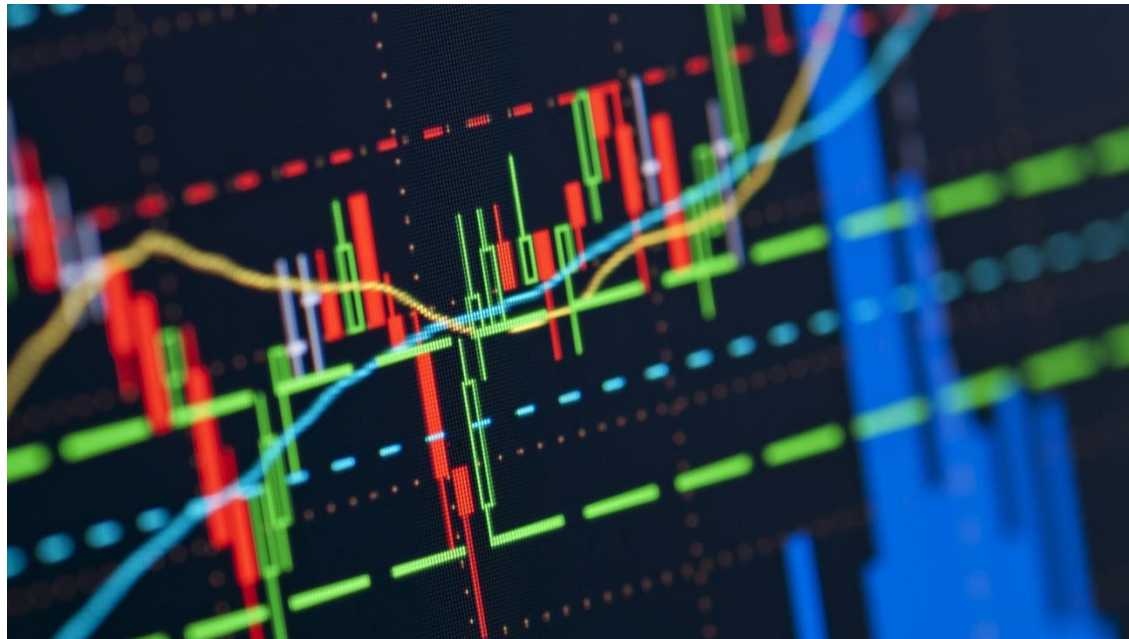


INVESTMENT BANKING & FX RISK MANAGEMENT FOR CORPORATES

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VIKTOR ZEISEL – KB MARKET RISK ADVISORY



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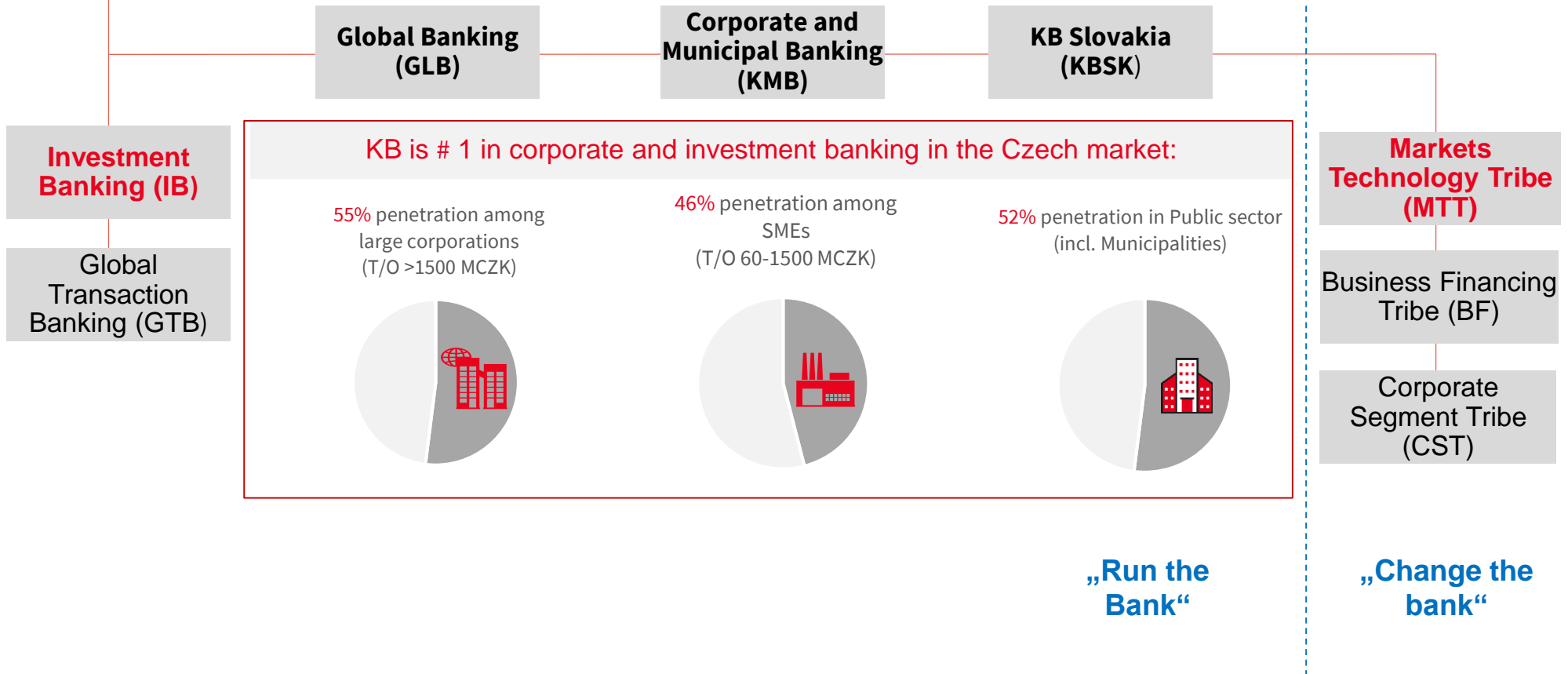
Komerční banka, a.s.
Na Příkopě 33, 114 07 Praha 1
www.kb.cz

1. INVESTMENT BANKING ARM OVERVIEW

CORPORATE AND INVESTMENT BANKING

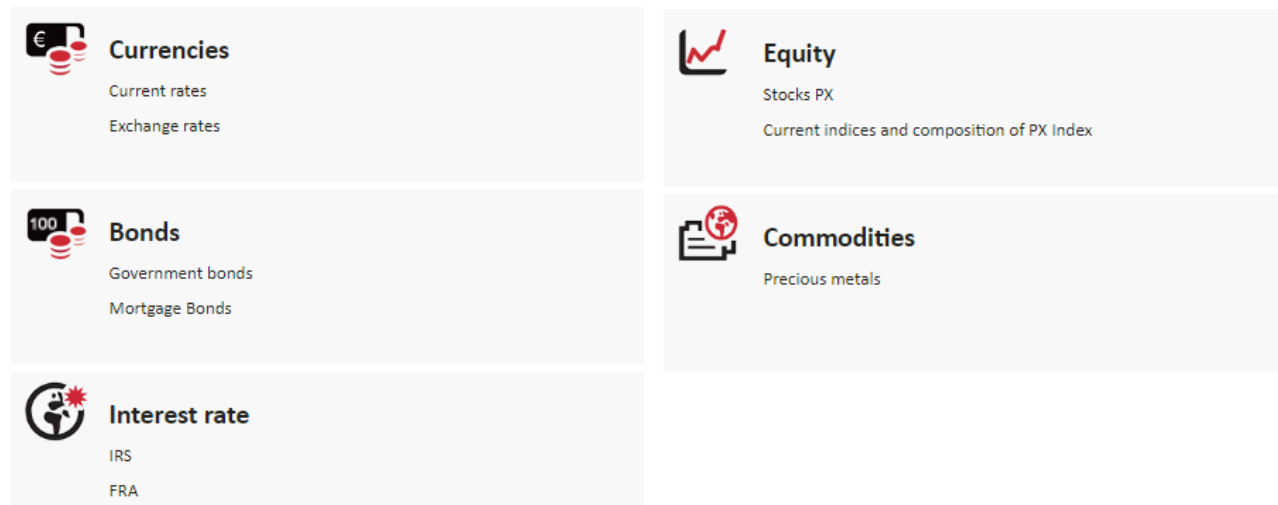


CIB includes 750 FTE and is organized:



