



FRE-GY 7851
INTEREST RATE DERIVATIVES

SPRING 2023

Assignment 2
Date - 230210

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1 US Treasuries

Select a Treasury Bill, a Treasury Note, and a Treasury bond. Screen shot from Bloomberg for each one, explain the differences between the securities, explain the fields and the standards used in the market, e.g. nominals, principal, maturities, day count, price and yield quotations, bid/ask spread (also explain bid and ask, significance of the spread). Compare relative size of quotation between price, yield and discount yield. Other source FRB.

Type of Security	Term	Maturity	Coupon	Yield
Bill	Short-term	1 year or less	No coupon	Lowest Yield
Note	Medium-term	2 to 10 years	Low Coupon	Medium Yield
Bond	Long-term	10 years or more	Higher Coupon	Highest Yield

Table 1: Differences between T-bill, T-note, and T-bond

Similarity: All three types of debt-securities have close to zero default risk since they are backed by the full faith and credit of the U.S. government.

T-bills are short-term Treasury securities that are sold at a discount to their face value. The return on a T-bill investment is the difference between the face value and the purchase price, with no periodic interest payments.

Treasury notes, also known as T-notes, are debt securities that pay interest to investors semi-annually, their yield is determined at auction. Upon maturity, the investor is paid the face value of the T-note. The prices of T-notes may fluctuate based on market conditions and the results of the auction, and they can be held until maturity or sold in the secondary market before they mature. T-notes generally pay less interest than Treasury bonds (T-bonds), but more than Treasury bills (T-bills) securities.

Treasury bonds, also known as T-bonds, are long-term debt securities issued by the United States government. They pay a fixed rate of interest semi-annually. At maturity, the investor is paid the face value of the bond. The yield on Treasury bonds is generally higher than that on Treasury notes and bills due to the longer term and greater risk involved. Treasury bonds tend to fluctuate in price more than Treasury notes and bills due to their longer term and greater interest rate risk and other macroeconomic factors.



Figure 1: T-Bill DES (Description function)
Source: [Bloomberg Terminal](#)



Figure 2: T-Bill Yield and Spread
Source: [Bloomberg Terminal](#)

B 0 07/20/23 Govt		1) Actions ▾		97) Settings		Page 1		Trade/Quote Recap			
Range 02/06/23 ▾		18:00:00		- 02/06/23 ▾		17:20:00		95) Buy		90) Sell	
2) Trade Recap		3) Quote Recap									
Source BGN ▾		Show Ticks All ▾		Cond Code Definitions							
High 4.6125		Low 4.4825									
Time		Bid/Ask								Cond	
16:29:14		4.6500 / 4.5700									
16:29:10		4.6500 / 4.5675									
16:29:06		4.6500 / 4.5700									
16:29:02		4.6500 / 4.5675									
16:28:51		4.6525 / 4.5675									
16:28:47		4.6525 / 4.5675									
16:28:39		4.6525 / 4.5675									
16:28:35		4.6525 / 4.5675									
16:28:29		4.6525 / 4.5675									
16:28:25		4.6500 / 4.5700									
16:28:21		4.6500 / 4.5675									
16:28:17		4.6500 / 4.5700									
16:28:13		4.6500 / 4.5675									
16:28:02		4.6525 / 4.5675									
16:27:52		4.6525 / 4.5675									
16:27:48		4.6525 / 4.5675									
16:27:45		4.6475 / 4.5725									
16:27:45		4.6475 / 4.5675									
16:27:41		4.6500 / 4.5675									
(Price: Best Quote, MM Quote, Previous Quote)											

Figure 3: T-Bill Bid Ask Spread
Source: [Bloomberg Terminal](#)

DES 11/15/32 Govt

< > | T 4 1/8 11/15/32 Govt • | DES • | Related Functions Menu

Message

2

T 4 1/8 11/15/32 1103-27+ -1-02 103-27 / 103-27+ 3.653 / 3.651

At 16:08 -- X-- Source: BGN

T 4 1/8 11/15/32 Govt

Actions •

Settings •

Page 1/11 Security Description: Bond

95 Buy 90 Sell

25) Bond Description

20) Issuer Description

Pages

11) Bond Info

12) Addit Info

13) Covenants

14) Guarantors

15) Bond Ratings

16) Identifiers

17) Exchanges

18) Inv Parties

19) Fees, Restrict

20) Schedules

21) Coupons

Quick Links

32) ALLQ Pricing

33) QRD Quote Recap

34) CACS Corp Action

35) CN Sec News

36) HDS Holders

60) Send Bond

Issuer Information

Name

US TREASURY N/B

Industry

Treasury (BCLASS)

Security Information

Issue Date

11/15/2022

Interest Accrues

11/15/2022

1st Coupon Date

05/15/2023

Maturity Date

11/15/2032

Floater Formula

N.A.

Workout Date

11/15/2032

Coupon

4.125

Cpn Frequency

S/A

Mty/Refund Type

NORMAL

Calc Type

STREET CONVENTION

Day Count

ACT/ACT

Market Sector

US GOVT

Country/Region

US

Currency

USD

TENDERS ACCEPTED: \$35000MM, \$32000MM ISS'D AS A REOPENING EFF 12/15/22.
\$32000MM ISS'D AS A REOPENING EFF 01/17/23.

Identifiers

ID Number

91282CFV8

CUSIP

91282CFV8

ISIN

US91282CFV81

SEDOL 1

BQXS7B2

FIGI

BBG01BC373F4

Issuance & Trading

Issue Price

104.515580

Risk Factor

8.336

Amount Issued

111256 (M...

Amount Outstanding

111256 (M...

Minimum Piece

100

Minimum Increment

100

SOMA Holdings

11.03

Suggested Functions

SXT Capture non-electronic cash sales

GPC Spot price trends in a candle chart

Figure 4: T-Note/Bond DES (Description function)
Source: [Bloomberg Terminal](#)



Figure 5: T-Note/Bond Yield and Spread
Source: [Bloomberg Terminal](#)



Figure 6: T-Note/Bond Bid Ask Spread
Source: [Bloomberg Terminal](#)

Fields and the standards used in the market:

- **Nominal Value:** The nominal value or face value is the amount the security will be redeemed for at maturity. T-Bonds/T-Notes typically have the largest face value compared to T-Bills.
- **Principal:** The principal amount is the original amount invested. For T-Bonds, the principal

is returned at maturity, while for T-Notes and T-Bills, the investor receives the face value at maturity.

- **Maturities:** T-Bonds have the longest maturities, typically 20 to 30 years, while T-Notes have maturities between 2 to 10 years, and T-Bills have maturities of 1 year or less.
- **Day Count:** The day count is the method used to calculate the interest paid. For T-Bonds and T-Notes, the day count is typically based on a 30/360 or actual/actual day count, while T-Bills have a special day count basis.
- **Price and Yield Quotations:** T-Bonds, T-Notes, and T-Bills are quoted in terms of yield to maturity, which represents the total return an investor will receive if the security is held until maturity. The price of the security is determined by the yield, with changes in yields leading to changes in prices.
- **Bid/Ask Spread:** The bid/ask spread is the difference between the bid price and the ask price. The bid price is the highest price a buyer is willing to pay for a security, while the ask price is the lowest price a seller is willing to accept. The significance of the bid/ask spread is that it represents the cost of executing a trade in the market and can impact an investor's return.

Differences between T-bill, T-note, and T-bond can be found in Table 1.

2 Floating Rate Notes:

Floating Rate Notes are securities that have interest payments that adjust periodically based on a predetermined benchmark, such as the London Interbank Offer Rate (LIBOR). They can be issued by both government-sponsored enterprises (GSEs) and corporations. The reference rate is one of the important components of the floater's structure, and the spread, which is added to the reference rate to determine the overall coupon, will depend on the credit quality of the issuer and the time to maturity. The reset frequency, which determines how often the interest rate is adjusted, can range from daily to once per year. Some floaters may have caps, which limit the maximum interest rate the issuer will pay, and/or floors, which set the minimum rate that will be paid. Floating Rate Notes can benefit investors who believe that interest rates and/or inflation may rise and are seeking to benefit from rising interest rates without locking in a fixed rate for the long term.

Floating Rate Note (FRN)

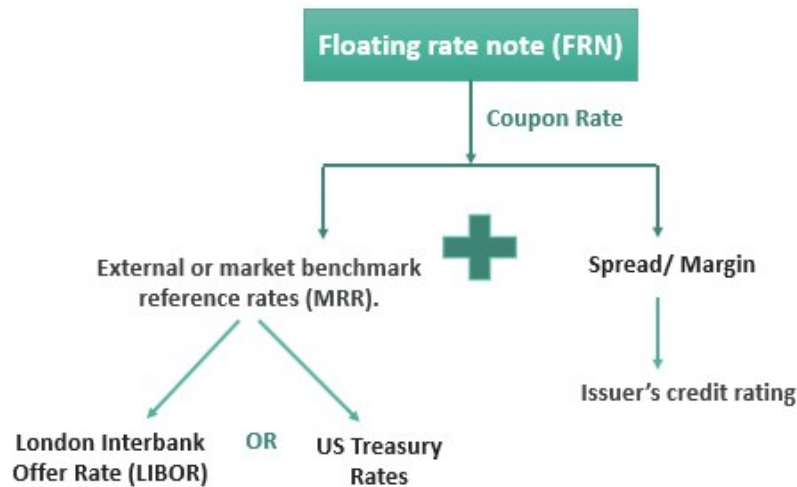


Figure 7: Floating Rate Notes

Source: wallstreetmojo.com/floating-rate-note

2.1 Discuss sensitivity to interest rates.

One of the main benefits of investing in floaters is the ability to benefit from rising interest rates. As the coupon rate on a floater is tied to changes in market rates, investors can enjoy higher returns as rates rise. This can be attractive to investors who believe that interest rates will increase in the future and are reluctant to lock-in a fixed rate for the long term.

However, compared to fixed-rate bonds, floaters are less sensitive to changes in interest rates. Fixed-rate bonds tend to decrease in value when interest rates rise and increase in value when rates fall. This is because the bond's value needs to compensate for the difference between its fixed coupon rate and current interest rates. On the other hand, a floater's coupon rate changes with market rates, which means its price will typically fluctuate less than that of fixed-rate bonds with a similar maturity.

