



INTERNATIONAL CORPORATE FINANCE

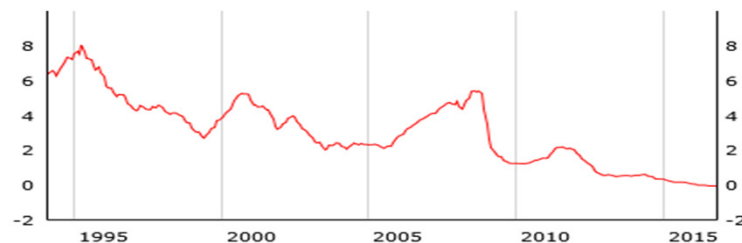
IR Hedging

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Interest Rates in Corporate Finance

- Interbank rates frequently used as benchmark for loan pricing (LIBOR + margin)
- Interbank rates are used in derivatives pricing
- Nominal interest rates reflect also inflation expectation



Source: ECB website, IY Euribor

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Interest rate exposure

- Situation where company faces profits or losses on the interest rate fluctuations
- Long position in interest rate is when Company benefits from interest rate increases
 - Company has significant liquid interest bearing assets
- Short position in interest rate is when Company benefits from interest rate decreases
 - Company has loans with interest calculated based on variable interest benchmark (e.g. LIBOR)

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Each currency has its rates

Nazwa	1 M	3 M	6 M
LIBOR (CHF)	-0,79440	-0,73120	-0,64400
EURIB (EUR)	-0,37300	-0,31300	-0,21300
LIBOR (GBP)	0,26563	0,39938	0,55819
LIBOR (JPY)	-0,03357	-0,04714	0,00957
WIBOR (PLN)	1,66000	1,72000	1,80000
WIBID (PLN)	1,46000	1,52000	1,60000
LIBOR (USD)	0,53200	0,87567	1,24822

Source: M Bank Nov 2016

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LIBOR Rates

London Interbank Offered Rates

Friday, November 04, 2016 [Find Historical Data](#) | [WHAT'S THIS?](#)

Rates shown are effective 11/3/2016

Libor Rates (USD)	Latest	Wk ago	52-WEEK	
			High	Low
Libor Overnight	0.43678	0.43489	0.43733	0.12800
Libor 1 Week	0.45950	0.45700	0.46258	0.15495
Libor 1 Month	0.53256	0.53433	0.54833	0.19450
Libor 2 Month	0.66644	0.67278	0.67722	0.26000
Libor 3 Month	0.88094	0.88733	0.89039	0.34140
Libor 6 Month	1.24711	1.25878	1.26433	0.57070
Libor 1 Year	1.56011	1.58233	1.56667	0.90065

Euro Libor Rates	Latest	Wk ago	52-WEEK	
			High	Low
Euro Libor Overnight	-0.40643	-0.40686	-0.18143	-0.40671
Euro Libor 1 Week	-0.38886	-0.38886	-0.17214	-0.38886
Euro Libor 1 Month	-0.38029	-0.37943	-0.14071	-0.38029
Euro Libor 2 Month	-0.34729	-0.34557	-0.10000	-0.35057
Euro Libor 3 Month	-0.32286	-0.31929	-0.07857	-0.32886
Euro Libor 6 Month	-0.21657	-0.21300	-0.00143	-0.21757
Euro Libor 1 Year	-0.07829	-0.07329	0.09143	-0.08329

Source: online.wsj.com

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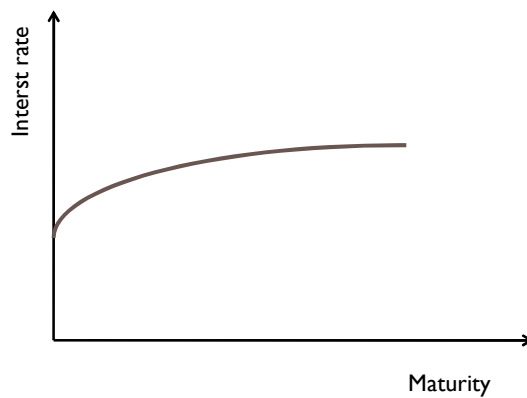
Pound Libor Rates	Latest	Wk ago	52-WEEK	
			High	Low
Pound Libor Overnight	0.22875	0.22813	0.48500	0.22375
Pound Libor 1 Week	0.24838	0.24869	0.49304	0.24156
Pound Libor 1 Month	0.26563	0.26750	0.51594	0.26250
Pound Libor 2 Month	0.32863	0.33350	0.55450	0.32288
Pound Libor 3 Month	0.39900	0.40488	0.59288	0.37544
Pound Libor 6 Month	0.55819	0.56694	0.75188	0.50063
Pound Libor 1 Year	0.80025	0.81494	1.07025	0.71538