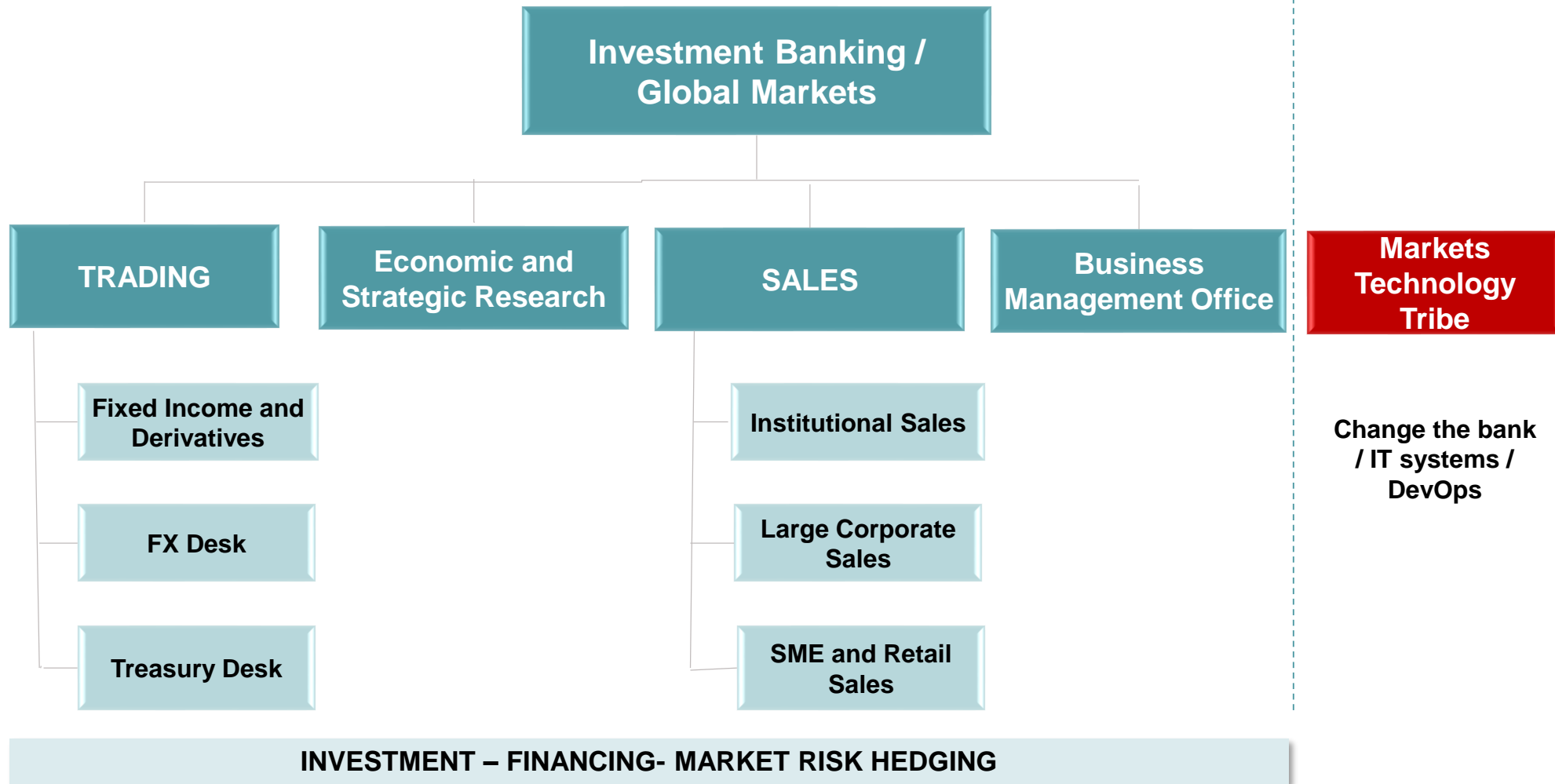
KB INVESTMENT BANKING- DEALING ROOM FACTS

- With its 50 employees working in 4 teams, the dealing room is the largest one of all Czech banks.
- More than 15 500 clients arranged their deals through the dealing room in 2019, of which more than 10 000 used our eTrading electronic platform at least once.
- The total volume of FX transactions (forwards options, spots, swaps) was in excess of CZK 550 billion in 2019.



INVESTMENT – FINANCING- MARKET RISK HEDGING

INVESTMENT BANKING – ORGANIZATION AND ACTIVITY



MISSION OF TRADING AND RISK MANAGEMENT

- Deal Foreign Exchange, Money Market, Derivatives and Securities for KB's own account in line with given financial budget , limits and other internal rules
- manage market risk of Investment Banking
- provide Sales, Treasury and GBIS with competitive pricing of approved products and order execution
- act as a market maker in approved products and follow given rules
- establish the business plan for the department
- request appropriate market and counterparty limits

Treasury	-liquidity management for ALM (depo, repo, financing)
FX & ST rates	-FX spot flow, market making -FX swap & forwards flow, market making
LT rates	-CZGB, CZK IRS flow -inventory mngt (CZGB, ASW, CCS basis, IRS)

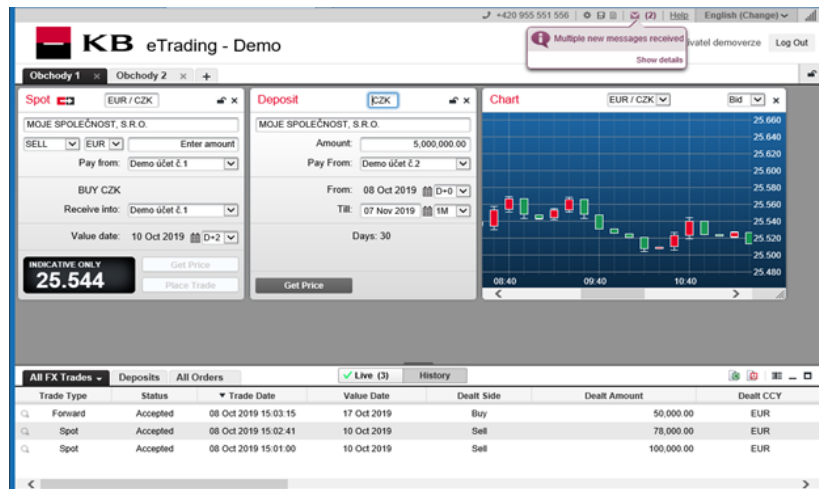
CZK, EUR and USD IR sensitivities



Limit Name	Utilization	Hard Limit/Threshold
Global VaR	-YYYY	-XXXX
Global ST	-YYYY	-XXXX
IR Sensi Global	YYY	+/-XXXX
Global FX Position	YYYY	+/- XXXXX

DIGITAL - PLATFORMS

- VOICE vs ELECTRONIC
- Development of Digital execution – over 90% of FX and MM transactions are done via platforms
- Single Dealer Platform- “one-stop-shop” evolving from execution-only trading applications to those featuring sophisticated pre- and post-trade capabilities.
 - Etrading (Demo version : <https://etrading.kb.cz/demo/index.html>)
- Multiple Dealers Platforms – electronic platforms are non-exchange financial trading venues which enable trade matching between counterparties, offering pricing from a selection of investment banks
 - 360T (Refinitiv)



CORPORATE SALES AND MARKET RISK ADVISORY

Currency Risk Hedging

- Currency spot
- Currency swap
- Currency forward
- American forward
- Currency options
- Currency option strategies

Interest Rate Risk Hedging

- Interest rate swap
- Cross currency swap
- Forward Rate Agreement (FRA)
- FX options
- Swaptions
- Interest rate option strategies

Market Risk Advisory (MRA)

- Identification of market risks of individual clients
- Management of market risk tailored to client's needs
- Identification of market opportunities
- Preparation of market overviews/analysis
- Provision of relevant market information

From Dashboards and campaigns to tailor made solutions

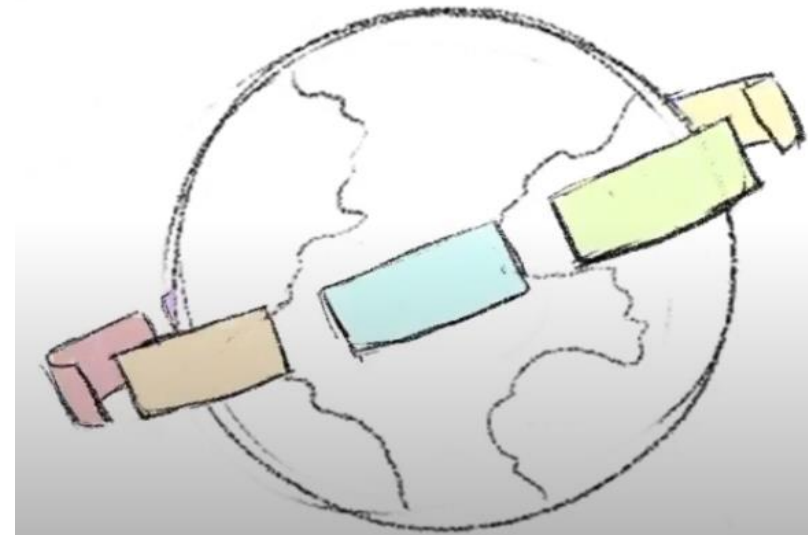


2.