Floaters are generally most suitable for investors who plan to hold the investment until maturity. However, if investors need to sell their floaters prior to maturity, they can be traded in the secondary market. The availability of a secondary market provides an opportunity for investors to sell their investment at prevailing market levels, which may be more or less than the purchase price. However, it's important to note that there is no guarantee that an active market will always be maintained for floaters.

Interest rate risk is a potential concern for investors in floating rate notes (FRNs). On one hand, some investors believe that FRNs carry little interest rate risk due to their low sensitivity to changes in market rates. This is because the Macaulay Duration of an FRN is roughly equal to the time remaining until the next interest rate adjustment, and its price is expected to remain constant even when market rates rise due to the coupon rate being adjusted in line with forward rates.

However, other investors have a different view on the efficacy of FRNs in protecting against interest rate risk. Author Dr. Annette Thau argues that in practice, FRNs have not always performed as expected in terms of maintaining the price of the bond close to par during times of extreme interest rate volatility. This is because rates may not be reset quickly enough to prevent price fluctuations and the coupon rates of FRNs are usually lower than those of long-term bonds, making them less attractive compared to shorter maturity bonds.

In conclusion, the efficacy of FRNs in protecting against interest rate risk is a subject of debate, with some investors viewing them as conservative investments, while others believe that their performance in practice has not met expectations. As with any investment, it is important for investors to carefully consider the potential risks and benefits before making a decision.

2.2 Compare risk profile and sensitivity of a FRN with a ZCB

Fixed rate notes (FRNs) and zero coupon bonds (ZCBs) are both types of bonds, but they differ in terms of their risk profile and sensitivity.

FRN, has a fixed coupon rate which is paid at regular intervals throughout the life of the bond. This means that the bond's yield will change as market interest rates change. If market rates go up, the yield on the FRN will also go up, making the bond less attractive to investors. As a result, the price of the FRN will decrease, which increases its risk profile.

ZCBs do not make coupon payments and instead, the investor receives the full face value of the bond at maturity. Since ZCBs do not make regular interest payments, their yields are not impacted by changes in market interest rates. This makes ZCBs a low-risk investment. However, the lack of regular interest payments makes ZCBs more sensitive to changes in the market than FRNs.

In summary, FRNs are more sensitive to changes in interest rates, which impacts their yields, but they have a lower risk profile due to the regular coupon payments. ZCBs, on the other hand, have a lower sensitivity to interest rate changes but a higher risk profile due to the lack of regular

coupon payments.

2.3 Discuss the Duration and Convexity of a FRN

Duration is price sensitivity to change in interest rates, therefore for floating rate bond duration should be low. The duration of a floating rate bond is simply the time until next coupon payment, because the upcoming coupon payments are not known. If the curve shifts up, the future cashflows are shifted up but also the discount factors are shifted down which leads to low duration.

Discrete form:

Consider floating rate bond V with notional principal N . The bond pays floating coupon every Δt . The coupon is indexed to some market index, for example Libor. For quarterly payments it would be Libor 3M.

Then the value of a Floating rate note is:

$$V = \sum_{i=1}^M CF_i \times DF_i \quad (1)$$

where M is the number of coupon payments, CF is cashflow and DF is discount factor. The last cashflow CF_M is Notional principal N + interest. For valuation we only consider future/unpaid cashflows, hence realized cashflows are not considered. The first cashflow CF_1 is known, we know it because Libor has been set. Other cashflows are unknown and will be fixed in the future. For valuation purposes, we substitute unknown cashflows with forward rates F_i in **1**.

Therefore we get:

$$V = CF_1 \times DF_1 + \sum_{i=2}^{M-1} N \times F_i \times DF_i + (N + N \times \Delta t \times F_M) \times DF_M \quad (2)$$

where the forward rate is:
$$F_i = \frac{1}{\Delta t} \times (DF_{i-1}/DF_i - 1)$$

Therefore the cashflow CF_i is: $CF_i = F_i \times \Delta t \times N$

Substituting it all together we get:

$$\begin{aligned}
V &= CF_1 \times DF_1 + \sum_{i=2}^{M-1} N \times F_i \text{ times } \Delta t \times DF_i + (N + N \times \Delta t \times F_M) \times DF_M \\
&= CF_1 \times DF_1 + \sum_{i=2}^{M-1} \frac{1}{\Delta t} \times N \times (DF_{i-1}/DF_i - 1) \times DF_i + N \times DF_M + N \times (DF_{M-1} - DF_M) \\
&= CF_1 \times DF_1 + \sum_{i=2}^{M-1} N \times (DF_{i-1} - DF_i) + N \times DF_{M-1}
\end{aligned}$$

we get a lot of cancellations in the summation post which we get:

$$\begin{aligned}
V &= CF_1 \times DF_1 + N \times DF_1 \\
&= F_1 \times \Delta t \times N \times DF_1 + N \times DF_1
\end{aligned} \tag{3}$$

Applying the formula for duration on **3**, we get

$$Duration = -\frac{1}{V} \frac{dV}{dDF_1} = \Delta t \tag{4}$$

Applying the formula for convexity on **3**, we get

$$Convexity = \frac{1}{V} \frac{d^2V}{dDF_1^2} = \Delta t^2 \tag{5}$$

Continuous form:

With zero spread the price of the note is given by:

$$p_\tau = (1 + c_1)e^{-r(\tau_1) \cdot \tau_1} \tag{6}$$

Hence the duration is:

$$-\frac{\frac{dp_\tau}{r}}{p_\tau} = \tau_1 \tag{7}$$

So the duration is the time τ_1 until the next coupon payment.

The convexity for the same is:

$$\frac{\frac{d^2 p_\tau}{dr^2}}{\frac{p_\tau}{r}} = \tau_1^2 \quad (8)$$

When the spread is not zero(i.e 0), the price in time 0 is given by:

$$p_\tau^s = (1 + c_1)e^{-r(\tau_1) \cdot \tau_1} + \sum_{k=1}^n s \cdot e^{-r(\tau_k) \tau_k} \quad (9)$$

So the duration will be:

$$-\frac{\frac{dp_\tau^s}{dr}}{p_\tau^s} = \frac{\tau_1 \cdot (1 + c_1)e^{-r(\tau_1) \cdot \tau_1} + \sum_{k=1}^n s \cdot \tau_k \cdot e^{-r(\tau_k) \tau_k}}{(1 + c_1)e^{-r(\tau_1) \cdot \tau_1} + \sum_{k=1}^n s \cdot e^{-r(\tau_k) \tau_k}} \quad (10)$$

And the convexity will be:

$$\frac{\frac{d^2 p_\tau^s}{dr^2}}{p_\tau^s} = \frac{\tau_1^2 \cdot (1 + c_1)e^{-r(\tau_1) \cdot \tau_1} + \sum_{k=1}^n s \cdot \tau_k^2 \cdot e^{-r(\tau_k) \tau_k}}{(1 + c_1)e^{-r(\tau_1) \cdot \tau_1} + \sum_{k=1}^n s \cdot e^{-r(\tau_k) \tau_k}} \quad (11)$$

Hence, the floating rate note that pays coupon based on LIBOR + margin (example : 200 bp) will have higher duration. We can consider this bond as a sum of two bonds: pure floating rate bond(refer above calculation) and a fixed rate bond (where coupon rate is a margin).

2.4 What should be the fair price of a LIBOR FRN?

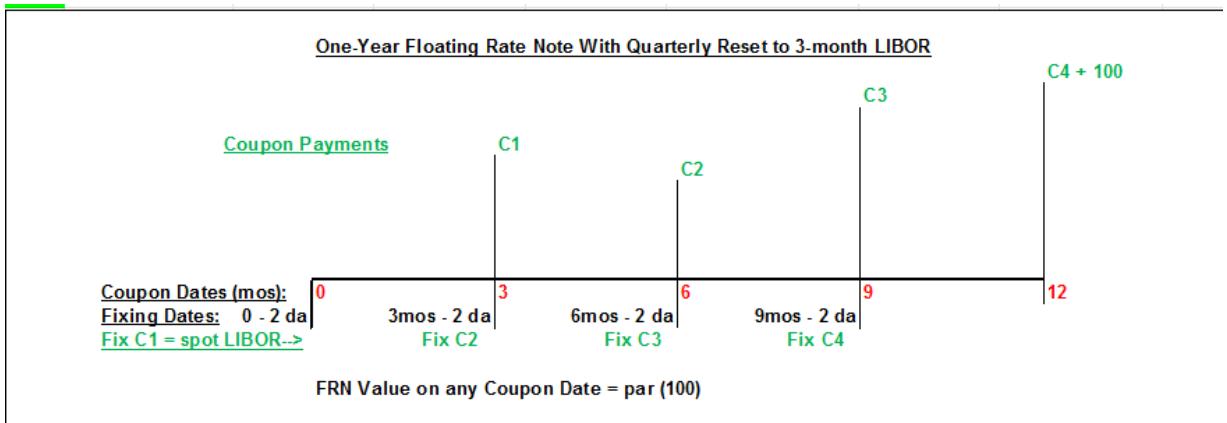


Figure 8: 1 year Floating Rate Note with quarterly resets of 3-month LIBOR

The fair price of a 1year + d days LIBOR FRN which resets every months is given by the

below formula

$$\text{FRN fair price} = \frac{100 + (C/2)}{1 + Z \times \frac{d}{360}} \quad (12)$$

where C is the coupon paid at last reset d days after note issuance ($t = 0$), and Z is the 6 month forward rate as of last reset.

In essence, the fair value of a Floating rate note is equal to the sum of the PV of all future cashflows discounted by forward rates.

3 Size up the FRA and the IRS markets. Sources: BIS, ISDA

According to the Bank for International Settlements (BIS), the FRA(Forward Rate Agreement) market has seen a steady increase in outstanding contracts since the early 2000s. The market size is \$496,456 Million currently for FRA and \$4,490,980 Million for swaps according to BIS.

