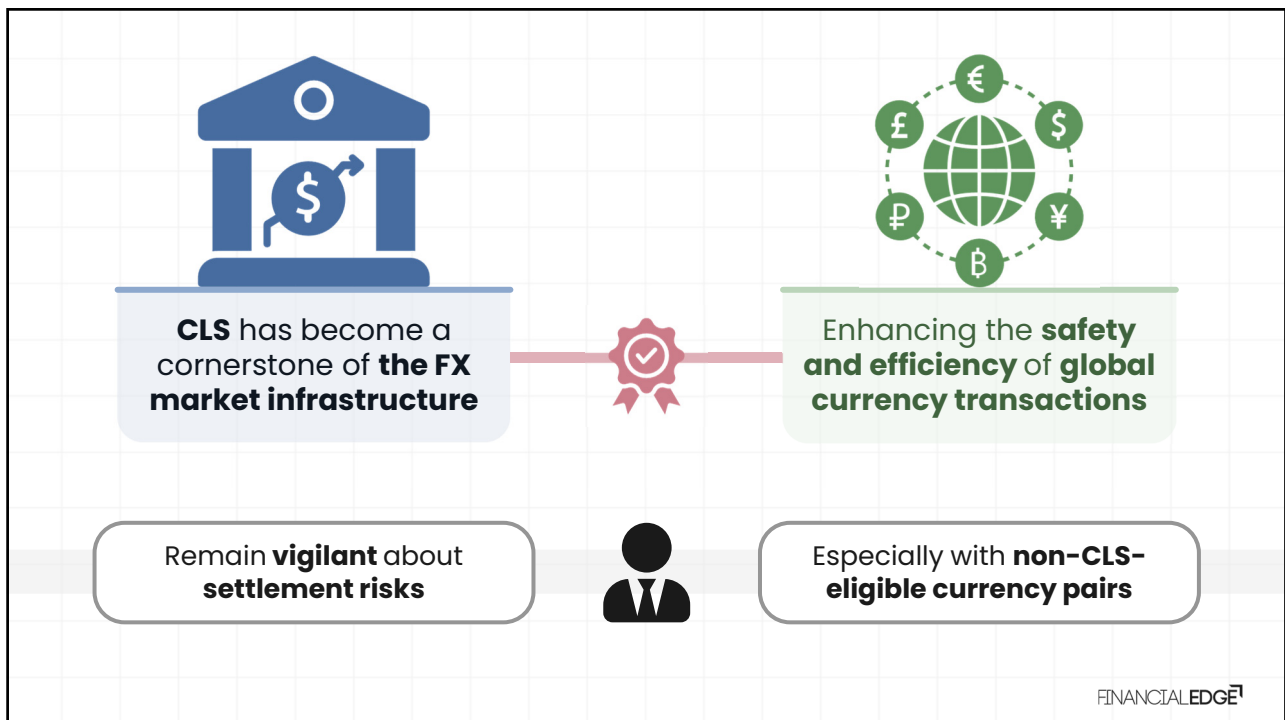
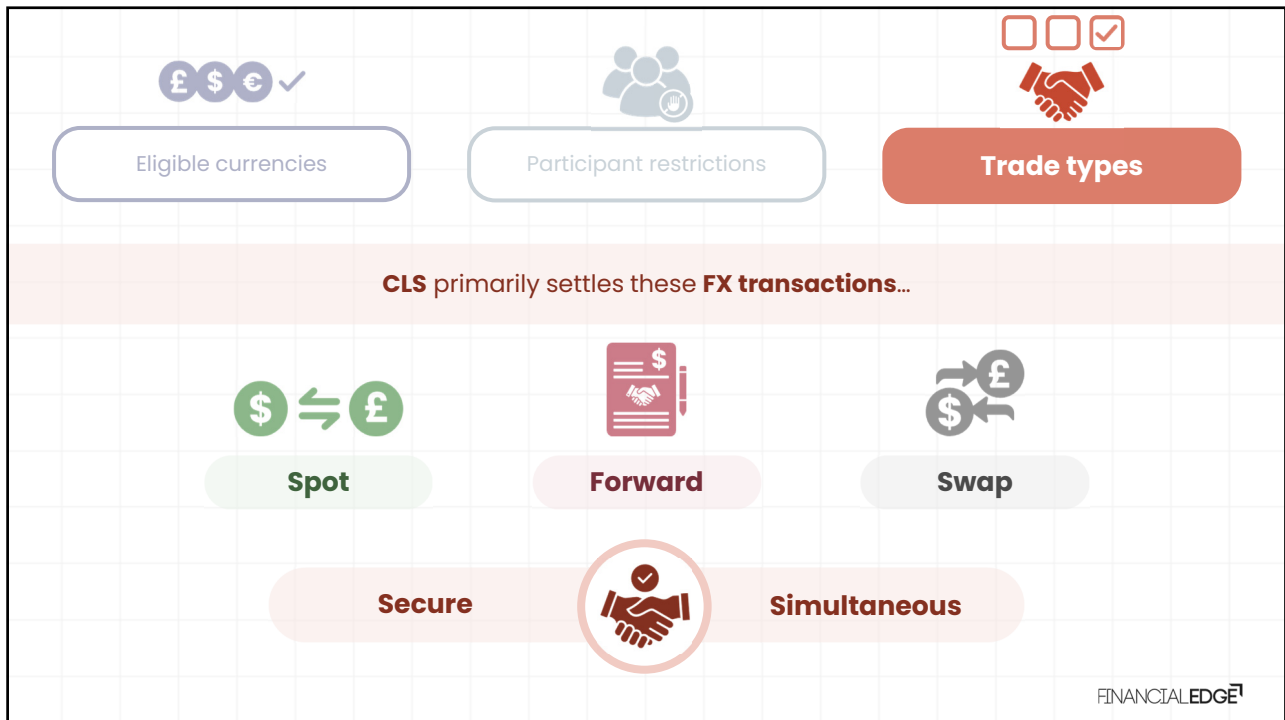
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FX Forwards

FX Forwards (“outrights”)

Agreement to buy/sell the currency at a **price agreed today**, with **settlement** at an **agreed upon date** after the spot date



Settlement date

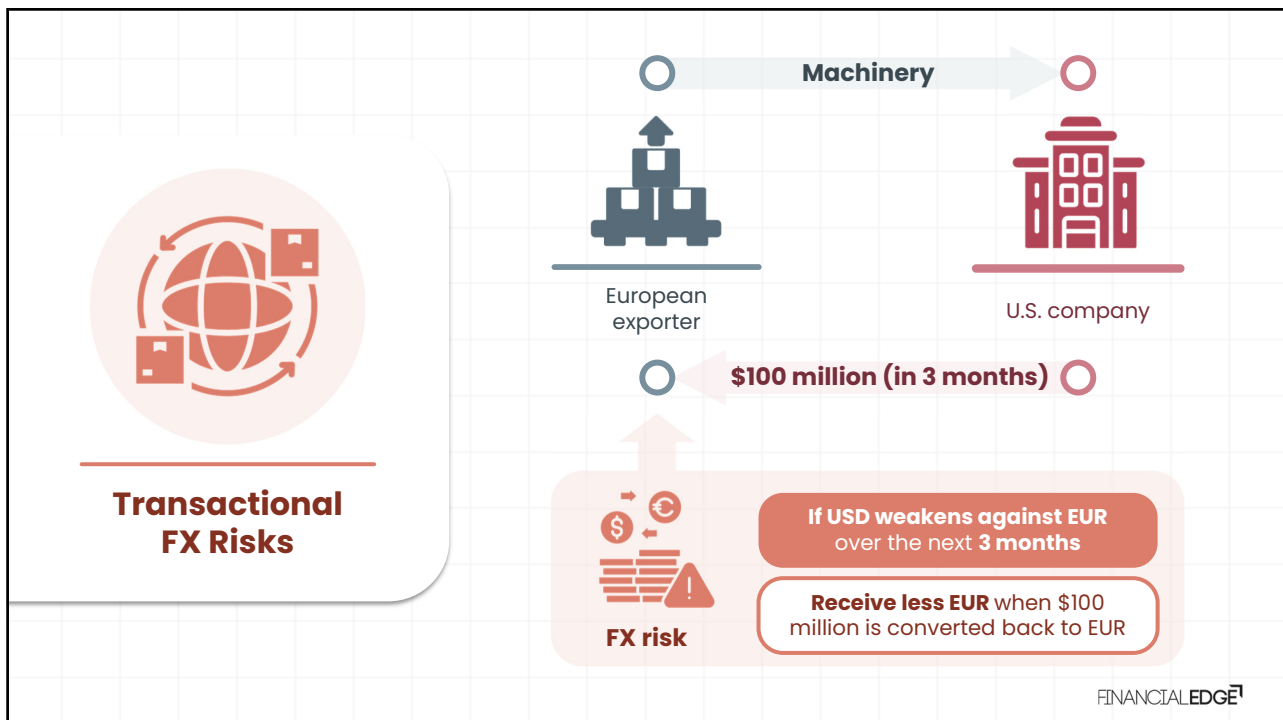
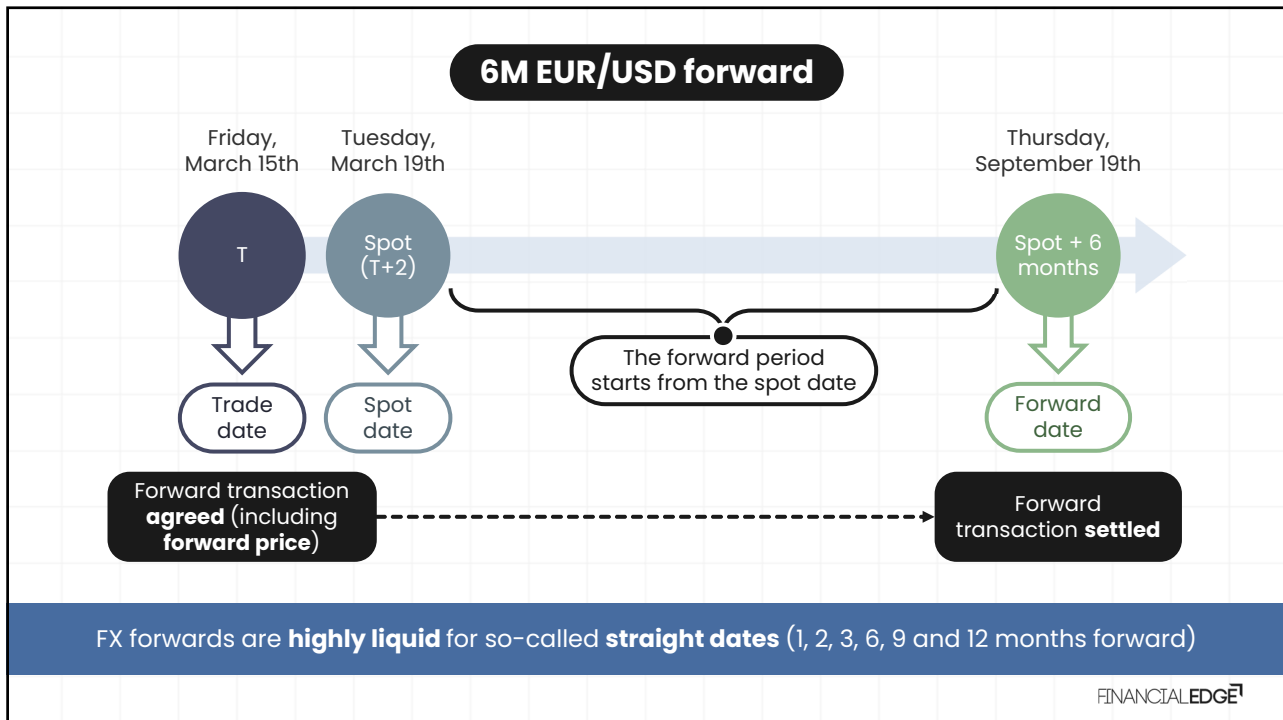


