Quoting Credit Spread Prices for Ringgit Corporate Bonds (PDS) In Addition to Absolute Yields

Briefing Organised by Bank Negara Malaysia and The Financial Markets Association of Malaysia (PPKM)

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Outline

- Decomposing Interest Rate Term Structure versus Credit Spread Term Structure Generating Risk/Return Earnings as Separate Individual Components
- PPKM to introduce Credit Spread Price Quotation for Ringgit Corporate Bonds in Addition to Absolute Yields
- Credit Spread Methodology & Learning from the Evolution and Growing Pains of the USD and other fixed income markets
- USD Treasury + Spread Market Practices for both investors and corporate issuers to Watch Out for
- Credit Spread Trading Examples: Portfolio Management, Expanded Hedging Risk Reduction Solutions & Expansion of Targeted Risk Return Profiles in Both Rates and Credit
- Conclusion

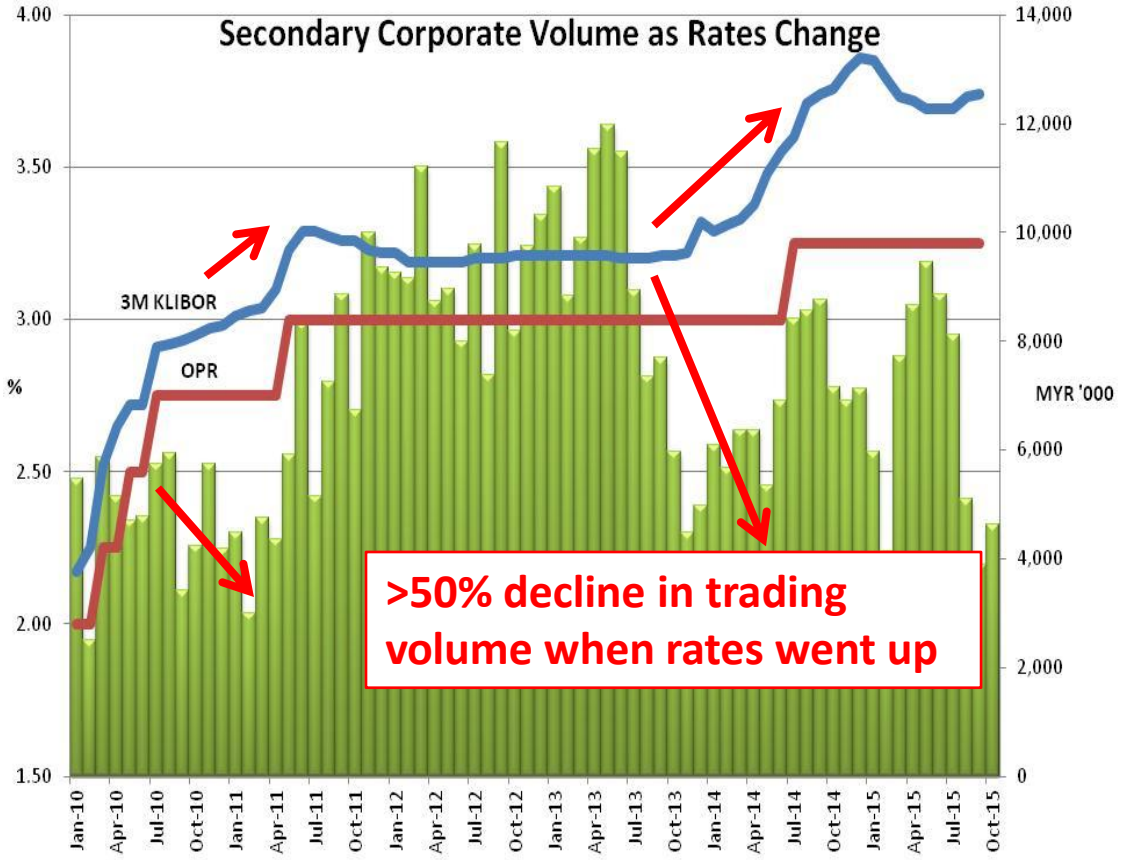
Ringgit Bond Markets have Developed Strongly