BIS

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DER

> Table

D12.1

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D11.6

» D12.2

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2022

Level: 1 2 3

4

	All products	Forward rate agreements	Swaps			Total options	Other products
			Total	Of which: overnight index swaps	Of which: other interest rate swaps		
<input checked="" type="checkbox"/> Total, "net-net" basis	5,225,827	496,456	4,490,930	2,317,186	2,173,743	234,563	3,878
<input type="checkbox"/> By currency							
<input type="checkbox"/> By counterparty							
<input checked="" type="checkbox"/> By country							
United Kingdom	2,626,080	361,595	2,101,318	1,231,902	869,416	163,166	...
United States	1,689,144	8,555	1,628,896	788,450	840,446	51,694	...
Hong Kong SAR	321,106	14,140	305,147	159,370	145,777	1,724	94
Germany	272,952	55,763	212,885	60,455	152,430	4,303	...
France	203,931	64,699	131,605	37,920	93,685	7,483	145
Singapore	155,974	187	132,920	54,134	78,786	21,316	1,552
Australia	112,725	158	112,237	51,295	60,942	330	...
Canada	72,165	1,065	70,189	15,965	54,224	910	...
Japan	50,736	185	48,496	26,894	21,602	2,055	...
Netherlands	38,247	8,142	29,615	5,258	24,356	490	...
Ireland	...	...	...	...	...	...	...
Italy	21,418	7,567	12,498	5,612	6,886	1,353	...
Denmark	19,925	7,984	10,471	939	9,532	1,354	116
Switzerland	17,749	1,816	15,742	9,642	6,100	191	
Other countries	166,362	23,013	134,400	38,068	96,332	6,471	2,479

Turnover of OTC interest rate derivatives

Daily averages in April 2022, in millions of US dollars

Figure 9: FRA - By Country
Source: [BIS](#)

Referring ISDA(International Swaps and Derivatives Association), The IRD (Interest Rate derivatives) notional outstanding totaled \$502.6 trillion and accounted for 79.5% of total notional

Turnover of OTC interest rate derivatives

Daily averages in April 2022, in millions of US dollars

◀ 2022 ▶							
Level: 1 2 3 4	All products	Forward rate agreements	Swaps			Total options	Other products
			Total	Of which: overnight index swaps	Of which: other interest rate swaps		
<input checked="" type="checkbox"/> Total, "net-net" basis	5,225,827	496,456	4,490,930	2,317,186	2,173,743	234,563	3,878
<input type="checkbox"/> By currency							
<input checked="" type="checkbox"/> By counterparty							
<input checked="" type="checkbox"/> With reporting dealers	1,003,423	86,895	861,459	334,150	527,309	55,069	...
Local	461,244	28,482	405,970	165,433	240,537	26,792	...
Cross-border	542,179	58,413	455,489	168,717	286,772	28,277	...
<input checked="" type="checkbox"/> With other financial institutions	3,942,628	301,504	3,466,897	1,933,930	1,532,967	174,227	...
Local	1,598,435	127,342	1,358,472	890,052	468,420	112,621	...
Cross-border	2,344,194	174,162	2,108,425	1,043,878	1,064,547	61,606	...
<input checked="" type="checkbox"/> With non-financial institutions	275,898	108,057	162,574	49,106	113,468	5,267	...
Local	190,200	93,083	93,894	24,206	69,687	3,224	...
Cross-border	85,698	14,974	68,680	24,899	43,780	2,044	...
Of which: related party trades	1,197,726	...	...	...	...	...	...
Of which: back-to-back trades	460,863	8,543	380,776	136,246	244,529	71,542	2
Of which: compression trades	336,996	28,901	308,094	167,901	140,193	1	...
<input type="checkbox"/> By country							

Figure 10: FRA - By Counterparty

Source: BIS

Turnover of OTC interest rate derivatives

Daily averages in April 2022, in millions of US dollars

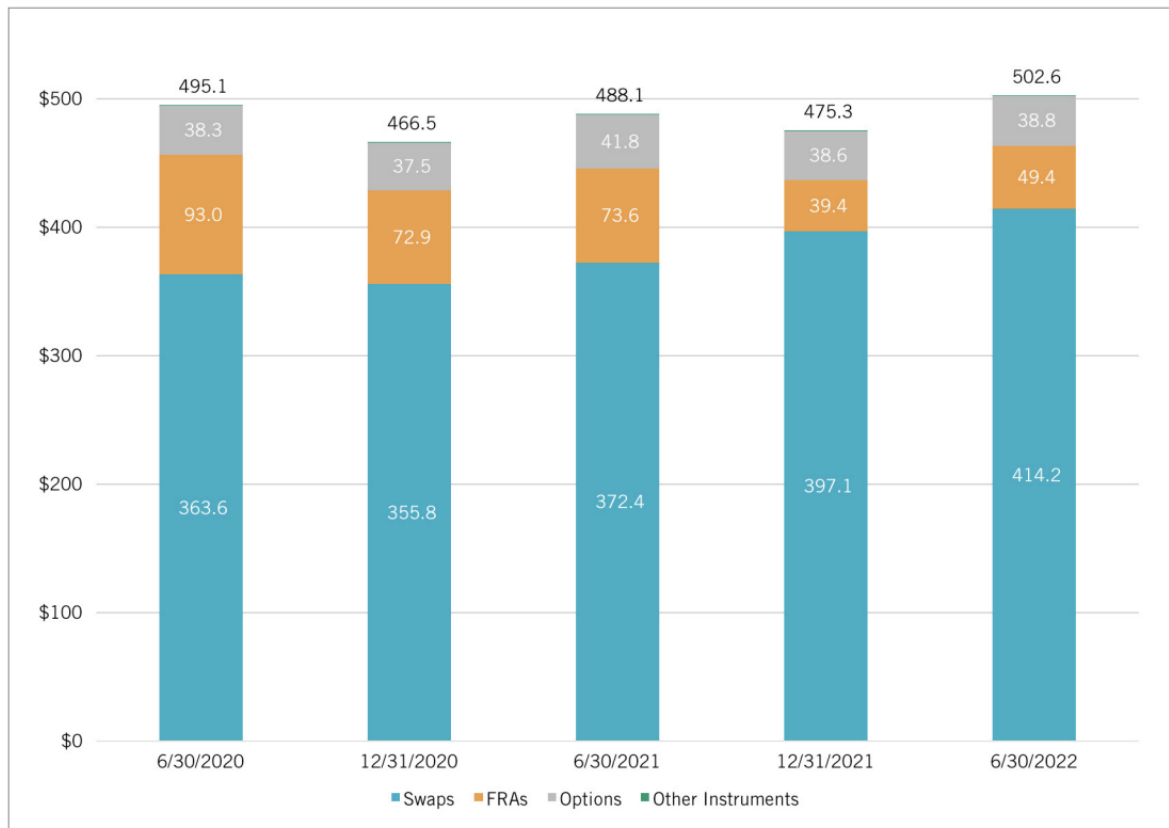
◀ 2022 ▶							
Level: 1 2 3 4	All products	Forward rate agreements	Swaps			Total options	Other products
			Total	Of which: overnight index swaps	Of which: other interest rate swaps		
<input checked="" type="checkbox"/> Total, "net-net" basis	5,225,827	496,456	4,490,930	2,317,186	2,173,743	234,563	3,878
<input checked="" type="checkbox"/> By currency							
US dollar	2,275,610	26,100	2,182,683	1,067,609	1,115,074	66,827	...
Euro	1,752,980	420,703	1,266,852	675,010	591,842	65,425	...
Pound (sterling)	350,180	1	340,580	307,014	33,567	9,598	...
Australian dollar	279,315	1,660	276,624	132,220	144,405	1,030	...
Yen	116,895	...	48,596	34,828	13,768	68,298	...
Canadian dollar	60,151	37	59,694	16,635	43,059	421	...
New Zealand dollar	47,965	435	47,492	23,833	23,659	39	...
Won	47,769	16	32,386	1,168	31,218	15,367	...
Czech koruna	31,859	8,634	22,413	...	22,413	811	...
Renminbi	29,544	...	29,485	967	28,518	59	...
Rand	27,279	2,983	23,582	260	23,321	714	...
Swedish krona	24,901	11,937	10,725	446	10,279	2,239	...
Indian rupee	23,131	46	23,032	15,827	7,205	53	...
Mexican peso	22,396	433	21,869	822	21,047	94	...
Other currencies	135,852	23,471	104,915	40,547	64,368	3,588	...
<input type="checkbox"/> By counterparty							
<input type="checkbox"/> By country							

Figure 11: FRA - By Currency

Source: BIS

outstanding at mid-year 2022. IRD notional outstanding increased by 3.0% versus mid-year 2021 and rose by 5.7% compared to year-end 2021. Interest rate swaps notional outstanding increased

Chart 6: Global IRD Notional Outstanding by Product (US\$ trillions)



Source: BIS OTC Derivatives Statistics

Figure 12: Chart 6

Source: www.isda.org

by 11.2% to \$414.2 trillion and accounted for 82.4% of total IRD notional outstanding at mid-year 2022. Forward rate agreements (FRAs) notional outstanding declined by 33.0% at mid-year 2022 compared to mid-year 2021. FRAs and options notional outstanding was \$49.4 trillion and \$38.8 trillion, respectively. (Figure 12)

4 What is a “relative pricing advantage” for Swaps and how does it apply to swaps? (look into IRS’s creation history)

The relative pricing advantage refers to the ability of two parties to benefit from differences in their cost of borrowing in different currencies. In the example of the World Bank and IBM, the World Bank was facing high interest rates in Switzerland and West Germany and had reached its borrowing limit in those countries.

The World Bank was in a bit of a conundrum: interest rates were sky high, with the Federal Funds rate at 17%, the Swiss key rate at 8%, and the West German key rate at 12%. Similarly, per laws in both countries, the World Bank had reached its borrowing cap in Switzerland and West Germany.

IBM, at the same time, held a large amount of debt priced in Swiss Francs and German Marks, which exposed it to interest rate risk. To help one another out, the World Bank borrowed \$290 million in U.S. markets and swapped those U.S. Dollar obligations in exchange for taking on IBM’s Swiss Franc and German Mark obligations; swaps were born.

By entering into an IRS agreement, the World Bank was able to borrow funds at a lower cost in US markets, and then swap those US Dollar obligations for IBM’s Swiss Franc and German Mark obligations. As a result, the World Bank was able to reduce its borrowing costs, while IBM was able to reduce its interest rate exposure.