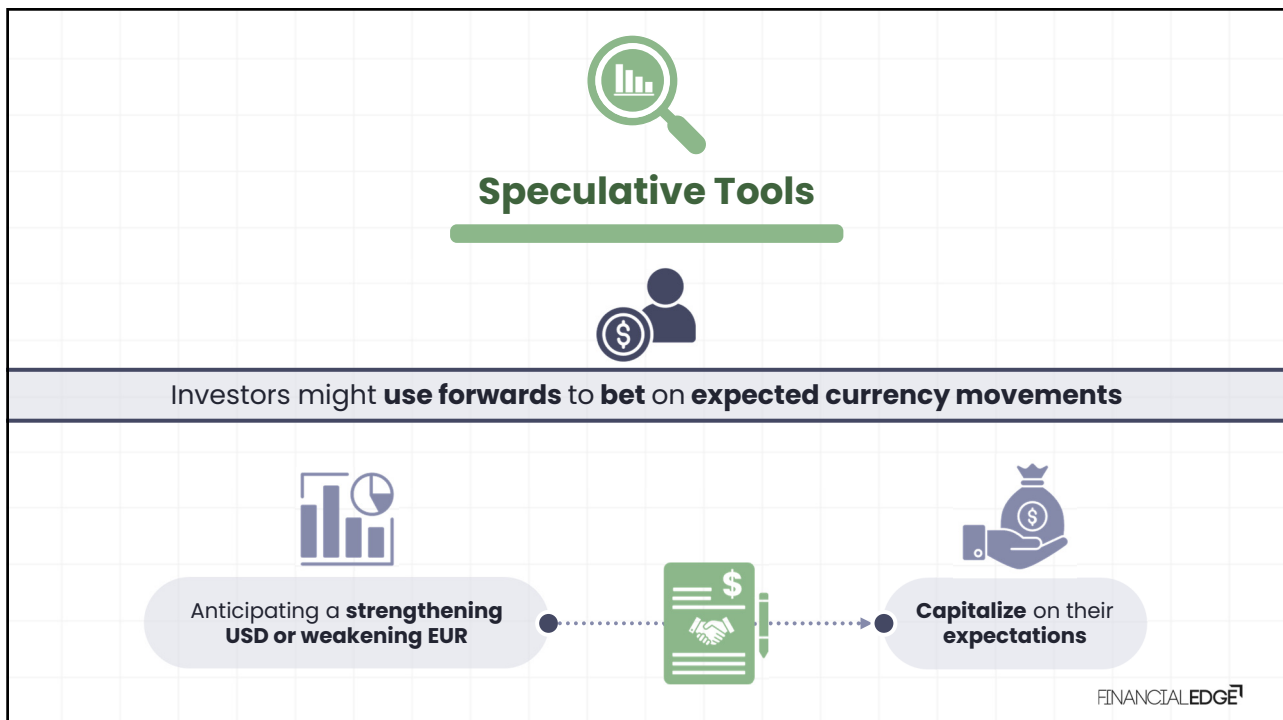
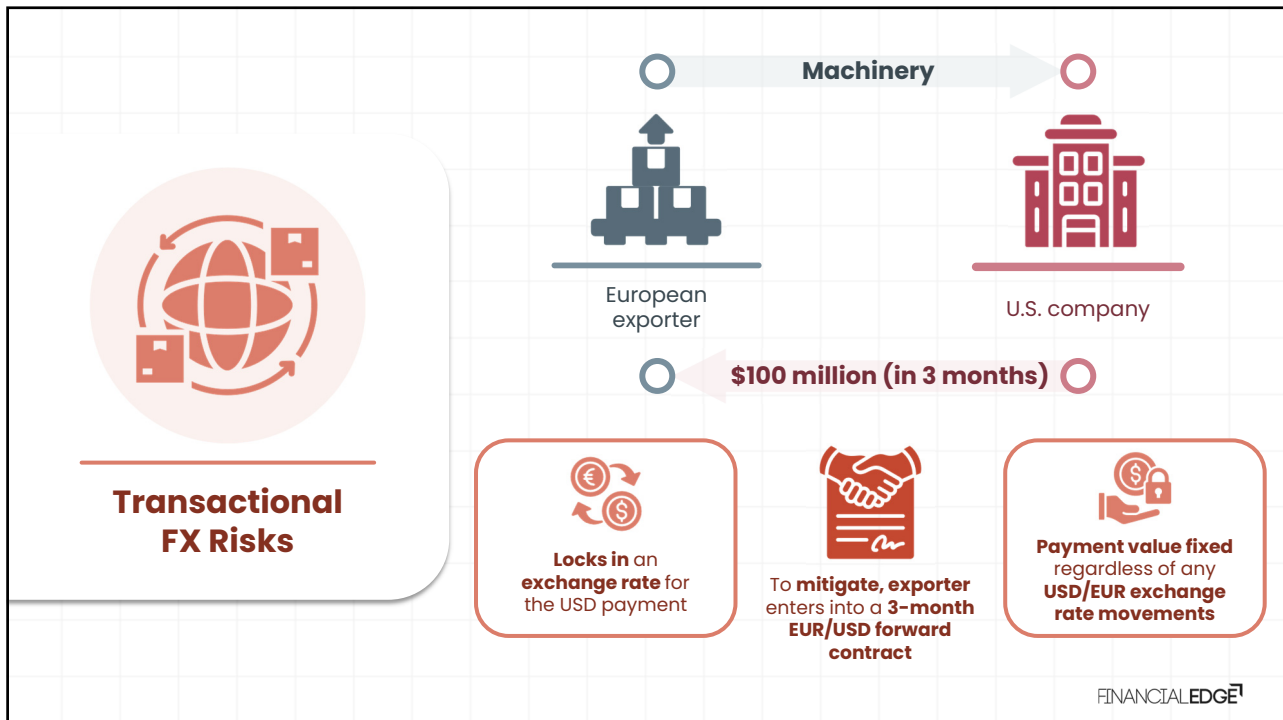
Forward date

Agreed-upon price



Forward price





FX Forward Quotation



FX Forward Quotation

FX forwards are quoted in **forward points**, reflecting the difference between the **spot FX rate** and the **outright forward rate**

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
1W	3.21	3.25	0.50	0.53	-16.32	-16.27
2W	6.19	6.27	1.01	1.05	-32.48	-32.36
3W	9.24	9.34	1.54	1.60	-48.69	-48.6
1M	13.37	13.47	2.36	2.46	-69.78	-69.68
2M	30.62	30.82	6.45	6.65	-146.95	-146.75
3M	45.15	45.35	8.90	9.20	-219.2	-218.95
4M	58.30	58.70	11.10	11.40	-286.38	-285.98
5M	74.60	75.10	13.60	14.00	-361.19	-360.54
6M	89.10	89.60	15.20	15.70	-426.26	-425.41

Scaling factor

Reflects how we **apply the forward points to the exchange rate**, depending on the **currency pair**

EUR/USD

Scaling factor = **10,000**

One pip = 1/10,000th of 1 USD

USD/JPY

Scaling factor = **100**

One pip = 1/100th of 1 JPY

FINANCIALEDGE¹

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
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Direction of adjustment

Positive forward points

Negative forward points

Add them to the spot rate

Subtract them from the spot rate

FINANCIALEDGE¹

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Scaling factor

Direction of adjustment

6M EUR/USD forward bid price

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
1W	3.21	3.25	0.50	0.53	-16.32	-16.27
2W	6.19	6.27	1.01	1.05	-32.48	-32.36
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6M	89.10	89.60	15.20	15.70	-426.26	-425.41

Scaling factor

Direction of adjustment

6M EUR/USD forward bid price

EUR/USD

Scaling factor = 10,000

89.10

÷

10,000

=

0.00891

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
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Scaling factor

Direction of adjustment

6M EUR/USD forward bid price

EUR/USD

Scaling factor = 10,000

Positive forward points

$$89.10 \div 10,000 = 0.00891$$

$$1.0950 + 0.00891 = 1.10391$$

FINANCIALEDGE¹

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
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1M	13.37	13.47	2.36	2.46	-69.78	-69.68
2M	30.62	30.82	6.45	6.65	-146.95	-146.75
3M	45.15	45.35	8.90	9.20	-219.2	-218.95
4M	58.30	58.70	11.10	11.40	-286.38	-285.98
5M	74.60	75.10	13.60	14.00	-361.19	-360.54
6M	89.10	89.60	15.20	15.70	-426.26	-425.41

Scaling factor

Direction of adjustment

6M USD/JPY forward bid price

FINANCIALEDGE¹

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
1W	3.21	3.25	0.50	0.53	-16.32	-16.27
2W	6.19	6.27	1.01	1.05	-32.48	-32.36
3W	9.24	9.34	1.54	1.60	-48.69	-48.6
1M	13.37	13.47	2.36	2.46	-69.78	-69.68
2M	30.62	30.82	6.45	6.65	-146.95	-146.75
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Scaling factor

Direction of adjustment

6M USD/JPY forward bid price

USD/JPY

Scaling factor = 100

$$426.26 \div 100 = 4.2626$$

FINANCIALEDGE¹

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
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Scaling factor

Direction of adjustment

6M USD/JPY forward bid price

USD/JPY

Scaling factor = 100

Negative forward points

$$426.26 \div 100 = 4.2626$$

$$149.04 - 4.2626 = 144.78$$

FINANCIALEDGE¹

Tenor	EURUSD		GBPUSD		USDJPY	
	Bid	Ask	Bid	Ask	Bid	Ask
Spot	1.0950	1.0953	1.2621	1.2623	149.04	149.05
1W	3.21	3.25	0.50	0.53	-16.32	-16.27
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6M	89.10	89.60	15.20	15.70	-426.26	-425.41

Direction of adjustment

Bid > ask
Subtract

Bid-ask spread always wider for the forward rate than the spot rate

Bid forward points < ask

Bid forward points > ask

Add them to the spot rate

Subtract them from the spot rate

FINANCIALEDGE¹

What Determines FX Forward Points? – Part 1

FINANCIALEDGE¹

What Determines FX Forward Prices?



The **forward rate** is **not a prediction** of the **spot FX rate**

Forward prices are driven by...



Supply



Demand



Forward price calculations are rooted in...

The no-arbitrage principle

If there are **two or more ways** to achieve the same:

Financial outcome

OR

Risk profile

The **prices** of these alternatives **must be identical**

FINANCIALEDGE⁷

What Determines FX Forward Prices?



The **forward rate** is **not a prediction** of the **spot FX rate**

Forward price calculations are rooted in...

The no-arbitrage principle

If there are **two or more ways** to achieve the same:

Financial outcome

OR

Risk profile

The **prices** of these alternatives **must be identical**

Risk-free profit

Market participants



Buy



Market A

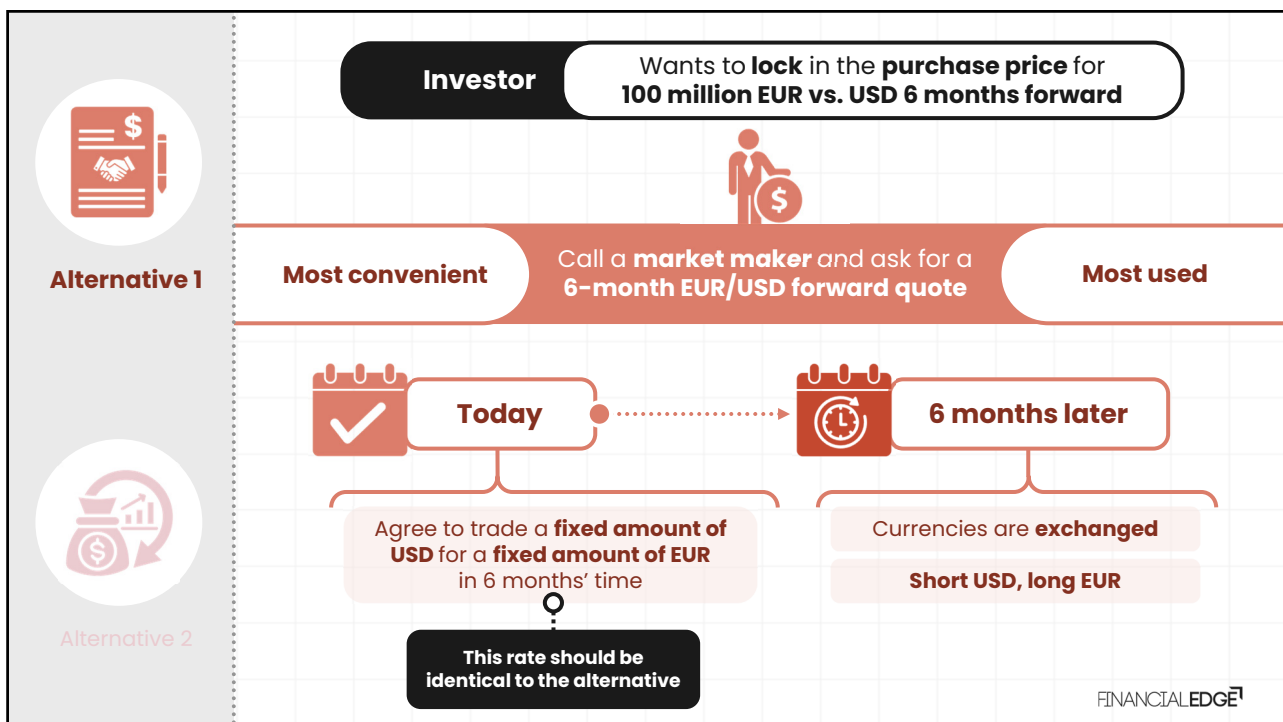
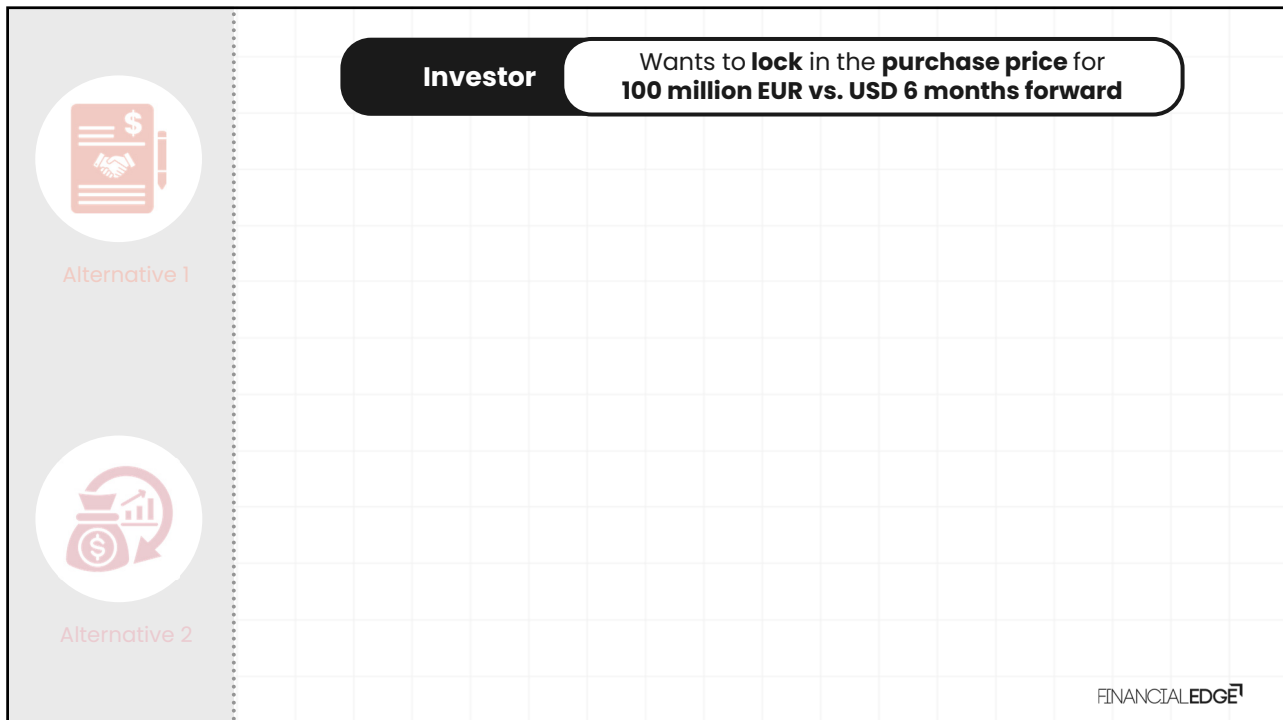


