

6.

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INTERNATIONAL FINANCE

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CONTENTS:

- Exchange rate quotation
- Cross exchange rates
- Bilateral arbitration
- Trilateral arbitration
- Quotation of forward ER

EXCHANGE RATES QUOTATION

DIRECT RECORDING: 0,85 EUR/USD (expresses 0,85 EUR for 1 USD). In terms of formal mathematical notation it is correct.

It is necessary to note, that in Foreign Exchange Market practice is used reverse recording.

(It means formally incorrect)

0,85 USD/EUR (expresses 0,85 EUR for 1 USD).

QUOTATION OF EXCHANGE RATE

Exercise 1A: Complete the table:

Exchange rates to October 2001

Exchange rates to October 2016

	x/EUR	EUR/x		x/EUR	EUR/x	
British Pound	0,61 ?		0,72	?	EUR/GBP
Canadian Dollar	1,43 ?		1,45	?	EUR/CAD
Japanese Yen	111,1 ?		132,88	?	EUR/JPY
Russian Ruble	27,03 ?		70,57	?	EUR/RUB

Exercise 1B:

Calculate the price of individual goods in EUR according to both tables:

- a) woolen sweater - price 72 CAD in Toronto
- b) Hotel Room – price 39 000 JPY in Tokyo
- c) Hat – price 2 700 RUB in Moscow
- d) Suit – price 120 GBP in London

Questions:

- a) When the EURO depreciates, what happens to the price of foreign goods for French consumers?
- b) When the EURO depreciates, what happens to the price of French goods for consumers outside the EU?
- c) When the EURO evaluates, what happens to the price of foreign goods for French consumers?
- d) When the EURO evaluates, what happens to the price of French goods for consumers outside the EU?

Questions 2:

Suppose floating exchange rate between RUSSIA and JAPAN.

Assess whether the *RUSSIAN RUBLE against the YEN will evaluates or depreciates*....when:

- a) Japan unilaterally reduced tariffs on Russian products.
- b) Inflation in Russia will increase.
- c) The political situation in Russia will be worse - tourism from Japan will be limited.
- d) Russian products will be more popular for the Japanese.
- e) The Russian government will support Japanese businesses by investment incentives in extraction of oil.
- f) The rate of productivity in Japan will be reduced.

BUYING AND SELLING OF CURRENCIES

2 exchange rates are indicated for each currency in Banks.

exchange rate for purchase **BID**

- exchange rate at which bank is willing to buy the currency.

exchange rate for sale **ASK, OFFER**

- exchange rate at which bank is willing to sell the currency.

In the case that we want to exchange foreign currency into domestic currency, the bank will apply for this exchange the exchange rate **BID**.

$$K_{\text{dom}} = K_{\text{for}} * QR$$

Amount in domestic currency we receive from the bank

Exchanged amount in foreign currency

Quick exchange rate expressed by direct quotation

In the case we want to exchange domestic currency into foreign currency, the bank will use for this exchange the exchange rate **OFFER**.

$$K_{\text{for}} = K_{\text{dom}} / QR$$

Amount in foreign
currency – we want

Amount in domestic
currency - we have

Quick exchange
rate expressed by
direct quotation

CROSS EXCHANGE RATES

From quotation of domestic currency to the individual foreign currencies we can identify these cross rates of foreign currencies.

$$QR_{C/B} = \frac{QR_{A/B}}{QR_{A/C}}$$

A, - domestic currency

B, C – foreign currencies

QR - Quick exchange rate

Exercise 2:

We will use 1 cross exchange rate - the median.

$$QR_{A/B} = 22,328 \text{ CZK/USD}$$

$$QR_{A/C} = 29,550 \text{ CZK/EUR}$$

$$QR_{C/B} = QR_{EUR/USD} = ?$$

$$1 \text{ USD} = ? \text{ EUR}$$

RESULT:

$$QR_{C/B} = 22,328 / 29,550 = 0,756$$

For 1 USD we get 0,756 EUR.

As the exchange rate $QR_{B/C}$ is directly quoted at the market, it should be approximately equal to the **cross exchange rate**. In the case quoted exchange rate is not the same as cross exchange rate, there is possibility to do **trilateral arbitration**.

ARBITRATION

- type of financial transactions in which the entity implementing it, reaches in any market development net profit.

ARBITRATION

- purchasing of commodities, securities, bills or currencies of exchange in one market and selling them in another where the price is higher.

Exchange rate risk - effect on revenues and expenses from variations in the value of the one currency in term of the other currencies.

Exercise 3:

We calculated cross rate $QR_{EUR/USD} = 0,756$.

Suppose that at the market is quoted $QR_{EUR/USD} = 0,766$.

Calculate the **trilateral arbitration**:

Transaction		1. exchange CZK → USD	2. exchange USD → EUR	3. exchange EUR → CZK
Amount	1 000 CZK	?	?	?