Both parties were able to benefit from their relative pricing advantage. The World Bank was able to access funds at a lower cost, and IBM was able to reduce its interest rate risk. This demonstrates how the IRS market provides an opportunity for parties to take advantage of differences in their cost of borrowing and manage their interest rate exposure. The relative pricing advantage was a key factor in the creation of the IRS market, as it provided a solution to the financing challenges faced by the World Bank.

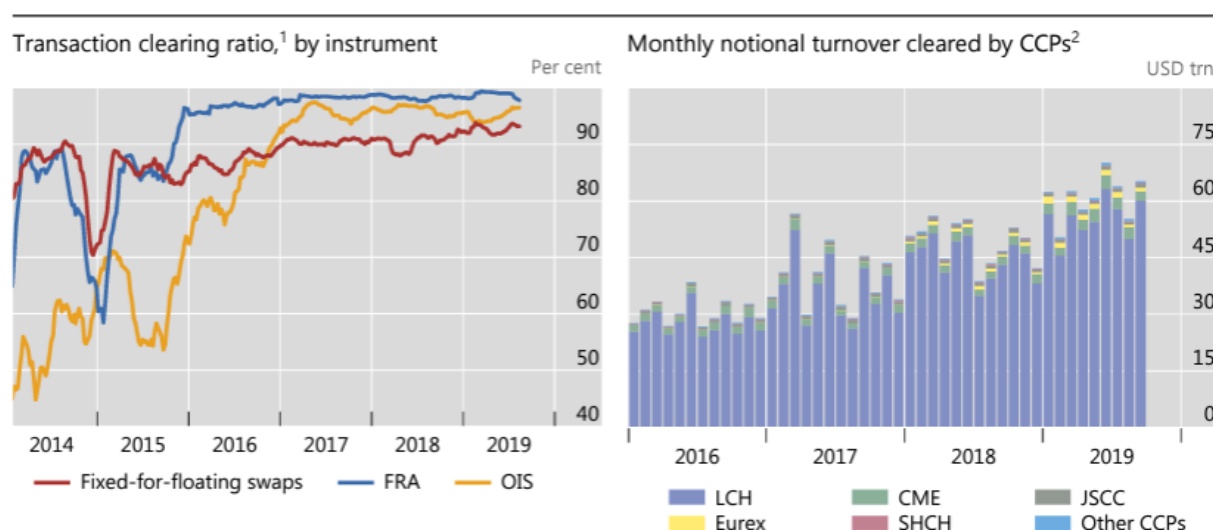
5 What are the trends in the IRS market; research and discuss

“Cleared Over the Counter Derivatives”:

Trends in IRS markets

Regulatory reforms as a result of the 2008 crisis have modeled the major trends observed in the IRS markets and IR derivatives market in general. Salient few are mentioned below -

1. **Shift to Central clearing :** The shift to central clearing has been an important structural change for OTC interest rate derivatives markets. The move was spurred in large part by a concerted regulatory push in response to the 2007–09 financial crisis. The strong regulatory incentives developed led to a surge in IRD trades cleared with central counterparties. These include clearing requirements for some products, preferential capital treatment for cleared derivatives and higher margin requirements for uncleared derivatives. The move to clearing also brought other benefits, such as reduced counterparty risk, more netting opportunities for cleared contracts and increased compression opportunities (BCBS et al (2018), Bellia et al (2019)). As per below infographic, in the US market, over 90% (in terms of notional turnover) of Interest rate swaps are cleared through CCPs as of 2019.



¹ Share of transactions centrally cleared, by product; three-month moving averages. ² LCH = London Clearing House; CME = Chicago Mercantile Exchange; JSCC = Japan Securities Clearing Corporation; Eurex = Eurex Exchange; SHCH = Shanghai Clearing House; other CCPs = Asigna MexDer, ASX Clear, BME Clearing, The Clearing Corporation of India (CCIL), Hong Kong Exchanges and Clearing (HKEX), Central Securities Depository of Poland (KDPW), Korea Exchange (KRX), Nasdaq OMX Clearing and Singapore Exchange (SGX).

Sources: US Commodity Futures Trading Commission; Clarus Financial Technology.

Figure 13: Concentration of CCPs in the OTC interest rate derivatives market

Source: [BIS Quarterly Review 2019](#)

The Commodities Futures Trading Commission (CFTC), a regulator of OTC derivatives in the United States, has mandated the initial implementation of “central clearing” of certain classes of Interest Rate Swaps and passed the final rule on the same in aug 2022. These Interest Rate swaps in four major currencies (USD, EUR, GBP, JPY) on major indices, and in four distinct classes are :

- a) Fixed-to-Floating Swaps
- b) Basis Swaps

- c) Forward Rate Agreements
- d) Overnight Index Swaps (OIS)

More details regarding the maturity and reference rates of this rule can be found on the [CFTC website](#)

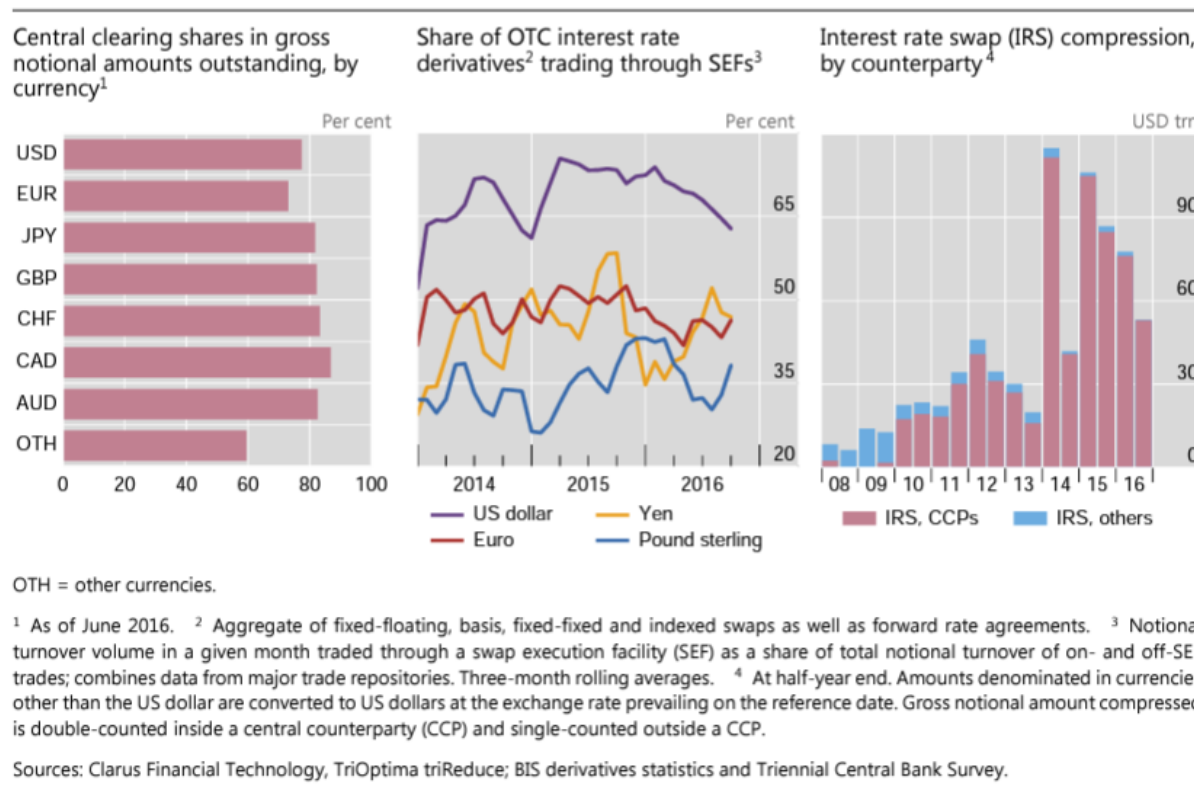


Figure 14: OTC interest rate derivatives markets adapt to regulatory reforms
Source: [BIS Quarterly Review 2016](#)

2. **Rise in electronic trading :** Electronic trading has also become more prevalent. Since the mandatory execution requirements for swap trades came into effect in October 2013 as part of the Dodd-Frank Act, swap execution facilities (SEFs) have served to move a large share of OTC swap trading to electronic platforms . The proliferation of electronic trading platforms reduced transaction costs, which in turn incentivised greater trading, especially by investment funds and other asset managers.
3. **Margin requirements for uncleared contracts:** Another key element of the G20 reform agenda has been the introduction of initial and variation margins for non-centrally cleared contracts. This has recently come into effect in the United States, Japan and Canada, and will be implemented in Europe and Asia in 2017 (FSB (2016)). Such margining requirements could raise the costs of OTC trading and thereby encourage a shift in trading activity to

exchanges.

4. **Portfolio compression :** OTC markets have also adapted to regulatory changes by a wider adoption of portfolio compression (Figure 14, right-hand panel). Portfolio compression is a post-trade netting technique through which market participants can modify or remove outstanding contracts and create new ones in order to reduce their overall market gross position without modifying their net positions. Such compression reduces capital charges and trading costs by shrinking notional amounts outstanding, while leaving net exposures unchanged. The increasing use of clearing houses has facilitated trade compression, as they allow for an efficient identification of offsetting exposures.