FX MARKETS AND FX INSTRUMENTS

FX MARKETS

- FX Market is a global decentralized and over-the-counter (OTC) market for the trading of currencies. This market determines foreign exchange rates for every currency.
- It includes all aspects of buying, selling and exchanging currencies at current or determined prices. In terms of trading volume, it is by far the largest market in the world
- In most major economies since the end of Golden Standard and Bretton Woods (convertibility of USD and Gold), the exchange rate of a domestic currency against that of another country or economy is constantly floating,
- According to the Bank for International Settlements, the values for Forex trades average approximately \$220 billion per hour.
- Negative foreign exchange exposure can have devastating effects on a company's bottom line, forcing it to either risk competitive disadvantage by increasing prices or watch profit margins erode.

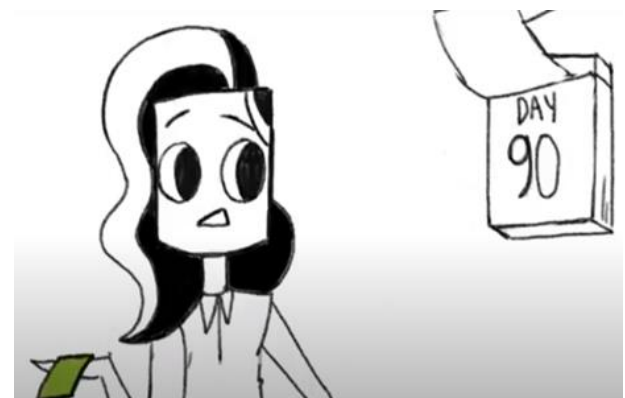


WHAT EFFECTS THE VALUE OF THE CURRENCY? TYPES OF FX RISKS

- **Interest Rates** - Higher rates make the currency more attractive. People willing to deposit money.
- **Relative Inflation Rates** - Lower inflation makes higher local purchasing power which leads to appreciation of currency
- **Balance of payments-** If country has a large current account deficit it means it is importing more goods and services than it is exporting. There is less interest in local currency and the currency's value will decrease in relation to its trading partners.
- **Performance of the economy, level of public debt, speculative buying** - If investors lose confidence in an economy and its currency, the Exchange rate will fall. It can be both due to political and economic factors. In most major economies, the exchange rate of a domestic currency against that of another country or economy is constantly floating,

■ Types of FX Risk for corporates

- **Implicit Risk** – transactions affected by change in Exchange rates (between quoting the price in foreign currency and agreeing the transaction)
- **Explicit Risk** – Time gap between agreeing the price and making the payment



FX INSTRUMENTS

1. Spot rate

2. **Hedge** – handle any FX risk to the bank for a fee

A. Forward contract (OTC) - non-standardized derivative instrument where two

parties agree to exchange two currencies at a specified future time at a price agreed on at the time of conclusion of the contract

B. Future (standardized, via Exchange / collateral Exchange – margining / mitigated credit risk)

C. Option

- purchase currency at agreed upon rate in the future, but not required to buy the currency if the previously agreed upon rate is worse than the rate on the open market

-Premium is paid whether it is exercised or not (**buying the option removes company's downside risk**)

D. Cross currency swap --allows to borrow in one currency and swap the principal to different currency and pay interest in the original currency



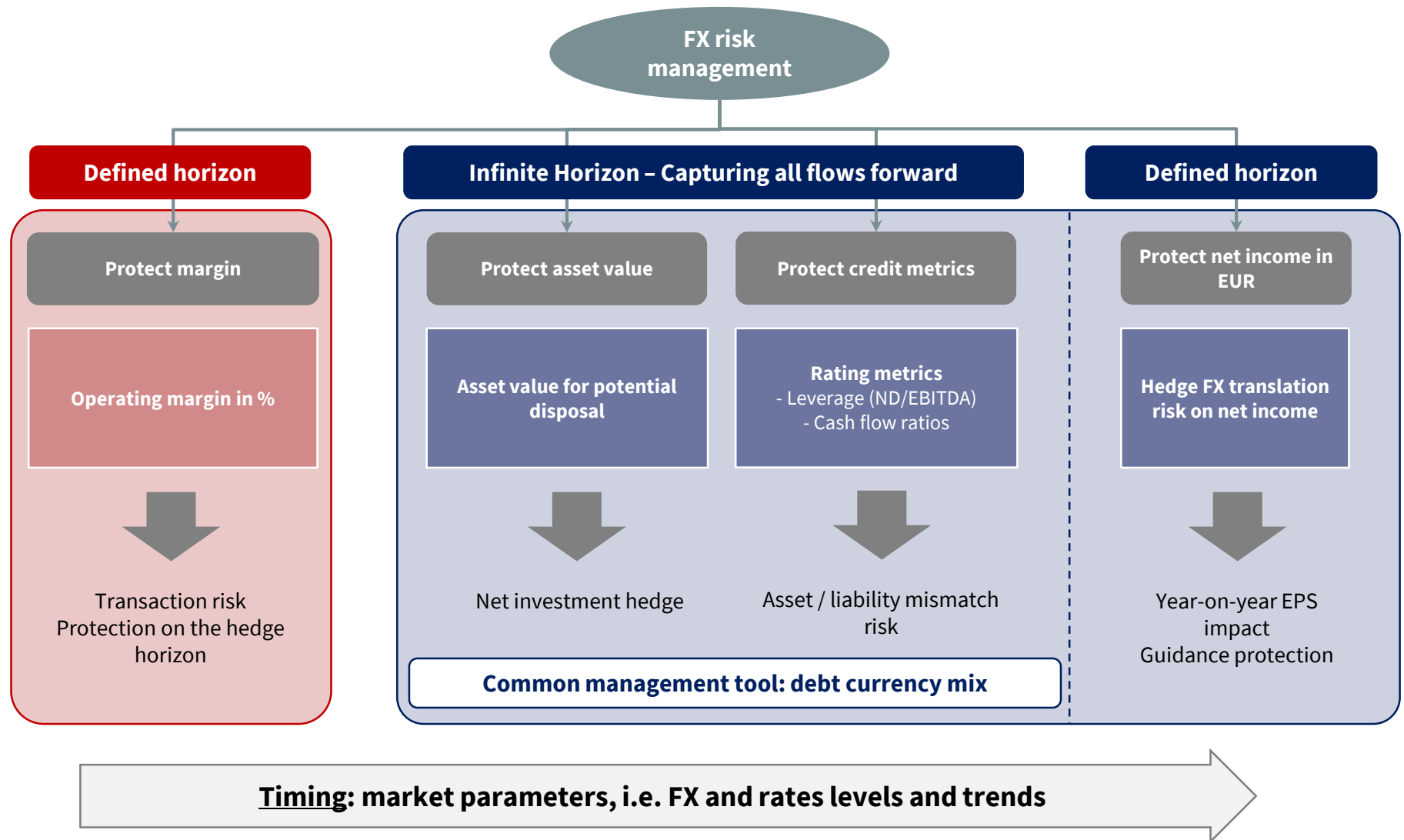
Covered Interest Rate Parity:

theoretical condition in which the relationship between interest rates and the spot and forward currency values of two countries are in equilibrium

