



Challenges in Today's Markets:

Tools & techniques to master FX volatility and increase profitability in the current environment



Treasury Club Conference BNP Paribas Academy



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Managing FX risk from Budapest

This seminar attempts to provide business leaders with a framework to deal with the current FX uncertainty. First, corporate clients will learn how to determine the outlook for both EUR/HUF using real-life market data. Using market rather than macro-economic data allows for a better understanding of the pricing and success-rate of various FX hedges. Obviously, a comprehensive macro-outlook will be presented. Second, clients will learn to identify their business' sensitivity to various FX rates and to select appropriate hedging tools. More generally, we investigate how to select the "optimal" hedging strategy from an earnings volatility perspective. Thirdly, attention should be paid to the accounting issues like IAS39 & IFRS9. How to deal with transaction versus translation risk?

BNP Paribas' experts on corporate fixed income solutions will share their experience and provide participants with practical advice and guidance for implementing appropriate foreign exchange hedging policies. A real-life business case will be presented using in-house developed tools such as the FX-Cone, FX Portfolio Analyzer or Heed™, an excel based Risk Management Tool, designed to handle treasury, risk management and accounting activities. Participants are free to have such tools implemented within their businesses and will receive a USB stick containing all documents & programs shown.

Research Update:

Hungary 'BB/B' Ratings Affirmed; Outlook Remains Negative

(Editor's Note: In the following research update, published earlier today, we misstated in the text our forecast for Hungary's average real GDP growth in 2013-2015. A corrected version follows.)

Overview

- In our view, Hungary's creditworthiness continues to be constrained by the economy's weak growth prospects, limited monetary flexibility, and high stocks of public and private external debt.
- The rating is supported by the economy's well-diversified economic and export structures, which ensure a relatively stable tax base.
- We are affirming our 'BB/B' long- and short-term sovereign credit ratings on Hungary, as well as the 'BB' long-term issuer credit rating on the National Bank of Hungary.
- The outlook remains negative, reflecting at least a one-in-three chance of a downgrade if the policy framework lessens confidence and medium-term economic growth prospects, or significantly raises financing costs and leaves the country exposed to sharply diminished capital inflows.

Rating Action

On Oct. 25, 2013, Standard & Poor's Ratings Services affirmed its 'BB/B' long- and short-term foreign and local currency sovereign credit ratings on Hungary. The outlook remains negative.

Hungary -- Selected Indicators

Mil. HUF	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nominal GDP (US\$ bil)	113	136	154	127	128	139	126	131	138	146
GDP per capita (US\$)	11,167	13,520	15,352	12,826	12,777	13,890	12,604	13,230	13,941	14,761
Real GDP growth (%)	3.9	0.1	0.9	(6.8)	1.3	1.7	(1.7)	0.7	1.7	1.5
Real GDP per capita growth (%)	4.1	0.2	1.1	(6.6)	1.5	1.9	(1.5)	1.0	2.0	1.8
Change in general government debt/GDP (%)	8.5	4.6	9.9	4.2	5.0	3.3	(1.1)	2.8	3.2	3.4
General government balance/GDP (%)	(9.4)	(5.1)	(3.7)	(4.6)	(4.3)	4.3	(1.9)	(2.9)	(2.8)	(2.8)
General government debt/GDP (%)	65.9	67.1	73.0	79.8	81.8	81.4	79.2	79.9	79.2	78.5
Net general government debt/GDP (%)	64.0	65.6	66.4	73.7	76.3	75.2	73.7	74.6	74.2	73.7
General government interest expenditure/revenues (%)	9.2	9.1	9.1	9.9	9.2	7.8	9.2	9.4	9.4	9.3
Oth dc claims on resident non-govt. sector/GDP (%)	54.3	60.3	67.9	67.6	67.3	63.7	54.4	50.3	47.9	45.6
CPI growth (%)	4.0	7.9	6.0	4.0	4.7	3.9	5.7	2.0	3.4	5.0
Gross external financing needs/CARs + use. res (%)	125.2	125.4	135.0	125.9	112.9	113.4	106.5	108.4	105.7	97.5
Current account balance/GDP (%)	(7.4)	(7.3)	(7.4)	(9.2)	1.1	0.8	1.6	1.5	1.3	0.1

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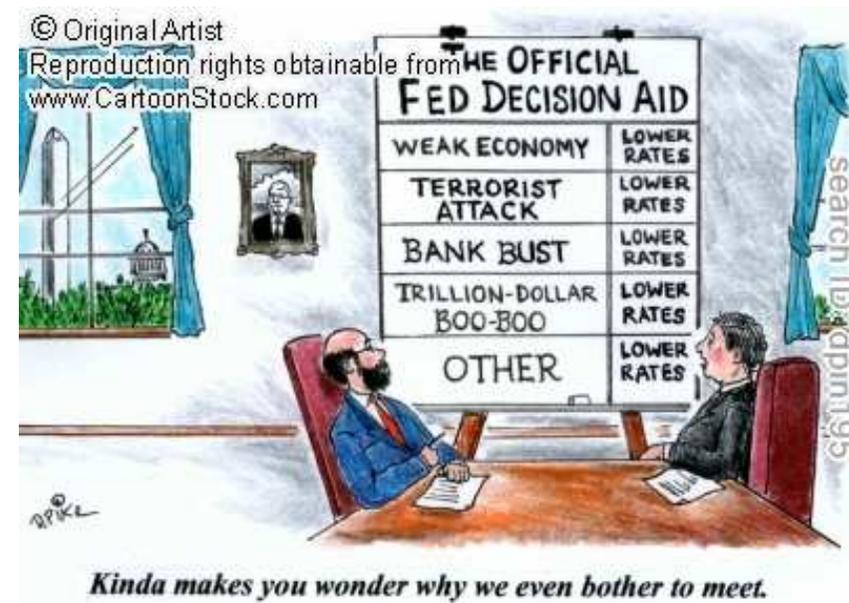
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Case Study

A Hungarian Company is selling goods mainly on the European market.

To produce the goods the company purchases components on the HUF market.

All in all, the company is net EUR seller.

Moreover the company faces a 3 months lag between the payments of components and the receivables from goods sold. Due to this timing mismatch (i.e. difference in spot rate), the company faces P&L volatility.

Furthermore, we witnessed past trends whereby the HUF appreciated with respect to EUR. This moves caused additional accumulated losses.

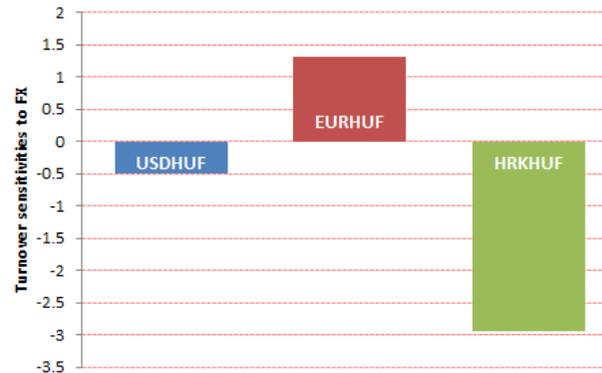
Transaction Risk ?

Yes, when EUR depreciates versus HUF, that is, when EURHUF moves down



Case Study: *Magyar Olaj- és Gázipari Nyilvánosan működő Részvénytársaság*

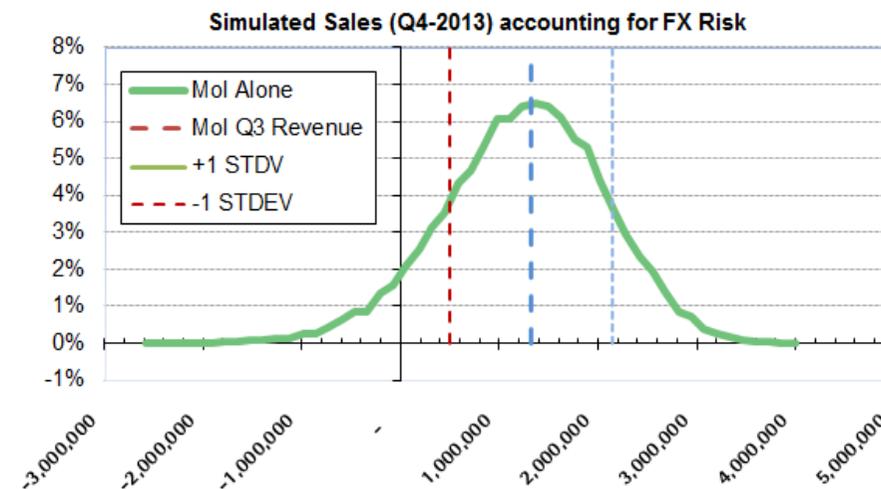
What is MOL's sensitivity of revenues to currencies ?



What is MOL's 2013 Q4 Revenue at Risk ?

- Using Monte Carlo analysis (LogNormal model) for 20,000 simulations and accounting for the currency correlations, we can establish paths for the three currencies combined
- Combining these currency paths and the respective revenue sensitivity coefficients, we can create a distribution of the expected revenues for Q4

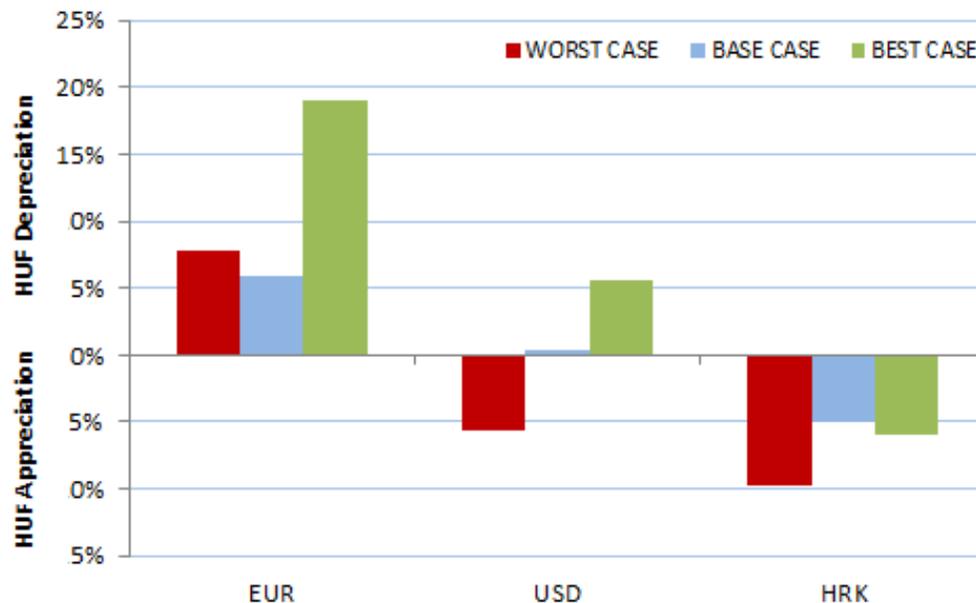
Sales	Q3 2013	Q2 2014-Simulation			
	Average	Stdev	VaR 90%	AVG-VaR	
MOL	1,319,993	1,312,349	823,561	250,171	1,062,178



FX rate Strategy

Using our 20,000 currency path simulations (accounting for FX correlations), we can identify currency movements having a negative, neutral and positive impact upon expected revenue numbers for Q4

- Best case: MOL's Q4 revenue will exceed its Q3 revenue
- Base case: MOL's Q4 revenue will be around its Q3 revenue
- Worst case: MOL's Q4 revenue will be below its Q3 revenue