Cleared Over the Counter Derivatives

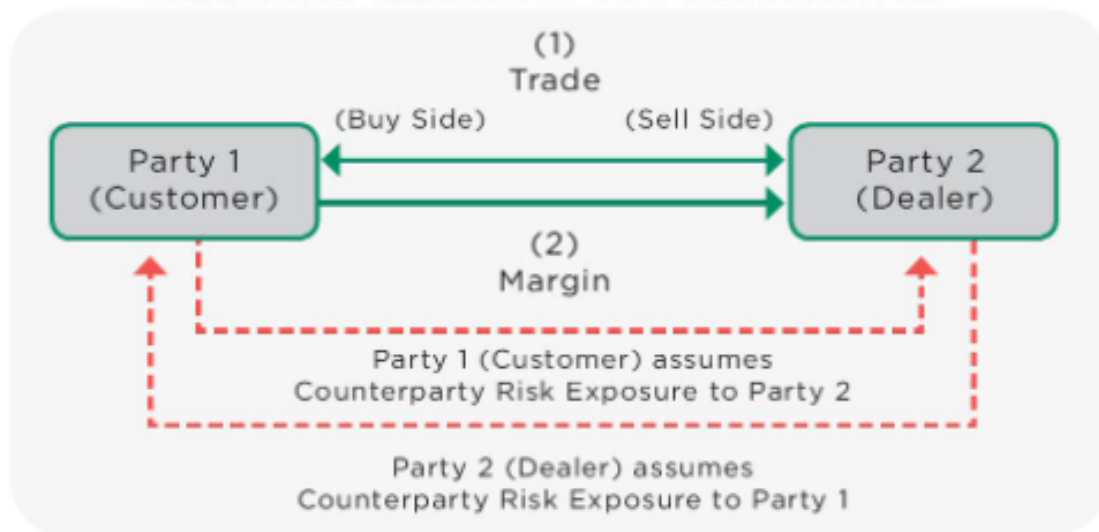
To explain “*Cleared Over the Counter Derivatives*”, we need to first define what clearing entails in banking and finance. Clearing refers to all activities from the time a commitment is made for a transaction until it is settled. This process turns the promise of payment (for example, in the form of a cheque or electronic payment request) into the actual movement of money from one account to another. It involves the management of post-trading, pre-settlement credit exposures to ensure that trades are settled in accordance with market rules, even if a buyer or seller should become insolvent prior to settlement. Processes included in clearing are risk reporting/monitoring, risk margin, netting of trades to single positions, tax handling, and failure handling. Clearing houses were formed to facilitate such transactions among banks.

OTC (or over the counter) clearing refers to a process under which standardized derivative contracts which relate to over-the-counter transactions will be cleared. They can be cleared centrally or bilaterally.

A centrally cleared OTC derivative trade is one which is cleared through a clearinghouse, instead of directly (bilaterally) between two counterparties, and both counterparties effectively assume credit risk exposure to the clearinghouse. A central clearinghouse is also called a CCP. A Central CounterParty or CCP is an entity that interposes itself between the two counterparties in a financial transaction. After the parties have agreed to a trade, the CCP becomes the buyer to every seller and the seller to every buyer. In doing so, the CCP reduces counterparty credit and liquidity risk exposures through netting. It also provides standardized and transparent risk management.

Below info-graphics demonstrate the difference between the two clearing methods.

BILATERAL CLEARING OTC DERIVATIVES



CENTRAL CLEARING OTC DERIVATIVES

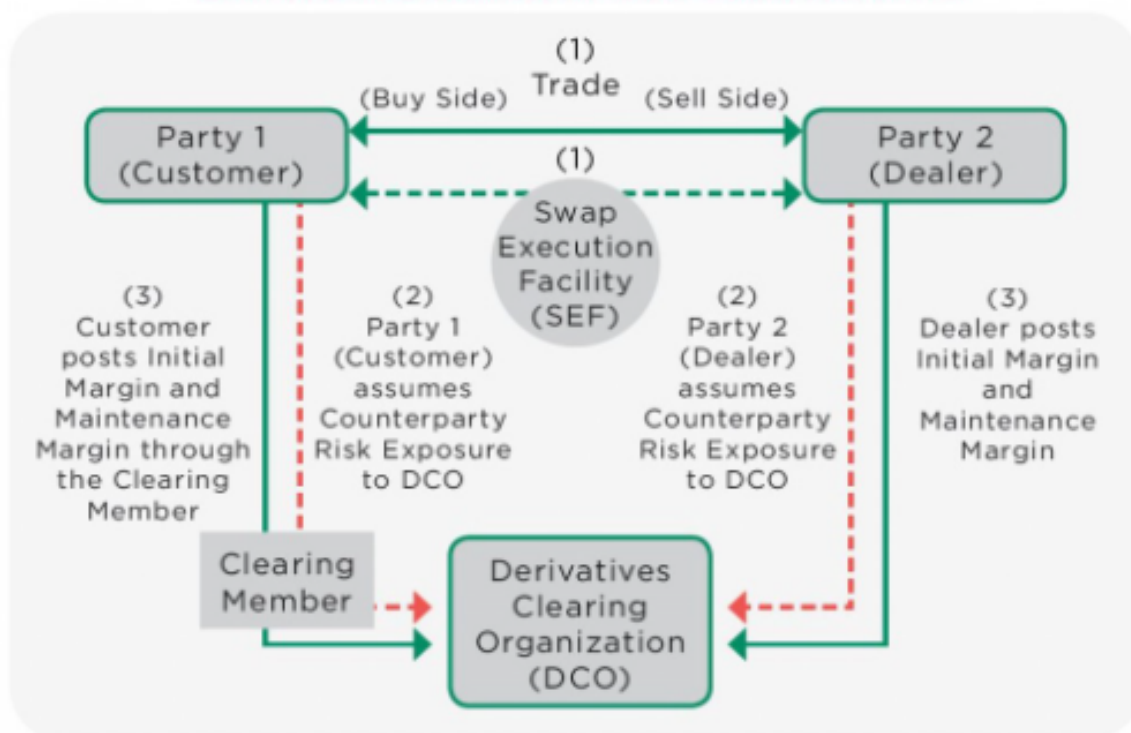


Figure 15: Bilateral vs Central OTC Clearing

Source: www.riskadvisorsinc.com/otc-derivatives-central-clearing-united-states

Central clearing has a variety of advantages including but not limited to transparency in pricing of standardized OTC instruments as well as reduction in credit and default risk.

The shift to central clearing is a key element of financial system reforms in the aftermath of the Great Financial Crisis. To reduce the systemic risks resulting from bilateral trading, the G20 Leaders agreed at the 2009 Pittsburgh Summit that all standardized derivatives contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through CCPs. CCPs had, indeed, proved resilient during the crisis, continuing to clear contracts even when bilateral markets had dried up.

5.1 Price discovery? MAT trades? Central Limit Order Book (CLOB)? Request for Quotation (RFQ)? What differences, and why?

- **Price discovery:** Price discovery, also referred to as price discovery mechanism or process, is the method of determining a spot price of an asset through interactions between buyers and sellers. Generally, the balance between buyers and sellers is an effective indicator of demand and supply in a market; and demand and supply are significant driving factors of price movements.

Price discovery enables buyers and sellers to set the market prices of tradable assets. This is because the mechanisms of price discovery set out what sellers are willing to accept, and what buyers are willing to pay. As a result, price discovery is concerned with finding the equilibrium price that facilitates the greatest liquidity for that asset. Auction markets enable multiple buyers and sellers to compete until the middle-ground – or market price – is found.

In the OTC derivatives market, clearing, in general, encourages better price discovery because it eliminates the importance of counterparty creditworthiness in pricing swaps cleared through a given DCO (Derivatives Clearing Organization). By making the counterparty creditworthiness of all swaps of a certain type essentially the same, prices should reflect factors related to the terms of the swap, rather than the idiosyncratic risk posed by the entities trading it. Because most of these swaps are cleared voluntarily, these effects on price discovery are currently being realized. Requiring clearing would ensure that they continue to be realized.

- **MAT trades:** On May 16, 2013, the Commodity Futures Trading Commission (CFTC)

approved the 'made-available-to-trade' (MAT) rule, which gives the market clarity on which products must be, by law, traded on swap execution facilities (SEFs). Once the CFTC issues a MAT determination, a mandate is established for trading that product on SEF, which prevents it from being traded bilaterally by counterparties subject to the SEF requirements. For specifications of MAT trades, please refer to the [CFTC website](#)

- **Central Limit Order Book (CLOB):** A central limit order book or "CLOB" is a trading method used by most exchanges globally. It is a transparent system that matches customer orders (e.g. bids and offers) on a 'price time priority' basis. The highest ("best") bid order and the lowest ("cheapest") offer order constitutes the best market or "the touch" in a given security or swap contract. Customers can routinely cross the bid/ask spread to effect immediate execution. They also can see market depth or the "stack" in which customers can view bid orders for various sizes and prices on one side vs. viewing offer orders at various sizes and prices on the other side. The CLOB is by definition fully transparent, real-time, anonymous and low cost in execution.
- **Request for Quotation (RFQ):** In the wake of the 2007-09 financial crisis, there was an initiative to create more pre-trade transparency, for which it is essential to know who is requesting which financial product. RFQ came into being as a result. RFQ is defined as the trading method wherein a customer queries a finite set of participant market makers who quote a bid/offer ("a market") to the customer. The customer may only "hit the bid" (sell to the highest bidder) or "lift the offer" (buy from the cheapest seller).

The Swap Execution Facility's Standard RFQ functionality permits an RFQ Requester to request a one-sided market (bid or offer quote) for a swap from identified Quote Providers. In the context of this protocol, the RFQ Requester specifies notional size (or quantity), Swap instrument, and side (or direction) it desires to transact.

There are some **key differences between the trading methods of CLOB and RFQ :**

1. In the CLOB model, customers can trade directly with dealers, dealers can trade with other dealers, and importantly, customers can trade directly with other customers anonymously. On the other hand, in the RFQ method, customers can only trade with dealers. They can not trade with other customers, and importantly, they can not make markets themselves.

2. CLOB is a symmetric trade execution model as opposed to RFQ which is an asymmetric trade execution model.
3. In RFQ, the customer is prohibited from stepping inside the bid/ask spread and thereby reducing its execution fees. However, in CLOB, customers can routinely cross the bid/ask spread to effect immediate execution.

5.2 Clearing and settlement? Market actors? SEF? CCP? FCM?

- **Clearing & Settlement:** Clearing refers to the process of matching and validating trade details between the buyer and the seller and their respective banks, to ensure that the terms of the trade have been met. This typically involves the transfer of ownership and the payment of funds between the parties involved. The objective of clearing is to reduce the risk of default on a trade by ensuring that both parties have fulfilled their obligations before the trade is considered final. It involves the management of post-trading, pre-settlement credit exposures to ensure that trades are settled in accordance with market rules, even if a buyer or seller should become insolvent prior to settlement. Processes included in clearing are risk reporting/monitoring, risk margin, netting of trades to single positions, tax handling, and failure handling.

Settlement, on the other hand, refers to the process of transferring the ownership of a financial instrument, such as securities or commodities, from the seller to the buyer and the payment of funds from the buyer to the seller. The settlement process usually occurs after the clearing process and confirms the completion of a trade. The objective of settlement is to make the transfer of ownership and payment of funds final and irrevocable.