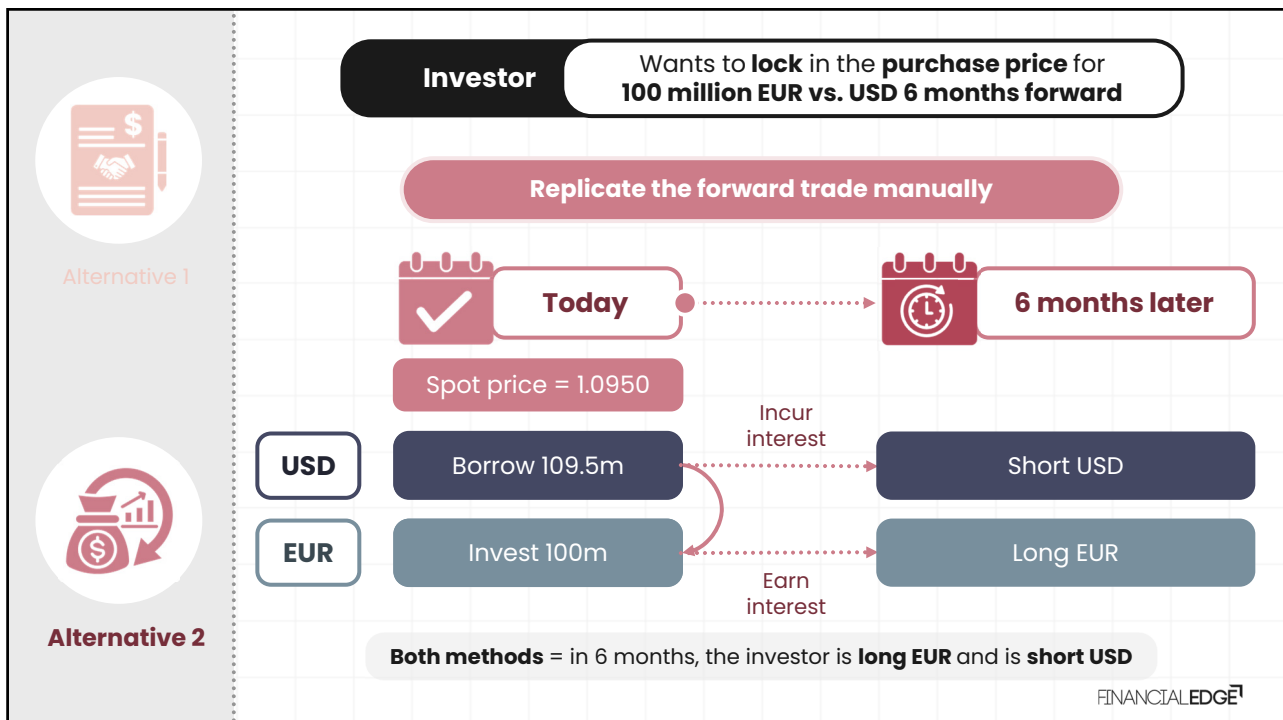
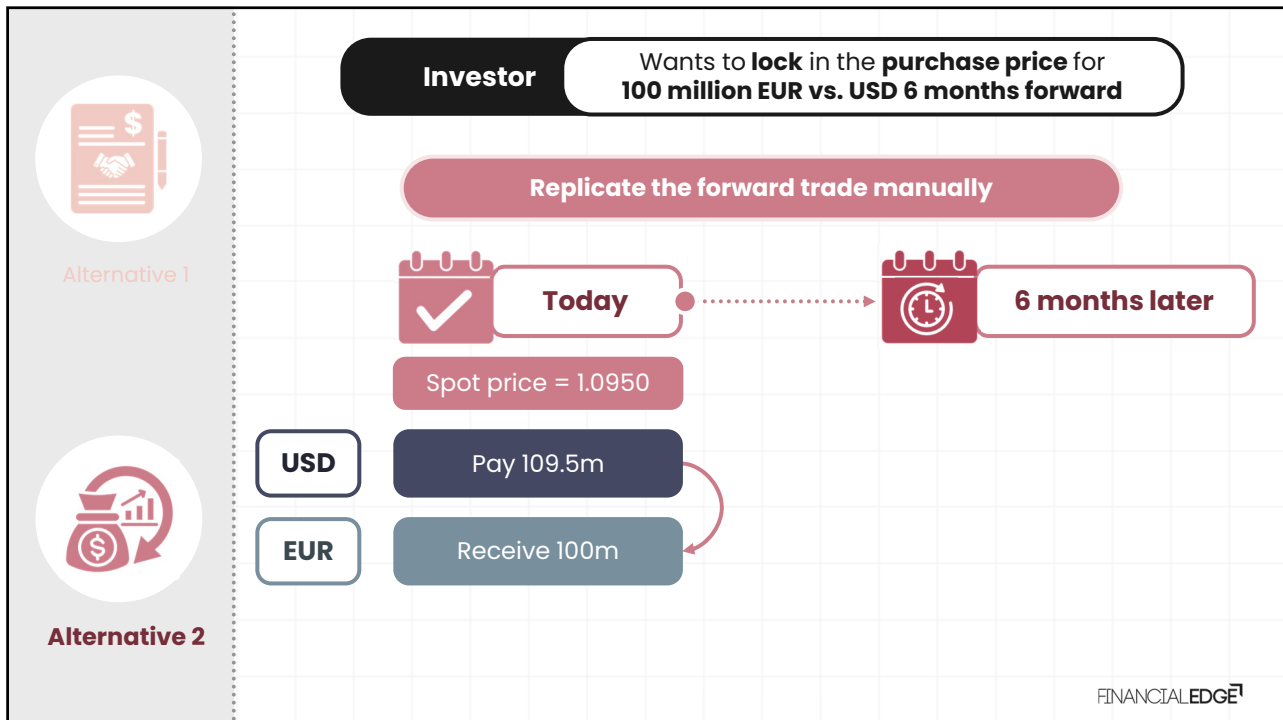
Market B

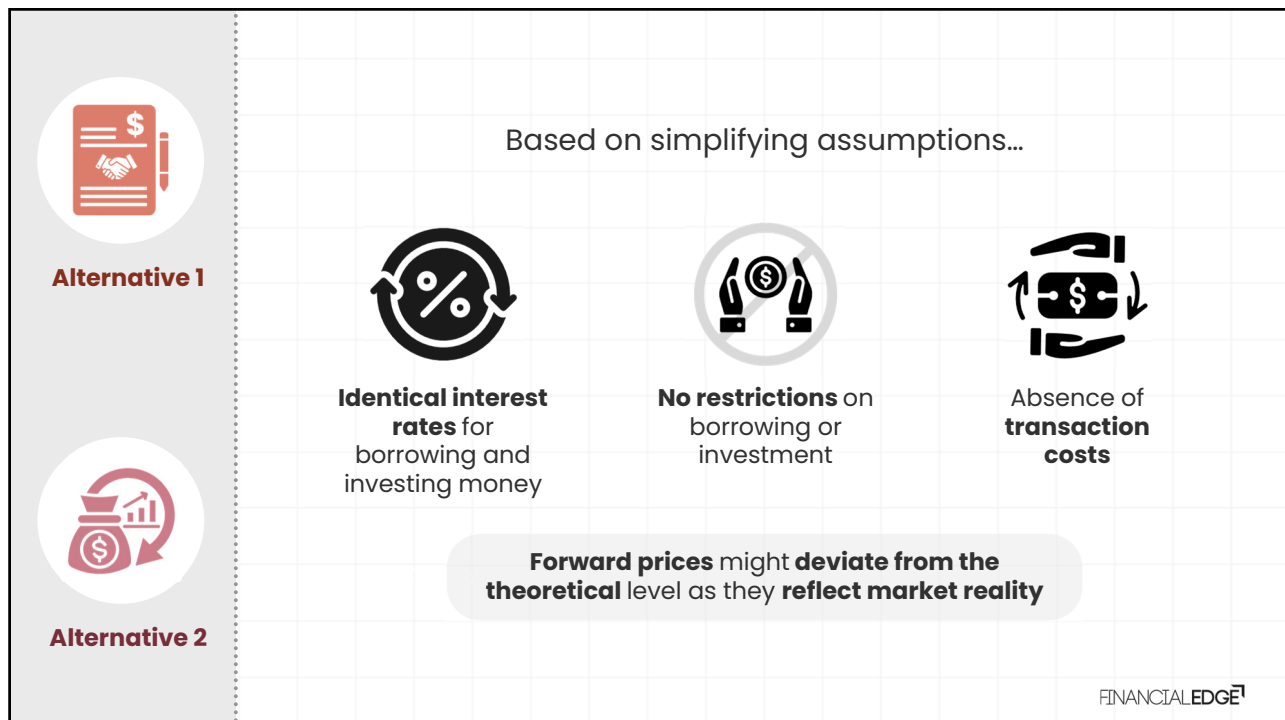
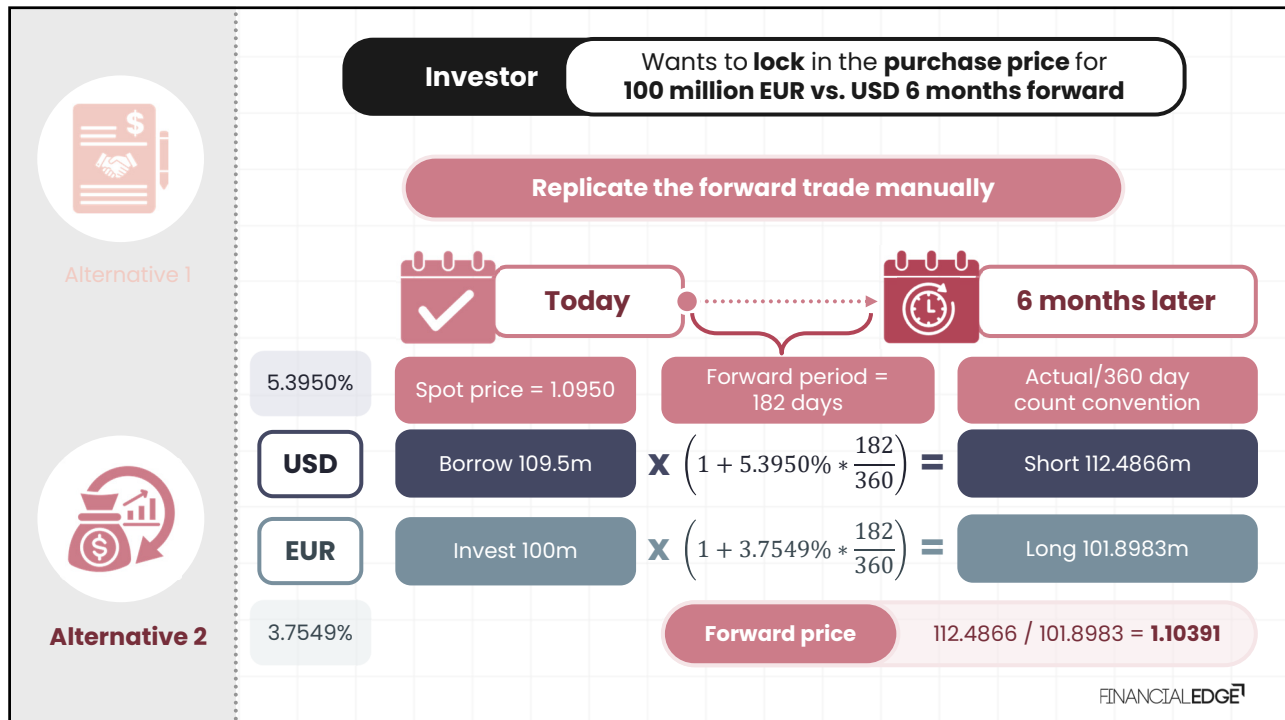
Sell



FINANCIALEDGE⁷







The Interest Rate Parity Formula

The **forward FX rate equals the spot FX rate**, adjusted by the **interest rate differential** between the two currencies

$$\text{FX forward rate} = \text{FX spot rate} \times \frac{1 + i_{\text{quoted}} \times \frac{\text{days}}{\text{basis}}}{1 + i_{\text{base}} \times \frac{\text{days}}{\text{basis}}}$$

