

LCH vs Eurex: Central Counterparty Basis Spread

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Valuation Financial Instruments

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RISKMANAGEMENTforBANKS 2017 – Cologne, 08/11/2017

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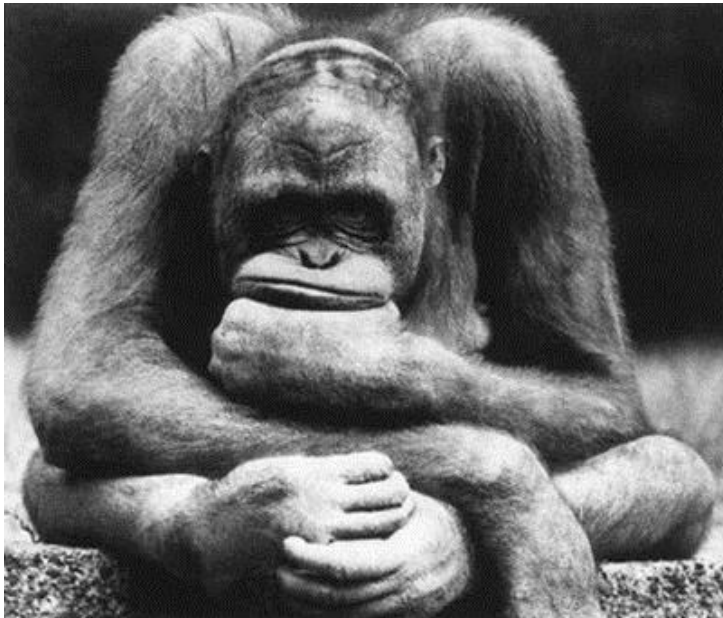
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Questions to be answered

- What is the central counterparty (CCP) basis?
- Reasons for the existence of the CCP basis
- Is this relevant for me? Where to start?



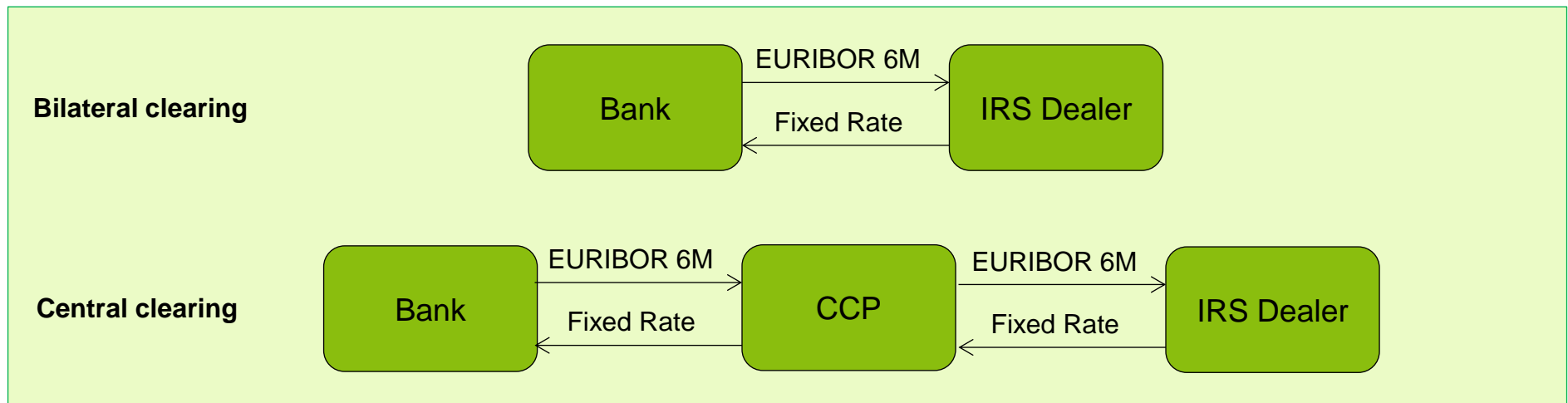
Agenda

1. Background
2. CCP-Basis
3. Market Data
4. “Eurex” Curves
5. Final remarks

Background

Legal framework in European Union

- EMIR regulation 648/2012 requires **clearing** of OTC IR derivatives via **CCP**
 - EUR, USD, GBP, JPY and later NOK, SEK, PLN
- **Clearing** – the process of establishing positions ensuring that financial means are available to secure the exposures arising from those positions
- **Central counterparty (CCP)** - legal person that interposes itself between the counterparties becoming the buyer to every seller and the seller to every buyer. Major CCPs in EU: **LCH Ltd** and **Eurex Clearing AG**



Background

Cleared IR Swap

- Exchanges 6m EURIBOR for fixed rate
- Quoted as a fixed rate on the market
- Fixed rate ↔ Average expected EURIBOR
- Collateral
 - Variation margin - VM (~MtM)
 - Initial margin - IM (~5-10d VaR(MtM))

Eurex IM for 10mln IR swap, EUR

Maturity	Flavor	
	Pay	Rec
10y	279K	271K
30y	978K	762K

ID: _____ Version: _____ State: _____ 03/11/2017

Clearing house / Clearing member / Broker _____

Trade Diary: NO Pay: Receive: T248 TradeCleared: NONE

Company / Desk / Book / Folder _____

DEPFA _____

Portfolio _____

Trade

Start 07/11/2017 End 07/11/2027

Pay Receive

Ccy EUR Ntl 10,000,000.00 Ccy EUR Ntl 10,000,000.00

Index FIXED Ntl exp _____ Index EO6M Ntl exp _____

Term _____ Rate 0.84 Term 6M Rate _____

Basis 30/360 Spread _____ Basis A360 Spread _____

Counterparty _____ Broker _____ Do!

Product / Formula _____

[Product description] _____ [Product description] _____

More...