ASEAN (in alphabetical order)	Government Bond Market		Corp Bond Market		Total
	Size (in USD bil)	% to GDP	Size (in USD bil)	% to GDP	% to GDP
Indonesia	105.5	12%	18.0	2%	14%
Malaysia	**185.0**	**57%**	**130.5**	**40%**	**97%**
Philippines	87.1	31%	17.2	6%	37%
Singapore	146.5	48%	94.6	31%	79%
Thailand	211.2	56%	70.2	19%	75%
Total @ Dec-2014	735.2	41%	330.4	19%	60%

Source: ADB / Asianbondsonline, Bloomberg

- Malaysian government & corporate bond markets have developed strongly. Quite large relative to GDP today
- However Ringgit Corporate Bonds are mostly quoted on absolute yield basis only
- Unable to decompose, price and trade out interest rate term structure versus credit spread term structure risk return components individually
- BUY BOTH risks together or SELL BOTH risks together

Secondary Ringgit Bond Markets Liquidity

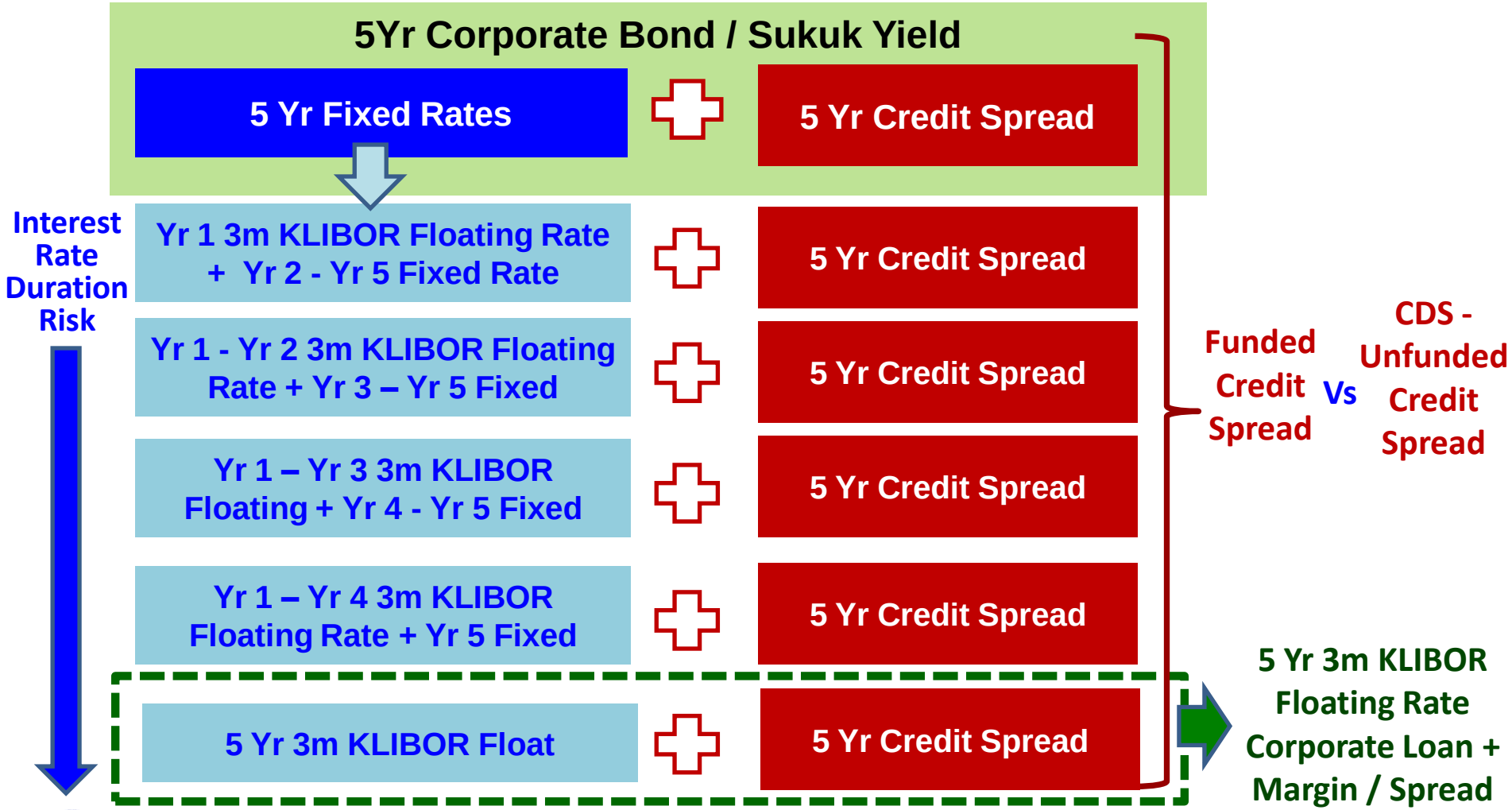


Source: Bloomberg

- Ringgit Corporate Bond Markets serves investors and corporate issuers well with good levels of liquidity (price visibility with decent bid offer spreads good for respectable amounts)
- Except when RM interest rates are rising or there is fear of rates rising. Characterized by selling of existing bond holdings, unwillingness to buy new bonds and if rates do rise, mark-to-market losses fuelling redemptions and liquidating in a difficult selling environment
- In general, bid offer spreads widen significantly and liquidity declines markedly
- And its been a generally declining interest rate environment since 1998 where markets have not experienced rising rates for long time

De-Composing Interest Rate and Credit Spread Term Structure

Risk Return: Earning 5 year Credit Spread Does not Mean Taking on 5 Year Interest Rate / Profit Rate Risk



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PPKM is Proposing for Banks to Quote Credit Spread Prices In addition to Absolute Yields for Ringgit Corporate Bonds (PDS)

Slightly wider bid-ask spread to cover IRS trade

MYR Corporate Bond Indicative Bid/Offer

RATING	ISSUER	MATURITY / FIRST CALL	PRICE		Absolute Yield (YTM)		+ Credit Spread (bps) off KLIBOR IRS	