$$F = S * \frac{(1+i_d)}{(1+i_f)}$$

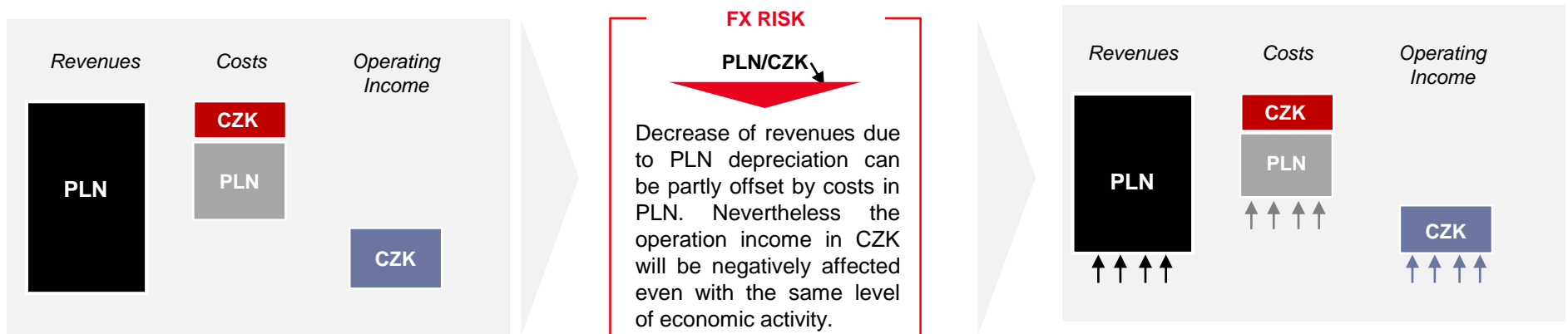
3. FX RISK MANAGEMENT WITH CORPORATES

FX RISK MANAGEMENT FOR DIFFERENT OBJECTIVES



THE IMPORTANCE OF FX HEDGING FOR A CORPORATE

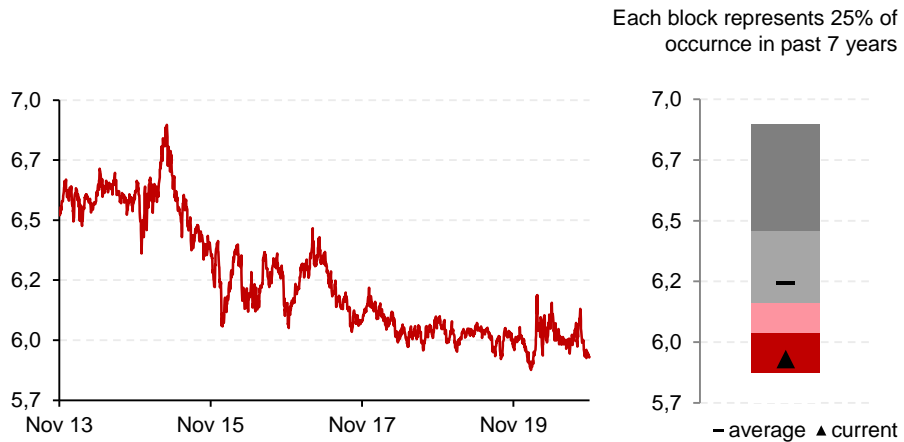
- NEJLEPŠÍ STAVEBNÍ is Czech company expanding on international markets, which translates in increasing revenues in foreign currency. NEJLEPŠÍ STAVEBNÍ is exposed to FX risk. See below example of project realised in Poland with revenues in PLN.



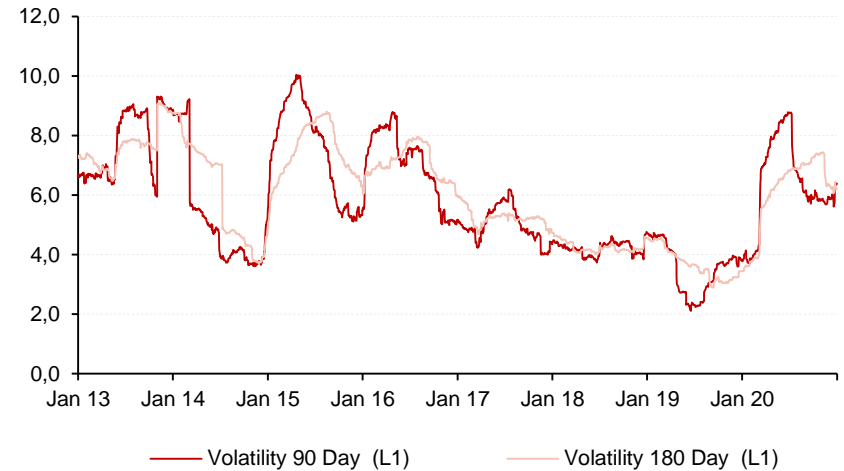
- **Introducing of FX risk management can help to:**
 - Operating Income and margin protection (in %) against negative moves of FX rates
 - Increase visibility of expected cash flows
 - Decrease volatility of economic results a losses due to FX rate changes
 - Ensuring the competitive pricing (in relation of policy of direct competitors)
- Moreover company should consider FX risk in case of M&A (Acquisitions and disposals) and large investment projects.
- It requires often adhoc risk management strategy using more flexible products (window contracts, american forwards, options, contingent hedges)

MARKET RISK ASSESSMENT: FOCUS ON PLN/CZK

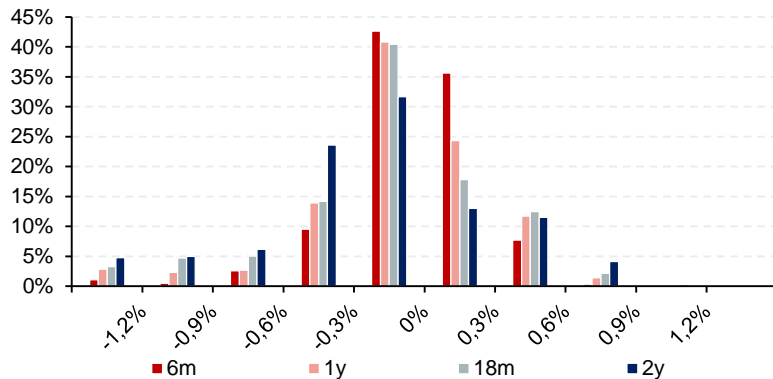
DOWNWARD TREND OF PLN/CZK



PLN/CZK VOLATILITY



PLN/CZK - historical sudden drops in value

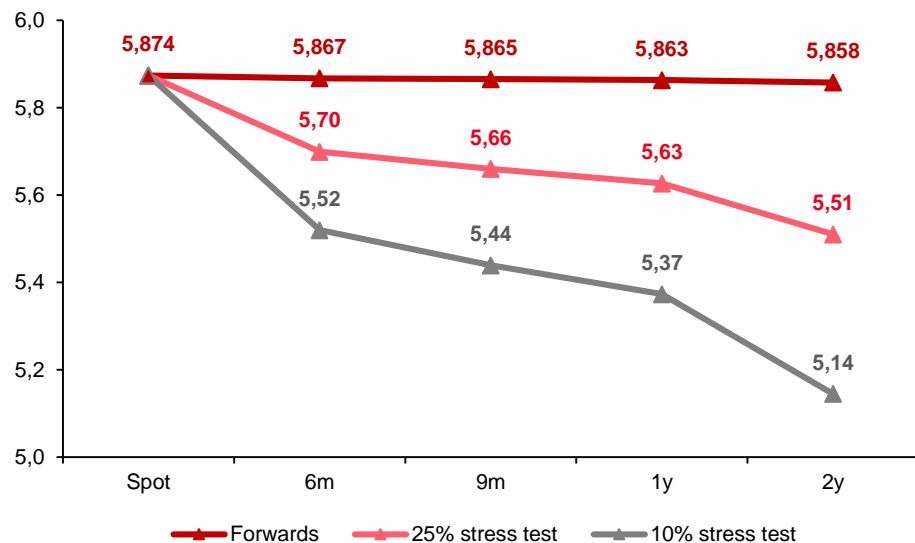


- Downward trend of PLN/CZK evolution with decreasing volatility.
- We can observe sudden drops in PLN/CZK evolution.

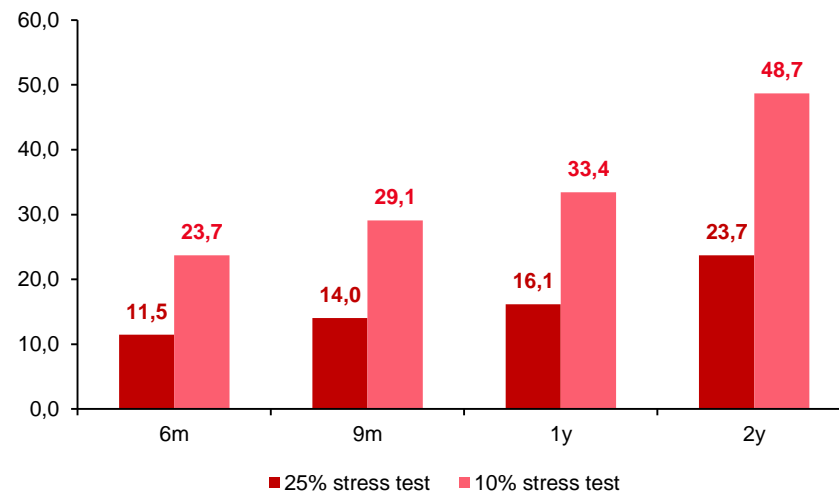
Source: SG/KB FX & Interest Rate Risk Advisory, Bloomberg k 24.11.2020 – spot rate at 5,86 (today 5,79)

ASSESSMENT OF MARKET RISK EXPOSURE / DOWNWARD RISK

SCENARIOS FOR PLN/CZK



STRESS TEST SCENARIO ANALYSIS (FOR 400M CZK)