Schedule

	Freq	Day	Roll date	Cal		Freq	Day	Roll date	Cal
Pay	A	7	MF	EUR	Pay	S	7	MF	EUR
Reset					Reset	S	7	MF	EUR

Valuation

Pay -827,836.27 EUR Net 0.02 EUR Receive 827,836.29 EUR

Encumbered _____ EVT _____

CCP Basis Example 1

- The same financial instrument, e.g. 30y swap
- Substantially different swap rates (152bp vs 155.2 bp) depending on the clearing house

<Menu> to Return

97) Settings- 98) Output- 200) Show in Launchpad Page 1/1 ICAP Global Menu

3s Vs CME & Eurex 6s Vs CME & Eurex Interest Rate Swaps Forward Euro FX Forward Euro FX (Private)

ICAP EUR vs 6s 6) MSG Contributor 16:23:26
Zoom 100%

ICAP Global Menu -> ICAP EMEA -> Country -> UK, London -> EUR Swaps & MM -> 6s Vs CME & Eurex

Term	Eur vs 6s	Basis	CME	Eur vs 6s	Basis	Eurex
1) 2Y	-0.204	-0.150	-0.206	-0.204	0.350	-0.201
2) 3Y	-0.089	-0.200	-0.091	-0.089	0.550	0.084
3) 4Y	0.043	-0.250	0	0.043	0.650	0.050
4) 5Y	0.180	-0.300	0	0.180	0.800	0.188
5) 6Y	0.317	-0.450	0.313	0.317	1.000	0.327
6) 7Y	0.451	-0.550	0.446	0.451	1.150	0.463
7) 8Y	0.582	-0.600	0.576	0.582	1.300	0.595
8) 9Y	0.705	-0.650	0.699	0.705	1.500	0.720
9) 10Y	0.819	-0.700	0.812	0.819	1.700	0.836
10) 12Y	1.013	-0.700	1.006	1.013	1.900	1.032
11) 15Y	1.223	-0.750	1.216	1.223	2.200	1.245
12) 20Y	1.410	-0.800	1.402	1.410	2.700	1.437
13) 25Y	1.485	-0.850	1.477	1.485	2.950	1.515
14) 30Y	1.520	-0.900	1.511	1.520	3.200	1.552

LCH

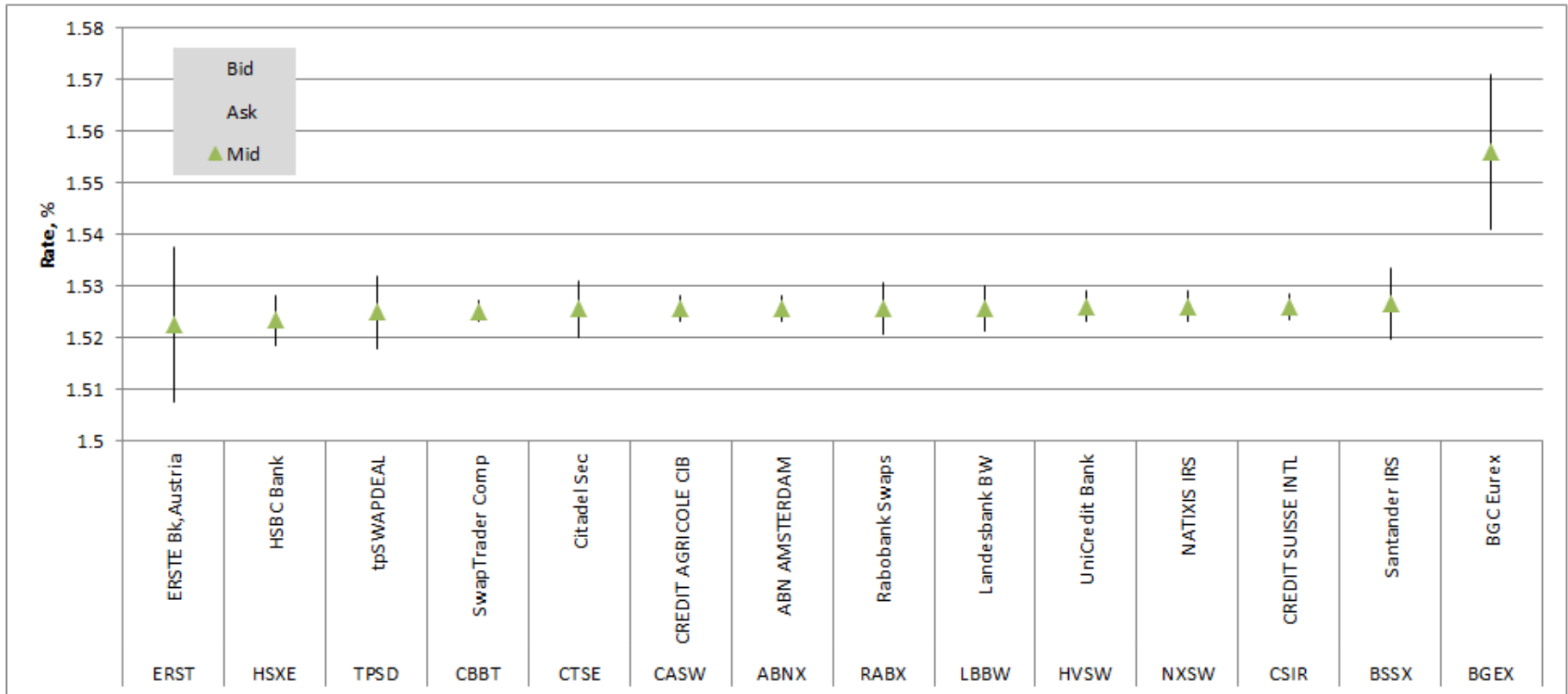
Eurex

CCP Basis

CCP Basis

Example 2

- The same financial instrument, e.g. 30y swap
- Substantially different swap rates (152bp vs 155.2 bp) depending on the clearing house



CCP Basis

Example 3

- History of the Eurex-LCH basis spread for 10y and 30y swaps
- CCP-basis is unlikely to disappear