USD

360 days

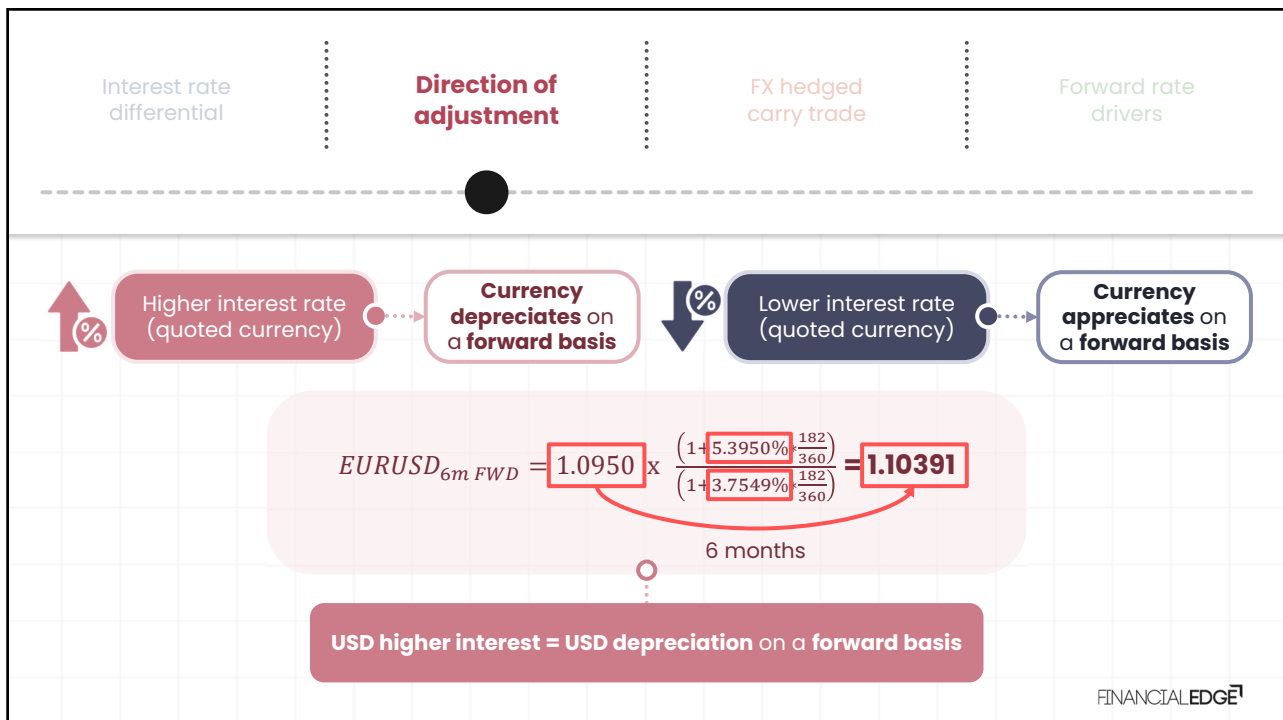
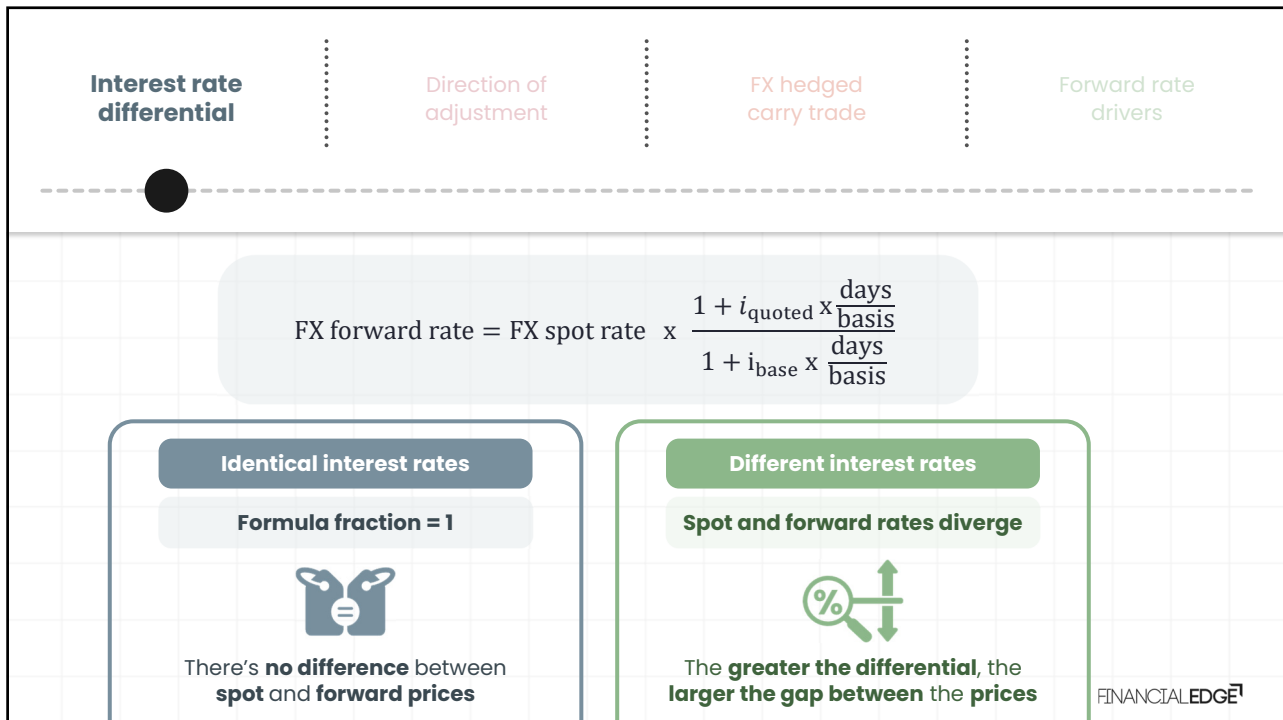
EUR

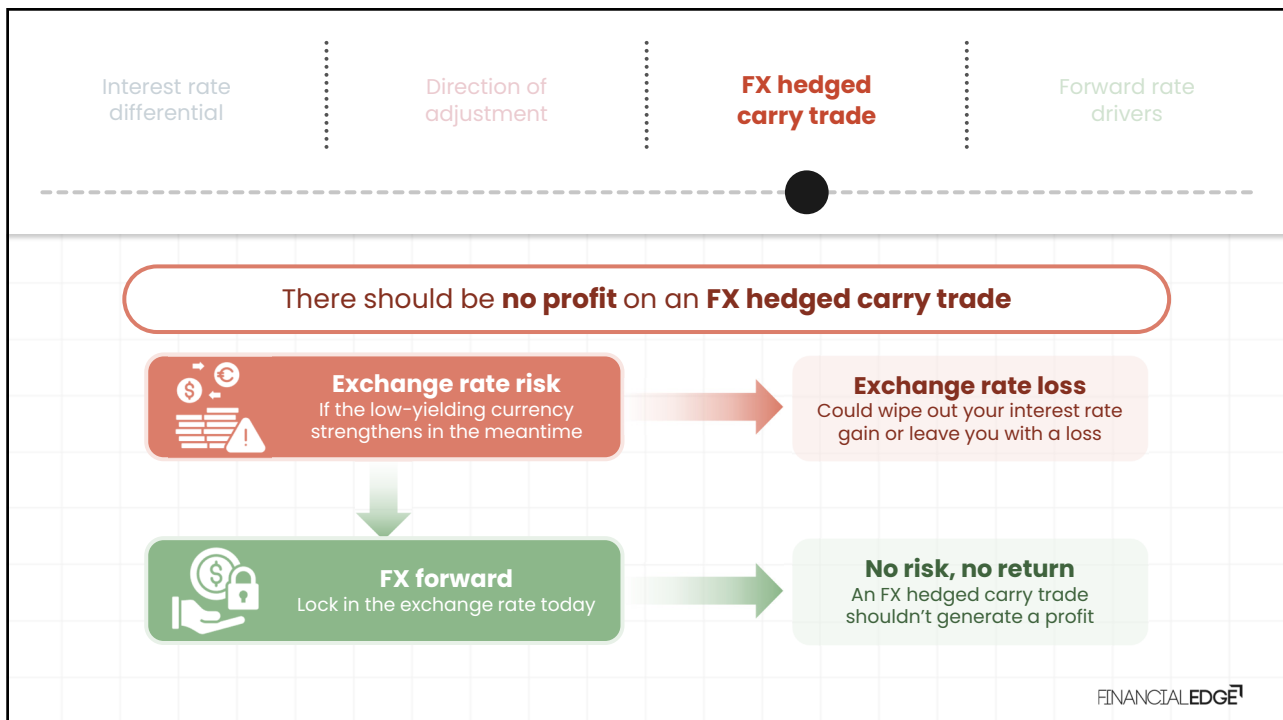
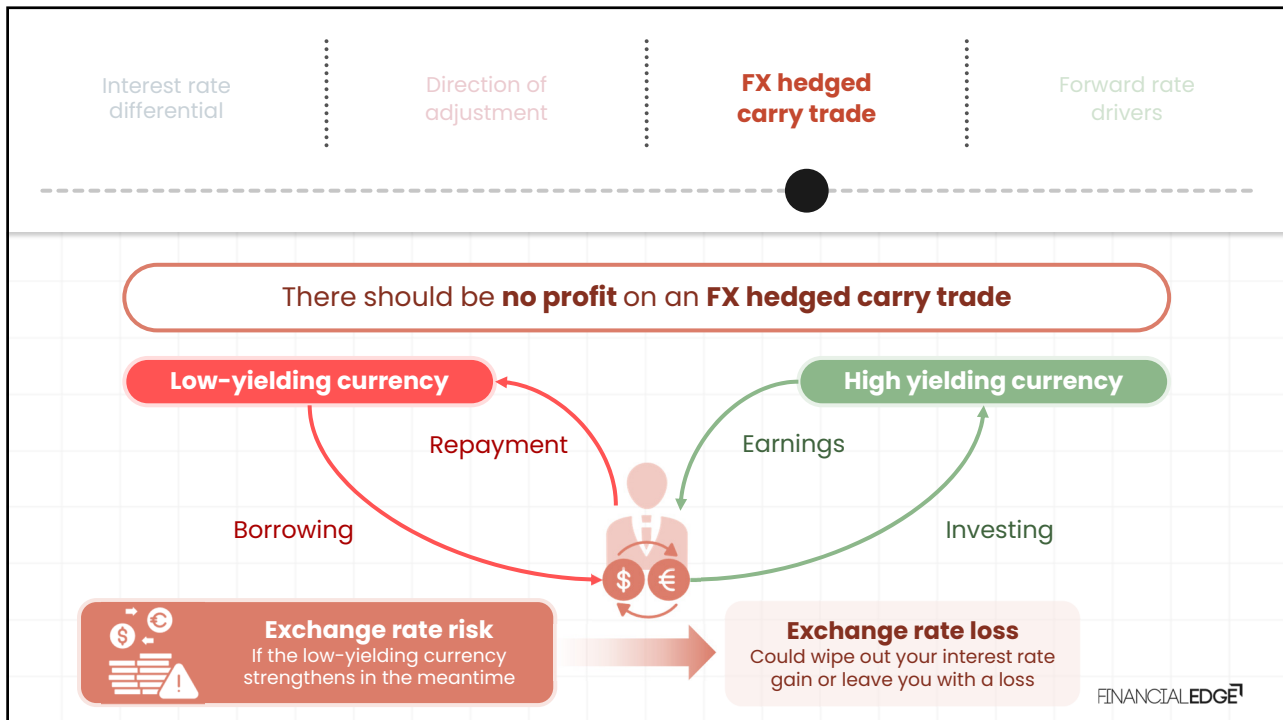
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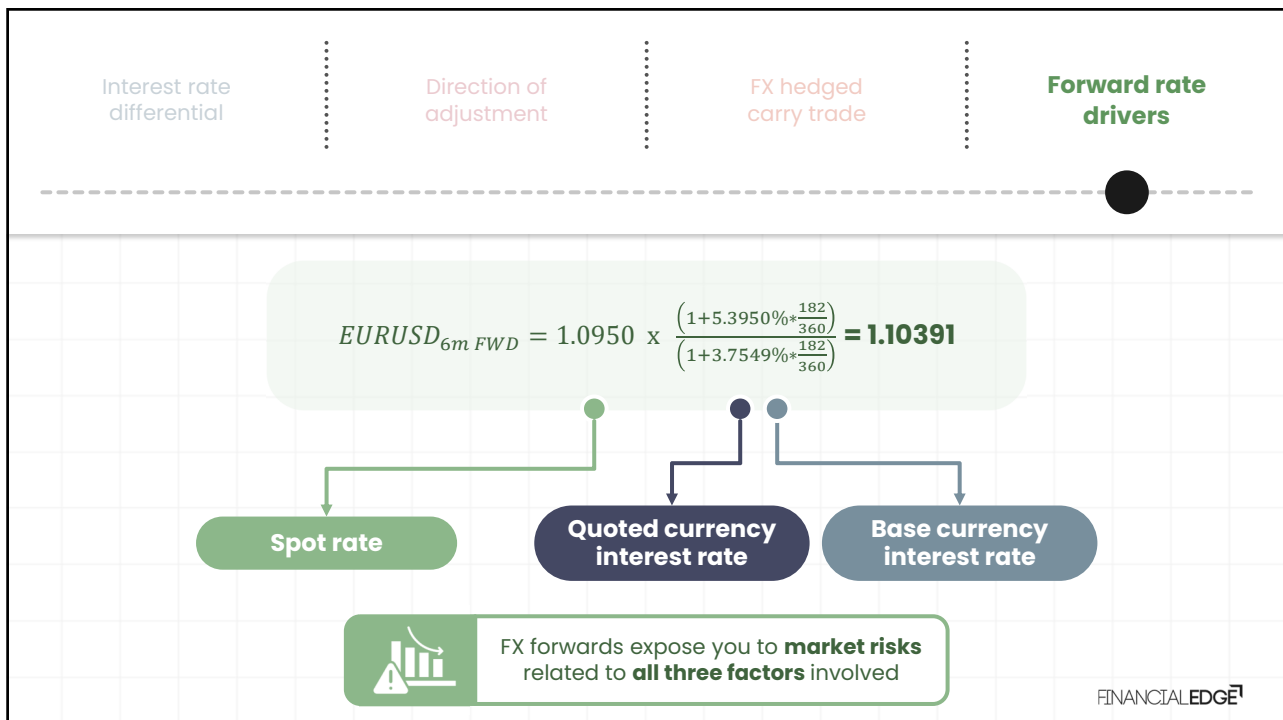
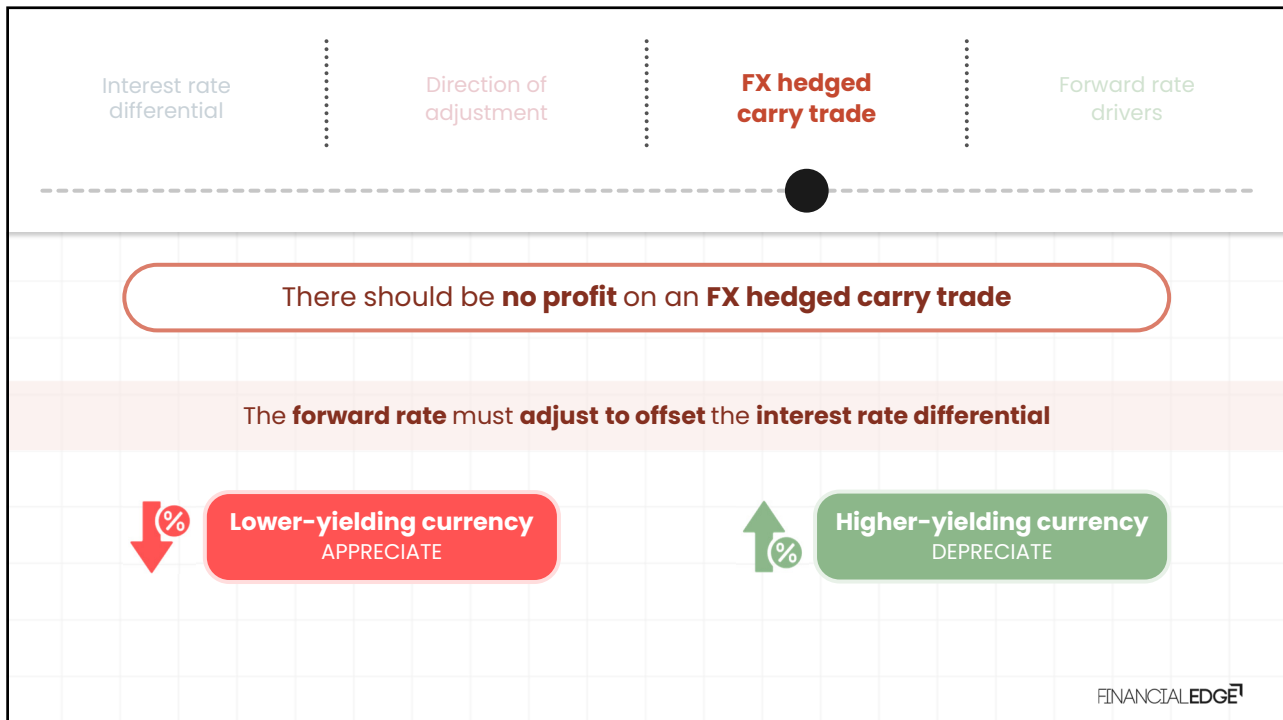
What Determines FX Forward Points? – Part 2