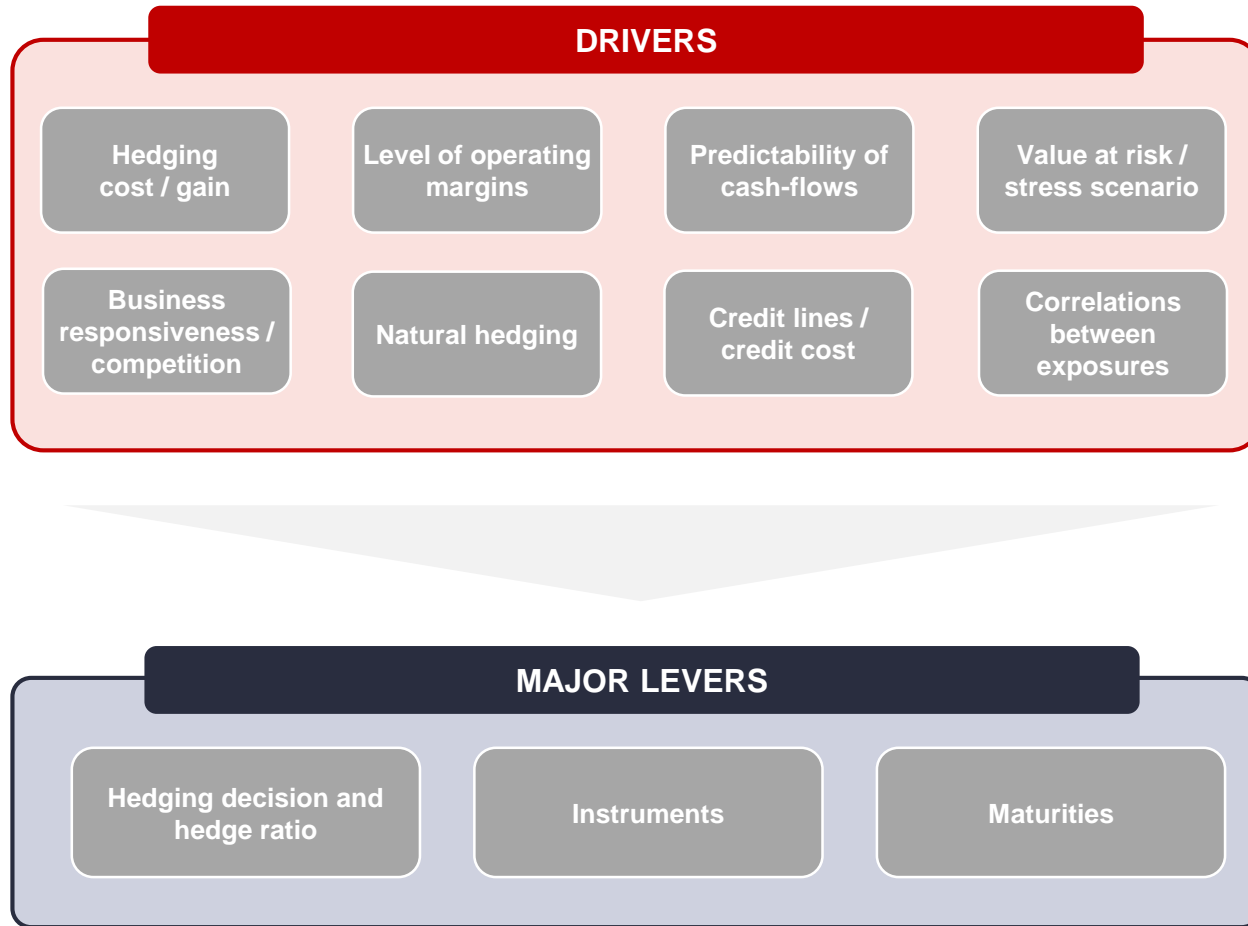


- In order to evaluate the risk that company NEJLEPŠÍ STAVEBNÍ is facing in the transaction, we prepared stress test scenarios with 10Y history of PLN/CZK development.
 - The analysis shows that there is 10% probability PLN/CZK could depreciate to na 5,31 (around 8,5% move) in the next 12 months. It translates in loss of **33,4m CZK on the 400 mio CZK investment.**
 - Other scenario shows that PLN/CZK could depreciate with 25% probability to 5,63 (around 4% move) in next 12 months. It translates in loss of **16,1 m CZK on the 400 mio CZK investment.**

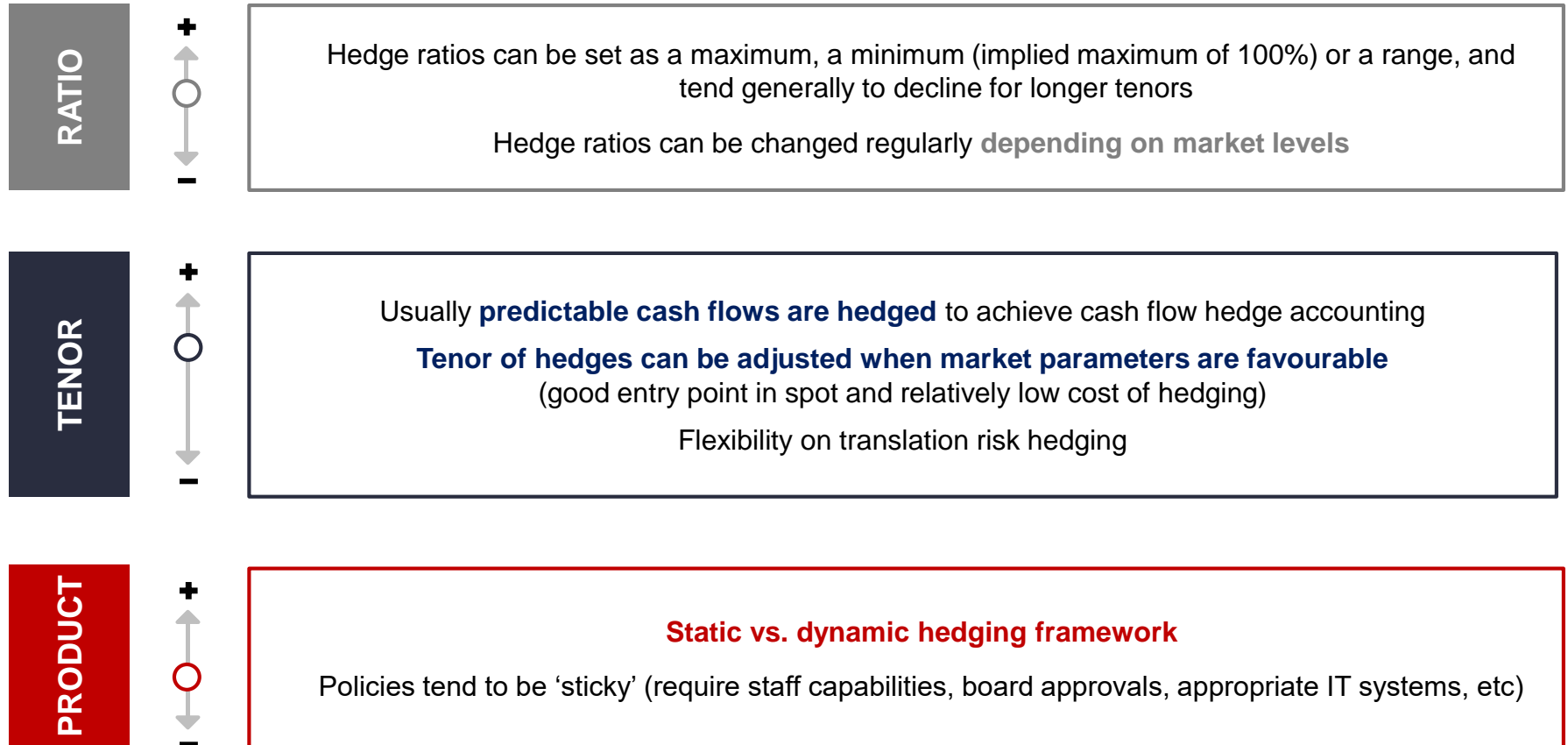
Source: KB Market Rate Risk Advisory, Bloomberg k 24.11.2020

MINULÁ, BUDOUCÍ NEBO SIMULOVANÁ VÝKONNOST (AŽ UŽ MINULÁ NEBO BUDOUCÍ) NEJSOU SPOLEHLIVÝM UKAZATELEM BUDOUCÍ VÝKONNOSTI. TO SE VZTAHUJE I NA HISTORICKÁ DATA. VÍCE INFORMACÍ O MINULÉ, BUDOUCÍ I SIMULOVANÉ VÝKONNOSTI NAJDETE V UPOZORNĚNÍ NA ZAČÁTKU TĚTO PREZENTACE.