CCP basis

Reasons for existence

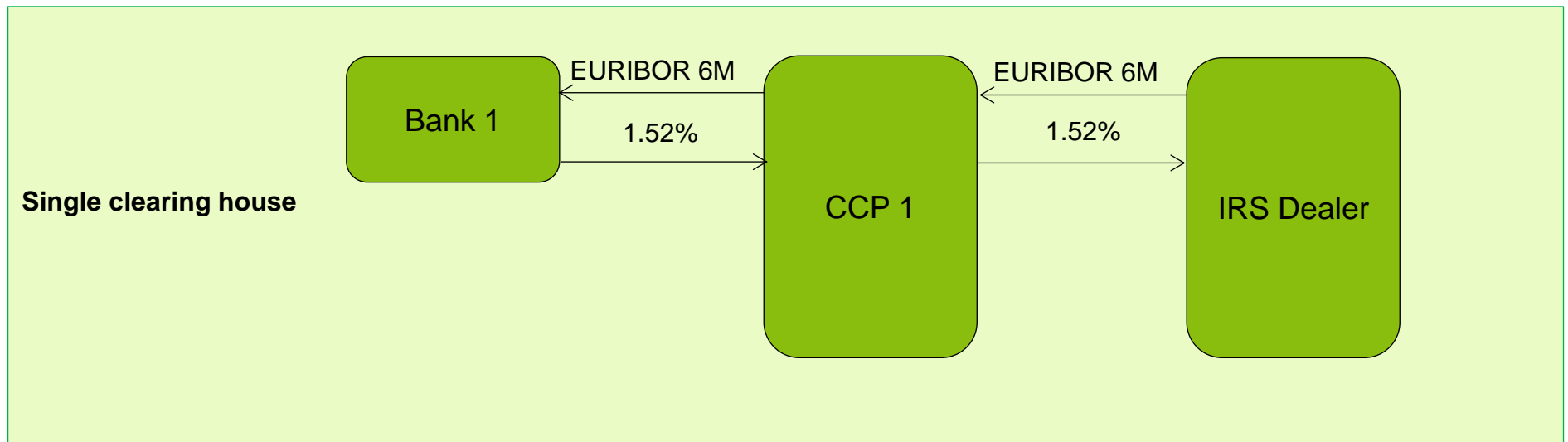
- Different incremental costs associated with particular clearing house
 - Initial Margin Requirements
 - Range of Clearing House Eligible Collateral & Haircuts;
 - Default Fund contribution
 - Netting Efficiencies across asset classes;
 - Cross Margining Efficiencies across listed and OTC derivative products;
 - Different market view on CCP credit risk.
 - **Dealer imbalance/supply-demand considerations**

$$\text{CCP_Basis} = [(\text{MVA}_2 + \text{OtherCosts}_2) - (\text{MVA}_1 + \text{OtherCosts}_1)] / \text{PV01}$$

CCP-Basis

IM netting as reason for CCP-basis (1)

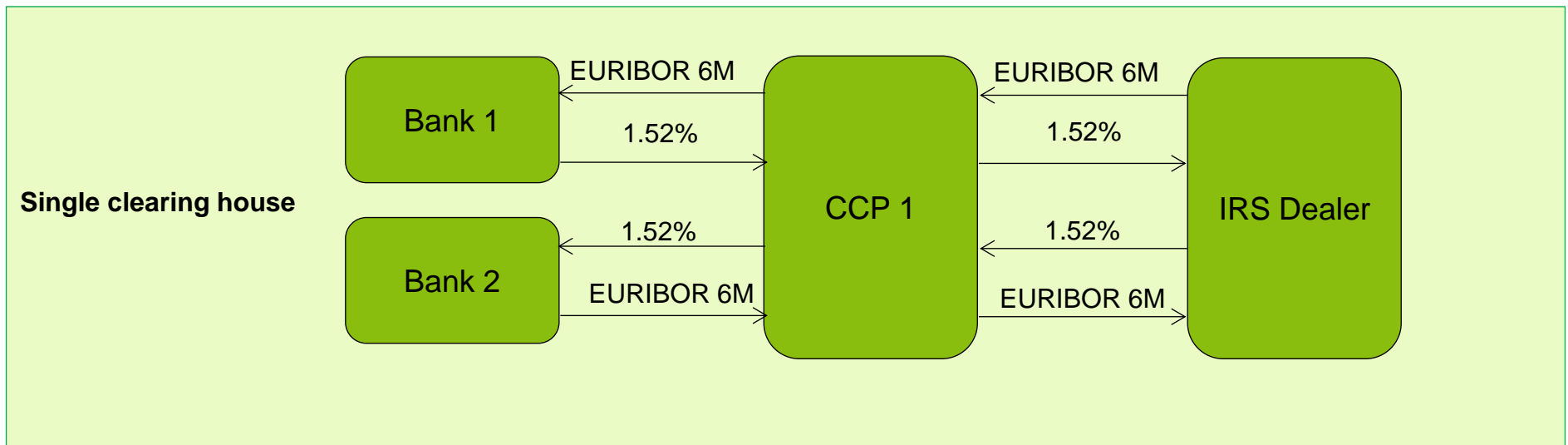
- Mirror trades in the same clearing house



CCP-Basis

IM netting as reason for CCP-basis (2)

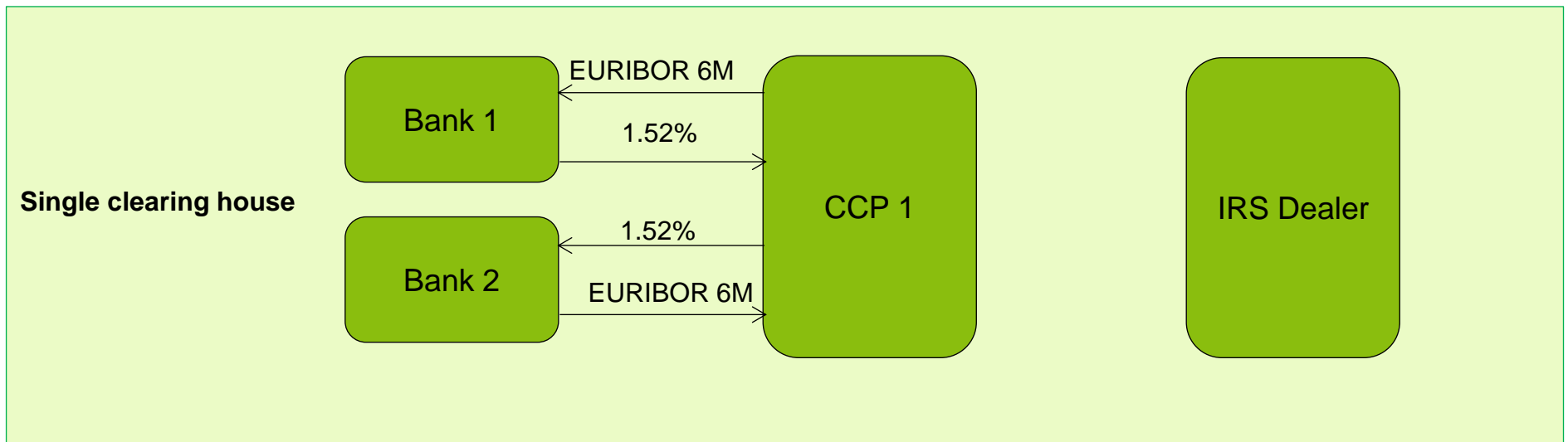
- Mirror trades in the same clearing house