Yen Libor Rates	Latest	Wk ago	52-WEEK	
			High	Low
Yen Libor Spot/Next	-0.04157	-0.02200	0.04857	-0.15229
Yen Libor 1 Week	-0.03757	-0.00971	0.04571	-0.18029
Yen Libor 1 Month	-0.04000	-0.02400	0.05286	-0.10271
Yen Libor 2 Month	-0.07286	-0.01129	0.07357	-0.07700
Yen Libor 3 Month	-0.04086	-0.01700	0.08300	-0.05129
Yen Libor 6 Month	0.01229	0.01521	0.12071	-0.03543
Yen Libor 1 Year	0.11529	0.11588	0.22829	0.05036

n.a. - not available

Source: ICE Benchmark Administration Ltd. via SIX Financial Information

Yield curve



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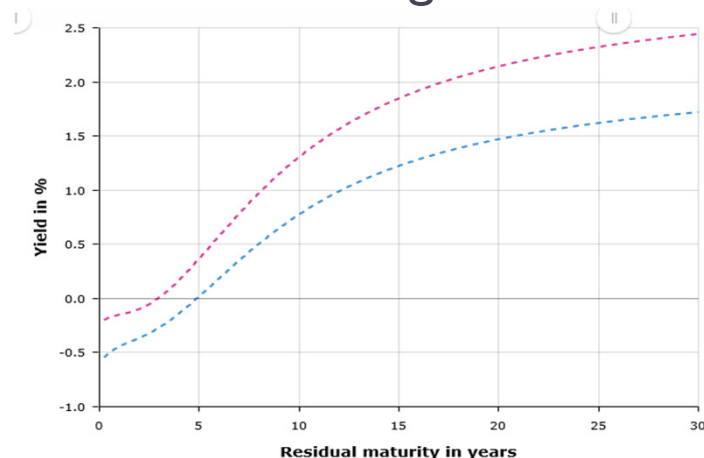
Possible shapes of the yield curve

- Upward sloping (normal) – long-term interest rates higher than short-term interest rates
- Flat – long-term and short-term interest rates on the same level
- Inverted – short-term interest rates higher than long-term interest rates
- Hump-shaped

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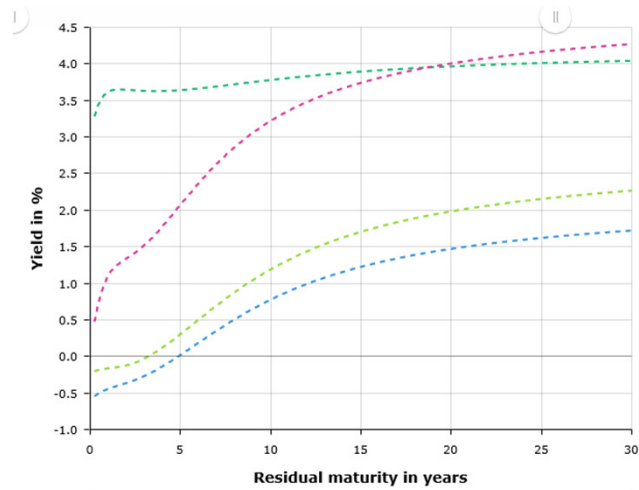
Yield curve changes over time



Source: ECB <https://www.ecb.europa.eu/stats/money/yc/html/index.en.html>
(Nov 2016 and Nov 2015)

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Slope changes as well

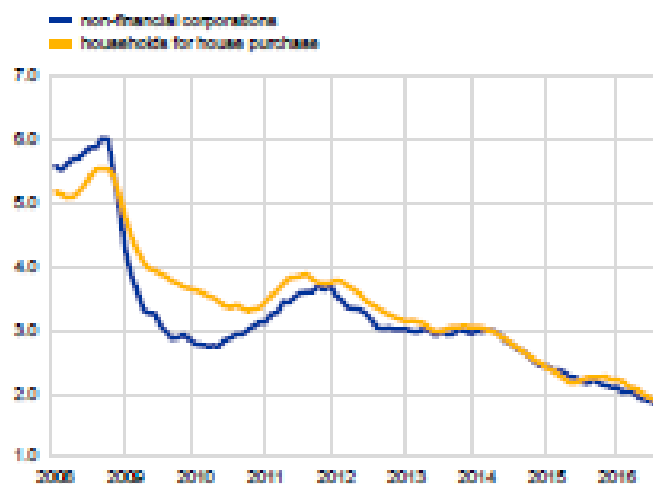


Source: ECB <https://www.ecb.europa.eu/stats/money/yc/html/index.en.html>
(Nov 2006, 2012, 2015 and 2016)