HEDGING FX TRANSACTION RISK - DRIVERS & LEVERS

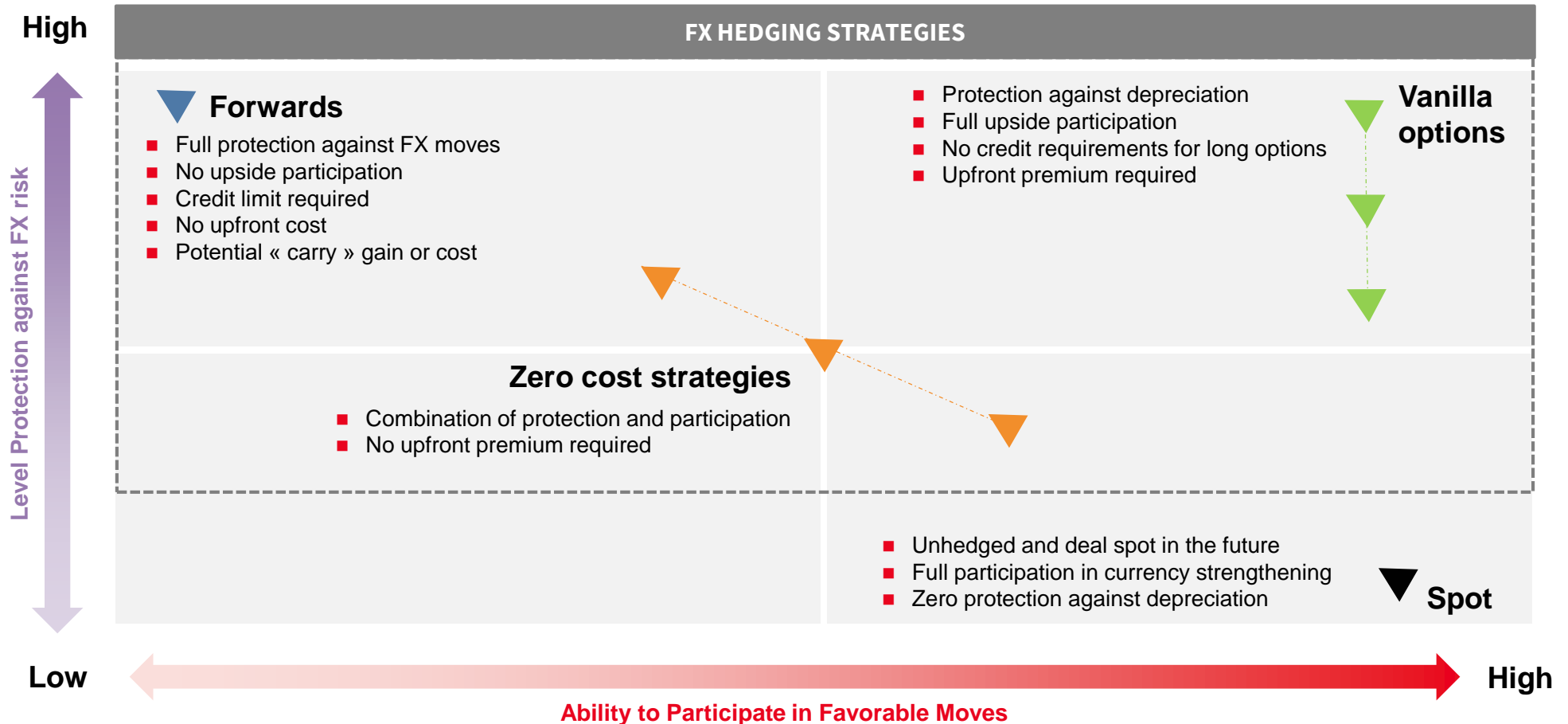


AVAILABLE LEVERS OF AN FX HEDGING STRATEGY



A FIRST APPROACH OF CUSTOMARY DERIVATIVE SOLUTIONS

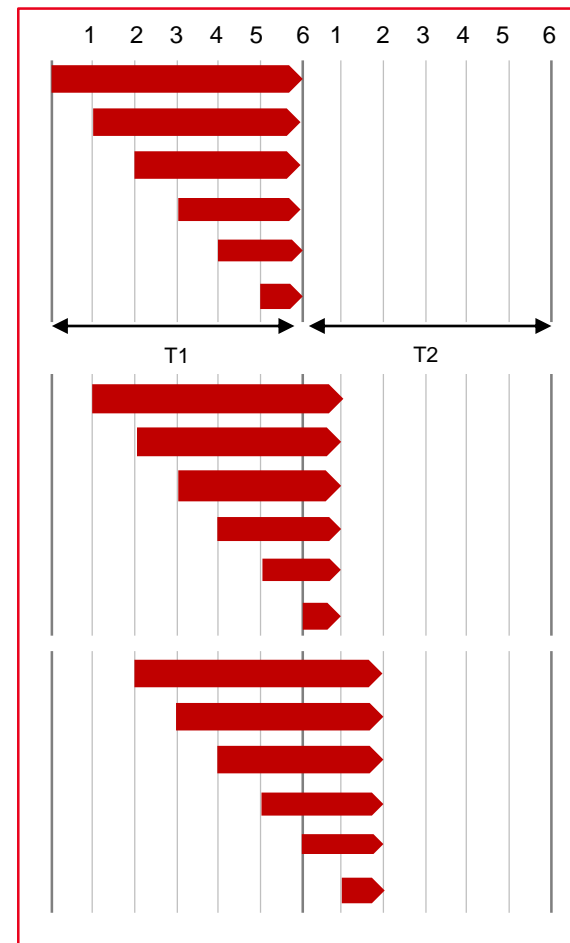
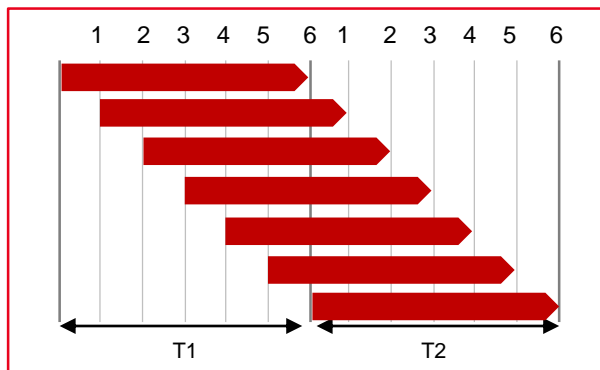
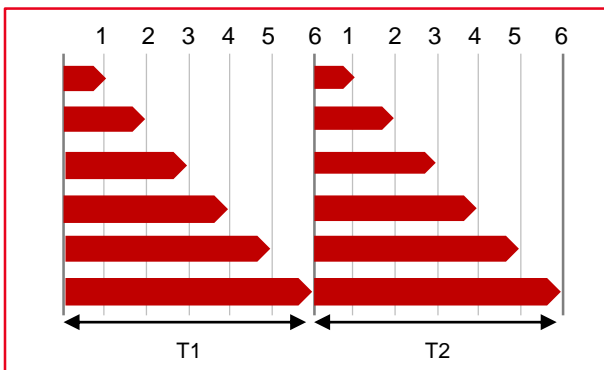
- Structural foreign exchange exposures may be hedged using various products depending on the hedging mandate



We would suggest including in the risk management policy the flexibility to adjust the product mix to market conditions

Rather than use cost of hedging as a switch to hedge or not to hedge, like some corporates do, we would instead suggest a regular monitoring of the hedging parameters to fine tune the tenor, ratio and product under the chosen policy

HEDGING FX TRANSACTION RISK: DIFFERENT APPROACHES



- **Static hedging**, often referred to as “set-and-forget” hedging, is when a company executes all hedges of forecast cash flows at the beginning of the considered **period/hedge horizon**. For example, a company executes hedges of monthly exposures for the full year at the beginning of the fiscal calendar when budget rates are set. The company then lets the hedges unfold throughout the year and repeats the process in Y+1
 - Hedged against adverse FX moves over the considered period, however no benefit from improving spot levels
 - Unhedged beyond the considered period and **exposed to large shifts in achieved rates from one period to the other**
- A **rolling hedge** is a strategy through which businesses roll forward exchange contracts of the same tenor such that **a certain percentage (or 100%) of expected cash flows are hedged for a given maturity at all times**. The strategy is mostly systematic but some flexibility can be introduced by adjusting the hedge ratio depending on market levels
 - Hedged against short-term spikes/dips in spot levels between roll dates
 - **Impact of long-term adverse trends will just be postponed**
- A **layered strategy** is a dual approach which involves gradually increasing the hedged amount as cash flows approach (and forecasts of exposures become more certain), and rolling hedges at maturity
 - Allows to factor in uncertainties on exposures by hedging less in longer tenors
 - **Greater flexibility** via discretion on the tenor and hedge ratio depending on market levels
 - **Smooths out the achieved exchange rate**: represents a trailing average of forward levels, hence removes the volatility in spot level

STATIC VS. DYNAMIC APPROACH

STATIC

- Same FX strategy applied **regardless of market parameters**
- Strategy could be applied consistently across all FX exposures or;
- Strategies can **be designed for each specific type of exposures or currencies** (G10 vs. EM, long vs. short, positive or negative carry exposures, cash flow or net investment hedging etc...)