We start from the exchange rate:

22,328 CZK/USD

29,550 CZK/EUR

0,766 EUR/USD

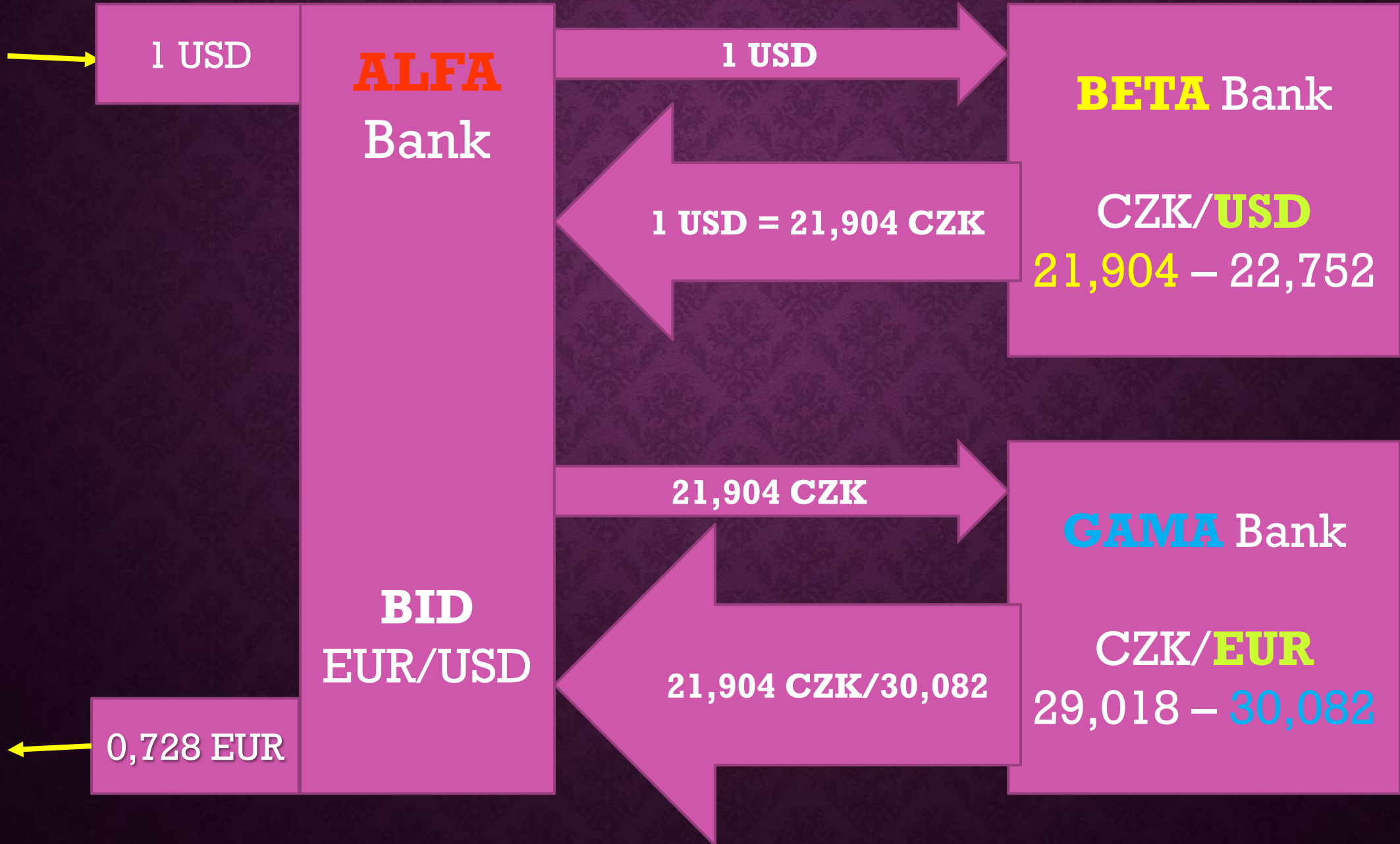
Exercise 4 RESULTS:

Must be valid:

$$BID QR_{EUR/USD} = \frac{BID QR_{CZK/USD}}{OFFER QR_{CZK/EUR}}$$

$$BID QR_{EUR/USD} = 0,728 \text{ EUR/USD}$$

$$1 \text{ USD} = 0,728 \text{ EUR}$$



Exercise 5:

In the newspaper the following exchange rates were quoted:

$$1 \text{ AUD} = 23,251 \text{ CZK}$$

$$1 \text{ USD} = 42,526 \text{ CZK}$$

$$1 \text{ GBP} = 66,719 \text{ CZK}$$

$$1 \text{ EUR} = 41,963 \text{ CZK}$$

Calculate the cross rates: USD/GBP

USD/EUR

AUD/USD

BILATERAL ARBITRATION

Exercise 6:

Suppose the following quotation of exchange rates at the American market in Bank A and B:

		BID	OFFER
Bank A	USD/GBP	1,7335	1,7340
Bank B	USD/GBP	1,7345	1,7350

We have 1 734 000 USD. What will be the profit from arbitrage?