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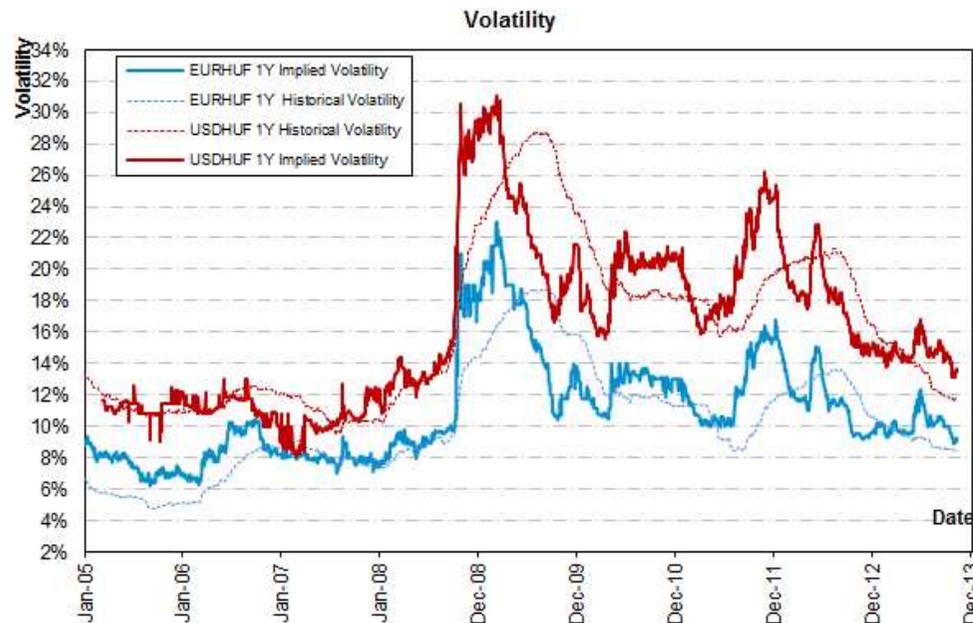
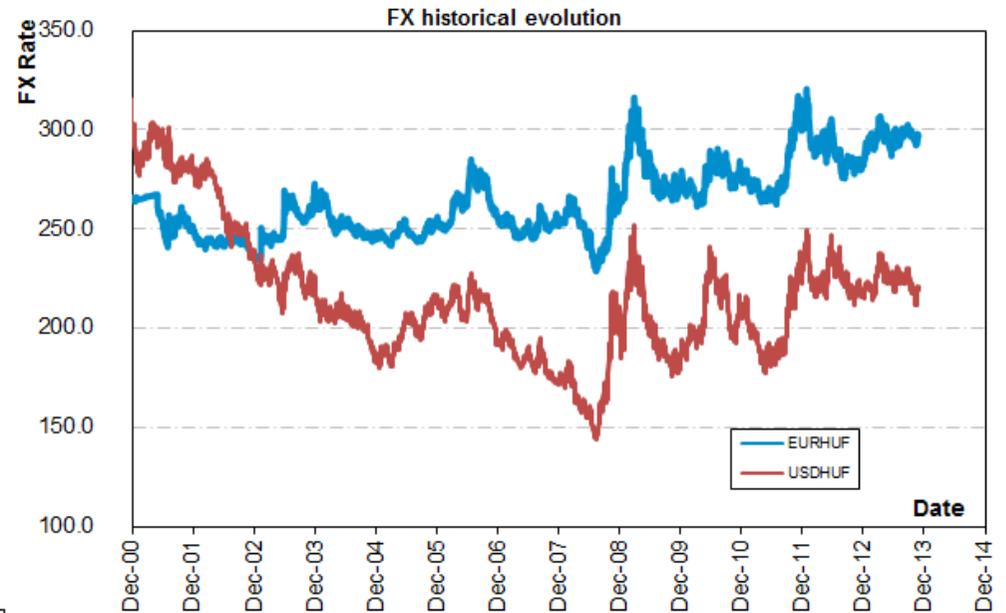
"Sorry, I don't do financial advice..."



Market Risk Assessment

USD & EUR

We show the historical evolution of the EURHUF and USDHUF exchange rates since 2000.



Volatility

USDHUF volatilities (whether historical or implied) have been larger than their corresponding EURHUF volatilities, EURHUF implied volatility has been constantly higher than historical volatility up to 2009.

This means higher cost of hedging for USD with optional strategies.



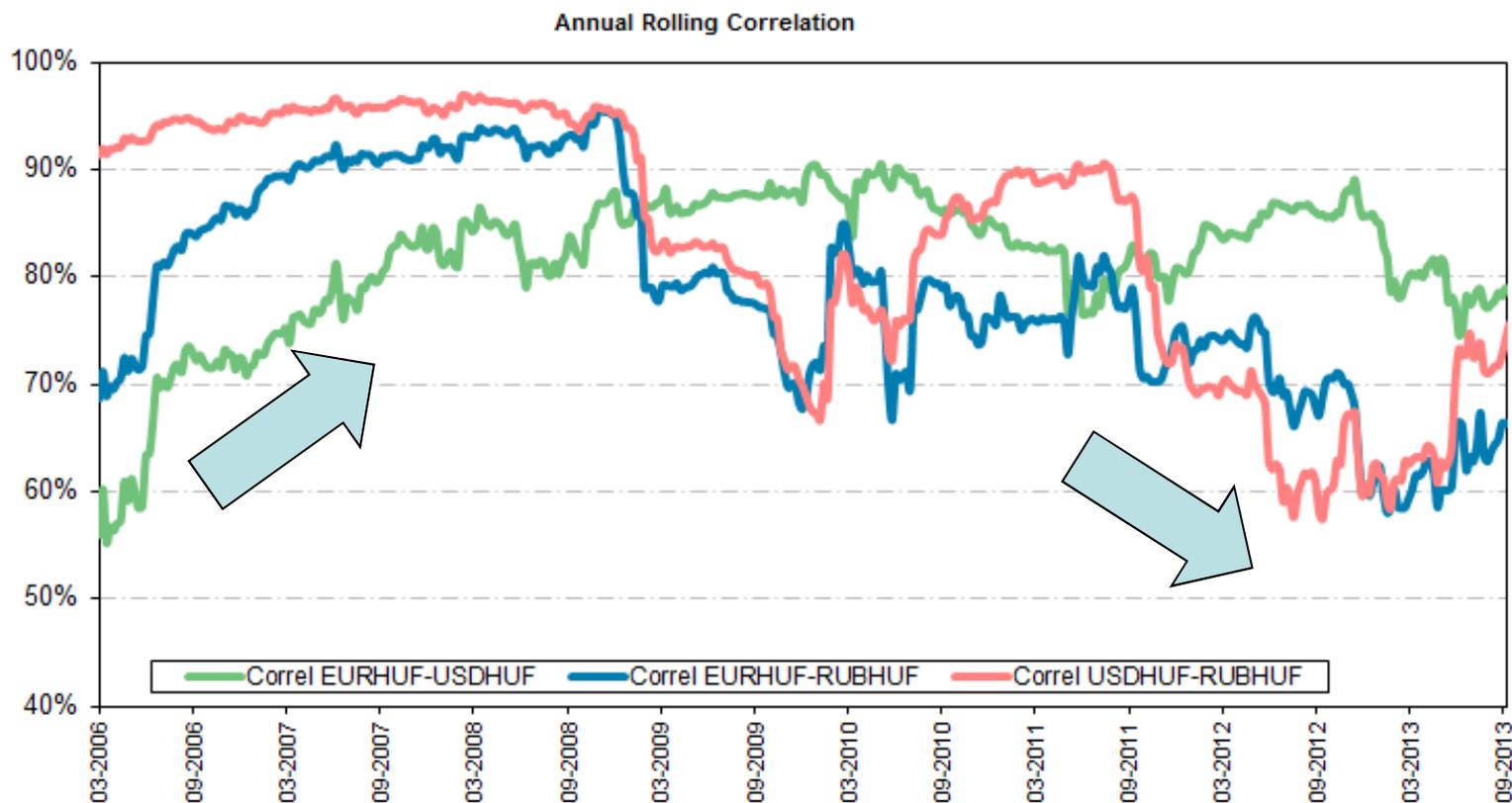
Currencies Correlations

Correlations between currency pairs aim at identifying the relationship between the changes in one currency pair with the ones in the other. A high positive correlation level implies that the underlying risks of the two variables could be managed together.

We show below the FX performance of various pairs

We observe that:

Currencies are highly correlated during RISK ON – RISK OFF times, thus really up to 2009



Current Implied Volatilities

Implied volatility is the main driver for assessing the hedging cost of optional strategies. For simple vanilla options (puts/calls), the higher the volatility the higher the option cost. When options are combined in structures, the volatility asymmetry impacts directly the structure payoff.

Here we see the implied volatilities on EURHUF and USDHUF options for several maturities and several strike moneyness.

The option moneyness is assessed through the implied probability to be in-the-money at the option maturity, i.e. the delta of the option: a 10 delta Call is a call option that has 10% to be in the money at maturity.

For both currency pairs, we observe currently that:

The longer the maturity the higher the volatility:

Clients should reduce the maturity of the hedges to reduce costs.

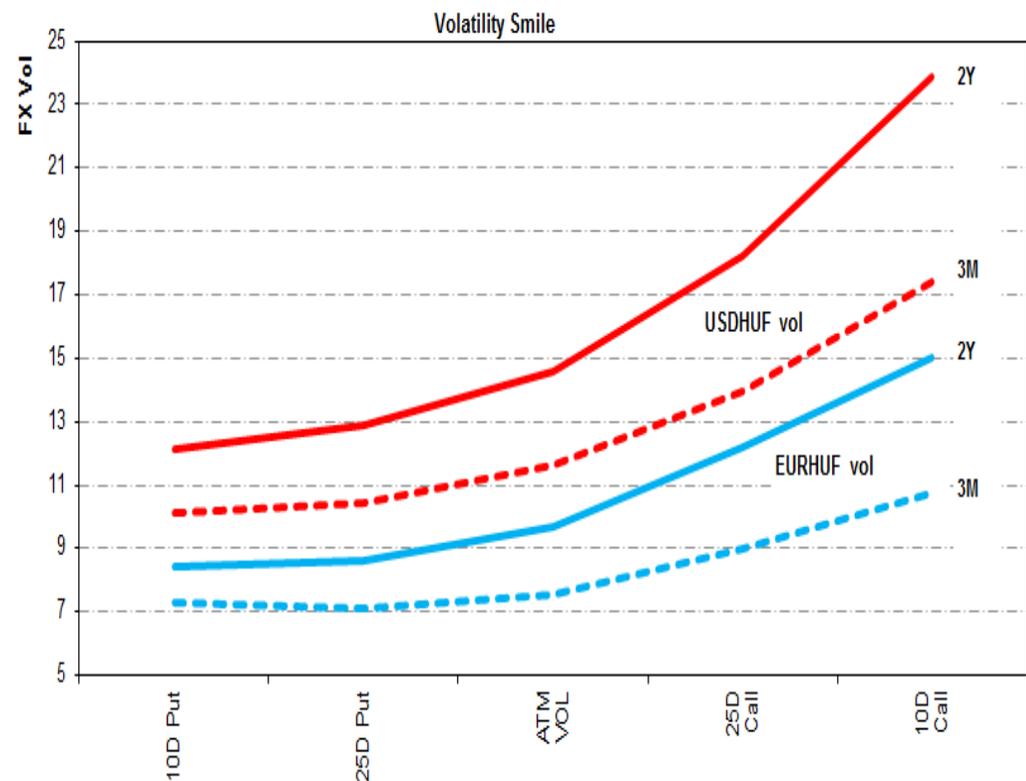
The lower the strike the lower the volatility:

This is an advantage for EUR Sellers:

Buying protection against EUR depreciation is relatively cheap.

This is a negative for EUR Buyers:

Selling EUR puts to finance EUR calls reduces opportunity cost.