DYNAMIC

SYSTEMATIC HEDGING

- **Hedging decision based on pre-specified trading rules**
 - Hedge ratio is determined by certain triggers based on market parameters
 - Realised and implied volatilities, forward premiums, implied volatility skew (risk reversal), correlations etc.
- **Favouring vanilla products due to the systematic nature of the hedging strategy**
 - Hedging is achieved using forwards and risk reversals
- **Dynamic hedging can incorporate:**
 - Short-term momentum based triggers
 - Long-term trend based triggers

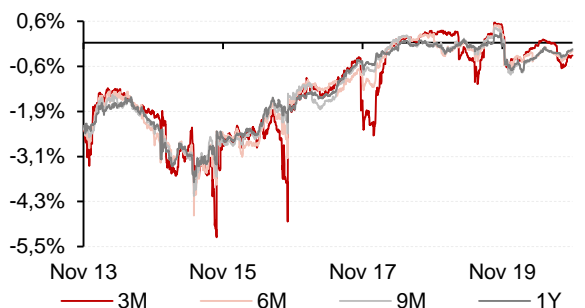
OPPORTUNISTIC

- **Hedging decision taken on a case-by-case basis depending on:**
 - Currency
 - Timing
 - Exposure
 - Market levels
- **Client may choose to hedge using option strategies to account for FX outlook, constraints, and market environment**
 - The hedge ratio can be achieved using low-delta strategies
 - Consider vanilla options, call spreads, optimisation solutions etc.

Risk management policy may combine different approaches e.g. having a systematic hedging layer to be rolled over time for only part of the targeted hedging ratio to leave room for additional opportunistic hedges

FACTORING MARKET PARAMETERS IN: PLN/CZK FOCUS

ANNUALISED CARRY LEVELS

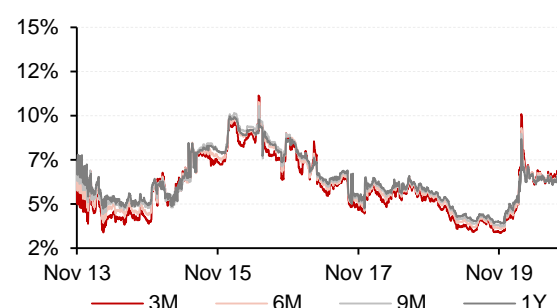


	3M	6M	9M	1Y
Current	-0.54%	-0.41%	-0.26%	-0.23%
Average	-1.29%	-1.30%	-1.27%	-1.26%
Time indicator	6.7%	5.5%	4.7%	4.9%

$(\text{Forward/Spot})^{(1/n)} - 1$
The lower the better for *Nejlepší Stavební*

As carry is mostly linked to rates differential between PLN and CZK, diverging monetary cycles have pushed carry high. Further monetary tightening in Czechia might push it even higher.

IMPLIED VOLATILITY LEVELS

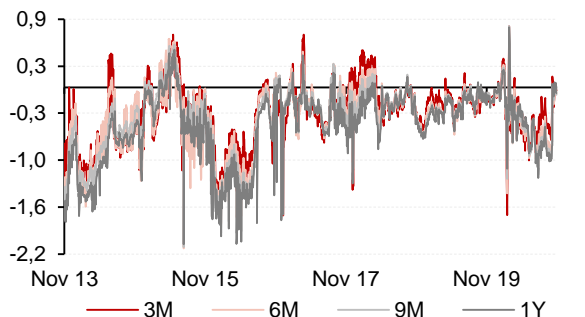


	3M	6M	9M	1Y
Current	5.82	5.81	5.80	5.81
Average	5.60	5.80	5.95	6.01
Time indicator	57%	54%	52%	50%

Implied from option prices
The lower the better when buying insurance-like products

Level of volatility spiked due to Covid-19 crisis Followed by decrease to 6% levels as the level of global uncertainties started to fade out..

25-DELTA RISK REVERSALS



	3M	6M	9M	1Y
Current	0.00	-0.02	0.00	0.03
Average	-0.35	-0.41	-0.43	-0.51
Time indicator	15.4%	14.7%	11.1%	5.9%

25-delta σ PLN/CZK Call - 25-delta σ PLN/CZK Put
The lower the better when buying collar-like products

Risk reversals stand for indicator of the **market risk perception** i.e. when positive, it indicates that market is considering the upside risk relatively more important than the downside one

SPOT VS. 1Y CARRY



Spot market tends to evolve in line with the rates differential through the cycle i.e. a significant rates differential (CZK rates being roughly some as PLN ones) would generally retain the PLN/CZK at current levels.

Source: KB Market Risk Advisory, Bloomberg k 24.11.2020

Timing indicator represents the occurrence of less favourable levels on 15-year history. Thus, the higher it is, the more attractive the market timing for hedge implementation

4. EXAMPLES OF HEDGING STRATEGIES

VANILLA PUT: ILLUSTRATIVE EXAMPLE

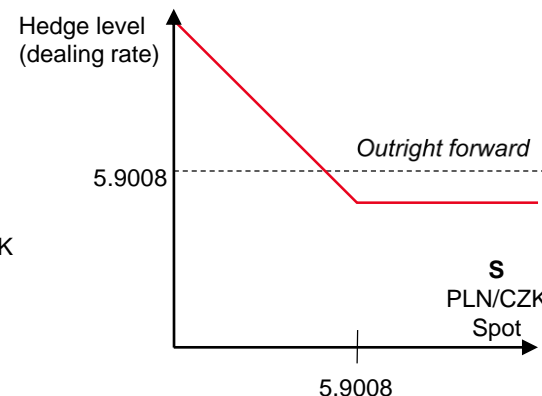
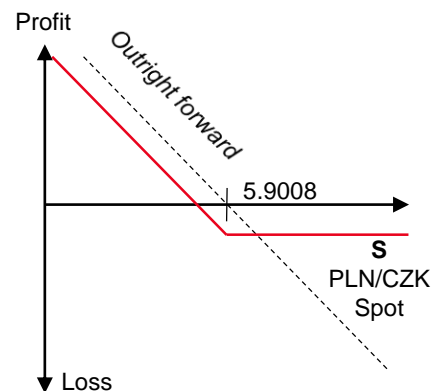
- Vanilla Put Option gives its holder a right, without any obligation, to sell a specific amount of PLN against CZK at maturity of the contract at a rate defined at inception.
- Purchase of the product involves payment of fixed upfront unconditional premium.

Format	OTC	
Counterparty	Komerční banka	
Final Maturity	29-Feb-2021	
Client way	PLN seller/ CZK buyer	
Nominal	PLN 50m	
Strike	ATMf (5.9008)	5.7250
PLN/CZK Spot Reference*	5.9072	
PLN/CZK Forward Reference*	5.9008	
Premium	PLN 2.0%	PLN 0.9 %

PRODUCT MECHANISM

- **At Final Maturity** of ATMf as described above,
 - **If PLN/CZK is above 5.9008:**
 - Company will not exercise the option and choose to **buy CZK at favourable spot rate**
 - **If PLN/CZK is below 5.9008:**
 - Company could exercise an option and **sell PLN at 5.9008**

PAYOFF AT MATRURITY **



BENEFITS

- At expiry, Company is fully hedged against PLN depreciation below 5.9008.
- Company can benefit from potential appreciation.

DRAWBACKS

- Purchase of product involves payment of fixed upfront unconditional premium.

*Source: Bloomberg 27.1.2020. The market information displayed in this document is based on data at a given moment and may change from time to time.

**The figures used in this example are given for purely indicative purposes and exclude any potential execution slippage, the objective is to describe the mechanism of the product . It allows an understanding of how the product would have performed at different market stages over previous years., but is no guarantee as to future returns and has no contractual value.

COLLAR: ILLUSTRATIVE EXAMPLE

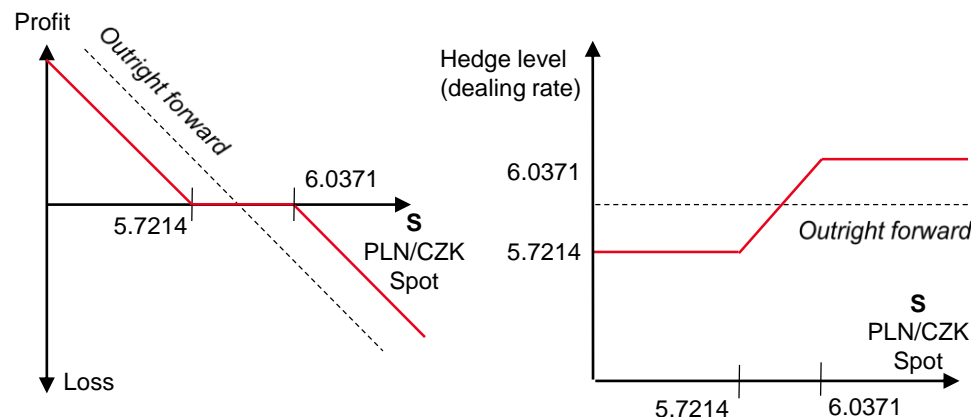
- Collar is a combination of standard call and put options producing a forward-like payoff.
- Compared to Forward, the exchange rate (*Strike*) remains unknown until the maturity and depends on PLN/CZK Spot rate observed on the market at maturity of the contract.