Interest Rate Parity Intuition

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FX Forward – Market Risk

FINANCIALEDGE⁷

Market Risk

FX spot rate exposure



Interest rate exposure

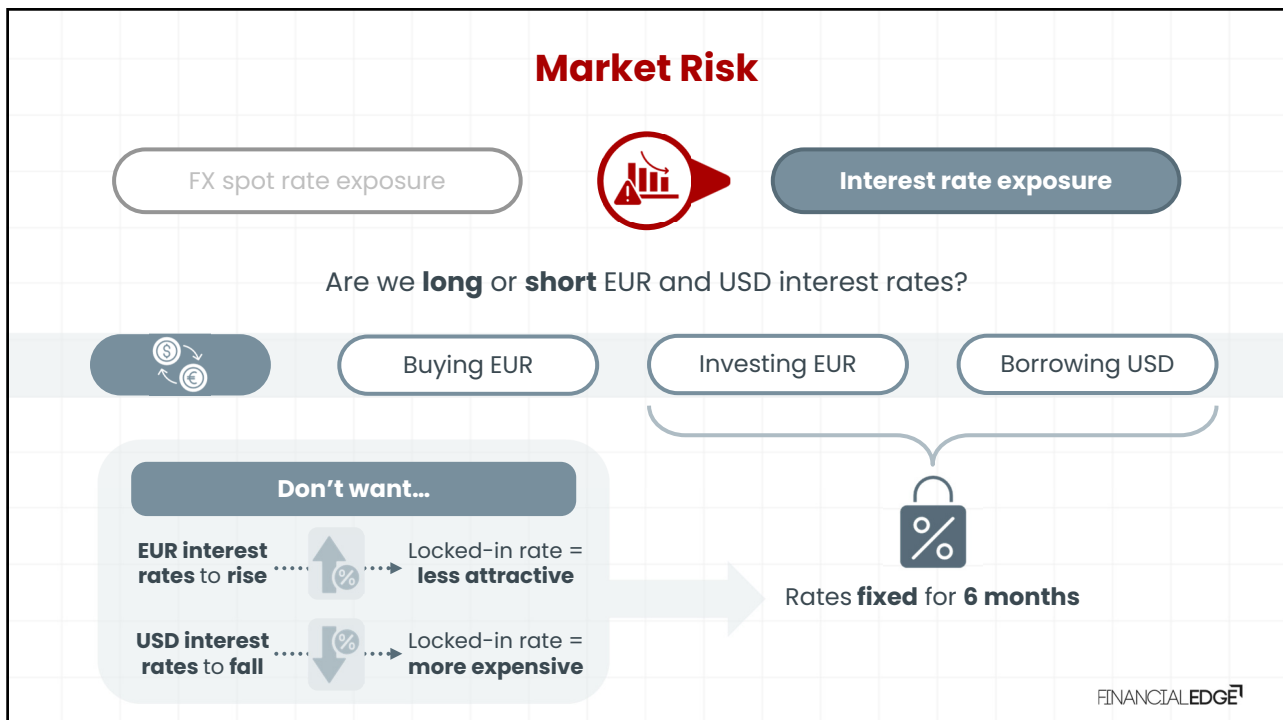
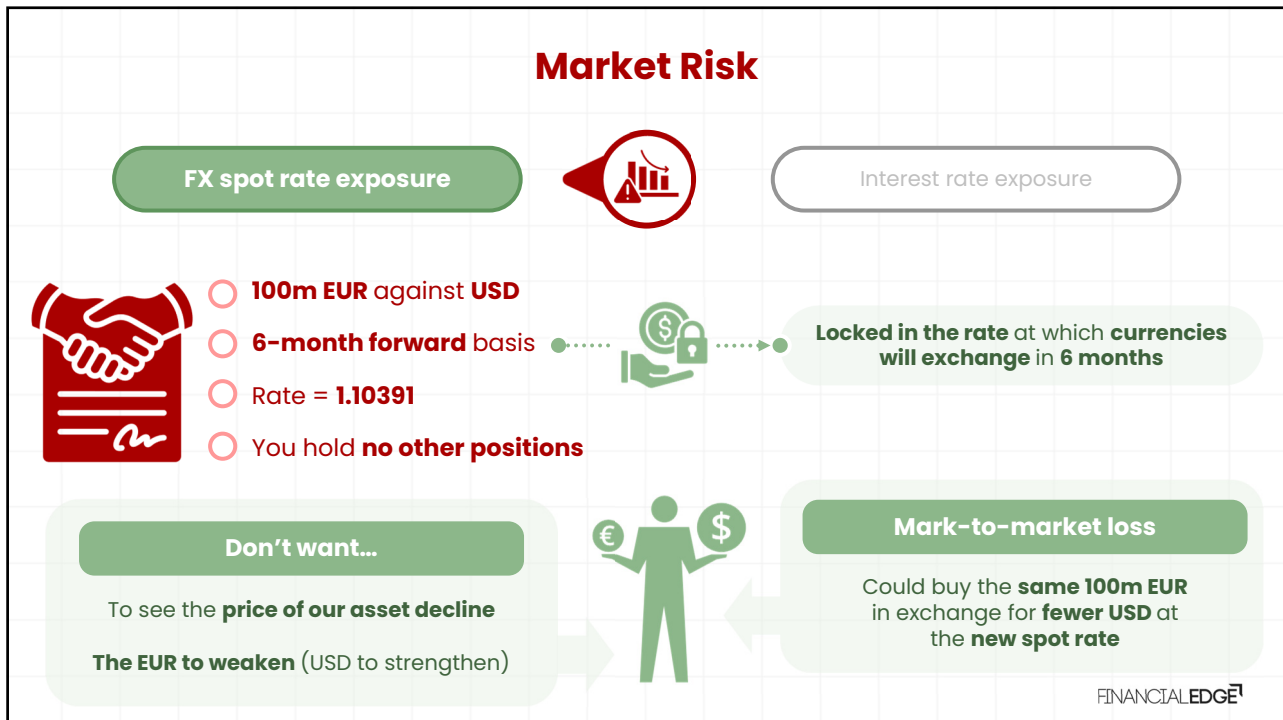


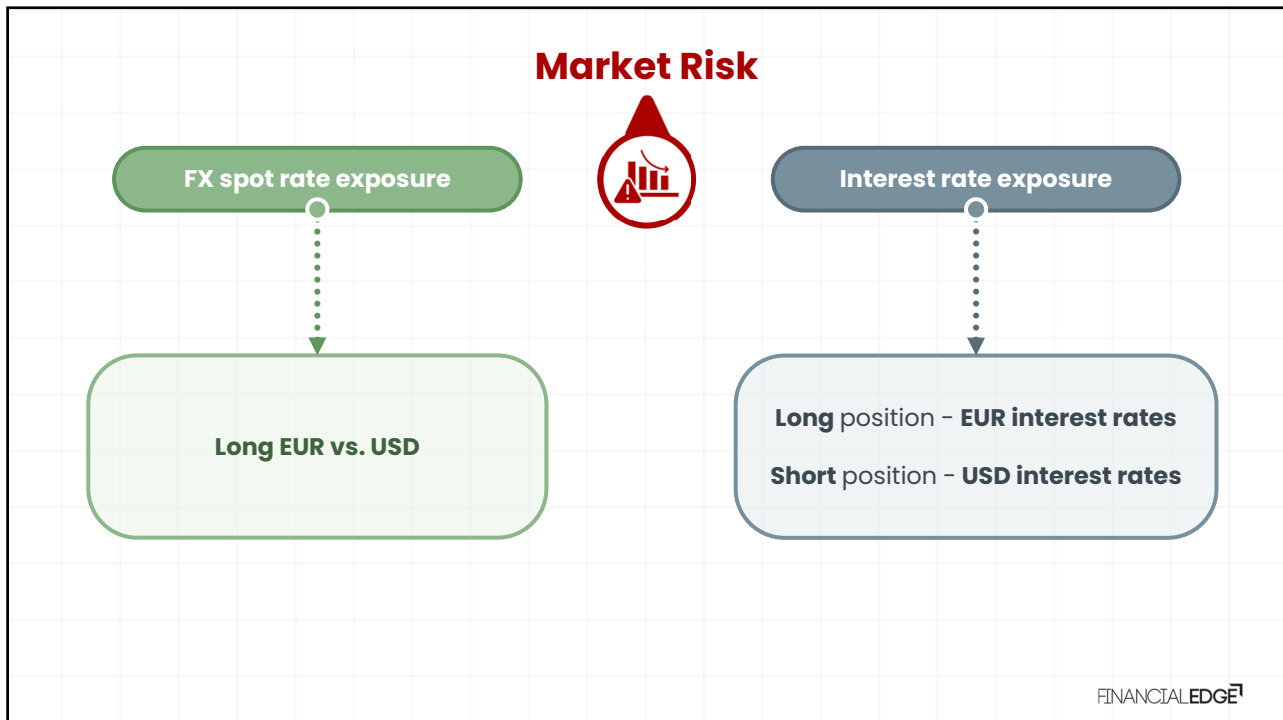
- 100m EUR against USD
- 6-month forward basis
- Rate = **1.10391**
- You hold **no other positions**

Interest rate parity formula

$$EURUSD_{6m\ FWD} = 1.0950 \times \frac{\left(1 + \frac{5.3950\%}{360}\right)^{182}}{\left(1 + \frac{3.7549\%}{360}\right)^{182}} = 1.10391$$

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Non-deliverable Forwards (NDFs)

Non-deliverable Forwards (NDFs)

Foreign exchange derivatives designed to help **hedge** or **speculate** on currencies that are...