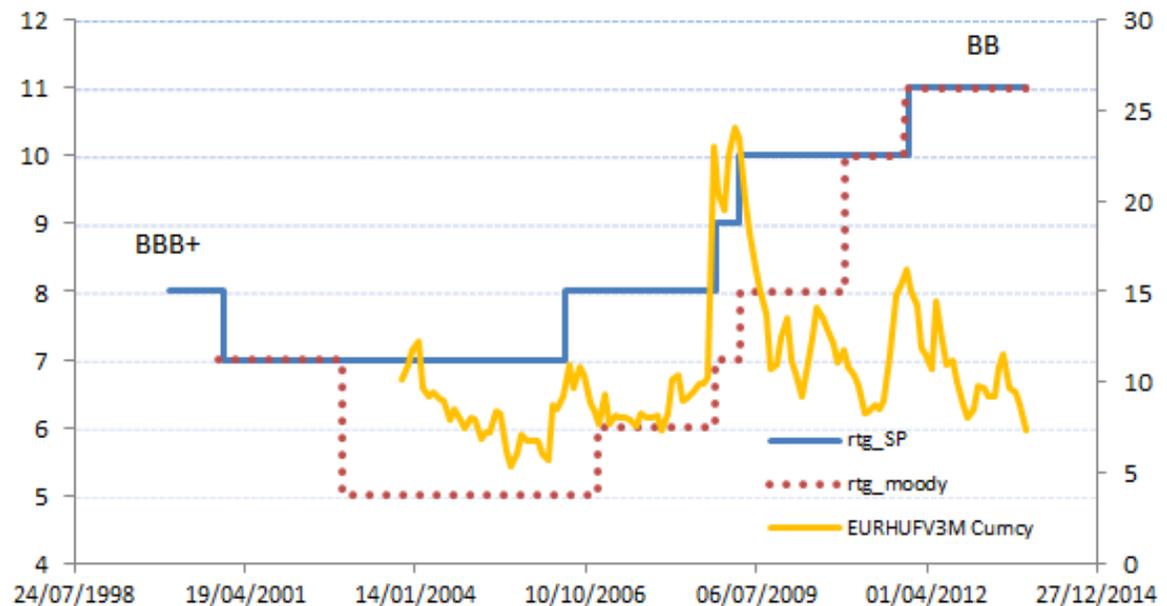
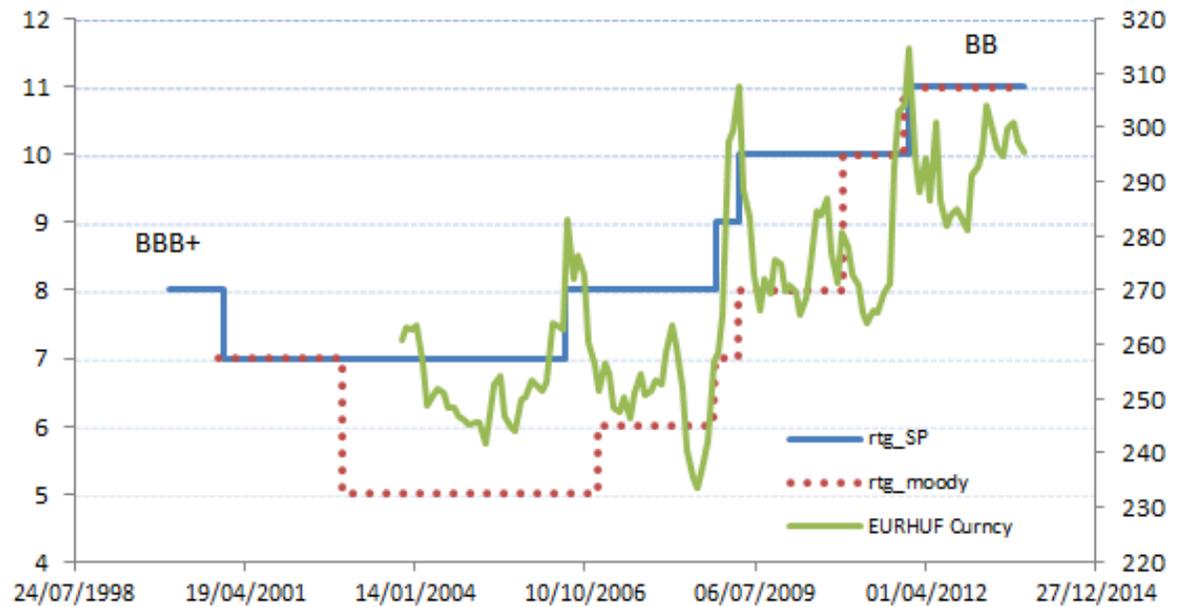
Currency depreciation closely linked to country rating downgrades

we observe that:

The exists a perfect relationship between the timing of rating downgrades and strong Forint depreciation versus EUR:

Depreciations tend to forecast downgrades

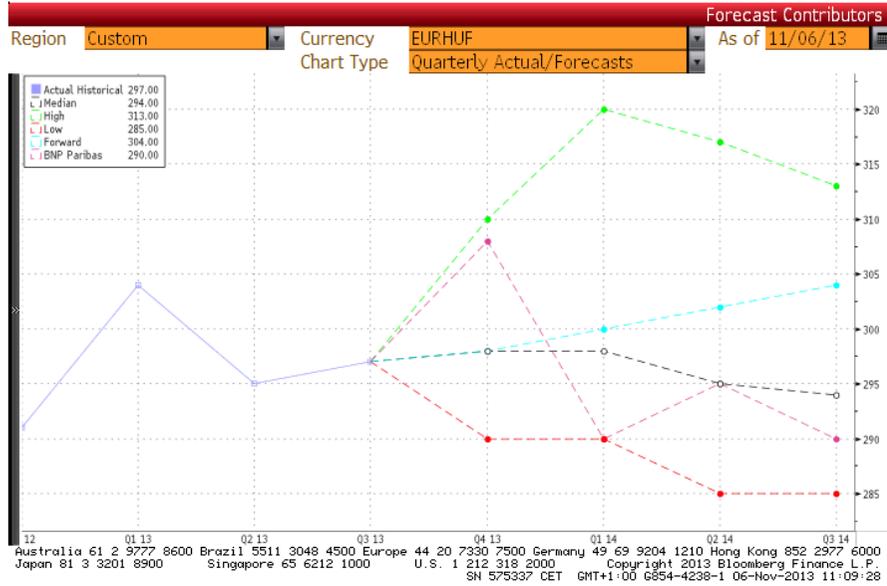
Country ratings do not tend to be driven by changes in implied volatility for ATM 3M FX options.



Forecasts

EURHUF

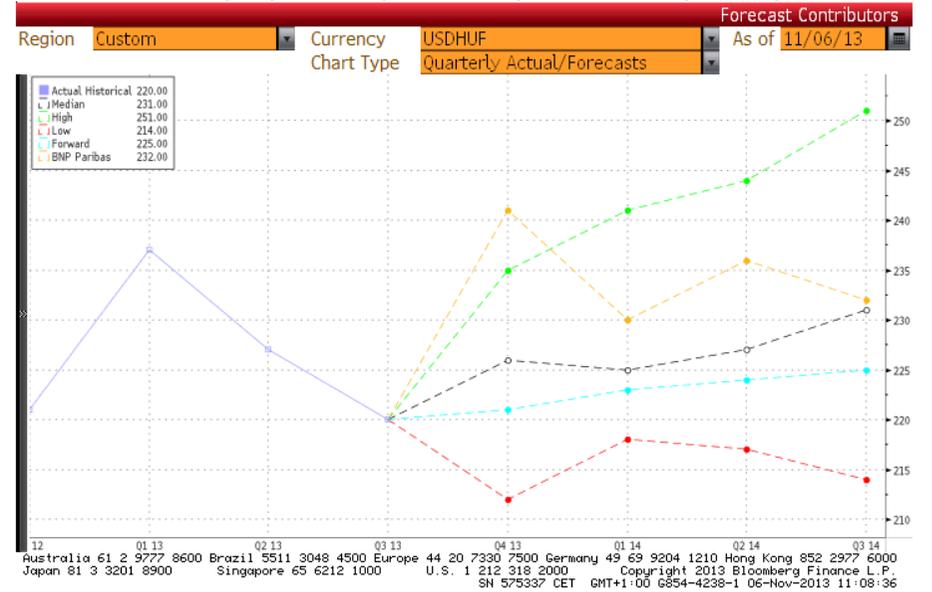
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USDHUF

<HELP> for explanation.

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[Tools] : Easy FX Cone module

The Easy FX Cone module is a FX rate simulator to forecast currency confidence interval at a given time horizon. Based on real time market rates and implied volatilities.

- Multi-Currency
- Custom time horizon
- Bloomberg/Reuters data feeding.

Color Code	Fixed	Free	mailto:clientsolutions.cib@bnpparisfortis.com
Currency Pair	EURHUF		
Local Ccy	EUR		
FX Ccy	HUF		
Start Date	08/11/2013		
EndDate	10/11/2014		
Time period	1Y		
Fixing period	1M		
Nbr Fixings	12		
Spot	296.6100		
Forward at Maturity	303.9913		
Nbr iterations	5000		

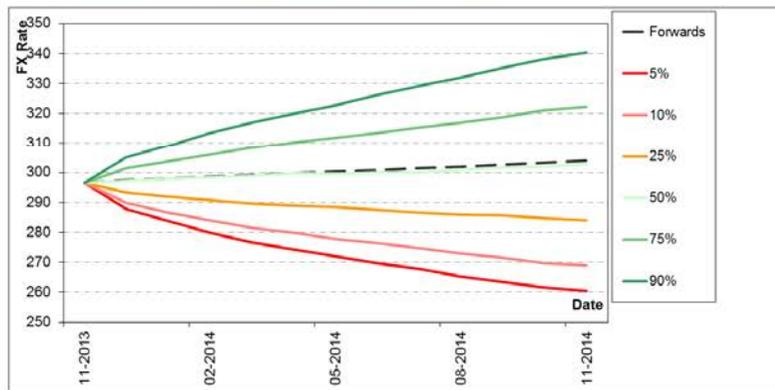
SHIFT +F9 to updat

	11-2013	12-2013	01-2014	02-2014	03-2014	04-2014	05-2014	06-2014
Forwards	296.61	297.3444006	297.8275083	298.5474	299.1198	299.7635263	300.2040259	300.7190941
Percentile 5%	296.61	287.6294131	283.7464538	279.8219644	276.6415165	274.3905188	271.9349079	269.5614133
Percentile 10%	296.61	289.7375885	286.6801484	283.9323923	281.4548645	279.8540798	277.8609011	276.4956814
Percentile 25%	296.61	293.2153389	291.9090019	290.6868781	289.6871166	288.8065821	288.3322256	287.5099565
Percentile 50%	296.61	297.2848232	297.8025305	298.2652655	298.7624774	299.6868295	299.5979775	300.0207746
Percentile 75%	296.61	301.3938796	303.6893373	306.0470568	308.233166	310.2230948	311.8874877	313.4936184
Percentile 90%	296.61	305.1319027	309.122962	313.3425912	316.9866674	319.9938706	322.7107566	326.1050483
Percentile 95%	296.61	307.4298876	312.1823118	317.8498672	322.1237623	326.1388181	329.7187218	333.2975374

	11-2013	12-2013	01-2014	02-2014	03-2014	04-2014	05-2014	06-2014
280 000	100.0%	99.7%	98.4%	94.9%	92.0%	89.8%	87.3%	86.5%
290 000	100.0%	89.1%	81.3%	76.8%	74.1%	72.5%	71.3%	70.2%
291 000	100.0%	89.5%	78.3%	74.2%	71.6%	70.9%	69.4%	68.2%
295 000	100.0%	65.2%	61.9%	62.0%	61.1%	60.7%	60.7%	60.2%
298 000	0.0%	44.9%	49.1%	51.0%	52.5%	54.1%	53.9%	54.0%
300 000	0.0%	32.3%	39.9%	44.2%	45.6%	49.2%	49.1%	50.0%

Parameter Space of evolution

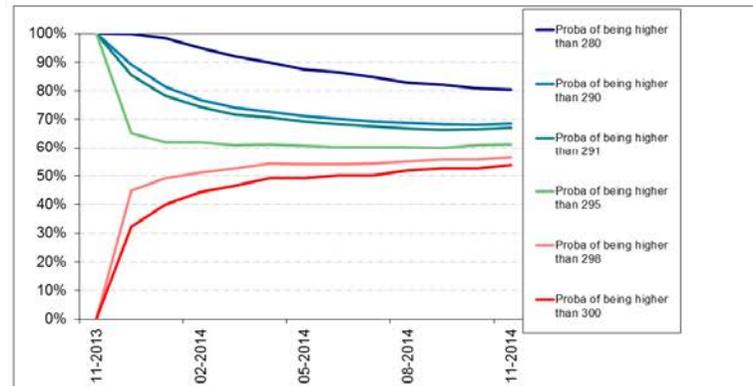
The 5% percentile indicates that 5% of the occurrences are below the line.