CCP-Basis

IM netting as reason for CCP-basis (3)

- Mirror trades in the same clearing house

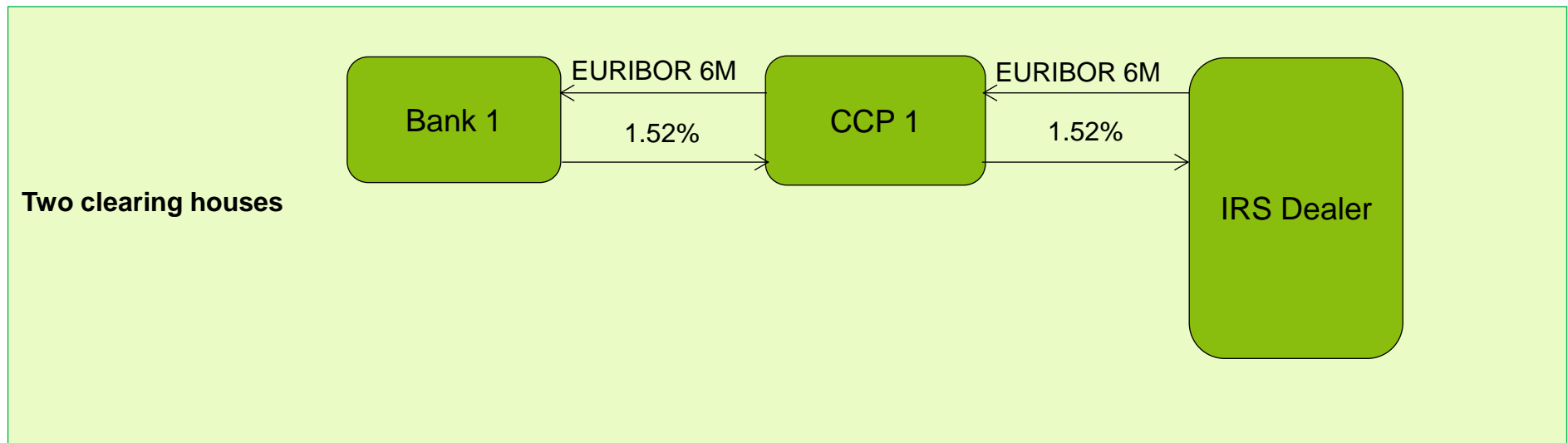


- Perfect match, trades are compressed => no position, no initial margin

CCP-Basis

IM netting as reason for CCP-basis (4)

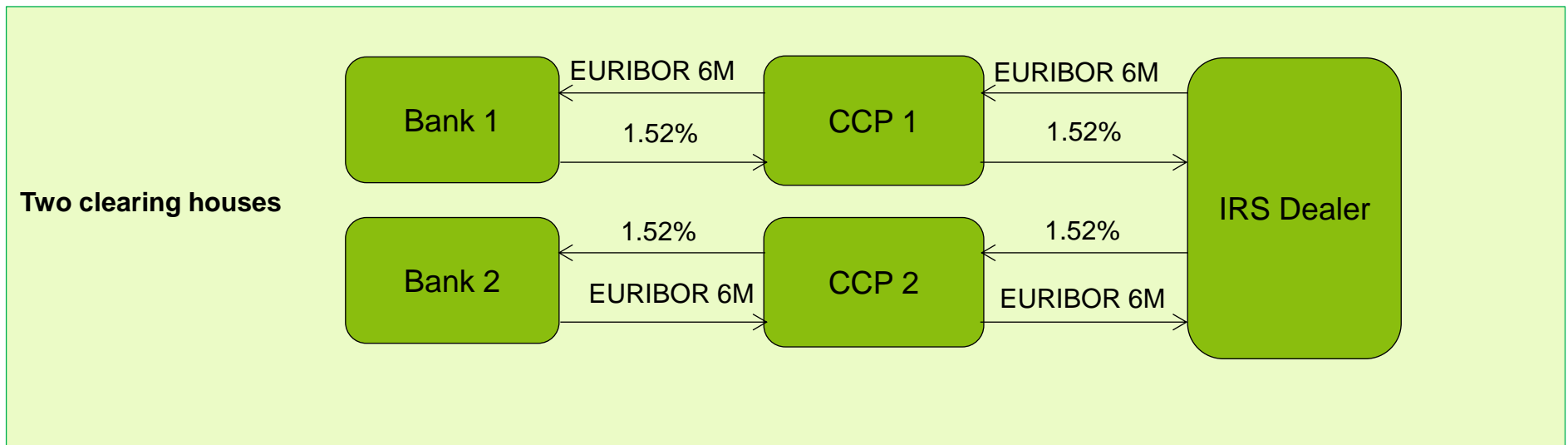
- Mirror trades in the different clearing houses



CCP-Basis

IM netting as reason for CCP-basis (5)

- Mirror trades in the different clearing houses
- No netting => IM for payer swap in CCP1 + IM for receiver swap in CCP2