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Composite bank lending rates for NFCs and households

(percentages per annum)

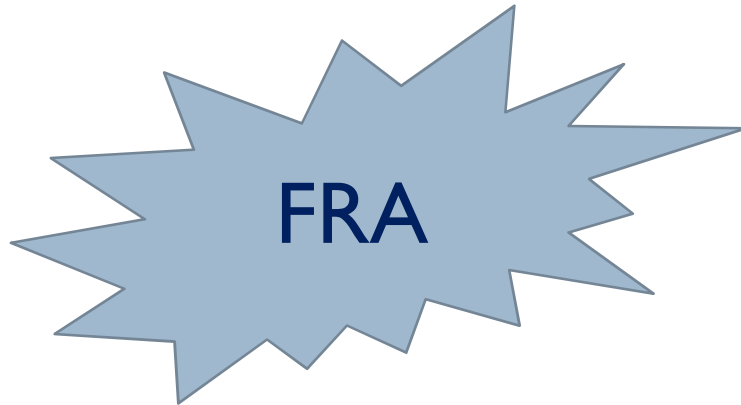


Source: ECB Economic Bulletin 7/2016

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Price for lending is interest rate...

- So maybe contract for future interest rate?



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Forward rates

Maturity	1	2	3	4
Spot rate	4.50	4.25	3.83	3.62
Forward rate	---	???	???	???

$$(1 + 4.5/100)(1 + ???/100) = (1 + 4.25/100)^2$$

$$??? = 4.00$$

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Forward rates

Maturity	1	2	3	4
Spot rate	4.50	4.25	3.83	3.62
Forward rate	---	4.00	???	???

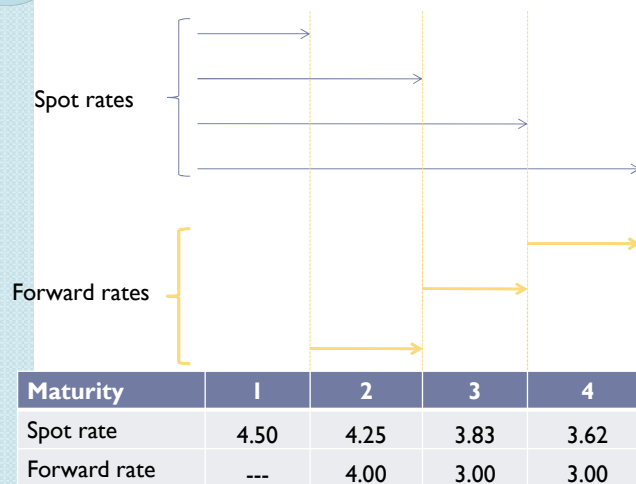
$$(1 + 4.25/100)^2(1 + ???/100) = (1 + 3.83/100)^3$$

$$??? = 3.00$$

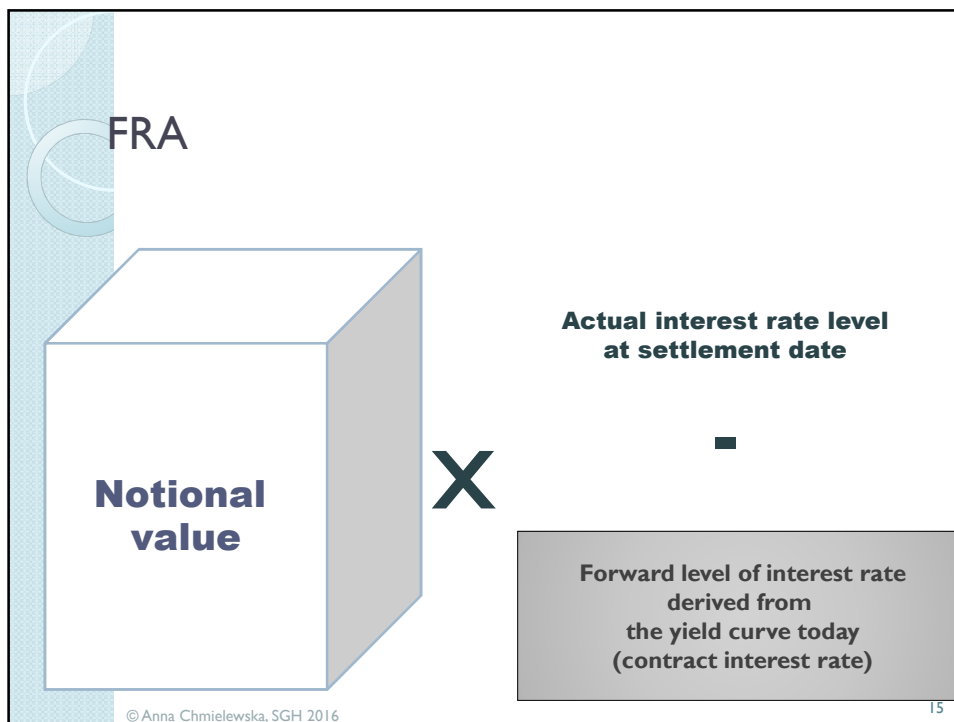
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Forward rates