The probability of being above or below given spot market levels in 1M, 3M and 6M

	12-2013		02-2014		05-2014	
	Below	Above	Below	Above	Below	Above
10%	289.7376	305.1319	283.9324	313.3426	277.8608	322.7108
25%	293.2153	301.3939	290.6869	306.0471	288.3322	311.8875
50%	297.2848	297.2848	298.2653	298.2653	299.5980	299.5980

Probability of being higher than a given level



Spot High and Low Range, with 90% Confidence Level

	Forward	High	Low
12-2013	297.3444	307.4299	287.6294
02-2014	298.5474	317.8499	279.8220
05-2014	300.2040	329.7187	271.9348

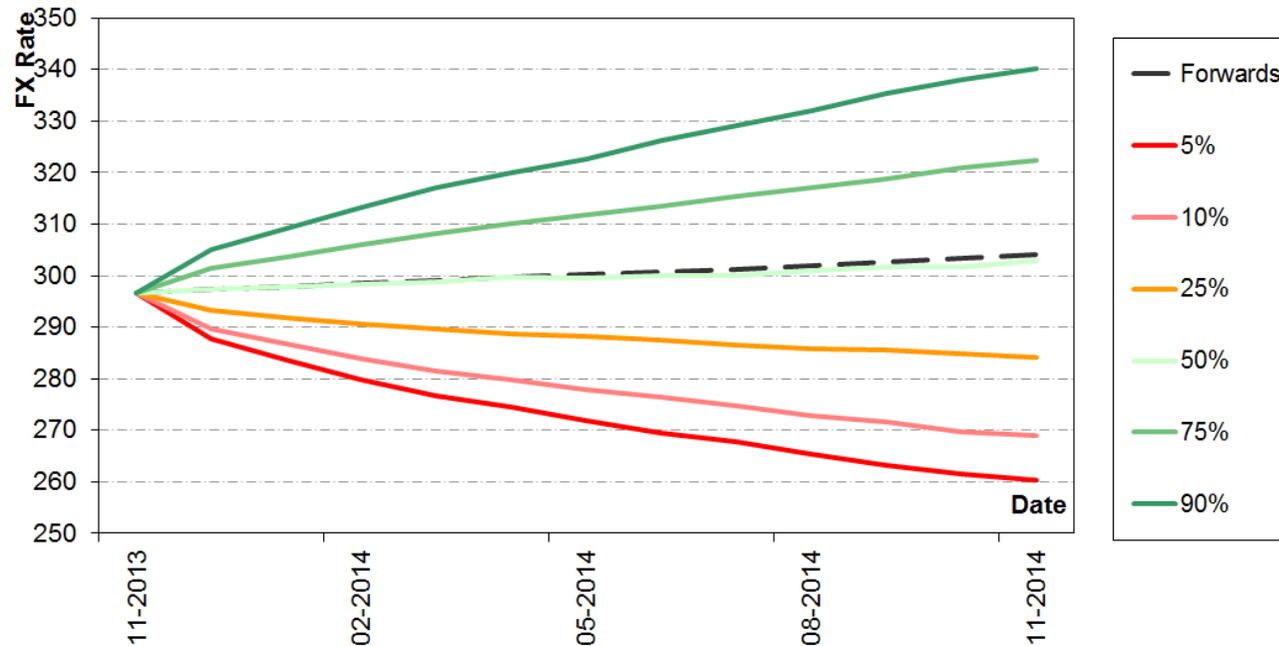


The chart (below) has been constructed using current market parameters (spot, forward and implied volatility) to simulate (with varying levels of confidence) possible high and low spot ranges for EURHUF from Nov 2013 to Nov 2014.

Parameter Space of evolution.

The percentile 5% indicates that 5% of the occurrences are below the line.

Spot Ref: 296.61 (06/11/2013)



[Tools] : Risk Assessment : EURUSD Value-at-Risk

Spot Ref: 296.61 (06/11/2013)

	12-2013		02-2014		05-2014	
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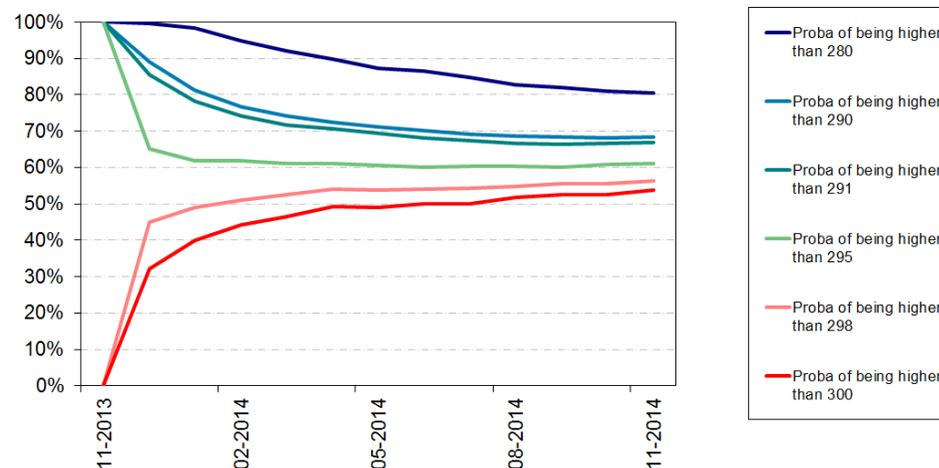
The table (left) illustrates the probability of being above or below given spot market levels in 1M, 3M and 6M time.

These levels can be calculated by looking at where the barriers would be for a European digital option (Call and Put) costing 10%, 25% and 50% respectively.

Probability to be higher than a given level.

To be more precise, we can calculate the probability at each moment until Nov 2014 to be higher of one exchange rate level.

On the right hand of the slide, we can see the evolution of these probabilities through the year.



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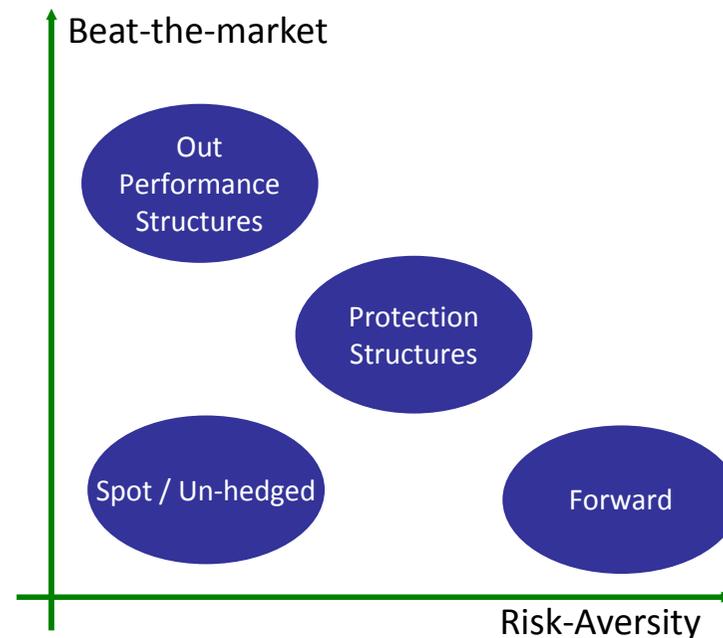
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Corporate Hedging Profiles

Clients broadly use four kinds of tools:

- **Forward** – the most common and simplest hedging product to use. Absolute certainty, 100% risk reduction
- **Protection/Participating Structures** – the main purpose of protective hedging is to guarantee the translation cost of foreign income or costs but also have some flexibility. Participation structures include a cylinder or forward extra
- **Beat-The-Market Structures** – clients willing to take more risk look for strategies that allow them to “give up” some protection in order to potentially obtain a better rate than the forward
- **Do Nothing** – a very common and legitimate strategy particularly where large carry costs are involved



Features of Hedging Solutions

Completely eliminate the risk:

The company fixes the FX rate for future cash-flows

Product type: Forward contract.

Benefits	Drawbacks
No uncertainty	No flexibility (opportunity cost) May be at deteriorated level than spot rate

Protect the exposure at the spot rate:

The company fixes the worst case level for future cash-flows

Product type: vanilla options.

Benefits	Drawbacks
Protection level fixed Full participation to currency appreciation	Premium to be paid

Defend exposure and enjoy some degree of benefit:

The company lowers the hedging cost by deteriorating the protection level and by cutting the level of currency appreciation participation.

Product Type: structured options.

Benefits	Drawbacks
Protection level fixed Lowered premium or zero cost	Deteriorated protection level Limited participation to currency appreciation

Beat-the-market strategy:

The company enjoys better terms than the market level but also takes on more risk.

Product Type: Target Knock-out Forwards, Escalator Knock-out Forwards, etc.

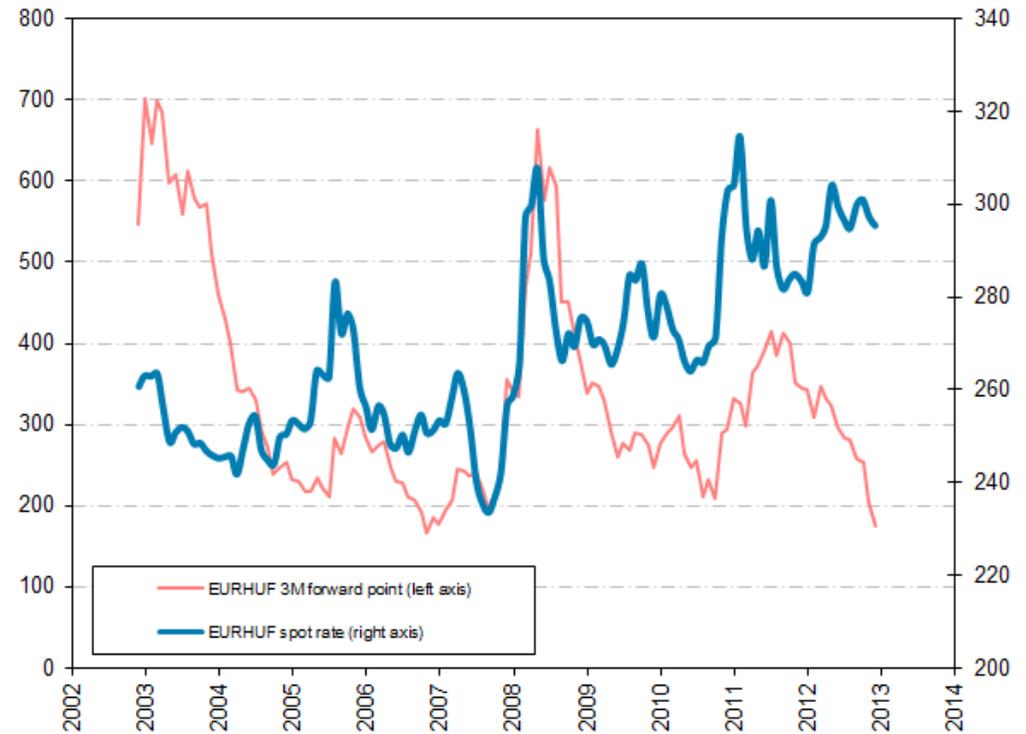
Benefits	Drawbacks
Direct profit from enhanced level	Trading strategies Increased Risk profile



Forward Contract

Forward contracts fix the future EURHUF rate and hedge future transactions against changes in the EURHUF spot rate.

The price of the Forward will be based on the prevailing EURHUF spot rate at the agreement date and the forward points for the maturity.



Forward exchange rate includes forward points that are either positive or negative for the client according to the deposit rate differential between HUF and EUR.

Indicative pricing:

Customer seller of EUR, buyer of HUF with value date in **3 months**

Spot reference : 294.00

- Forward rate : **Spot + 1.60 = 295.60**

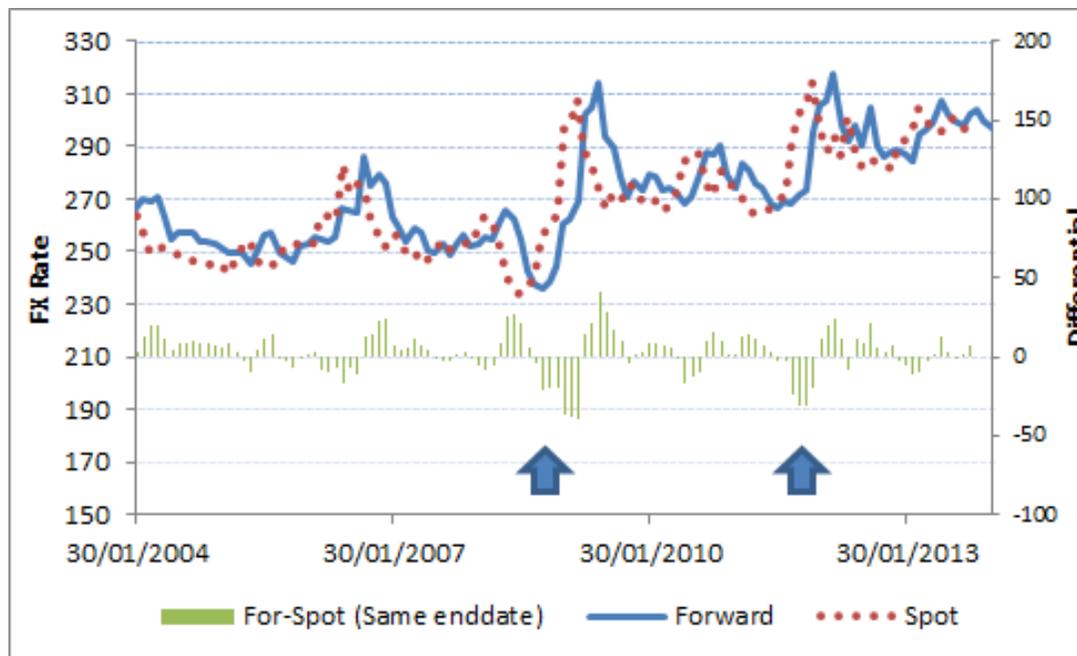


Forward Contract

Forward is not a good predictor of future spot rates

It is not even a good predictor of the direction, if not the magnitude, of the expected change. Thus a forward rate cannot be used to predict future exchange rates.