Format	OTC
Counterparty	Komerční banka
Final Maturity	29-Feb-2021
Client way	PLN seller/ CZK buyer
Nominal	PLN 50m
Strike 1/Strike 2	5.7214/6.0371
PLN/CZK Spot Reference*	5.9072
PLN/CZK Forward Reference*	5.9008
Premium	Zero-premium

PRODUCT MECHANISM

- **At Final Maturity** of collar as described above,
 - **If PLN/CZK is above 6.0371:**
 - Company will sell PLN for 6.0371
 - **If PLN/CZK is between 5.7214 and 6.0371:**
 - Company may sell PLN at Spot
 - **If PLN/CZK is below 5.7214:**
 - Company will sell PLN at 5.7214

PAYOFF AT MATRURITY **



BENEFITS

- Company is hedged against PLN depreciation leading PLN/CZK below 5.7214.
- Between 5.7214 and 6.0371, Company can potentially benefit from a favourable spot move. .

DRAWBACKS

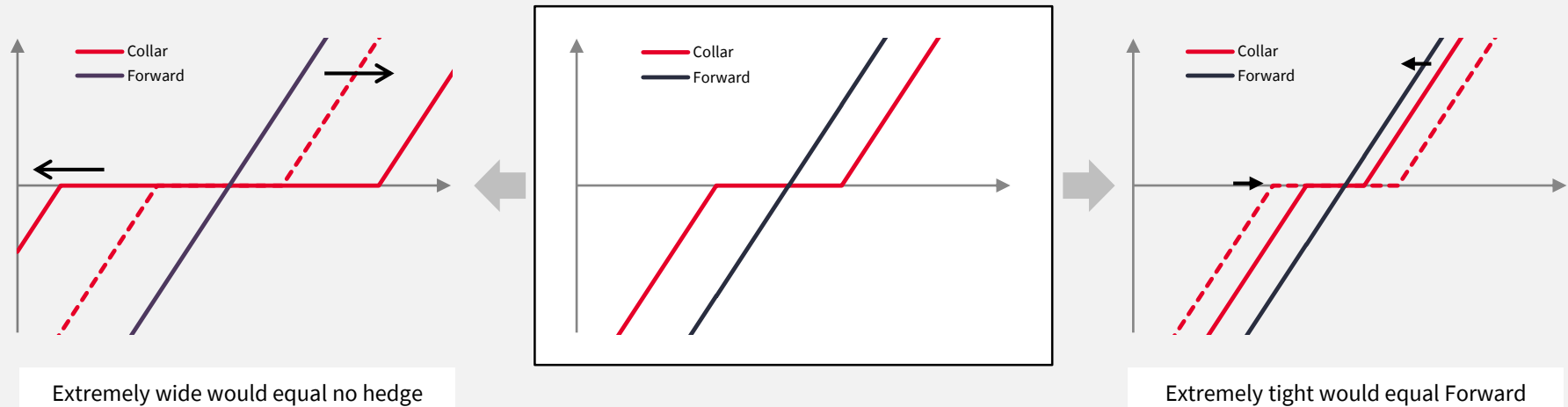
- The potential benefit from a favourable spot move is limited.

*Source: Bloomberg 27.1.2020. The market information displayed in this document is based on data at a given moment and may change from time to time.

**The figures used in this example are given for purely indicative purposes and exclude any potential execution slippage, the objective is to describe the mechanism of the product . It allows an understanding of how the product would have performed at different market stages over previous years., but is no guarantee as to future returns and has no contractual value.

ANOTHER ANGLE TO INTERPRET COLLARS

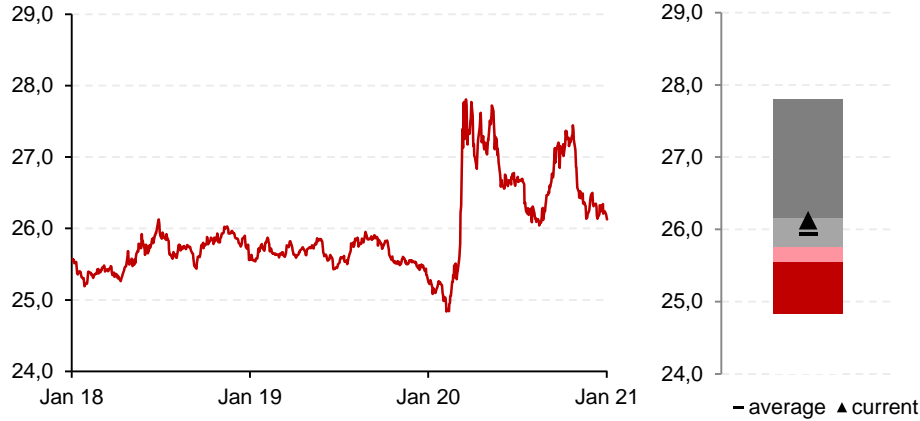
- Collars and Forwards are different hedging instruments and yet they share similarities. Forwards are just a particular version of a Collar
- A Collar is a **zero-premium strategy composed of vanilla options**. It allows to benefit from potential appreciation of the foreign currency up to a certain level (the put Strike) by **letting the currency potentially move against the hedger position** (up to the call Strike)
- The distance between the chosen strikes (Call and Put strikes) lets Company **define the trade-off between potential gain by opposition to potential depreciation moves**. By adjusting the strikes, Company can directly adjust the protection level achieved
- Collars offer greater flexibility in the hedging strategy of Company compared to simple forward strategies. The choice between forwards and collars has a direct impact on the hedging cost and its accounting treatment
 - **On currency pairs with costly carry, using collars may prove particularly efficient as it would reduce the cost of the forward component**
 - **The wider the collar, the less influence of the swap points**



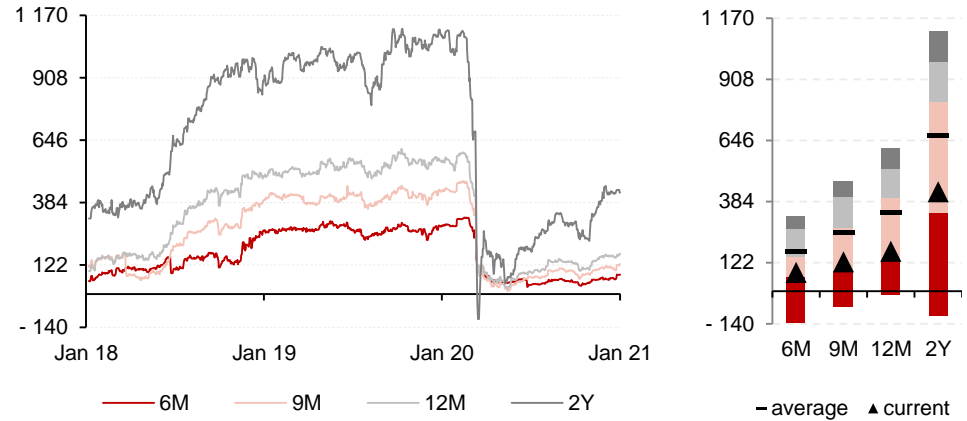
5. ANNEX

MARKET OVERVIEW: EUR/CZK FOCUS

EUR/CZK SPOT



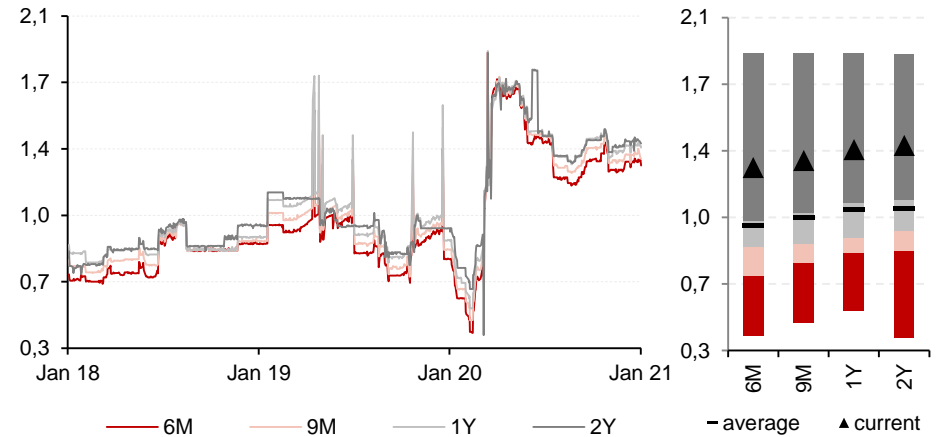
EUR/CZK FORWARD POINTS



EUR/CZK IMPLIED VOLATILITY



EUR/CZK 25D RISK REVERSAL



Source: SG/KB FX & Interest Rate Risk Advisory, Bloomberg as of 06/01/2021