Not freely
convertible



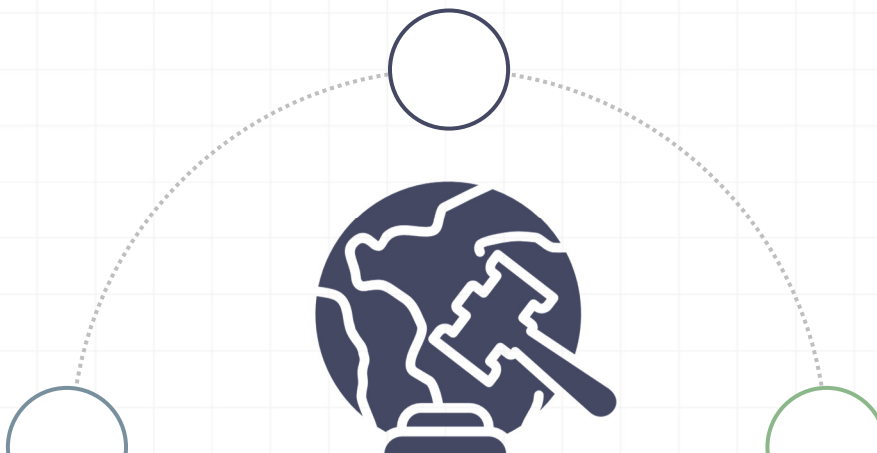
Subject to
exchange controls



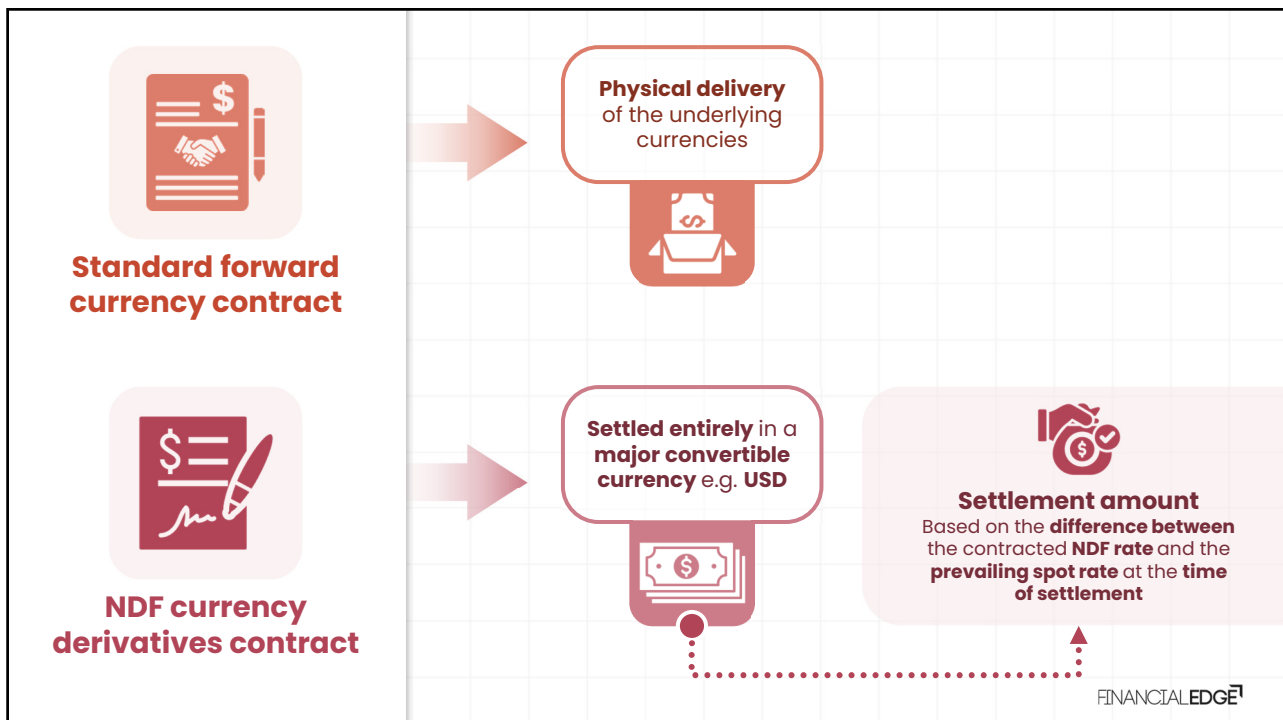
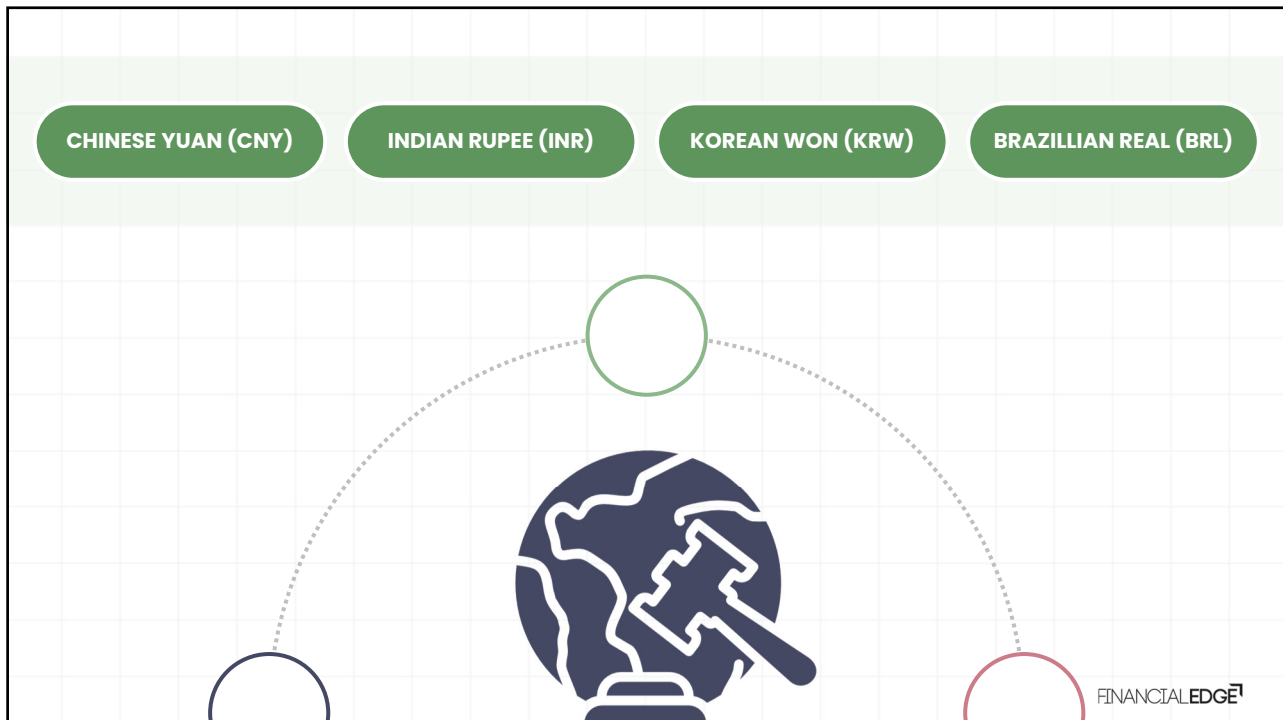
Prevent the use of standard FX forwards

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Restrictions and regulations
imposed by certain **countries**

FINANCIALEDGE¹







NDF currency derivatives contract

1

NDF
CONTRACT

2

WHO USES
NDFs?

3

NDF
SETTLEMENTFINANCIALEDGE¹

NDF currency derivatives contract

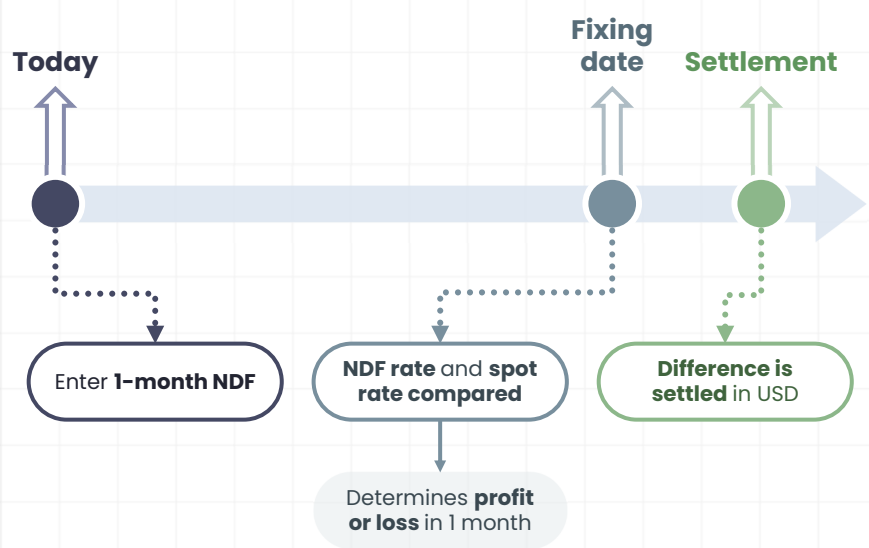
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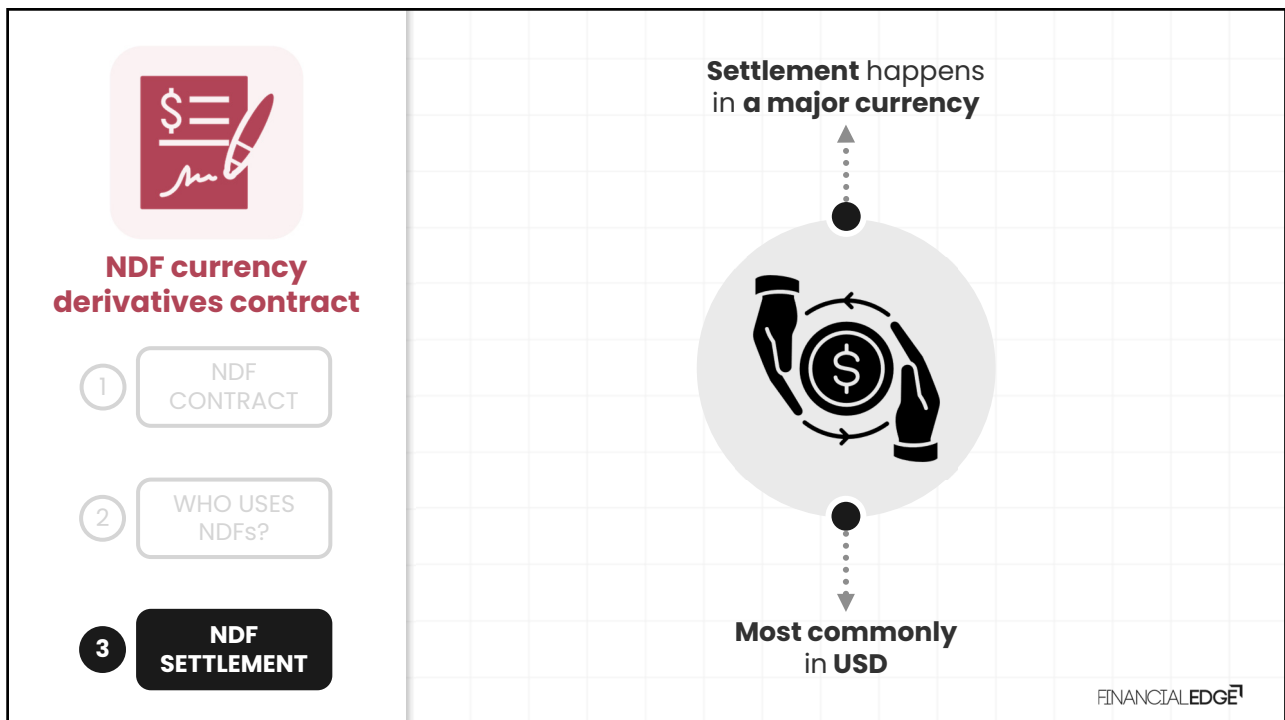
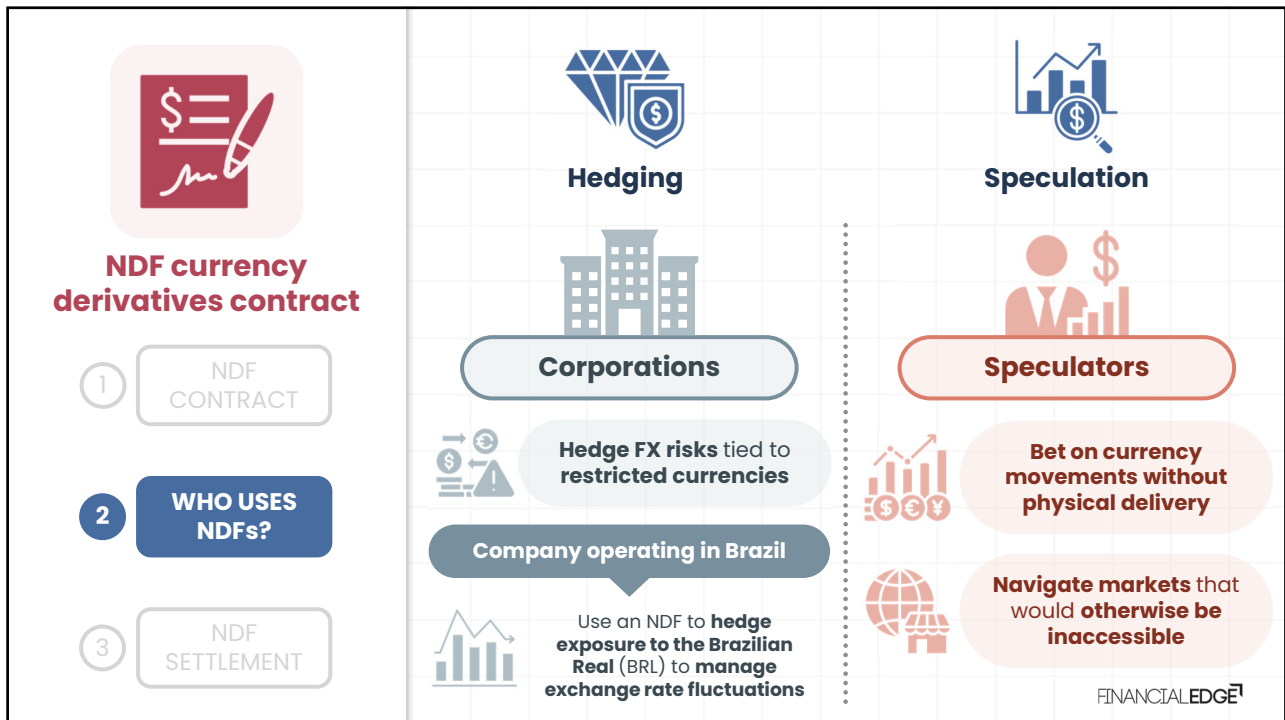
NDF
CONTRACT