Given that forward rates are merely exchange rates adjusted for interest rate differentials, they also have little predictive power in terms of forecasting future interest rates



 Journal of International Money and Finance
Volume 16, Issue 4, August 1997, Pages 609-623

Forward premiums as unbiased predictors of future currency depreciation: a non-parametric analysis

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Department of Finance, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong, China

Abstract

A large body of literature employing regression analysis has reported that the forward premium is not an unbiased predictor of future currency depreciation. Many studies argue that the forward market unbiasedness hypothesis may be falsely rejected due to biased parameter estimates. Possible sources of bias include: the existence of a time-varying risk premium, systematic forecast errors and measurement errors. This paper investigates whether the forward premium can predict the direction of change in the future spot exchange rate using a distribution-free, non-parametric approach. Our tests strongly reject the unbiasedness hypothesis and conclude that the forward premium contains either no information or the 'wrong' information about future currency depreciation.



Flexi Forward

The Flexi Forward is a term transaction to hedge a position on a specific period with **full flexibility on the timing and the flows**.

The client can **use the amount fully or partially at any time** between the activation date and maturity date. It provides flexibility of delivery at a single forward price during the life of the product. The client may come at any day to settle the Flexi-Forward.

The fixing rate is determined as the EURHUF 10am NY time fixing rate as you come before 10am NY time or the fixing of the next day if you call after.

The FX hedge price is slightly worse compared to the classical forward price to account for the liquidity and the flexibility provided to the client. If, by expiry date, the amount traded is not completely exercised, the remaining hedge amount will be delivered at the Final Delivery date.

Indicative pricing:

Customer seller of EUR, buyer of HUF with value date in **3 months**

Spot reference : 294.00

- Flexi Forward rate : **Spot - 0.10 = 293.90**



Participating Forward

Conversely to standard forwards, a Participating Forward allows a degree of « participation » in favorable spot movements. It also provides a full hedge at a guaranteed strike rate. This is achieved by **buying a EUR put** option for **100%** of the notional and **selling a EUR call** option for **50%** of the notional at the same strike.

The client is then 100% protected at the strike level against EUR depreciation while incurring only 50% of the losses for EUR appreciation.

Due to the participating feature, the hedge rate will be OTM compared to the prevailing outright forward. The structure has **zero premium**

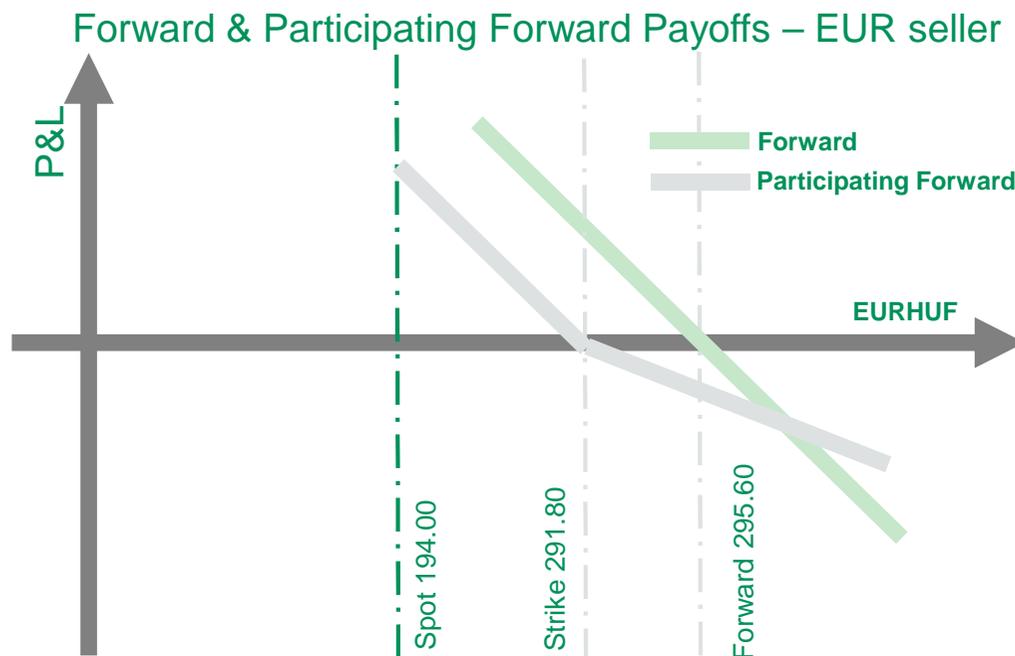
Indicative pricing:

Customer seller of EUR, buyer of HUF with value date in **3 months**

Spot reference : 294.00

- Client buys put EUR call HUF @ strike **291.80** for 100%
- Client sells call EUR put HUF @ strike **291.80** for 50%

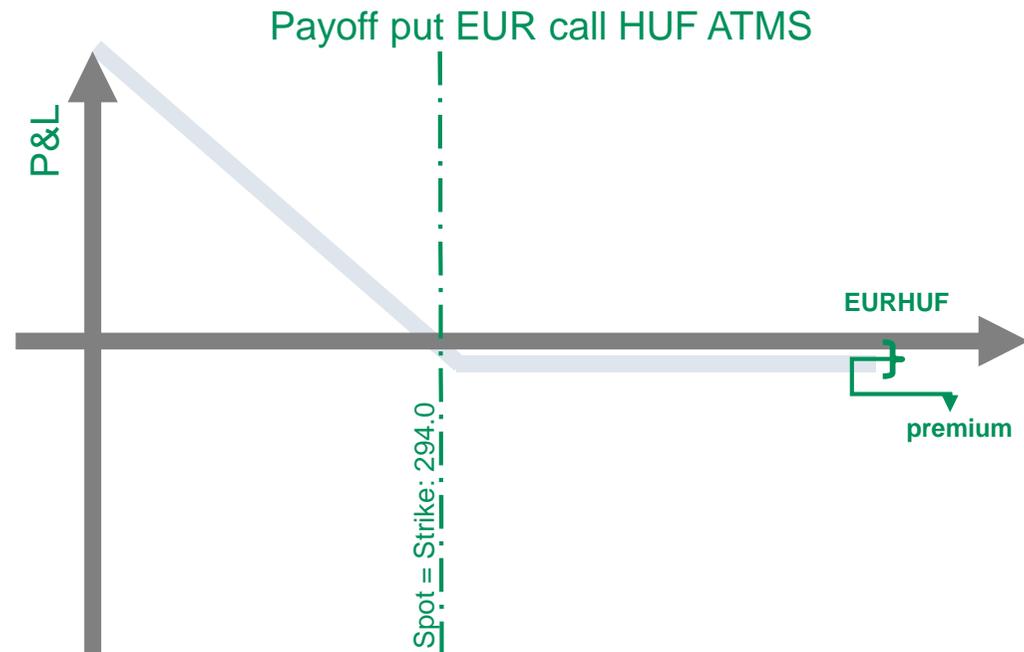
No Premium paid



Vanilla Option

A vanilla EUR put option enables the customer to be protected against HUF appreciation below the strike.

The client buys a put EUR call HUF with strike being equal to the prevailing spot rate and pays a given premium for it.



If at the exercise date, the EURHUF spot rate fixes above the strike the option is worth nothing and is not exercised.

If the EURHUF spot rate fixes below the strike, the customer sells EUR at the strike price and receives HUF.

Indicative pricing: EUR put HUF call with strike=spot, expiry in **3 months**.

The **premium** to pay is **1.25%** of the EUR amount.

Spot reference : 294.00; Forward rate : Spot + 1.60



Options Collar

A Forward Extra is a strategy that combines the protection of forwards with the flexibility of options.

The client buys a put EUR call HUF with deteriorated strike with respect to the forward rate and sell a call EUR put HUF with a higher strike. **No premium is paid.**

The client is protected against EUR depreciation below the strike (smaller than the forward rate) yet he is able to participate in EUR appreciation until the spot rate trades at the call strike.

At the fixing date:

- EURHUF spot rate fixes below the put strike, the customer sells EUR at the strike price and receives HUF,
- EURHUF spot rate fixes above the put strike and below the call strike, client can buy the spot at a better rate than the put strike.
- EURHUF spot rate fixes above the call strike, the client will sell at the call strike.

Indicative pricing: Put strike at **292.5** with Call Strike at **298.00**, expiry in **3 months**.

No Premium paid

Spot reference : 294.00; Forward rate : Spot + 1.60

Payoff Options Collar: buy EUR put & sell EUR call at a higher strike



Forward Extra

A Forward Extra is a strategy that combines the protection of forwards with the flexibility of options.

The client buys a put EUR call HUF with deteriorated strike with respect to the forward rate and sell a call EUR put HUF at the same strike with an European Knock-In. **No premium is paid.**

Compared to the Options collar, the Put's strike is at a higher level and the client can participate in EUR appreciation up to a higher KI level. On the other hand, once the barrier is touched, the settlement fall back on the strike level.

At the fixing date:

If the spot does not trade at the barrier, the client can buy the spot at a better rate than the strike.

If the spot trades at the barrier, knocking in the call, the client is then in the same position than with a forward at the strike rate.

Indicative pricing: Strike at **292.50** with European Knock-In at **305.00**, expiry in **3 months**.

No Premium paid

Spot reference : 294.00; Forward rate : Spot + 1.60

Payoff Forward Extra: buy put EUR & sell call EUR with European KI



Target Exact Knock-Out Forward: a Beat-the-market strategy

Problem to solve:

- Most companies use budget rates to project revenues and expenses in order to determine targeted earnings. Obviously, the budget rates may differ from the forward rates quoted in the market place.
However, the rates that govern the price of hedging transactions are fully market determined.
- If forwards are used to hedge, the difference between hedged and unhedged earnings is due to the company's budget rates not being based on market forwards.
- Hence the difference is not necessarily a cost, but rather a reflection of difference in the company's view of future market rates and the market's assessment of future market rates.



Target Exact Knock-Out Forward: a Beat-the-market strategy

Description

The *Target Knock-Out Forward* is the most basic of the “Target” family of forwards, aimed at providing the client with **better-than-market outright hedging rates**. Indeed, the client **potentially accumulates an FX Forward contract** at an improved rate.

In our example, the client will be able:

- to Sell EUR on a monthly basis
- at a very attractive strike rate until the Knock-Out Event is triggered.

The Knock-Out Event is triggered when: **Accumulated Monthly ITM Intrinsic Value \geq Knock-Out Amount**.
with $\text{Monthly ITM Intrinsic Value} = \text{Max} [(\text{Strike Rate} - \text{EURHUF fixing}), 0]$

Upon KO: *full settlement of notional at an adjusted strike* to convey the exact Target benefit to Client.

Expiry Profile

Knock-Out Event has not occurred:

- If EURHUF Fixing \leq Strike, Client sells 1M EUR against HUF at Strike rate;
- If EURHUF Fixing $>$ Strike, Client sells 2M USD against HUF at Strike rate.

Knock-Out Event has occurred:

$\text{Final Strike Rate} = \text{Final Fixing} + (\text{Knock-Out Amount less Previous Months Accumulated ITM Intrinsic Value})$

Hedge is *knocked out for all remaining months* following the Knock-Out Event

No further obligation between Client and BNP Paribas Fortis.