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What if multiple payments?

- Lets try to have a contract for a number of payments

IRS

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Interest Rate Swap

- Allows to change fixed rate interest payments into floating rate interest payments (or vice versa)
- Interest rate exposure
 - Company finances itself with a 1 year rolling working capital loan
 - Retail chain pays its supplier with 2 months delay
 - Company purchased medium term fixed rate bonds

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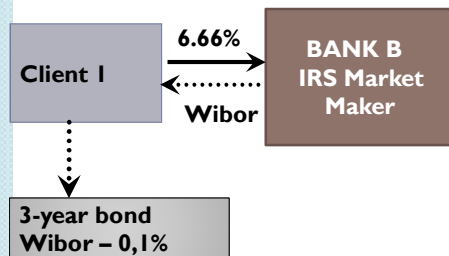
Market Maker - Quotes

- Bank B decided to quote to its clients the following IRS rates
- The clients decide to change their interest rate risk profile using IRS
- In each case determine IRS rates and estimate the effect for the client – what interest rate can the client ensure

Maturity	bid	offer
1	6.83	6.93
2	6.64	6.74
3	6.60	6.66
4	6.56	6.62
5	6.53	6.59
6	6.49	6.55
7	6.45	6.51
8	6.41	6.47
9	6.36	6.42
10	6.30	6.36

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Issuer of a bond with floating rate coupon



Effective rate?

Client pays: (Wibur-0,1%) and 6.66%

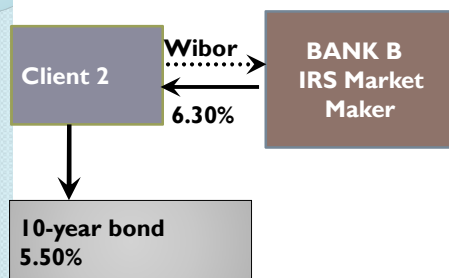
Client receives: Wibur

So it pays net **6.56%**

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Maturity	bid	offer
1	6.83	6.93
2	6.64	6.74
3	6.60	6.66
4	6.56	6.62
5	6.53	6.59
6	6.49	6.55
7	6.45	6.51
8	6.41	6.47
9	6.36	6.42
10	6.30	6.36

Issuer of a fixed coupon bond



Effective rate?

Client pays: Wibur and 5.50%

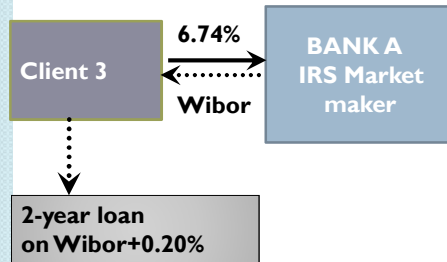
Client receives: 6.30%

It pays net **Wibur - 0.80%**

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Maturity	bid	offer
1	6.83	6.93
2	6.64	6.74
3	6.60	6.66
4	6.56	6.62
5	6.53	6.59
6	6.49	6.55
7	6.45	6.51
8	6.41	6.47
9	6.36	6.42
10	6.30	6.36

Borrower



Maturity	bid	offer
1	6.83	6.93
2	6.64	6.74
3	6.60	6.66
4	6.56	6.62
5	6.53	6.59
6	6.49	6.55
7	6.45	6.51
8	6.41	6.47
9	6.36	6.42
10	6.30	6.36

Effective rate?

Client pays: $(Wibor+0.20\%) + 6.74\%$

Client receives: Wibor

So it pays net **6.94%**

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