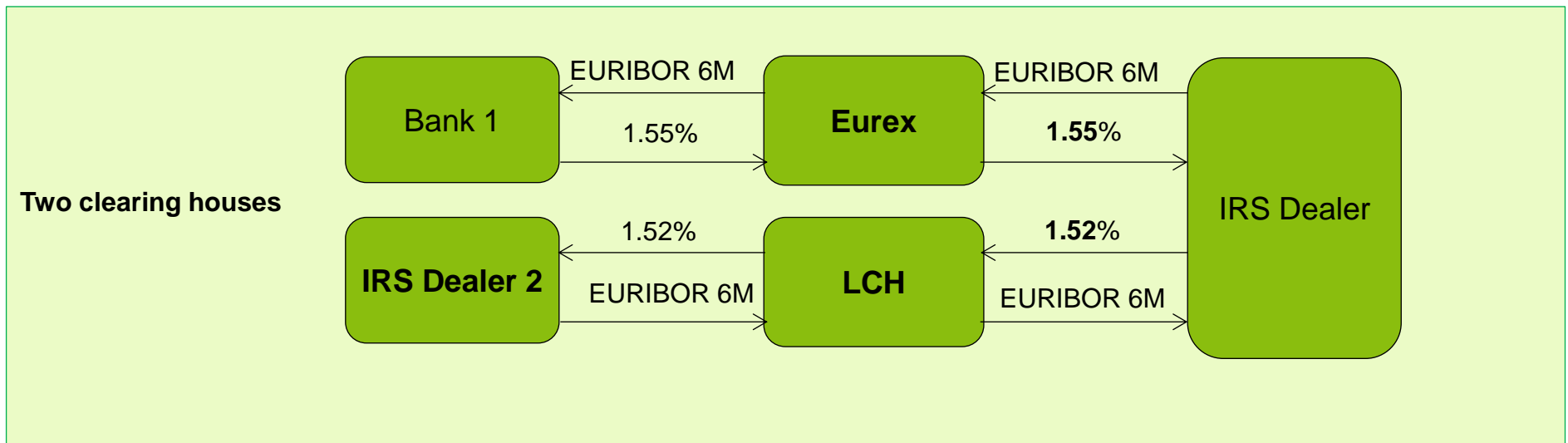
Eurex IM for 10mIn IR swap, EUR

Maturity	Flavor	
	Pay	Rec
10y	279K	271K
30y	978K	762K

CCP-Basis

IM netting as reason for CCP-basis (5)

- Eurex clears primary fixed rate payers
- Not enough clients to build the hedge for IRS dealers => Hedge at LCH



Market Data

Directly Quoted CCP-basis

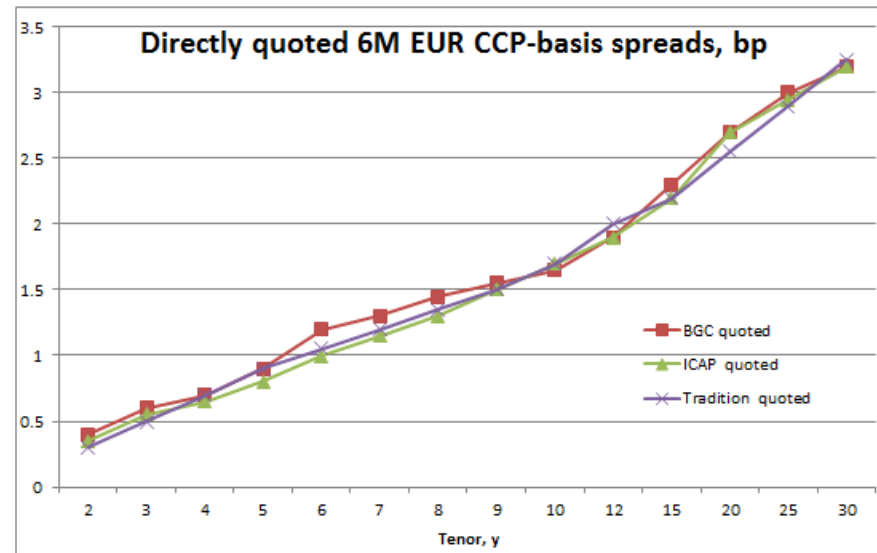
- ICAP, Tradition and BGC quote Eurex-LCH basis for 6m based swaps

AsOf 06/11/2017

Directly quoted

CFSW ICPL TEUX

EUR 6M IRS	BGC quoted	ICAP quoted	Tradition quoted
1 EULCEX1	0.25	#N/A N/A	#N/A N/A
2 EULCEX2	0.4	0.35	0.3
3 EULCEX3	0.6	0.55	0.5
4 EULCEX4	0.7	0.65	0.7
5 EULCEX5	0.9	0.8	0.9
6 EULCEX6	1.2	1	1.05
7 EULCEX7	1.3	1.15	1.2
8 EULCEX8	1.45	1.3	1.35
9 EULCEX9	1.55	1.5	1.5
10 EULCEX10	1.65	1.7	1.7
12 EULCEX12	1.9	1.9	2
15 EULCEX15	2.3	2.2	2.2
20 EULCEX20	2.7	2.7	2.55
25 EULCEX25	3	2.95	2.9
30 EULCEX30	3.2	3.2	3.25
40 EULCEX40	3.7	#N/A N/A	#N/A N/A
50 EULCEX50	=BDH(\$B23&" "&CS4&" Curncy","PX_LAST" SCS1 SCS1)		