Target Exact Knock-Out Forward

Termsheet

Indicative levels of a *Target Exact*

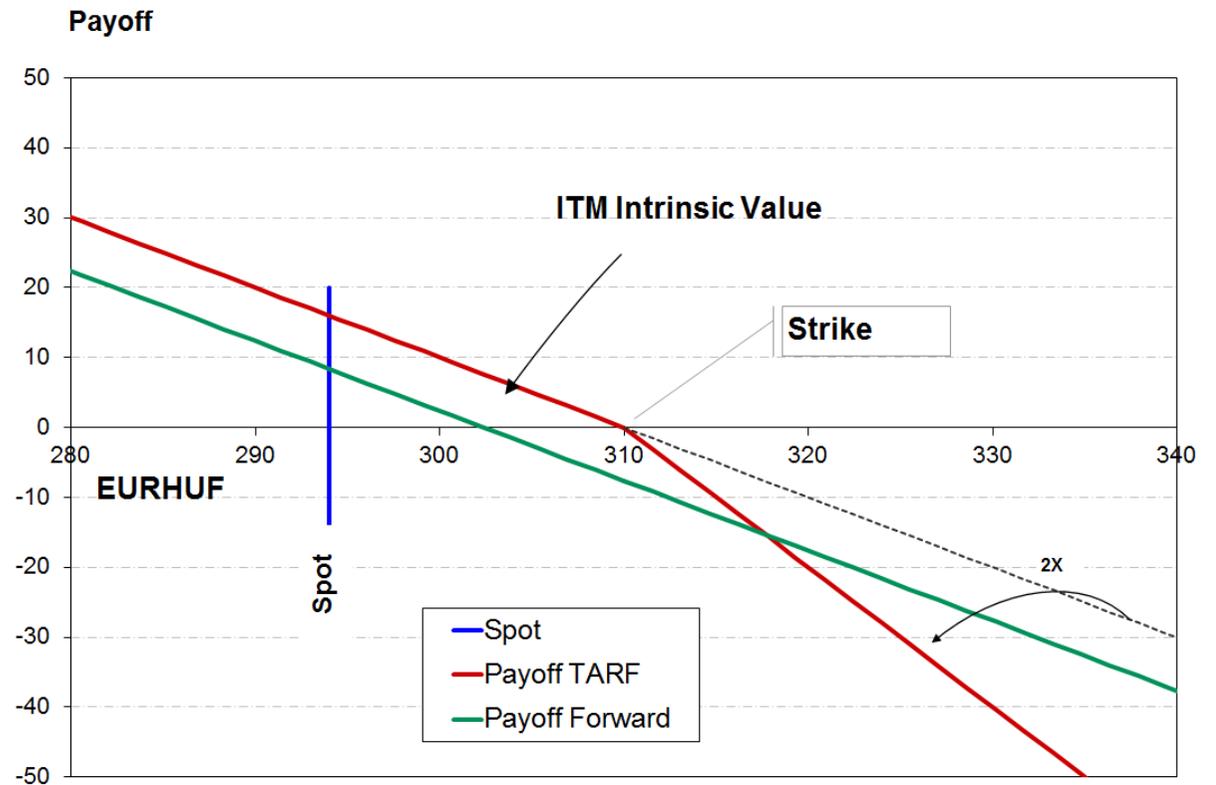
Trade Details	
Expiry Dates	from end January 2014 until end December 2014 (normal 1 month until 12 months)
Settlement Dates	Monthly, for 12 months
Notional Amount	EUR 1,000,000 vs EUR 2,000,000 per expiry
Strike rate	310.00
Spot Ref	294.00
Target (Knock-Out Amount)	75.00, (75 HUF per EUR)
Fixing source	12 ECB37

Total premium for customer is ZERO



Target Exact Knock-Out Forward

Payoff Diagram



Payout Profile

Intrinsic Value $\text{Max} [0 , (\text{strike} - \text{fixing})]$
 Accumulated IV Previous IV + new IV

If Accumulated IV < Target (75.00)

AND fixing \leq Strike custy sells 1 000 000 EUR at strike
 fixing > Strike custy sells 2 000 000 EUR at strike

If Accumulated IV \geq Target (75.00)

Custy sells a last time 1 000 000 EUR vs HUF at final strike

With final strike = final fixing + remaining IV

Remaining IV = target – previously accumulated intrinsic value

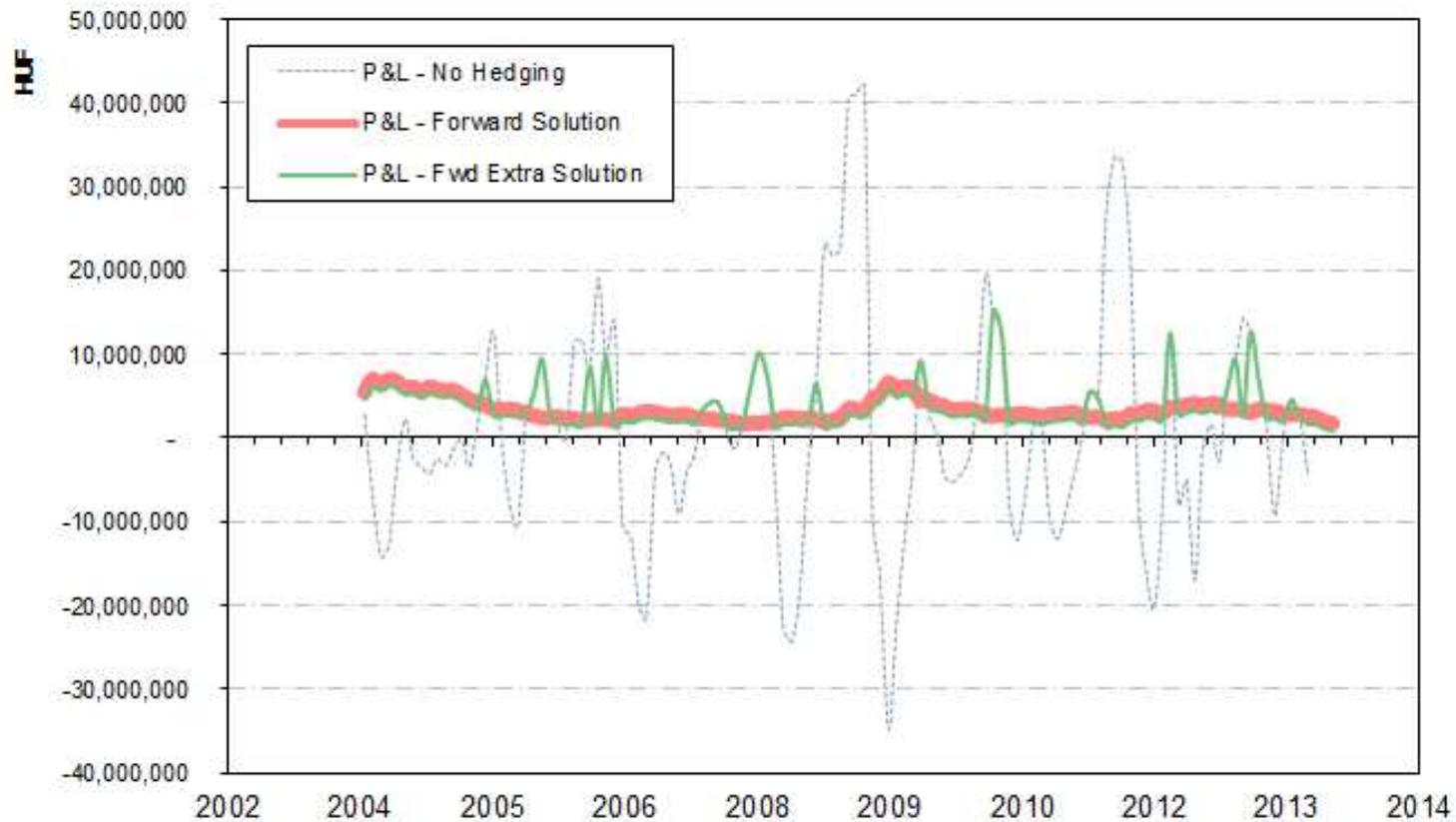


Solutions: Does it actually work ?.....P&L Volatility Reduction (Put EUR)

We look here at the 3 months mismatch between payable and receivables in HUF for 1Mio€ flows.

We analyze the volatility of the P&L on an historical basis depending of the strategy adopted. We consider monthly revaluations of the mismatch from end January 2004 to end October 2013.

On this chart is shown the P&L (in HUF) for several strategies.



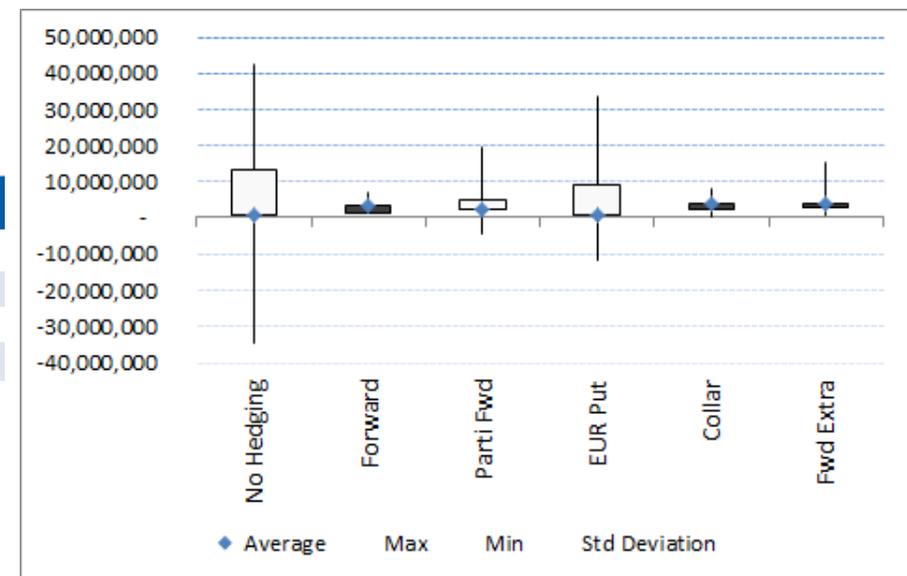
The EUR put strategy is assumed with strikes being the spot rate at trade date;
The Forward Extra and Collar strategy is assumed with put strike rate being at 99% at the money forward.



We observe that:

1. Not hedging the flows leads to an extremely volatile P&L.
2. The use of Forward reduces the most the P&L and thanks to historical deposit rate differential results in an almost zero P&L. This conclusion should hold also for Flexi-Forward since levels are very close.
3. The EUR put strategy reduces strongly the losses while permitting participation in a EUR appreciation. Nevertheless the premium paid may deteriorate the P&L especially in the case of high volatility.
4. The Forward Extra strategy reduces also the losses while leaving the possibility to get profits. Moreover the P&L is not penalized by any premium.