TRILATERAL ARBITRATION

Exercise 7:

Suppose the following quotation of exchange rates at the American market in Bank X, Y and Z:

		BID	OFFER
Bank X	CHF/USD	1,990	2,000
Bank Y	DKK/USD	4,000	4,040
Bank Z	CHF/DKK	0,510	0,520

We have 1 000 000 CHF. What will be the profit from arbitrage?

QUOTATION OF FORWARD EXCHANGE RATES

Forward contract

Secondary non-marketable agreement between two counterparties about exchange of two currencies in future at a predetermined price.

Premium (+ result)

appreciation of currency at the forward market against the spot market

Discount (- result)

depreciation of currency at the forward market against the spot market

SPOT AND FORWARD EXCHANGE RATE

Spot exchange rate – current rate being quoted for delivery of the currency on the spot

Forward rate - negotiated exchange rate for the purchase or sale of a currency where delivery will take place at a future date

QUOTATION OF FORWARD EXCHANGE RATES

$$f = \frac{FR - SR}{SR}$$

$$f = \frac{FR - SR}{SR} * \frac{360}{t} * 100 \quad (\text{on an annual basis})$$

f = premium/discount

FR = forward rate

SR = spot rate

t = the number of days of forward contract

in **Swap points** = **(FR - SR) * x**

x = transfer to the points (10 000)

3 KINDS OF FORWARD EXCHANGE RATES QUOTATION

- **outright quotation** (the middle, bid, offer, 1, 2, 3, 6 months, 1 year)
- **quotation in percentage**
- **quotation in swap points**

in Swap points = $(FR - SR) * x$

x = transfer to the points (10 000)

QUOTATION OF FORWARD EXCHANGE RATES

Exercise 8:

At the market the following forward exchange rates are quoted:

	SPOT	1.month	3.months	6.months
CZK/EUR	41,9634	41,9678	41,9718	42,1879
CZK/USD	42,5267	42,5266	42,5201	42,5158
CZK/GBP	66,719	66,7299	66,7002	65,7044

Calculate the **term discount/premium** on 6. months quotations of forward exchange rates CZK/EUR; CZK/USD; CZK/GBP for

A) the period and (quotation in %)

B) on an annual basis.

Exercise 9:

Suppose the following quotation of CZK/EUR at the Czech foreign exchange market in bank X and Y.

	BID	OFFER
Bank X	41,8532	41,9555
Bank Y	41,9759	41,9961

We have 10 million CZK.

What would be the profit from currency arbitrage?

Exercise 10:

Calculate the term discount/premium on 1. months quotations of forward exchange rates CZK/EUR on an annual basis.

Quotation of the exchange rates is:

$$\text{SR (CZK/EUR)} = 28,1800$$

$$\text{FR (CZK/EUR) 1 month} = 28,1311$$

VIDEO 1

Arbitrage

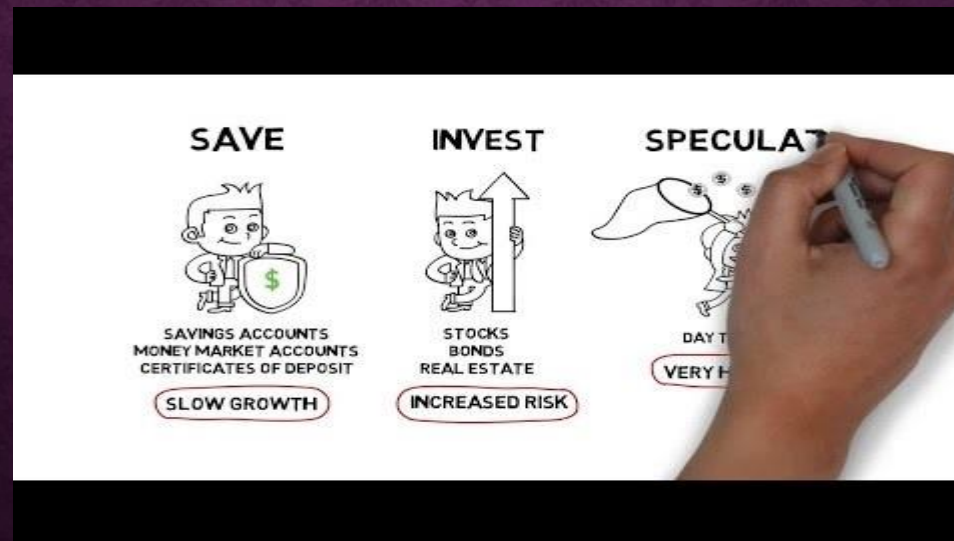
<https://www.youtube.com/watch?v=MhwrQpXQq4I>



VIDEO 2

The Difference Between Saving, Investing, and Speculating

<https://www.youtube.com/watch?v=blnbxbftme0>



VIDEO 3

Role of Speculators

<https://www.youtube.com/watch?v=Lwqz8F-JgqA>



IMPORTANT DATES:

- 10. week: Test 1 (for credit) 25.11.2021
+ presentations
- 13. week: Test 2 (EXAM) 16.12.2021

THANKS FOR ATTENTION!