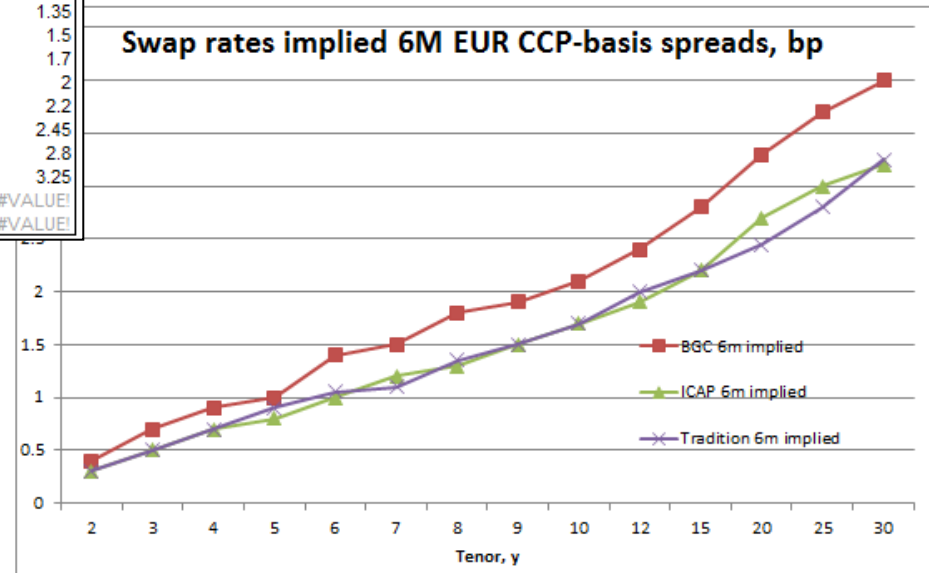
Market Data

6M swaps implied CCP-basis

- ICAP, Tradition and BGC quote Eurex and for LCH cleared 6m swaps rates

Implied CCP-Basis spreads															
		BGCX			BGC			IREX		ICPL		TEUX		TRPU	
EUR 6M IRS	BGC 6m implied			ICAP 6m implied			Tradition 6m implied								
	Eurex	LCH	CCP spread, bp	Eurex	LCH	CCP spread, bp	Eurex	LCH	CCP spread, bp	Eurex	LCH	CCP spread, bp			
1 EUSA1	-0.265	-0.267	0.2	#N/A	N/A	-0.267	#VALUE!	#N/A	N/A	-0.267	#VALUE!				
2 EUSA2	-0.199	-0.203	0.4	-0.201	-0.204	0.3	-0.201	-0.204	0.3	-0.201	-0.204	0.3			
3 EUSA3	-0.082	-0.089	0.7	-0.084	-0.089	0.5	-0.084	-0.089	0.5	-0.084	-0.089	0.5			
4 EUSA4	0.052	0.043	0.9	0.051	0.044	0.7	0.05	0.043	0.7	0.05	0.043	0.7			
5 EUSA5	0.19	0.18	1	0.189	0.181	0.8	0.191	0.182	0.9	0.191	0.182	0.9			
6 EUSA6	0.329	0.315	1.4	0.327	0.317	1	0.3275	0.317	1.05	0.3275	0.317	1.05			
7 EUSA7	0.463	0.448	1.5	0.462	0.45	1.2	0.462	0.451	1.1	0.462	0.451	1.1			
8 EUSA8	0.594	0.576	1.8	0.593	0.58	1.3	0.5935	0.58	1.35	0.5935	0.58	1.35			
9 EUSA9	0.718	0.699	1.9	0.718	0.703	1.5	0.718	0.703	1.5	0.718	0.703	1.5			
10 EUSA10	0.832	0.811	2.1	0.833	0.816	1.7	0.833	0.816	1.7	0.833	0.816	1.7			
12 EUSA12	1.028	1.004	2.4	1.029	1.01	1.9	1.03	1.01	2	1.03	1.01	2			
15 EUSA15	1.242	1.214	2.8	1.242	1.22	2.2	1.242	1.22	2.2	1.242	1.22	2.2			
20 EUSA20	1.433	1.4	3.3	1.434	1.407	2.7	1.4325	1.408	2.45	1.4325	1.408	2.45			
25 EUSA25	1.512	1.475	3.7	1.512	1.482	3	1.511	1.483	2.8	1.511	1.483	2.8			
30 EUSA30	1.549	1.509	4	1.55	1.518	3.2	1.5505	1.518	3.25	1.5505	1.518	3.25			
40 EUSA40	=BDH(B46;"	=SCS28&"	Currency",	PX_LAST",	SCS1,SCS1)		#N/A	N/A	1.54	#VALUE!					
50 EUSA50	1.55	1.5	5	#N/A	N/A	1.511	#VALUE!	#N/A	N/A	1.512	#VALUE!				

Swap rates implied 6M EUR CCP-basis spreads, bp

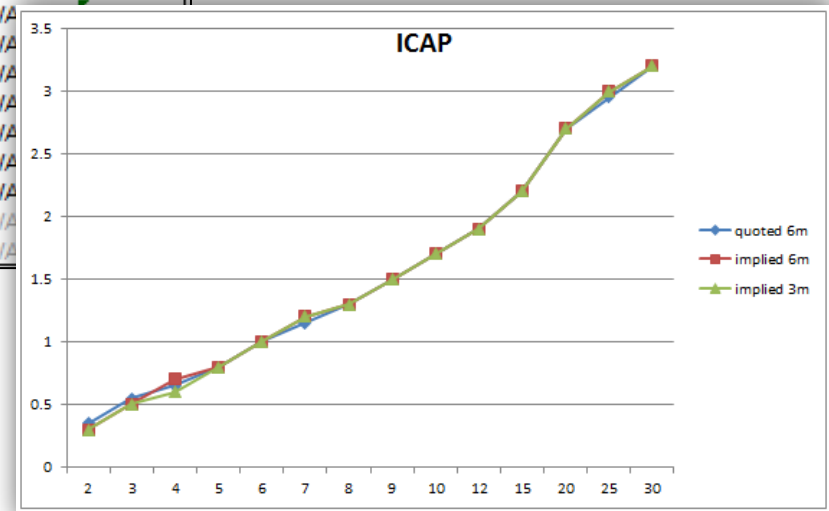
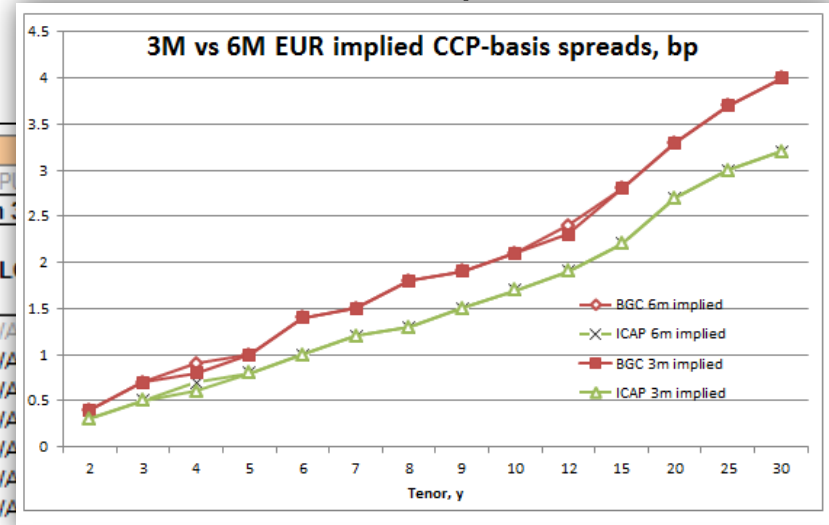