Monthly P&L (HUF)	No Hedging	Forward	Parti Fwd	EUR Put	Collar	Fwd Extra
Average	880,306	3,368,212	2,163,002	785,608	3,574,214	3,721,239
Std Deviation	13,317,581	1,306,494	4,644,454	9,059,268	2,112,847	2,730,909
Max	42,160,000	7,024,400	19,254,224	33,341,501	8,189,078	15,120,000
Min	-34,750,000	1,667,100	- 4,588,475	- 12,027,404	234,426	859,048

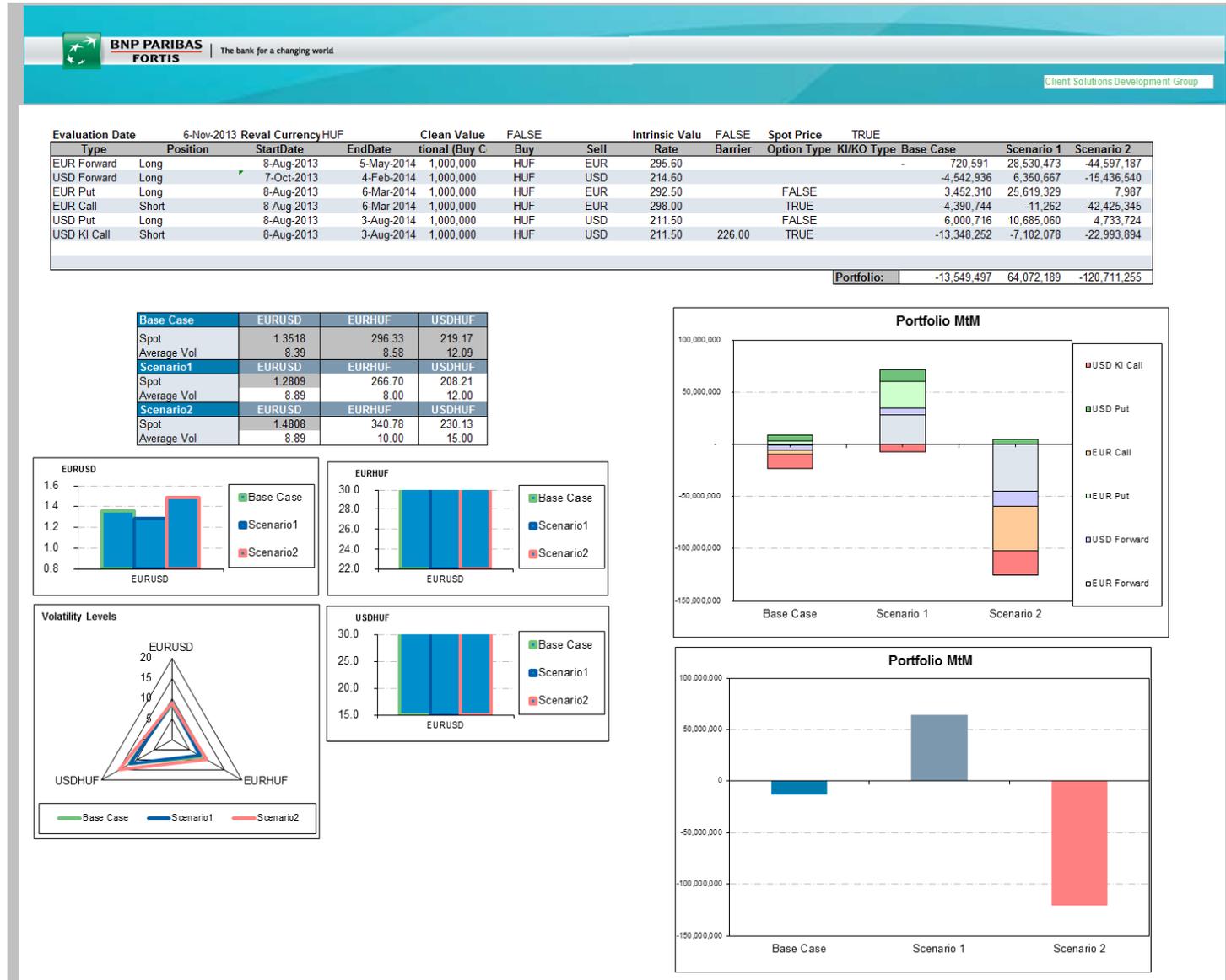


[Tools] : FXD Repricing module

Risk management and follow-up of interest rate and forex derivatives is made easy thanks to the set of tools we provide to our clients.

This tool is at your disposal for:

- Portfolio revaluation
- Scenario testing
- Sensitivity analysis
- Stress testing



[Tools] : IRD & FXD Repricing module

Interest rate and FX Products covered:

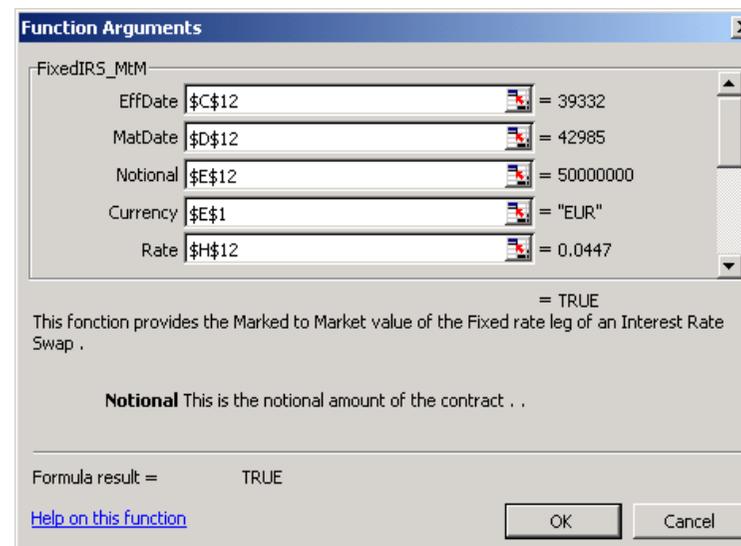
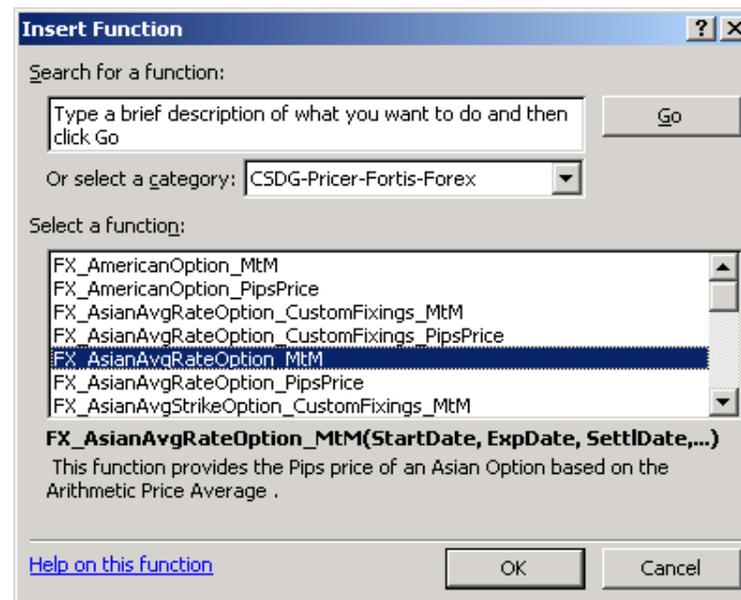
- Interest rate:
 - Bonds (float/fixed rate);
 - IR Swaps;
 - Caps/Floors (Vanilla, digital, Knock-In, Knock-out), Collars;
 - Swaptions;
- Forex:
 - Forward and swap contracts;
 - European, American Options;
 - Digital Options;
 - Chooser Options;
 - Single, Double Barrier Options;
 - Asian Options;
- Different currencies, day count conventions, spread;
- Free periodicity for monitoring barriers;
- With/without amortization table.

Evaluation Functions:

- Marked to Market value ;
- Clean/dirty value;
- Intrinsic/time value for options;
- Spot/forward points value for FX products;
- Future/Present Cash-flow Values & Cash-flow Dates;
- Pips price for Forex options;
- Basis Point Value, duration;
- Greeks for vanilla options.

Market data:

- Data introduced transparently in the Excel file;
- No remote connection for data feed.



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1. FX Risk Management Principles
Case study: Hungarian exporter ends up being net long EUR seller....
2. Risk Assessment
Fundamental Viewpoint: Macro-economic Outlook
Market Outlook: Volatilities
3. Hedging Solutions
Products ?
Effectiveness ?
4. **Translation Risk due to Consolidation**
5. Concluding Comments



"HOWEVER, BY USING AN ALTERNATE METHOD OF ACCOUNTING...."



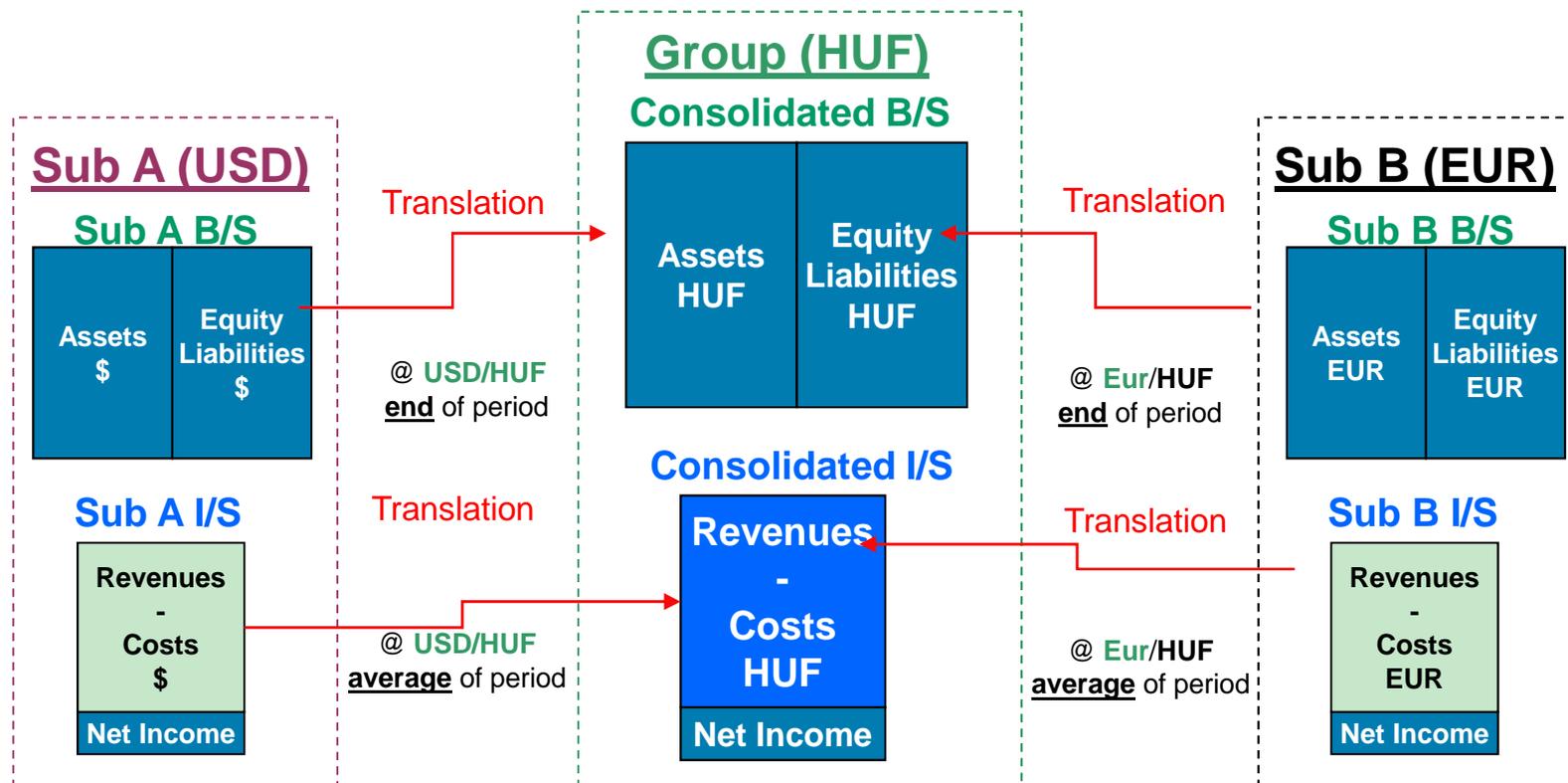
Consolidation principles

- Groups carry out foreign activities through foreign operation (subsidiaries, affiliates, joint ventures, branches).
- The foreign operations must be consolidated within the group using the group functional currency. Therefore, if foreign operation's functional currency is different from the Group reporting currency, the translation of a foreign operation financial statements expose the Group to FX risk.
- On consolidation, foreign operations financial statements are translated into Group reporting currency
 - Assets and liabilities are translated at **FX closing rate** at the date of the balance sheet;
 - Earnings items are translated at period **average rate**;
 - Equity is translated at **historical rate**.
- FX differences resulting from different translation rates are recognized in **Equity (translation reserve)**.