			BID	ASK	BID	ASK	BID	ASK
AAA	CAGAMAS BERHAD	26-Oct-18	99.28	99.39	4.21%	4.17%	22.3	16.3
AAA	AMAN SUKUK BHD	28-May-21	97.66	97.90	4.43%	4.38%	44.3	37.3
AAA	PROJEK LEBUHRAYA USAHASAMA BHD	12-Jan-23	96.24	96.41	4.57%	4.54%	58.3	53.3
AAA	TNB WESTERN ENERGY BHD	30-Jan-26	93.34	93.73	4.78%	4.73%	79.3	72.3
AA1	WESTPORTS MALAYSIA SDN BHD	1-Apr-25	93.63	93.91	4.80%	4.76%	81.3	75.3
AA1	YTL POWER INTERNATIONAL BHD	24-Mar-23	94.65	94.88	4.82%	4.78%	83.3	77.3
AA3	GAMUDA BERHAD	21-Mar-18	98.99	99.08	4.40%	4.36%	41.3	35.3
AA-	KIMANIS POWER SDN BHD	6-Aug-21	95.87	96.11	4.78%	4.73%	79.3	72.3
GG	DANAINFRA NASIONAL	30-Oct-20	99.33	99.46	4.10%	4.07%	11.3	6.3
GG	DANAINFRA NASIONAL	7-Feb-25	95.65	95.94	4.53%	4.49%	54.3	48.3

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Credit Spread Price Quotation will be (a) Benchmarked off the Interest Rate Swap Curve (b) on a Duration Matched basis and (c) Employing the Z Spread Methodology

+ 5 Yr Duration		- 5 Yr Duration	
5 Yr Fixed Rate Corporate Bond Yield	= 5 Yr Cr Spread $_{MGS}$	+ 5 Yr Fixed MGS	→ Equivalent MGS Negative Dollar Duration (PV01) Amount
	= 5 Yr Cr Spread $_{IRS}$	+ 5 Yr IRS	→ Equivalent IRS Negative Dollar Duration (PV01) Amount

- **Why IRS and not MGS?**
  - To trade out and generate the actual credit spread so that price is real and transactable, will require market-makers and investors to go long the corporate bond and concurrently go short on the reference benchmark security generating the same negative amount of dollar duration (same PVBP)
  - To short MGS of equivalent duration is not currently achievable
  - To sell MGS futures of equivalent dollar duration PV01 is not currently achievable
  - Credit Spreads quoted off MGS is just a number that cannot be crystalized into a real price
- **MYR IRS: market is developed and able to generate negative dollar duration in amount for each tenor up to 10 years (Pay Fixed IRS with Floating rate KLIBOR daily rate settings strictly monitored by BNM and PPKM)**

Credit Spread Price Quotation will be (a) benchmarked off the Interest Rate Swap Curve (b) on a Duration Matched basis and (c) employing the Z spread methodology