In summary, clearing is the process of confirming that a trade has been executed as agreed upon, while settlement is the process of transferring ownership and funds between the parties involved in the trade. Clearing and settlement are both processes carried out by a clearing house in the process of securities trading. It is important that a strong clearing and settlement system is set in place to maintain the smooth securities trading operations within financial markets. Clearing is the second part of the process which will come after the execution of the trade and before the settlement of the transaction.

- **SEF:** A Swap Execution Facility (SEF) (sometimes Swaps Execution Facility) is a platform for financial swap trading that provides pre-trade information (i.e. bid and offer prices) and

a mechanism for executing swap transactions among eligible participants.

Swap Execution Facilities are regulated by the Securities and Exchange Commission and the Commodity Futures Trading Commission. The regulated trading of certain swaps is a result of requirements in the United States by the Dodd–Frank Wall Street Reform and Consumer Protection Act (in particular Title VII). Financial swaps have traditionally been traded in over-the-counter (OTC) markets. However, regulatory changes have driven reporting, clearing, and settlement functions to SEFs, which are much more tightly regulated. SEFs provide a centralized platform for the trading of swaps, allowing market participants to execute trades electronically and in a transparent manner.

- **CCP:** A central counterparty (“CCP”) is a financial institution defined by the Bank for International Settlements (“BIS”) as, “a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts.” A CCP is also known in the US as a Derivatives Clearing Organization (“DCO”), and is regulated as such by the CFTC.

CCP members are financial institutions that wish to clear trades through a central counterparty in order to eliminate the counterparty credit risk arising from their trade with a bilateral counterparty. Prospective CCP members apply for membership in CCPs that clear the types of instruments the prospective member trades. **How CCP works? :**

- To minimize risk to both counterparties, the CCP enters into two contracts: one with Party A (e.g. the seller); and one with Party B (e.g. the buyer), which replace the “pre-clearing” direct agreement between buyer and seller. Legally this is referred to as “novation. From the moment of novation, both the buyer and the seller look to the CCP alone for future performance under the contract. A typical example for an interest rate swap is depicted in the above diagram.
- By standing in the middle of the above trade, the CCP assumes the counterparty credit risk of each side of the trade: of the Payer of Fixed as well as the Receiver of Fixed. If at any time during the life of the contract, one of those two parties defaults, and there is a cost to replace that defaulted counterparty in the then current market, then the CCP must pay that replacement cost. Of course, margin (in the form of collateral) is required from the two counterparties, and will normally offset this replacement cost

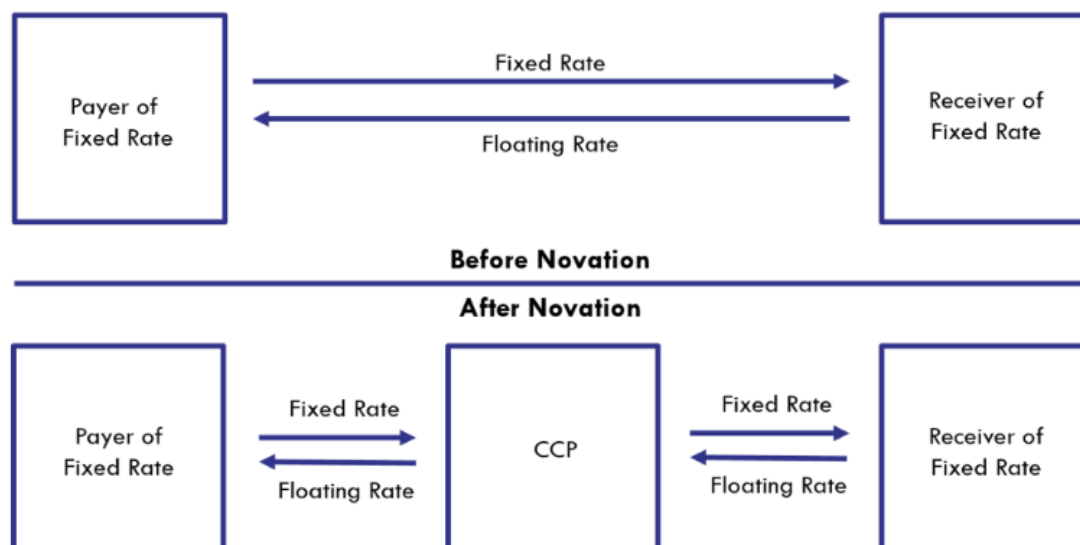


Figure 16: Example of a Centrally cleared Interest rate swap

Source: www.gfmi.com/articles/understanding-central-counterparties-ccps/

to the CCP.

- **FCM:** A futures commission merchant (FCM) is an entity that solicits or accepts orders to buy or sell futures contracts, options on futures, retail off-exchange forex contracts or swaps, and accepts money or other assets from customers to support such orders. A firm which is soliciting or accepting orders to buy or sell retail off-exchange forex contracts and accepting money or assets from retail customers would need to be designated as a Forex Dealer Member and comply with requirements outlined on the NFA (National Futures Association) website.
- Market actors are simply market participants in the OTC derivatives markets. That would include market makers and market takers. A market maker or liquidity provider is a company or an individual that quotes both a buy and a sell price in a tradable asset held in inventory, hoping to make a profit on the bid-ask spread, or turn. A market taker on the other hand sucks up liquidity by taking a one directional position in the market.

5.3 Futurization of the swaps market? Why, how, what, when, who?

The **futurization of swaps** refers to the use of futures to mimic the risk allocation functions that OTC swaps currently play in the market. **How** is it possible? Well, it is because swaps function as a string of individual futures contracts that are aggregated to hedge risk over a specific

period of time and against a specific set of risks. By using a series of futures contracts, swap traders can hedge risks without subjecting themselves to regulations that are only applicable to swap transactions.

Why? Swaps traders have recently begun to examine futures as an alternative to swap transactions in order to avoid certain Dodd-Frank regulatory requirements, including but not limited to:

1. Registration requirements for swap dealers (SDs) or major swap participants (MSPs).
2. Central clearing for swap transactions, which requires the availability of funds for margin collateral and fees.
3. Increased margin requirements for swaps, as compared to futures.

This has been much focussed on since 2013 when the CFTC held a roundtable on the topic, following which there was much discussion on market migration from swap transactions to futures contracts because of burdensome Dodd-Frank over the counter (OTC) swaps regulation.

6 “Uncleared Over the Counter Derivatives”: the regulator is stepping in to mitigate systemic risk in the OTC derivatives market. The first wave consisted of “Central Clearing” (question 5). Beyond Cleared OTCD, Uncleared OTCD are becoming subject to Initial Margin and Variation Margin.

6.1 What is IM and VM? What are their purpose? What type of risk do they protect against? What are the calculation standards for IM and VM?

IM or Intial Margin : For instruments cleared by a central counterparty (CCP), initial margin is the amount of collateral that each participant is required to provide to the CCP (or the clearing member) in order to cover potential losses in the event of that participant defaulting. The initial margin is calculated on the basis of a formula set by the CCP.

VM or Variation margin : Profits and losses calculated on a daily basis in open futures contracts and options may result in the counterparty to the bilateral trade making a payment to the relevant clearing house or vice versa.

The **purpose of Initial margin** is to protect the transacting parties from the potential future exposure that could arise from future changes in the mark-to-market value of the contract during the time it takes to close out and replace the position in the event that one or more counterparties default. The amount of initial margin reflects the size of the potential future exposure.

The **purpose of Variation margin** is to protect the transacting parties from the current exposure that has already been incurred by one of the parties from changes in the mark-to-market value of the contract after the transaction has been executed. The amount of variation margin reflects the size of this current exposure. It depends on the mark-to-market value of the derivatives at any point in time, and can therefore change over time.

Margin Calculation:

Covered entities include all financial firms and systemically important non-financial firms. Central banks, sovereigns, multilateral development banks, the Bank for International Settlements, and non-systemic, non-financial firms are not covered entities.

All covered entities must exchange, on a bilateral basis, initial margin with a threshold not to exceed €50 million. The threshold is applied at the level of the consolidated group to which the threshold is being extended and is based on all non-centrally cleared derivatives between the two consolidated groups.

For the purpose of informing the initial margin baseline, the potential future exposure of a non-centrally cleared derivatives should reflect an extreme but plausible estimate of an increase in the value of the instrument that is consistent with a one-tailed 99 per cent confidence interval over a 10-day horizon, based on historical data that incorporates a period of significant financial stress. The initial margin amount must be calibrated to a period that includes financial stress to ensure that sufficient margin will be available when it is most needed and to limit the extent to which the margin can be pro-cyclical. The required amount of initial margin may be calculated by reference to either (i) a quantitative portfolio margin model or (ii) a standardised margin schedule.

In favor of simplicity, the BCBS and IOSCO have provided an initial margin schedule which may be used to compute the amount of initial margin required on a set of derivatives transactions. The required initial margin will be computed by referencing the standardised margin rates in Appendix A of BCBS(2015) publication - "Margin requirements for non-centrally cleared derivatives", and by adjusting the gross initial margin amount by an amount that relates to the net-to-gross ratio

(NGR) pertaining to all derivatives in the legally enforceable netting set. The use of the net-to-gross ratio is an accepted practice in the context of bank capital regulation and recognises important offsets that would not be recognised by strict application of a standardised margin schedule.

The required initial margin amount would be calculated in two steps. First, the margin rate in the provided schedule would be multiplied by the gross notional size of the derivatives contract, and then this calculation would be repeated for each derivatives contract.¹⁸ This amount may be referred to as the gross standardised initial margin. Second, the gross initial margin amount is adjusted by the ratio of the net current replacement cost to gross current replacement cost (NGR). The total amount of initial margin required on a portfolio according to the standardised margin schedule would be the net standardised initial margin amount.

$$\text{Net standardised initial margin} = 0.4 * \text{Gross initial margin} + 0.6 * \text{NGR} * \text{Gross initial margin}$$

where NGR is defined as the level of net replacement cost over the level of gross replacement cost for transactions subject to legally enforceable netting agreements. Also,

As for variation margin calculation, all covered entities that engage in non-centrally cleared derivatives must regularly (e.g. daily) exchange, on a bilateral basis, the full amount of variation margin (ie a zero threshold) necessary to fully collateralise the mark-to-market exposure of the non-centrally cleared derivative.