Market Data

3M swaps implied CCP-basis

- ICAP and BGC quote Eurex-LCH basis for 3m based swaps

Implied CCP-Basis spreads													
		BGEX	BGCE	IREX			ICPL		TEUX		TRPL		
		BGC 3m implied			ICAP 3m implied			Tradition					
EUR 3M IRS		Eurex	LCH	CCP spread, bp	Eurex	LCH	CCP spread, bp	Eurex	LCH				
1	EUSW1V3	#N/A	N/A	#N/A	N/A	#VALUE!	#N/A	N/A	-0.325	#VALUE!	#N/A	N/A	#N/A
2	EUSW2V3	-0.268	-0.272	0.4	-0.27	-0.273	0.3	#N/A	N/A	#N/A	N/A	#N/A	#N/A
3	EUSW3V3	-0.161	-0.168	0.7	-0.163	-0.168	0.5	#N/A	N/A	#N/A	N/A	#N/A	#N/A
4	EUSW4V3	-0.037	-0.045	0.8	-0.038	-0.044	0.6	#N/A	N/A	#N/A	N/A	#N/A	#N/A
5	EUSW5V3	0.094	0.084	1	0.093	0.085	0.8	#N/A	N/A	#N/A	N/A	#N/A	#N/A
6	EUSW6V3	0.229	0.215	1.4	0.227	0.217	1	#N/A	N/A	#N/A	N/A	#N/A	#N/A
7	EUSW7V3	0.361	0.346	1.5	0.36	0.348	1.2	#N/A	N/A	#N/A	N/A	#N/A	#N/A
8	EUSW8V3	0.492	0.474	1.8	0.491	0.478	1.3	#N/A	N/A	#N/A	N/A	#N/A	#N/A
9	EUSW9V3	0.617	0.598	1.9	0.618	0.603	1.5	#N/A	N/A	#N/A	N/A	#N/A	#N/A
10	EUSW10V3	0.734	0.713	2.1	0.735	0.718	1.7	#N/A	N/A	#N/A	N/A	#N/A	#N/A
12	EUSW12V3	0.937	0.914	2.3	0.939	0.92	1.9	#N/A	N/A	#N/A	N/A	#N/A	#N/A
15	EUSW15V3	1.162	1.134	2.8	1.162	1.14	2.2	#N/A	N/A	#N/A	N/A	#N/A	#N/A
20	EUSW20V3	1.367	1.334	3.3	1.368	1.341	2.7	#N/A	N/A	#N/A	N/A	#N/A	#N/A
25	EUSW25V3	1.456	1.419	3.7	1.456	1.426	3	#N/A	N/A	#N/A	N/A	#N/A	#N/A
30	EUSW30V3	1.5	1.46	4	1.501	1.469	3.2	#N/A	N/A	#N/A	N/A	#N/A	#N/A
40	EUSW40V3	1.537	1.491	4.6	#N/A	N/A	1.5	#VALUE!	#N/A	N/A	#N/A	#N/A	#N/A
50	EUSW50V3	=BDH(B68;"&"&SC\$28;" Curncy", "PX_LAST" SC\$1 SC\$1)											



“Eurex” Curves

Change in the valuation methodology at Eurex Clear AG



DEUTSCHE
PFANDBRIEFBANK

- Eurex uses its own curves for margin calculation starting from 18/12/2017

eurex clearing circular 107/17

Date: 24 October 2017
Recipients: All Eurex Clearing Members, Non-Clearing Members, Registered Customers, FCM Clients, Basic Clearing Members of Eurex Clearing AG and Vendors
Authorized by: Thomas Laux

Eurex OTC Clear: EUR OTC IRS valuation by Eurex Clearing

Contact: EurexOTC Helpdesk, T +49-69-211-1 28 28, OTCClear@eurexclearing.com

Content may be most important for:

☞ All departments

Attachment:

None

Summary:

Eurex Clearing continues its ongoing effort to deliver market best practice as well as a prudent risk management. As a result of the continued growth and increased liquidity of our OTC IRS Clearing offering, Eurex Clearing specific EUR OTC IRS prices have become liquid and available in the market. To align our valuation methods for variation as well as initial margins to market observed prices and to further strengthen the price basis for our default management processes, these **Eurex Clearing specific observations will be included in the end of day as well as intraday calculations for EUR OTC IRS starting on 18 December 2017.**

No changes to reports or any other processes are required on member or vendor side.

Changes to the EUR swap curves underlying the mark-to-market and margin calculation will be done for all tenor curves on the input quote level (Eonia, 1m-, 3m-, 6m-, 12m-EURIBOR).