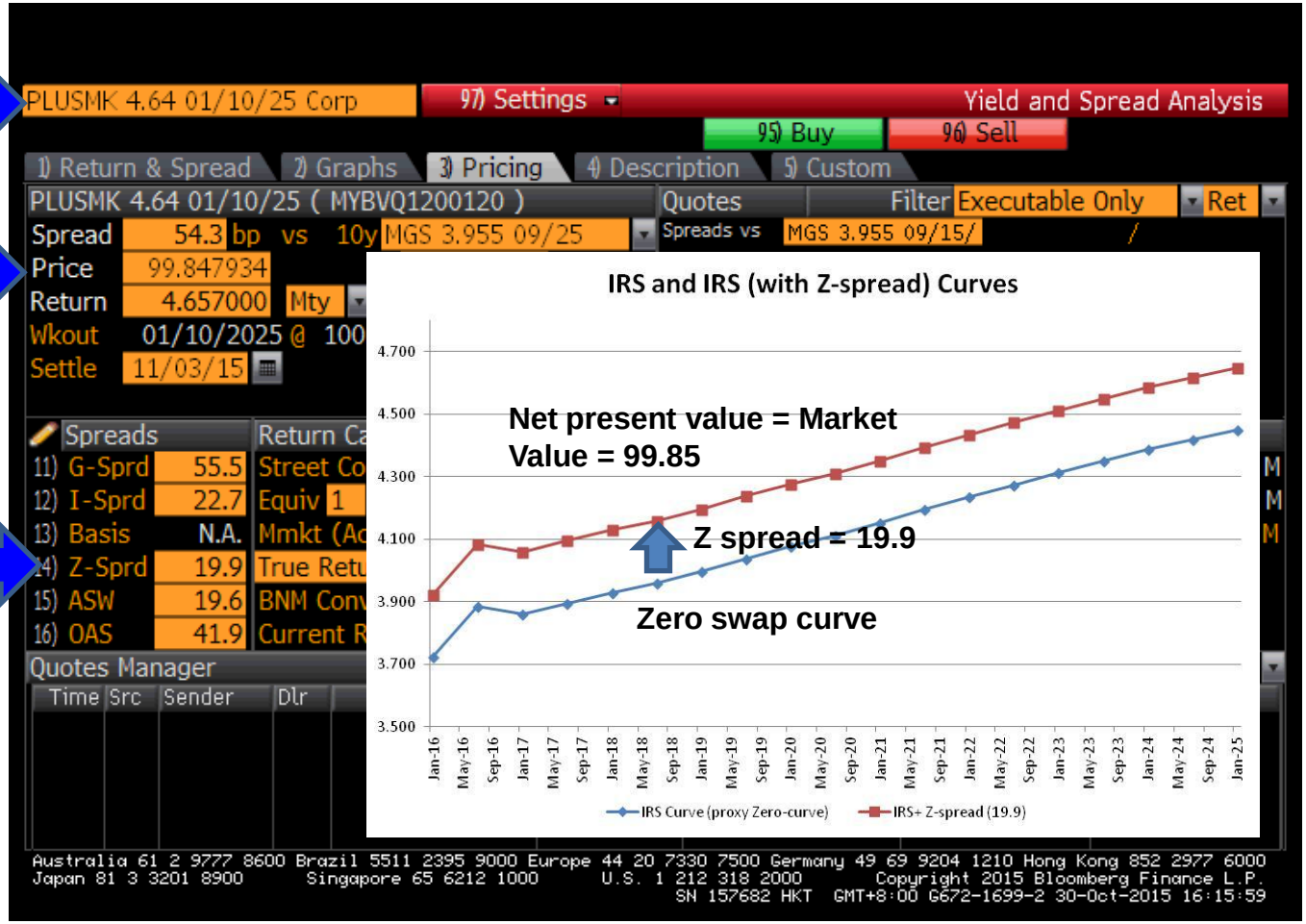
- **Why Z spread ?**
  - It is a more accurate representation of the credit spread as opposed to asset swap or **ASW** where the latter can involve upfront payments due to bonds trading above or below par
  - Z-Spread does not use the YTM of the bond to calculate the credit spread.
  - It is derived by iteratively shifting the (**bootstrapped) zero swap curve** in parallel and using it to Present Value the corporate bond cash flows until the bond price as calculated off the shifted par swap curve equals the corporate bond market price
  - The Z-Spread is the selected corporate bond's constant spread over the benchmark zero coupon swap curve, or the number of basis points to add to the spot curve in order to make the bond NPV equal to its market price