6.2 What are the differences, from a market participant point of view, between “cleared” and “uncleared” derivatives? What are the compliance timelines for UOTCD for IM and VM? Is IM and VM treated similarly from a regulatory perspective?

From a market participant perspective, cleared and uncleared derivatives are widely different. In a cleared derivative, both the counterparties are facing the clearing house in a buy and a sell trade, where as for uncleared derivatives, the transaction is bilateral between the counterparties themselves.

BCBS published the "Margin requirements for non-centrally cleared derivatives" in 2013 with revisions in 2015. The revisions delayed the beginning of the phase-in period for collecting and posting initial margin on non-centrally cleared trades from 1 December 2015 to 1 September


2016. The revisions also instituted a six-month phase-in of the requirement to exchange variation margin, beginning 1 September 2016.

Regulatory treatment: From a regulatory perspective, Initial and Variation margin are also not treated the same. Not only is their method of calculation different as seen in the last section, but their threshold levels prescribed by BIS are also more conservative for initial margin as opposed to variation margin. Please see figure 17 for more details regarding the same.



Basel Committee on Banking Supervision

BANK FOR INTERNATIONAL SETTLEMENTS



Summary of changes to the implementation of the margin requirements for non-centrally cleared derivatives		
	September 2013 framework	March 2015 revisions
Initial margin		
Covered entities belonging to a group whose aggregate month-end average notional amount of non-centrally cleared derivatives exceeds:		
€3.0 trillion	1 December 2015 to 30 November 2016 (based on average notional amounts for June, July and August 2015)	1 September 2016 to 31 August 2017 (based on average notional amounts for March, April and May 2016)
€2.25 trillion	1 December 2016 to 30 November 2017 (based on average notional amounts for June, July and August 2016)	1 September 2017 to 31 August 2018 (based on average notional amounts for March, April and May 2017)
€1.5 trillion	1 December 2017 to 30 November 2018 (based on average notional amounts for June, July and August 2017)	1 September 2018 to 31 August 2019 (based on average notional amounts for March, April and May 2018)
€0.75 trillion	1 December 2018 to 30 November 2019 (based on average notional amounts for June, July and August 2018)	1 September 2019 to 31 August 2020 (based on average notional amounts for March, April and May 2019)
Covered entities belonging to a group whose aggregate month-end average notional amount of non-centrally cleared derivatives exceeds €8 billion	From 1 December 2019 onwards (based on average notional amounts for June, July and August of that year)	From 1 September 2020 onwards (based on average notional amounts for March, April and May that year)
Variation margin		
Covered entities belonging to a group whose aggregate month-end average notional amount of non-centrally cleared derivatives exceeds €3 trillion	1 December 2015	1 September 2016
All other covered entities		1 March 2017

Figure 17: Summary of Initial and Variation margin requirement for Non-cleared OTC derivatives
Source: www.bis.org/bcbs/publ/d317summarytable.pdf

6.3 Using the documents provided in appendix, explain the purpose, the impact, the time line , and the implication of the UOTCD reform. Elaborate specifically on the operational, risk and industry impact of the UOTCD reform following the 2008 crisis.

The shift to central clearing has started to mitigate the risks that emerged in non-centrally cleared markets before and during the Great Financial Crisis. It has reduced financial institutions' exposure to counterparty credit risk shocks through netting, margining and collateralisation. And it has placed the focus on the need for sound risk management in trading markets more generally.

The compliance timeline for the proposed changes under UOTCD reform have been mentioned in 6.3

Margin requirements on non-centrally cleared derivatives will represent a significant policy change for most market participants. Initial margin requirements, in particular, are not currently applied to a large number of transactions across many market participants. Such requirements will require significant operational enhancements and will also require significant amounts of collateral for which liquidity planning will be required. While the changes that will be required as a result of universal margin requirements are important for limiting systemic risks, these changes must be managed effectively so as to allow for an appropriate transition and not create unduly large transition costs. Moreover, the benefits gained by managing the transition to the new requirements must be weighed against systemic risks that are left unmitigated during any transition period.

In addition, the requirements could impose some unnecessary operational costs on smaller entities that pose no significant systemic risk to the system and would not be expected to be bound by the initial margin requirements, in particular, in light of the provided threshold amount of €50 million.

Also, these requirements are new and interact with a large number of existing regulatory initiatives that, over time, should be reviewed and harmonised as appropriate. Accordingly, it is important that the appropriateness, efficacy and relationship of these requirements with other related requirements be monitored and evaluated on an ongoing basis.

6.4 Explain Prudential Regulators (who are they?), CFTC, SEC, Swap Dealer, Major Swap Participant, Major Securities Based Swap Participant, Netting, Netting Portfolio, Eligible Master Netting Agreement, Credit Support Annex, Minimum Transfer Amount, Eligible Collateral, Cheapest to Deliver, Haircuts, Segregation, Custody, Rehypotheication.

Prudential Regulators: Prudential regulation is a type of financial regulation that requires financial firms to control risks and hold adequate capital as defined by capital requirements, liquidity requirements, by the imposition of concentration risk (or large exposures) limits, and by related reporting and public disclosure requirements and supervisory controls and processes. Financial regulators that enforce these regulations are called Prudential regulators.

Different countries have their financial regulators along the lines of prudential/consumer protec-

tion such as the UK with the Prudential Regulation Authority or in Australia with the Australian Prudential Regulation Authority. The US federal prudential banking regulators include the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC) (collectively, prudential regulators).

CFTC : The Commodity Futures Trading Commission (CFTC) is an independent agency of the US government created in 1974 that regulates the U.S. derivatives markets, which includes futures, swaps, and certain kinds of options. After the financial crisis of 2007–08 and since 2010 with the Dodd–Frank Wall Street Reform and Consumer Protection Act, the CFTC has been transitioning to bring more transparency and sound regulation to the multitrillion dollar swaps market.

SEC : The U.S. Securities and Exchange Commission (SEC) is an independent agency of the United States federal government, created in the aftermath of the Wall Street Crash of 1929. The SEC’s authority was established by the Securities Act of 1933 and Securities Exchange Act of 1934. The primary purpose of the SEC is to enforce the law against market manipulation. The SEC has a three-part mission: to protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation.

Swap Dealer: A swap dealer (SD) is an entity that holds itself out as a dealer in swaps; makes a market in swaps; regularly enters into swaps with counterparties as an ordinary course of business for its own account; or engages in any activity causing the entity to be commonly known in the trade as a dealer or market maker in swaps. For example, entities are exempt from the SD registration on the basis of de minimis activity—the aggregate gross notional amount of the swaps that an entity enters into over the prior 12 months in connection with dealing activities. Currently, the de minimis threshold is \$8 billion. All registered and provisionally registered SDs must be NFA Members.

Major Swap Participant: There are three parts to the Dodd-Frank Act definition of a major swap participant. A person that satisfies any one of them is an MSP:

1. A person that maintains a "substantial position" in any of the major swap categories, excluding positions held for hedging or mitigating commercial risk and positions maintained

by certain employee benefit plans for hedging or mitigating risks in the operation of the plan.

2. A person whose outstanding swaps create "substantial counterparty exposure that could have serious adverse effects on the financial stability of the United States banking system or financial markets."
3. Any "financial entity" that is "highly leveraged relative to the amount of capital such entity holds and that is not subject to capital requirements established by an appropriate Federal banking agency" and that maintains a "substantial position" in any of the major swap categories.

The statutory definition excludes swap dealers and certain financing affiliates.

Major Securities Based Swap Participant: Major security-based swap participant means any person:

1. That is not a security-based swap dealer; and
2.
 - That maintains a substantial position in security-based swaps for any of the major security-based swap categories, excluding both positions held for hedging or mitigating commercial risk, and positions maintained by any employee benefit plan (or any contract held by such a plan) as defined in paragraphs (3) and (32) of section 3 of the Employee Retirement Income Security Act of 1974 (29 U.S.C. 1002) for the primary purpose of hedging or mitigating any risk directly associated with the operation of the plan;
 - Whose outstanding security-based swaps create substantial counterparty exposure that could have serious adverse effects on the financial stability of the United States banking system or financial markets; or
 - That is a financial entity that: a) Is highly leveraged relative to the amount of capital such entity holds and that is not subject to capital requirements established by an appropriate Federal banking agency (as defined in 15 U.S.C. 78c(a)(72)); and b) Maintains a substantial position in outstanding security-based swaps in any major security-based swap category.

Scope of designation: A person that is a major security-based swap participant in general shall be deemed to be a major security-based swap participant with respect to each security-based swap it enters into, regardless of the category of the security-based swap or the person's activities in connection with the security-based swap, unless the Commission limits the person's designation as a major security-based swap participant to specified categories of security-based swaps.

Netting: It is a method of reducing credit, settlement and other risks of financial contracts by aggregating (combining) two or more obligations to achieve a reduced net obligation. Netting leads to a reduction of credit risk, settlement risk, liquidity risk and systemic risk. There are 4 different types of Netting (Payment, Novation, Close-out and Multilateral). **A netting portfolio** is simply a portfolio of derivatives where we apply netting and collateralization to reduce the liquidity risk and the counterparty credit risk.

Eligible Master Netting Agreement: as defined by CFTC, means a written, legally enforceable agreement that:

1. creates a single legal obligation for all individual transactions covered by the agreement upon an event of default following any stay permitted by paragraph (2) of this definition, including upon an event of receivership, conservatorship, insolvency, liquidation, or similar proceeding, of the counterparty;
2. provides the covered swap entity the right to accelerate, terminate, and close-out on a net basis all transactions under the agreement and to liquidate or set-off collateral promptly upon an event of default, including upon an event of receivership, conservatorship, insolvency, liquidation, or similar proceeding, of the counterparty, provided that, in any such case, any exercise of rights under the agreement will not be stayed or avoided under applicable law in the relevant jurisdictions, other than:
 - in receivership, conservatorship, or resolution under the Federal Deposit Insurance Act (12 U.S.C. 1811 et seq.), Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act (12 U.S.C. 5381 et seq.), the Federal Housing Enterprises Financial Safety and Soundness Act of 1992, as amended (12 U.S.C. 4617), or the Farm Credit Act of 1971, as amended (12 U.S.C. 2183 and 2279cc), or laws of foreign jurisdictions that are substantially similar to the U.S. laws referenced in this paragraph

- (2)(i) in order to facilitate the orderly resolution of the defaulting counterparty; or
- where the agreement is subject by its terms to, or incorporates, any of the laws referenced in paragraph (2)(i) of this definition; and
3. does not contain a walkaway clause (that is, a provision that permits a non-defaulting counterparty to make a lower payment than it otherwise would make under the agreement, or no payment at all, to a defaulter or the estate of a defaulter, even if the defaulter or the estate of the defaulter is a net creditor under the agreement).