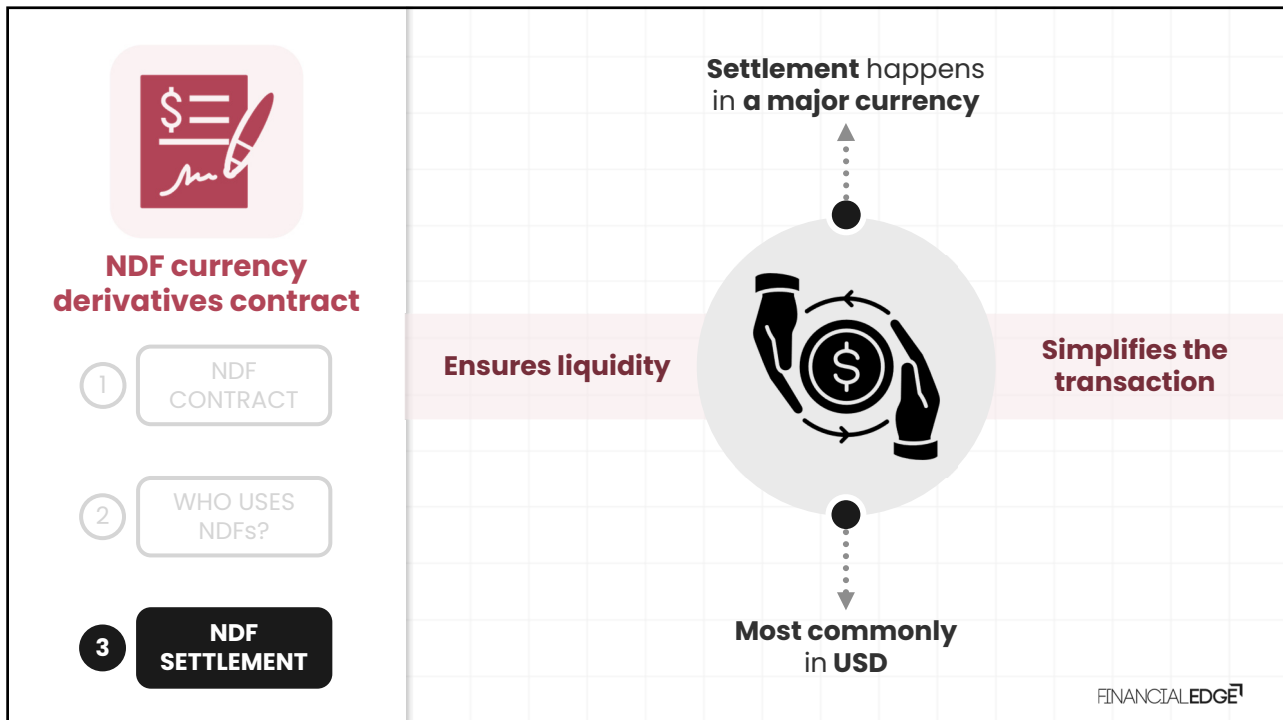
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WHO USES
NDFs?

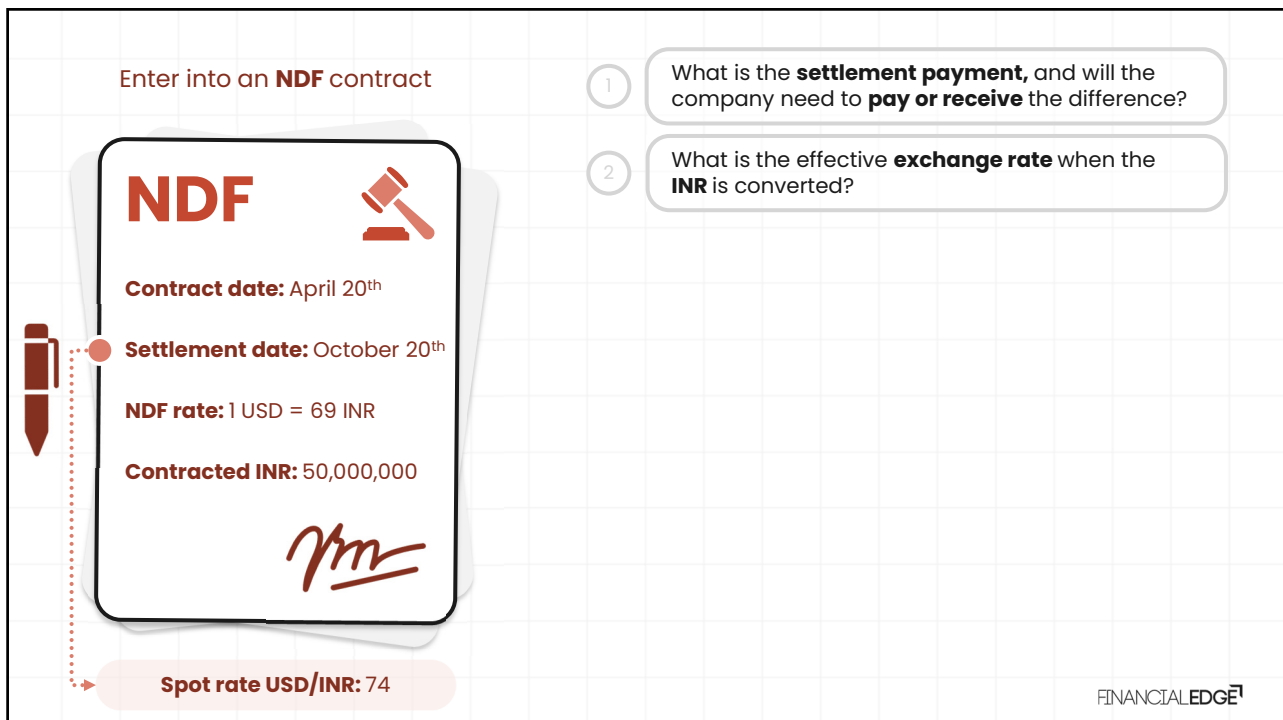
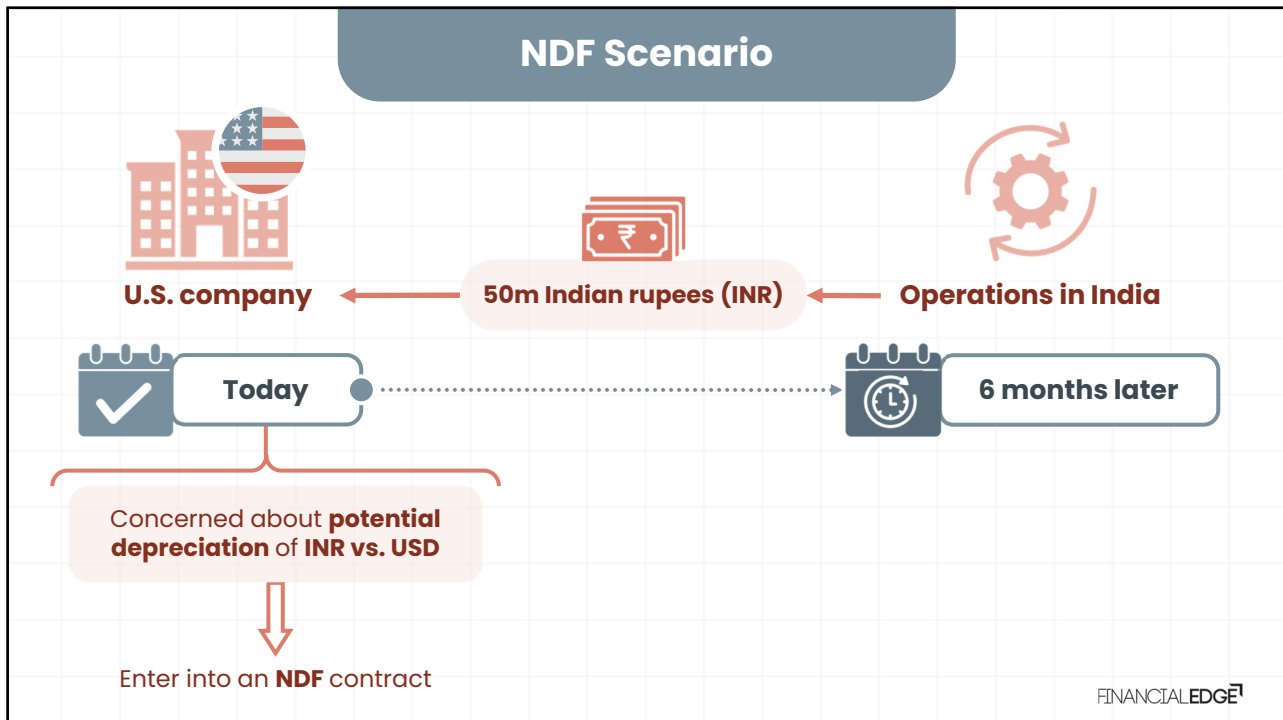
3

NDF
SETTLEMENTFINANCIALEDGE¹





Non-deliverable Forwards (NDFs) Scenario



Enter into an **NDF** contract**NDF****Contract date:** April 20th**Settlement date:** October 20th**NDF rate:** 1 USD = 69 INR**Contracted INR:** 50,000,000*Ymr***Spot rate USD/INR:** 74

1

What is the **settlement payment**, and will the company need to **pay or receive** the difference?

2

What is the effective **exchange rate** when the **INR** is converted?

$$50,000,000 \div 69 = 724,637.68$$

CONTRACTED
INR

NDF RATE

USD VALUE
(NDF RATE)FINANCIALEDGE⁷Enter into an **NDF** contract**NDF****Contract date:** April 20th**Settlement date:** October 20th**NDF rate:** 1 USD = 69 INR**Contracted INR:** 50,000,000*Ymr***Spot rate USD/INR:** 74

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What is the effective **exchange rate** when the **INR** is converted?

$$50,000,000 \div 74 = 675,675.68$$

CONTRACTED
INRPREVAILING
SPOT RATEUSD VALUE
(SPOT RATE)

724,637.68

USD VALUE
(NDF RATE)FINANCIALEDGE⁷

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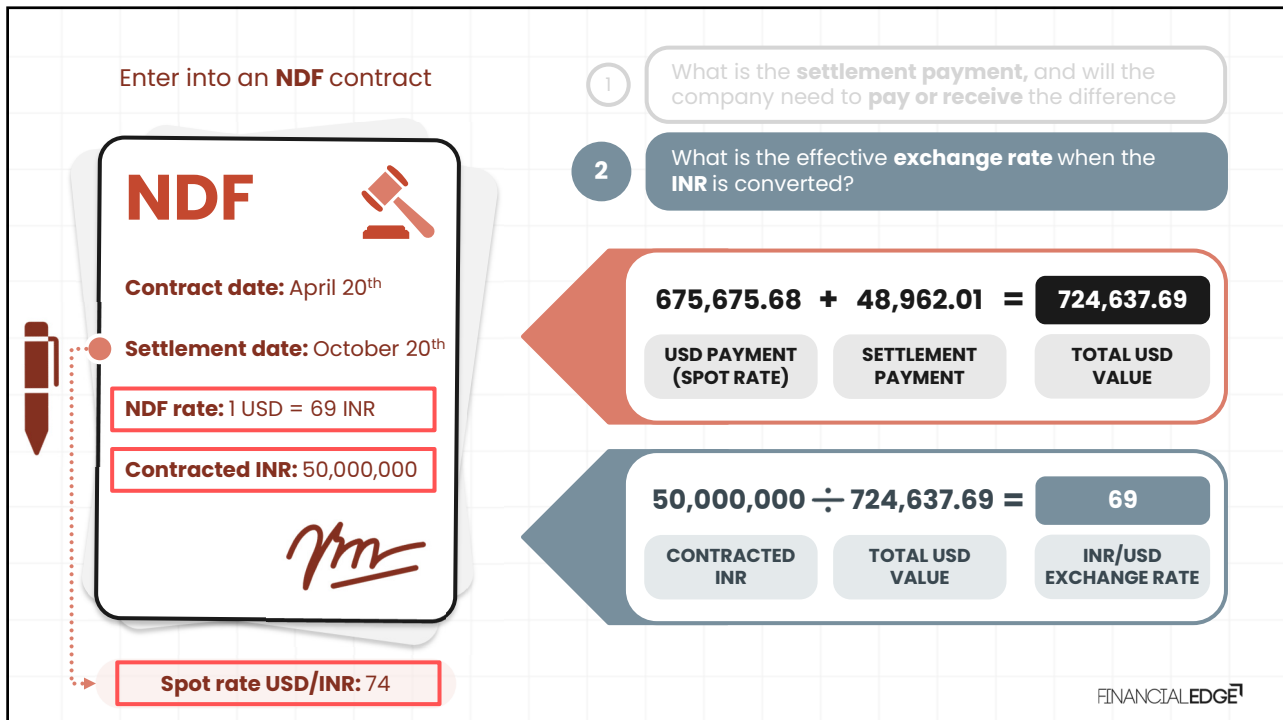
CONTRACTED
INRPREVAILING
SPOT RATEUSD VALUE
(SPOT RATE)**724,637.68**USD VALUE
(NDF RATE)FINANCIALEDGE⁷Enter into an **NDF** contract**NDF****Contract date:** April 20th**Settlement date:** October 20th**NDF rate:** 1 USD = 69 INR**Contracted INR:** 50,000,000*Ymr***Spot rate USD/INR:** 74