Z Credit Spread Analytics Widely Available on Bloomberg and Easy to Use

1. Select a bond, say PLUS 4.64 2025

2. Market Price shows 99.85

3. Z spread shows 19.9



Formula to determine z-spread:

$$\text{Price} = C_1 / (1 + r_1 + z)^{t1} + C_1 / (1 + r_2 + z)^{t2} + C_1 / (1 + r_3 + z)^{t3} \ldots\ldots T / (1 + r_n + z)^{tn}$$

Where

P = current clean price of the bond including accrued interest

C = coupon payments

T = total principal and coupon at maturity

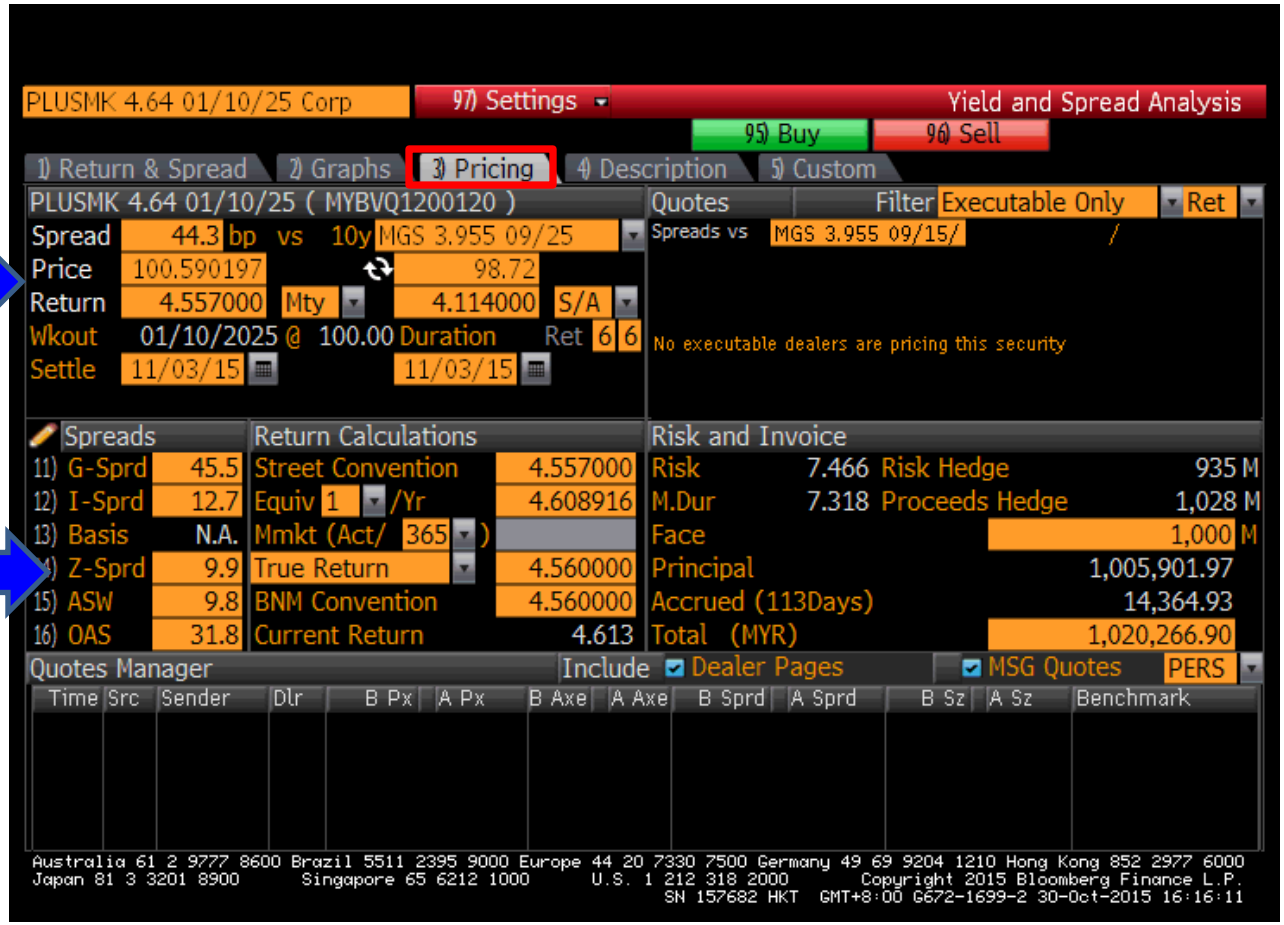
r = zero spot rates from interest rate swap curve

z = z spread

Can Toggle and Sensitize IRS Input levels and/or Corporate Bond Prices in Bloomberg to Your Heart's content (NOT plugging for Bloomberg & have no shares in Bloomberg)