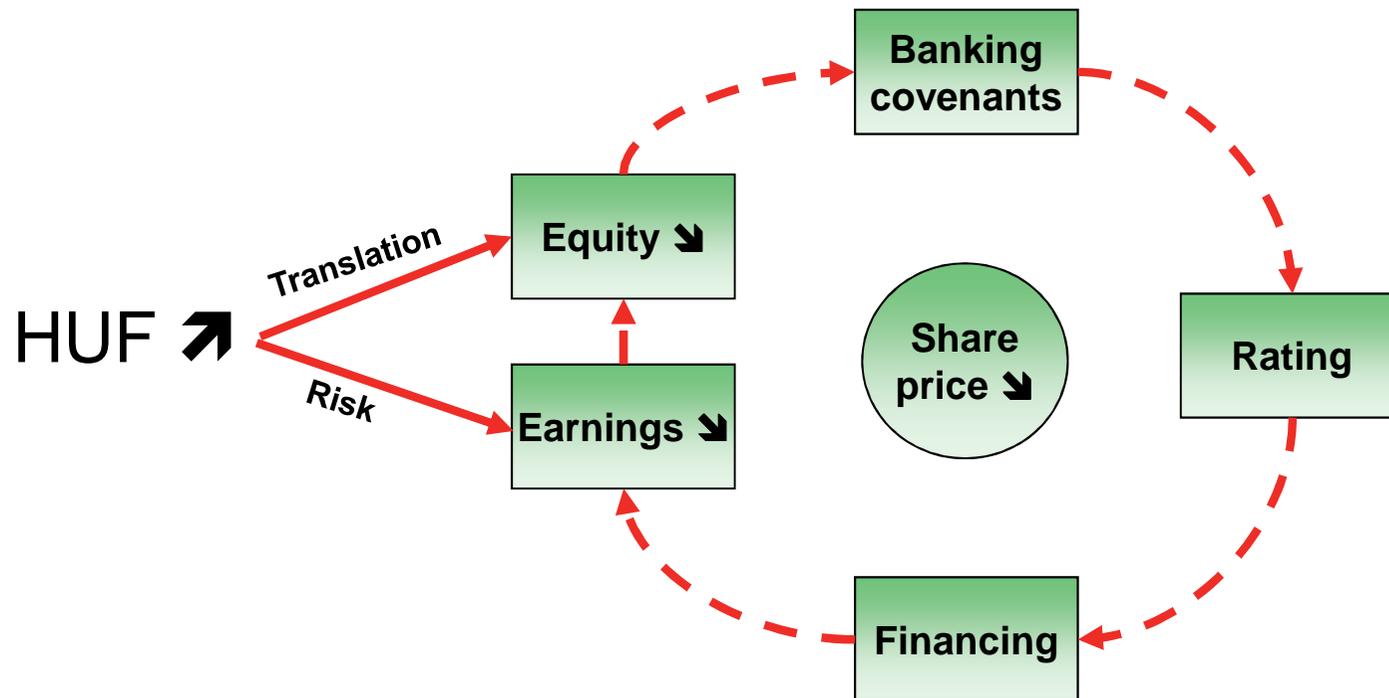
Translation risk

- Translation risk **arises from foreign operations being consolidated** into the Group reporting currency
 - Assets and liabilities are translated at FX closing rate at the date of the balance sheet;
 - Earnings items are translated at period average rate;
 - Equity is translated at historical rate.



Translation risk impacts

- In a **strengthening** HUF environment, Hungarian companies may suffer a significant decrease of their consolidated Equity and Earnings only due to the FX variations



Translation risk impacts

- Translation risk does impact financial statements and ratios

Balance Sheet	Income Statement	Ratios
<ul style="list-style-type: none">Shareholders' equity (translation adjustment)Net debt	<ul style="list-style-type: none">EBITDANet Income	<ul style="list-style-type: none">GearingNet debt ÷ EBITDAEarning per share

But hedging solutions exist

Net Investment hedge

Rational: optimising balance sheet sensibility to FX (shareholders' equity, gearing, Net debt/EBITDA)

Advantage: the product allows CFO's to reduce the volatility of financial indicators according to their priorities.

Hedge foreign net investments to protect shareholders' equity with

- FX forwards
- Cross Currency Swap
 - Fix/Fix
 - Fix/Floating
 - Floating/Floating

Net Income hedge

Rational: Reducing or cancelling the translation risk on consolidated net income.

Advantage: Stick to P&L forecasts whatever the FX rates.

Hedge of Net Income

- FX Average Rate Forward
- FX Average Rate option
- FX Average Rate Cylinder



Hedge accounting

There are three types of hedge accounting. Hedge accounting is an accounting method permitting to limit the P&L volatility due to derivatives' fair value.

	Hedged item	Derivative
Fair value Hedge	Gain or loss recognised in earnings for the portion being hedged	Derivative MtM at Fair Value Gain or loss in earnings
Cash Flow Hedge	Not recognized when forecasted Recognised when transaction occurs	Derivative MtM at Fair Value Gain or Loss in equity* and reclassified to earnings when transaction occurs
Net Investment hedge	Translation adjustment recorded in equity Reclassified to earnings when entity is sold	Derivative MtM at Fair Value Gain or Loss in equity* and reclassified to earnings when investment liquidated

**Portion which is effective as a hedge (non effective portion goes to earnings)*

- Translation risk arises from foreign operations being consolidated into the Group reporting currency
- Transaction risk arises from transactions denominated or settled in a foreign currency



[Tools] : Hedge Effectiveness Exploration Device (HEED™)

Hedge accounting enables to avoid P&L volatility due to derivative revaluation. In order to apply this technique, hedge effectiveness has to be proven.

- HEED is the BNP Paribas Fortis practical solution for assessing hedge effectiveness dedicated to our customers.
- HEED meets the IFRS requirements regarding the hedge effectiveness and its implementation.
- HEED covers a large range of hedging strategies and its open architecture allows for further instrument.

Underlying Product

Product Type: Fixed Rate Bond
 Start Date: 04/04/2005
 End Date: 04/04/2015
 Notional: 100000000
 Position Fixed: Short
 Currency Fixed: EUR
 Tenor Fixed: 3M
 Day Count Fixed: ACT/360
 Rate: 0.04

Hedging Product

Product Type: Interest Rate Swap
 Start Date: 04/04/2005
 End Date: 04/04/2015
 Notional: 100000000
 Position Fixed: Long
 Currency Fixed: EUR
 Tenor Fixed: 3M
 Day Count Fixed: ACT/360
 Spread: 0.0

Amortization

Marked to Market Fair Value

Frequency: Quarterly
 Pivot Date: 20/02/2008
 Number of Historical Dates: 0
 Number of Prospective Dates: 24

Translate Products Dates

Compute MTM
 Clean Price
 Intrinsic Value
 Cumulative Changes

Clear MTM

Hedge Tests

Hedge Tests
 Regression Analysis
 Volatility Reduction Method
 Dollar Offset Ratio
 T-test, F-test

Clear Tests

Dates	FV Fixed Rate Bond	DFV Fixed Rate Bond	FV Interest Rate Swap	DFV Interest Rate Swap	DFV Portfolio	Dollar Offset Ratio
57	2002/2008	-99,239,994.94	0.00	-774,159.54	0.00	
58	2005/2008	-97,931,990.47	1,308,904.47	-2,085,651.58	-1,311,493.04	-2,588.56
59	2008/2008	-97,601,715.07	1,638,279.88	-2,447,911.83	-1,673,753.29	-35,473.42
60	2011/2008	-102,298,235.53	-3,058,240.58	2,162,458.93	2,936,617.47	-121,623.11
61	2002/2009	-106,222,208.01	-6,982,213.07	6,096,613.51	6,870,772.05	-111,441.02
62	2005/2009	-106,231,645.14	-6,991,651.19	6,191,998.70	6,966,157.24	-25,493.96
63	2008/2009	-106,119,317.81	-6,873,322.86	6,104,533.65	6,878,832.19	-630.68
64	2011/2009	-106,840,245.40	-6,600,253.45	5,840,550.23	6,614,708.76	-14,455.91
65	19/02/2010	-105,412,125.03	-5,872,130.08	5,107,668.07	5,881,826.61	9,686.53
66	2005/2010	-104,382,082.91	-5,142,087.97	4,373,624.26	5,147,782.82	5,694.85
67	2008/2010	-103,728,401.53	-4,488,406.58	3,722,619.01	4,437,077.55	6,670.67
68	19/11/2010	-103,165,771.71	-3,925,776.77	3,110,526.68	3,884,685.22	-41,091.55
69	18/02/2011	-102,687,494.94	-3,427,499.90	2,681,541.46	3,436,700.00	6,200.10
70	2005/2011	-102,241,928.83	-3,001,933.88	2,184,205.32	2,958,363.85	-43,570.03
71	19/08/2011	-101,881,106.61	-2,641,111.67	1,874,263.51	2,648,422.05	7,310.38
72	18/11/2011	-101,573,900.47	-2,333,905.53	1,434,573.44	2,208,731.98	-125,173.55
73	2002/2012	-101,300,028.21	-2,060,033.27	1,231,222.93	2,005,381.47	-97,355.11
74	18/05/2012	-101,080,096.59	-1,840,101.64	1,053,355.74	1,827,514.28	-12,587.36
75	2008/2012	-100,876,828.25	-1,636,833.30	873,212.10	1,647,370.84	10,537.53
76	2011/2012	-100,708,070.36	-1,468,075.42	610,004.33	1,384,162.86	-83,912.56
77	2002/2013	-100,554,225.29	-1,314,230.35	501,952.93	1,276,111.47	-38,118.88
78	2005/2013	-100,425,935.11	-1,185,940.16	405,218.01	1,179,376.55	-99,455.11
79	2008/2013	-100,313,504.42	-1,073,509.48	310,252.01	1,084,410.55	10,901.08
80	2011/2013	-100,209,493.63	-969,498.69	132,857.26	907,115.80	-62,362.83
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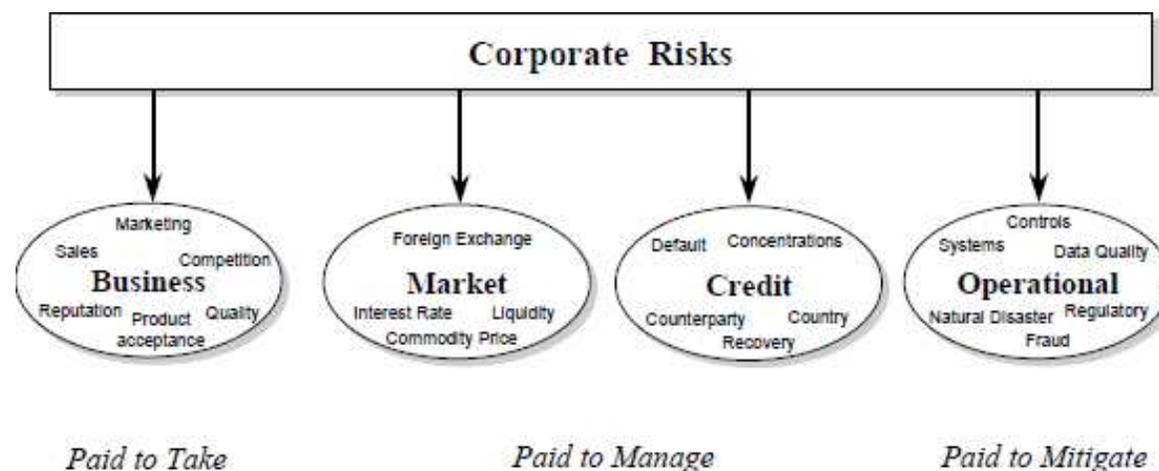
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Risk Management Benefits

- Increased transparency of risks ⇒ IFRS9, IAS39
- Communication ⇒ Rating agencies, shareholders, regulators
- Hedging decisions ⇒ Preserving margins, hedging anticipated transactions
- Capital allocation & performance evaluation
- Business risk monitoring

Each corporate should be able to assess the relative magnitude of market risk to business risk



Questions **you** should be asking.....

- Is there a strict hedging policy in place ?
 - Take into account the treasury policy and its objectives

 - Are we allowed to deal in options:
 - At all? Just as buyer? As a buyer and seller?

 - Are we allowed to deal in Exotic Options ?

 - How averse are we to paying for a risk management solution?
 - Paying premium or zero-cost solutions

- Do we need complete protection against any movements in price?

- If a degree of risk is tolerated, what is the balance between:
 - The desire to obtain upside savings
 - The desire to avoid downside risk

- What is our view of future market movements?

- Do we have a benchmark rate or price which must be achieved?
 - Will decide if we will use “participation” or “beat-the-market“ strategies



To conclude...

- FX risk is too important to be ignored,
- Natural hedges can be done thanks to correlation,
- Correct assessment of exposures have to be carried out,
- Optional products offer lot of flexibility while ensuring protection at a given level,
- Risk Management tools are available to clients.



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