1

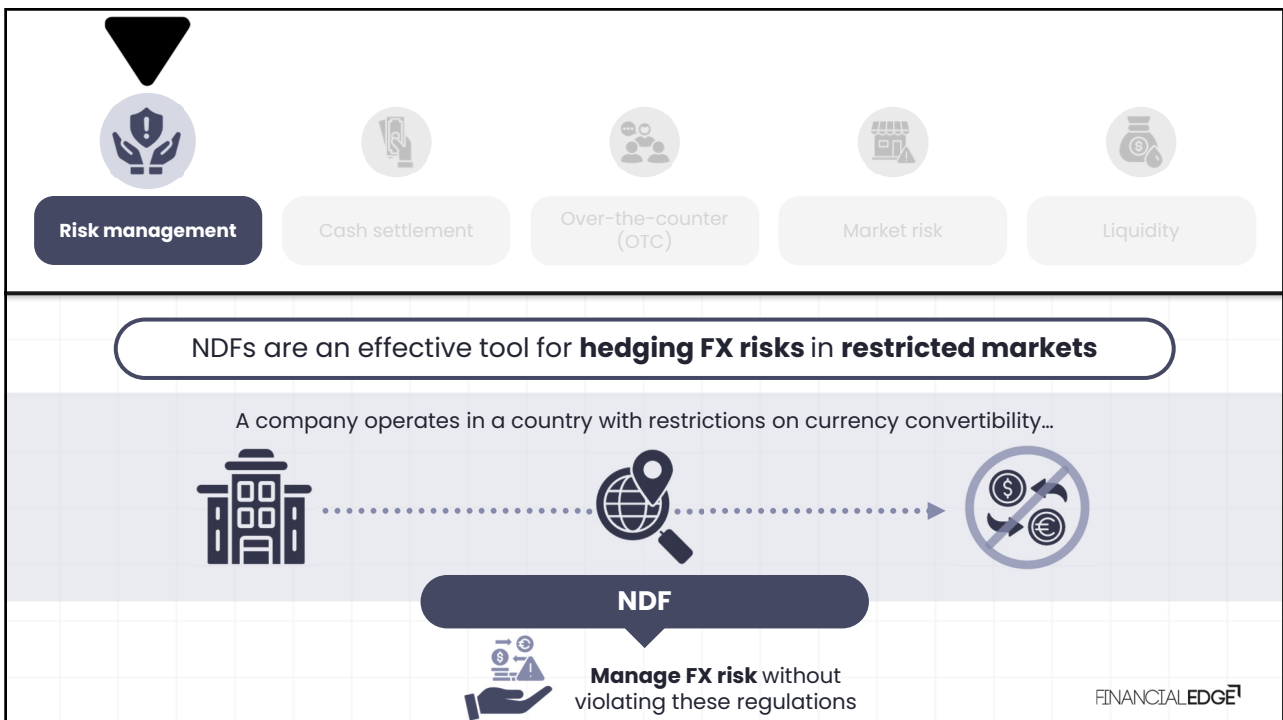
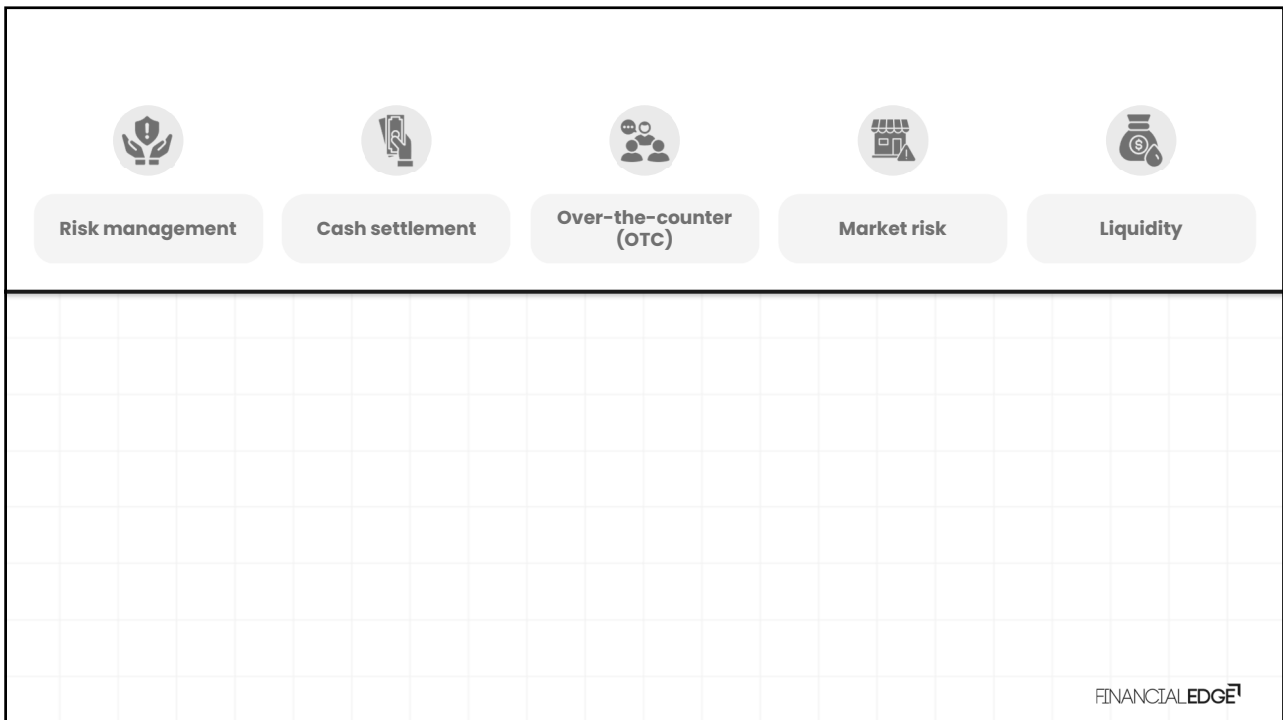
What is the **settlement payment**, and will the company need to **pay or receive** the difference?

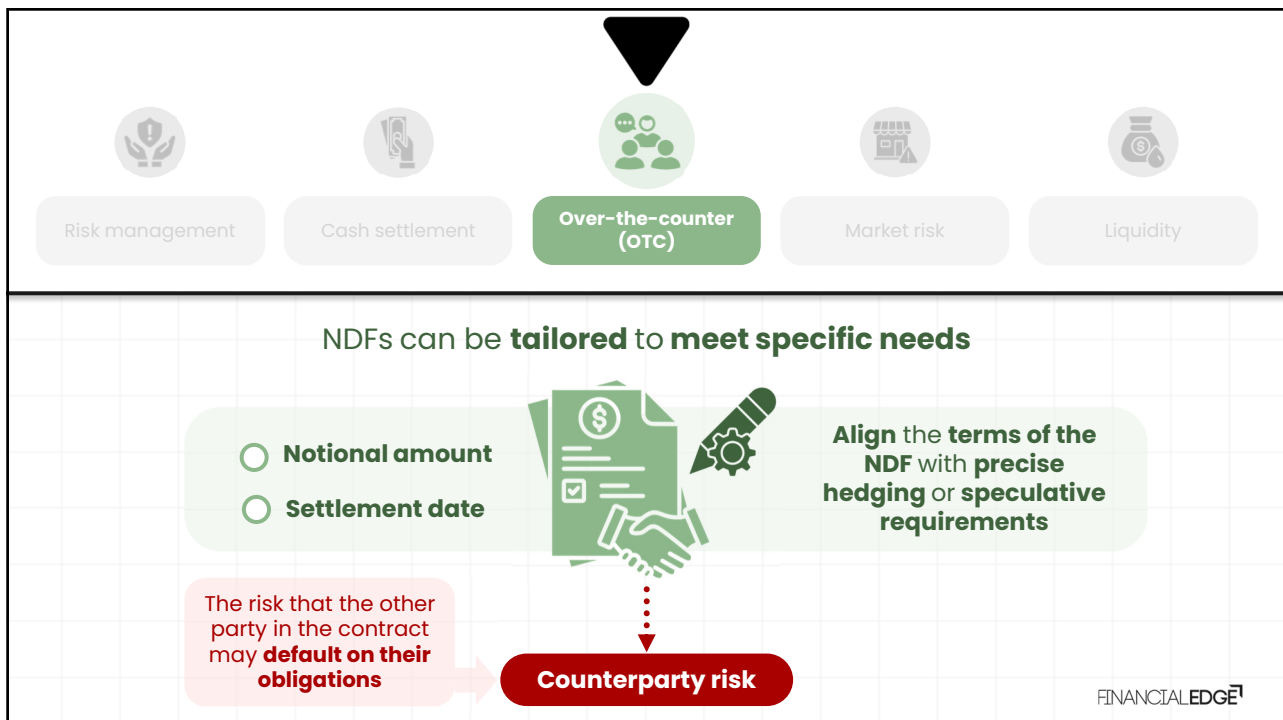
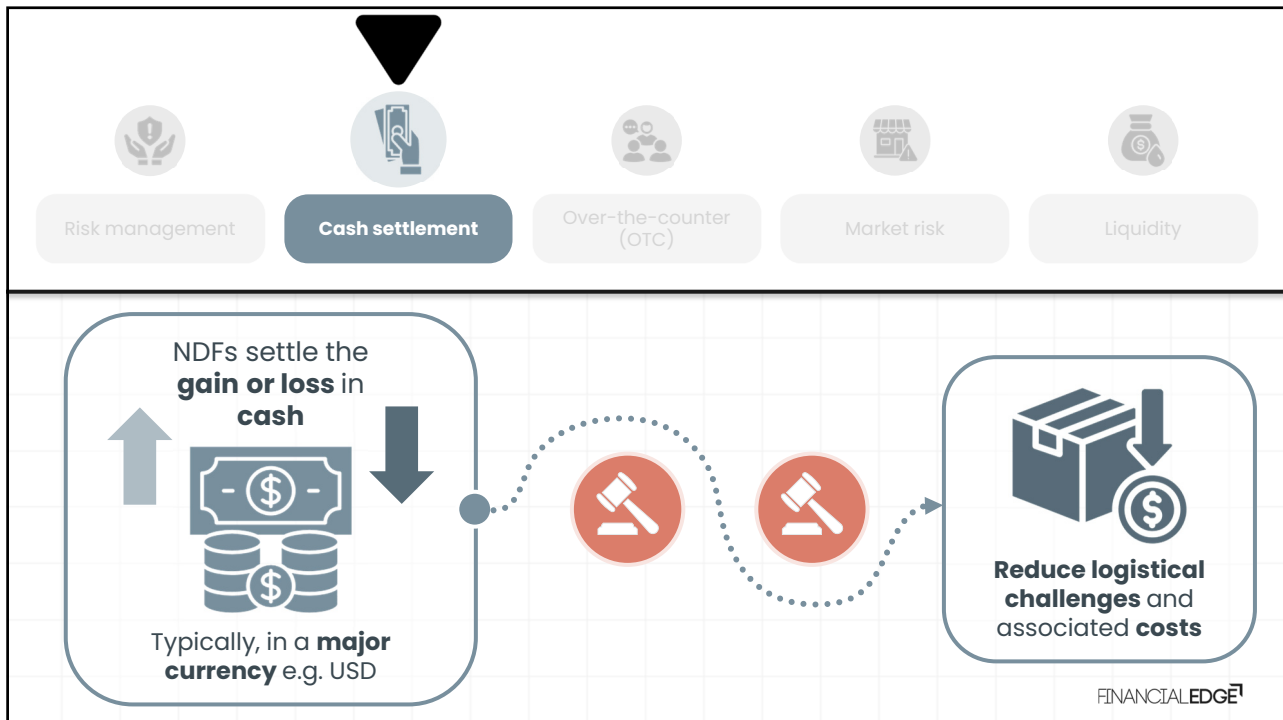
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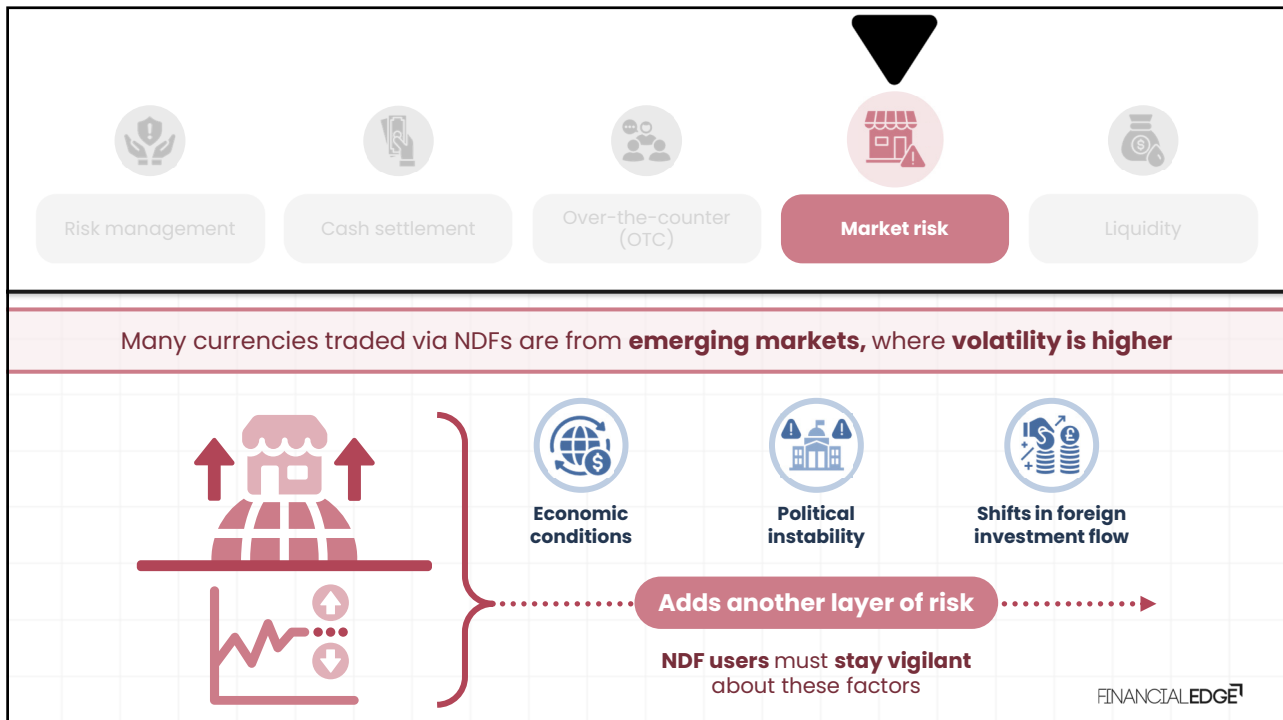
What is the effective **exchange rate** when the **INR** is converted?**INR weakened****724,637.68**USD VALUE
(NDF RATE)**- 675,675.68**USD VALUE
(SPOT RATE)**= 48,962.01**SETTLEMENT
PAYMENTCompany **receives** the differenceFINANCIALEDGE⁷



Non-deliverable Forwards (NDFs) Key Characteristics







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