	Eurex cleared EUR from Tradition				
Time to maturity	EONIA 1D	EURIBOR 1M	EURIBOR 3M	EURIBOR 6M	EURIBOR 12M
ON	EONIA=				
TN					
SN					
SW	EUREONE3W=TRDL				
2W	EUREONE2W=TRDL				
3W	EUREONE3W=TRDL				
1M	EUREONE1M=TRDL	EURIBOR1M=			
2M	EUREONE2M=TRDL	EURAM1EE2M=TRDL			
3M	EUREONE3M=TRDL	EURAM1EE3M=TRDL	EURIBOR3M=		
4M	EUREONE4M=TRDL	EURAM1EE4M=TRDL	EUR1X4F=TRDL		
5M	EUREONE5M=TRDL	EURAM1EE5M=TRDL	EUR2X5F=TRDL		
6M	EUREONE6M=TRDL	EURAM1EE6M=TRDL	EUR3X6F=TRDL	EURIBOR6M=	
7M	EUREONE7M=TRDL	EURAM1EE7M=TRDL	EUR4X7F=TRDL	EUR1X7F=TRDL	
8M	EUREONE8M=TRDL	EURAM1EE8M=TRDL	EUR5X8F=TRDL	EUR2X8F=TRDL	
9M	EUREONE9M=TRDL	EURAM1EE9M=TRDL	EUR6X9F=TRDL	EUR3X9F=TRDL	
10M	EUREONE10M=TRDL	EURAM1EE10M=TRDL	EUR7X10F=TRDL	EUR4X10F=TRDL	
11M	EUREONE11M=TRDL	EURAM1EE11M=TRDL	EUR8X11F=TRDL	EUR5X11F=TRDL	
1Y	EUREONE1Y=TRDL	EURAM1EE1Y=TRDL	EURAB3EE1Y=TRDL	EURAB6EE1Y=TRDL	EURIBOR12M=
15M		EURAM1EE15M=TRDL			
18M	EUREONE18M=TRDL	EURAM1EE18M=TRDL	EURAB3EE18M=TRDL	EURAB6EE18M=TRDL	
21M		EURAM1EE21M=TRDL			
2Y	EUREONE2Y=TRDL	EUR1E6EE2Y=TRDL	EUR3E6EE2Y=TRDL	EURAB6EE2Y=TRDL	EURGE12EE2Y=TRDL
3Y	EUREONE3Y=TRDL	EUR1E6EE3Y=TRDL	EUR3E6EE3Y=TRDL	EURAB6EE3Y=TRDL	EURGE12EE3Y=TRDL
4Y	EUREONE4Y=TRDL	EUR1E6EE4Y=TRDL	EUR3E6EE4Y=TRDL	EURAB6EE4Y=TRDL	EURGE12EE4Y=TRDL
5Y	EUREONE5Y=TRDL	EUR1E6EE5Y=TRDL	EUR3E6EE5Y=TRDL	EURAB6EE5Y=TRDL	EURGE12EE5Y=TRDL
6Y	EUREONE6Y=TRDL	EUR1E6EE6Y=TRDL	EUR3E6EE6Y=TRDL	EURAB6EE6Y=TRDL	EURGE12EE6Y=TRDL
7Y	EUREONE7Y=TRDL	EUR1E6EE7Y=TRDL	EUR3E6EE7Y=TRDL	EURAB6EE7Y=TRDL	EURGE12EE7Y=TRDL
8Y	EUREONE8Y=TRDL	EUR1E6EE8Y=TRDL	EUR3E6EE8Y=TRDL	EURAB6EE8Y=TRDL	EURGE12EE8Y=TRDL
9Y	EUREONE9Y=TRDL	EUR1E6EE9Y=TRDL	EUR3E6EE9Y=TRDL	EURAB6EE9Y=TRDL	EURGE12EE9Y=TRDL
10Y	EUREONE10Y=TRDL	EUR1E6EE10Y=TRDL	EUR3E6EE10Y=TRDL	EURAB6EE10Y=TRDL	EURGE12EE10Y=TRDL
11Y					
12Y	EUREONE12Y=TRDL	EUR1E6EE12Y=TRDL	EUR3E6EE12Y=TRDL	EURAB6EE12Y=TRDL	EURGE12EE12Y=TRDL
15Y	EUREONE15Y=TRDL	EUR1E6EE15Y=TRDL	EUR3E6EE15Y=TRDL	EURAB6EE15Y=TRDL	EURGE12EE15Y=TRDL
20Y	EUREONE20Y=TRDL	EUR1E6EE20Y=TRDL	EUR3E6EE20Y=TRDL	EURAB6EE20Y=TRDL	EURGE12EE20Y=TRDL
25Y	EUREONE25Y=TRDL	EUR1E6EE25Y=TRDL	EUR3E6EE25Y=TRDL	EURAB6EE25Y=TRDL	EURGE12EE25Y=TRDL
30Y	EUREONE30Y=TRDL	EUR1E6EE30Y=TRDL	EUR3E6EE30Y=TRDL	EURAB6EE30Y=TRDL	EURGE12EE30Y=TRDL
35Y					
40Y		EUR1E6EE40Y=TRDL	EUR3E6EE40Y=TRDL	EURAB6EE40Y=TRDL	EURGE12EE40Y=TRDL
45Y					
50Y	EUREONE50Y=TRDL	EUR1E6EE50Y=TRDL	EUR3E6EE50Y=TRDL	EURAB6EE50Y=TRDL	

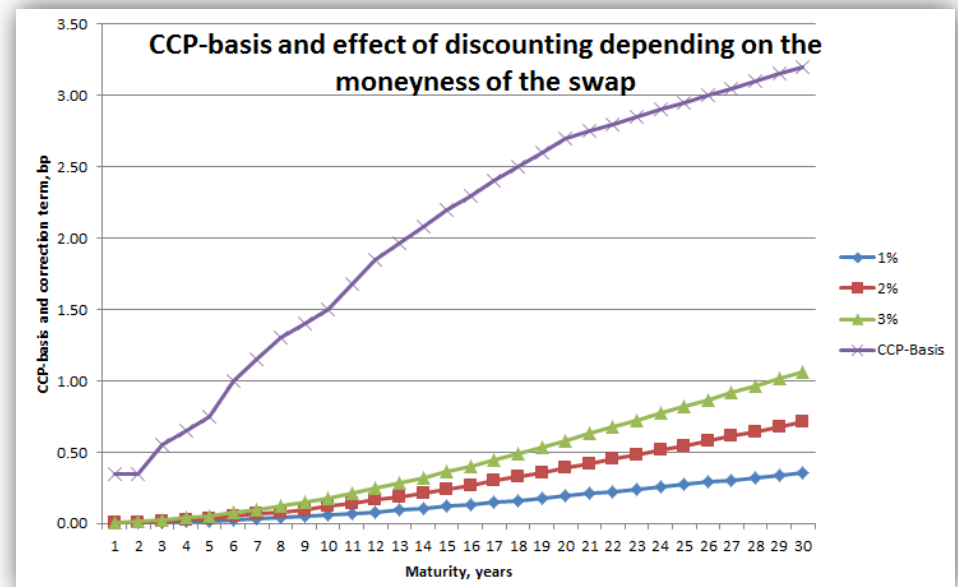
“Eurex” Curves

Curve construction

- Only ATM Eurex swap rates are available
- Pricing of the swap involves two curves: discounting and forward curves

Curve	Bilateral	Centrally cleared	
		Scenario 1	Scenario 2
Discounting	LCH ?	LCH	<u>Eurex</u>
Forward	LCH ?	<u>Eurex</u>	<u>Eurex</u>

- Methodologic difference for strong out-of-the-money swaps



Final remarks

- CCP-basis spread is an unprecedented phenomenon but yet an objective reality
- Driven by different incremental cost faced by IRS dealers at corresponding clearing house
- In short run relevant for:
 - FO, market conformity (novations, unwinds), collateral reconciliation
- In long run:
 - Treat CCP-basis as full featured risk factor similar to the tenor spread
- Raises a number of questions in relation to fair value, the projection of forward EURIBOR rates, the definition of ASW spreads, IFRS levels, hedge accounting, hedging, ...

Thank you very much for your attention