Credit Support Annex: A Credit Support Annex, or CSA, is a legal document which regulates credit support (collateral) for derivative transactions. It is one of the four parts that make up an ISDA Master Agreement but is not mandatory. It is possible to have an ISDA agreement without a CSA but normally not a CSA without an ISDA.

Essentially, a CSA defines the terms or rules under which collateral is posted or transferred between swap counterparties to mitigate the credit risk arising from "in the money" derivative positions.

Minimum Transfer Amount: The minimum amount that can be transferred for any margin call. The amount is specified in the margining agreement. Regulations only require parties to make a transfer of margin if it exceeds the Minimum Transfer Amount (MTA). The combined MTA for IM and VM cannot exceed USD 500k (similar amounts in other currencies) for non-cleared OTC derivatives.

Eligible Collateral: are the kind of collateral that can be posted for margin requirements of uncleared OTC derivatives transactions. More detailed definition on the CFTC website.

Cheapest to Deliver: CTD or the Cheapest to Deliver meaning is used to define the method that helps the investors figure out the Financial Instrument or the cheapest possible security that can prove the most lucrative options in the futures contract. The method is quite commonly used for different types of securities that share a few common features. The best example of the cheapest to deliver is the Treasury bond Futures Contract. While each U.S. Treasury futures contract has its own basket of eligible securities for delivery generally one, or sometimes two, price out to be most efficient for the short position to deliver to the long position. This security is most efficient because it is considered cheaper or cheapest to deliver versus the other alternative

securities.

Haircuts: In finance, a haircut is the difference between the current market value of an asset and the value ascribed to that asset for purposes of calculating regulatory capital or loan collateral. The amount of the haircut reflects the perceived risk of the asset falling in value in an immediate cash sale or liquidation. The larger the risk or volatility of the asset price, the larger the haircut.

Segregation & Custody: Segregation refers to the separation of assets from a larger group or creating separate accounts for specific groups, assets, or individuals. Segregation is common in the brokerage industry and is designed to avoid the commingling of customer assets with the working capital of the brokerage firm.

Custody services provided by a bank typically include the settlement, safekeeping, and reporting of customers' marketable securities and cash. Securities lending can allow a customer to make additional income on custody assets by loaning securities to approved borrowers on a short-term basis.

Rehypothecation: Rehypothecation is an alternative name for re-pledging. In the derivatives market, rehypothecation is sometimes called re-use. However, the term 're-use' is also applied in the repo market for the onward outright sale of collateral by a repo buyer to a third party in the cash market. This has caused some confusion.

There is an important legal distinction between pledge-based rehypothecation on the one hand and the sale or use of collateral in the (non-US) repo market on the other. In a pledge, title to collateral remains with the collateral-giver. If the collateral-giver grants a right of rehypothecation to the collateral-taker, the collateral-giver remains the owner but only until the collateral-taker exercises his right of rehypothecation. When this right is exercised, there is a material change in the legal relationship between the parties. The pledge is extinguished and the collateral-giver loses his title to the collateral, which is transferred to the third party to whom the collateral has been rehypothecated. In exchange, the collateral-giver is given a contractual right to the return of the same or similar collateral but this claim is intrinsically unsecured (although the collateral-giver is likely to have received funding in return for giving the right of rehypothecation to the collateral-taker and, in the event of the collateral-taker's insolvency, the collateral-giver

may have a contractual right of set-off of all mutual obligations to and from the collateral-taker).

In a repo, the buyer becomes the owner of the collateral at the start of the transaction and can dispose of the collateral when and as he wishes. His right of use is not a discretionary right granted by the seller. It is an automatic right arising from property ownership.

7 References

1. A guide to understanding floating rate securities
Source:<https://www.raymondjames.com/wealth-management/advice-products-and-services/investment-solutions/fixed-income/fixed-income-strategies/a-guide-to-understanding-floating-rate-securities>
2. Stats - BIS
Source:<https://stats.bis.org/statx/srs/table/d12.1>
3. ISDA Report
Source:<https://www.isda.org/a/L6xgE/Key-Trends-in-the-Size-and-Composition-of-OTC-Derivatives-Markets-in-the-First-Half-of-2022.pdf>
4. Duration of floating rate notes
Source:<https://quant.stackexchange.com/questions/57839/duration-of-a-floating-rate-bond-with-spread?rq=1>
5. Why interest rate swaps are important? - a brief history
Source:www.hedgebookpro.com/resources/why-interest-rate-swaps-are-important-a-brief-history/
6. Clearing (finance) - Wikipedia
Source:[www.wikipedia.org/wiki/Clearing_\(finance\)](http://www.wikipedia.org/wiki/Clearing_(finance))
7. Central clearing: trends and current issues, BIS Quarterly Review 2015
Source:www.bis.org/publ/qtrpdf/rqt1512g.htm
8. otc derivatives central clearing in the united states
Source:<https://riskadvisorsinc.com/otc-derivatives-central-clearing-united-state>
9. The evolution of OTC interest rate derivatives markets, BIS Quarterly Review 2019
Source:www.bis.org/publ/qtrpdf/rqt1912i.pdf
10. The changing shape of interest rate derivatives markets, BIS Quarterly Review 2016
Source:<https://www.bis.org/publ/qtrpdf/rqt1612f.pdf>
11. Federal Register - clearing requirements
Source:www.federalregister.gov/documents/2022/05/31/2022-10490/clearing-requirement-determination-under-section-2h-of-the-commodity-exchange-act-for-interest-rate
12. What is Price Discovery?
Source:www.ig.com/us/trading-strategies/what-is-price-discovery-and-how-does-it-work-190605
13. Make Available To Trade, ISDA
Source:www.isda.org/a/quiDE/mat-study-20140404-final-w-all-edits.pdf
14. Central Limit Order Book - Wikipedia
Source:[www.wikipedia.org/wiki/Central limit order book](http://www.wikipedia.org/wiki/Central_limit_order_book)
15. Request for Quote - Wikipedia
Source:[www.wikipedia.org/wiki/Request for quote](http://www.wikipedia.org/wiki/Request_for_quote)
16. Trading and Execution Protocols, CFTC
Source:<https://www.cftc.gov/sites/default/files/filings/orgrules/16/01/rule011516twsefsef003.pdf>
17. Difference Between Clearing and Settlement
Source:www.differencebetween.com/difference-between-clearing-and-vs-settlement/

18. Swap Execution Facility - Wikipedia
Source:[www.wikipedia.org/wiki/Swap Execution Facility](http://www.wikipedia.org/wiki/Swap_Execution_Facility)
19. Futures Commission Merchant, NFA
Source:www.nfa.futures.org/registration-membership/who-has-to-register/fcm.html
20. understanding central counterparties (ccps)
Source:<https://www.gfmi.com/articles/understanding-central-counterparties-ccps/>
21. Trending Now: The "Futurization" of Swaps, Thomson Reuters
Source:www.uk.practicallaw.thomsonreuters.com/4-524-3077
22. Margin requirements for non-centrally cleared derivatives
Source:www.bis.org/bcbs/publ/d317.htm
23. Prudential Regulation - Wikipedia
Source:[www.wikipedia.org/wiki/Prudential regulation](http://www.wikipedia.org/wiki/Prudential_regulation)
24. Commodity Futures Trading Commission - Wikipedia
Source:[www.wikipedia.org/wiki/Commodity Futures Trading Commission](http://www.wikipedia.org/wiki/Commodity_Futures_Trading_Commission)
25. Swap Dealers, NFA
Source:www.nfa.futures.org/registration-membership/who-has-to-register/sd-msp.html
26. U.S. Securities and Exchange Commission - Wikipedia
Source:[https://en.wikipedia.org/wiki/U.S. Securities and Exchange Commission](https://en.wikipedia.org/wiki/U.S._Securities_and_Exchange_Commission)
27. Final Rules Regarding Further Defining “Swap Dealer,” “Major Swap Participant” and “Eligible Contract Participant” , CFTC
Source:[www.cftc.gov/sites/default/files/idc/groups/public/@newsroom/documents/file/msp_eop factsheet final.pdf](http://www.cftc.gov/sites/default/files/idc/groups/public/@newsroom/documents/file/msp_eop_factsheet_final.pdf)
28. ECFR - Definition of “major security-based swap participant.”
Source:<https://www.ecfr.gov/current/title-17/chapter-II/part-240/subpart-A/subject-group-ECFR7f73a3146a9007c/section-240.3a67-1>
29. Newyork Fed- Millers presentation on netting
Source:www.newyorkfed.org/medialibrary/microsites/fmlg/files/Millerspresentationonnetting.pdf
30. Davispolk - EMNA Definition
Source:[https://www.davispolk.com/sites/default/files/EMNA Definition.pdf](https://www.davispolk.com/sites/default/files/EMNA_Definition.pdf)
31. ISDA - Non Cleared Initial Margin
Source:www.isda.org/a/IvPME/Non-Cleared-Initial-Margin-By-the-Numbers.pdf
32. CME Group - Introduction to treasuries
Source:<https://www.cmegroup.com/education/courses/introduction-to-treasuries/get-to-know-treasuries-ctd.html>
33. Segregation Investopedia
Source:<https://www.investopedia.com/terms/s/segregation.asp>
34. Custody Services
Source:<https://www.occ.treas.gov/topics/supervision-and-examination/capital-markets/asset-management/custody-services/index-custody-services.html>

35. Repo and collateral markets

Source:<https://www.icmagroup.org/market-practice-and-regulatory-policy/repo-and-collateral-markets/ic>

36. What is rehypothecation of collateral

Source:[ma-ercc-publications/frequently-asked-questions-on-repo/10-what-is-rehypothecation-of-collateral/](https://www.ma-ercc-publications.com/frequently-asked-questions-on-repo/10-what-is-rehypothecation-of-collateral/)