If target **higher price** say at 100.59 for PLUS 4.64% 2025

Z spread compresses to 9.9



USD Treasury + Credit Spread: Some Trading Practices to Look Out For

(a) Rolling Down the Curve

	T Spread (bps)			UST Benchmark	
	31 Dec 2014	2 Jan 2015	Change	31 Dec 2014	2 Jan 2015
Toyota 2.053 2018	5	100	+ 95	CT5 (T 1 ⅝ 12/31/19)	CT2 (T 0 ⅝ 12/31/16)
MALAYS 4.646 2021	68	138	+ 70	CT10 (T 2 ¼ 11/15/24)	CT5 (T 1 ⅝ 12/31/19)

Z Spread (bps)			Yield (%)		
31 Dec 2014	2 Jan 2015	Change	31 Dec 2014	2 Jan 2015	Change
19	16	-3	1.70%	1.66%	-0.04%
88	93	+ 5	2.83%	2.84%	+ 0.01%

T Spread widened due to credit bonds aging by 1 year and referencing different US Treasury benchmark

But Z Spread and Bond Yield hardly moved

- Over course of a week, Dollar Credit spread of Toyota and Malaysian Sovereign widened dramatically between the end of 2014 and the start of 2015.
- Corporate credit remains solid. Time to go long big?

Source: Bloomberg

USD Treasury + Credit Spread: Some Trading Practices to Look Out For

(b) Employing different UST benchmark for different tenor

Security	T spread	Benchmark	Z spread
EXIM Bank (EIBMAL) 2.875 2017	130	CT2 (T 0 ⅝ 09/30/17)	115
EIBMAL 2.874 2019	116	CT5 (T 1 ⅜ 10/31/20)	150

For the same credit, the UST Spread of the 2Y paper is so much wider vs 4 Years

- ⇒ **Markets seem to have mispriced the tenors for the same credit. Go Long the 2 Year paper and Short the 4 Year paper?**
- ⇒ **If no mandate to do relative credit trading, buy 2 year paper versus 4 year paper?**
- ⇒ **Or if one has the 4Y paper, sell it and buy the 2Y paper?**

Source: Bloomberg

USD Treasury + Credit Spread: Some Trading Practices to Look Out For

(c) Same benchmark for same issuer with different maturities

Security	T spread	Benchmark	Z spread
PETRONAS (PETMK) 7.875 2022	138	CT10 (T 2 08/15/25)	186
PETMK 7.625 2026	185	CT10 (T 2 08/15/25)	195

For the same credit,

⇒ **Why is the 7Y paper so much more expensive than the 11Y paper ?**

⇒ **Dump the 7Y paper and buy the 11Y paper?**

Historical USD Treasury credit spread prices relatively meaningless even within same tenor let alone across tenors - not apple to apple [Note 1]

Source: Bloomberg

Credit Spread Quotation will be (a) Benchmarked off the Interest Rate Swap Curve (b) on a Duration Matched basis and (c) Employing the Z Spread Methodology

- Proposed Z spread methodology does not suffer such weaknesses
- Employ methodology that is accurate with strong theoretical basis backed up by mathematics
- Must not be misleading to investors and issuers
- Standardize the credit spread quoting convention so that spread quotes from one bank to the next means the same thing down to same mathematical translation to actual prices for all market participants
- Similar to standardizing yield quotation and pricing formula for bonds and derivatives (bonds: USD 30/360, MYR Actual/365, IRS: USD 30/360, MYR Actual/365) so that there is no ambiguity to actual price for any single yield quote - standardized and mathematically defined
- Learn from the weaknesses and mistakes of others – growing pains and evolution of the USD fixed income markets - Not to reinvent wheel – Go straight to best practices and best technology unsaddled by history and historical market conventions

With Convention Standardized, Credit Spread Price quotation from all banks will be on same basis and are easily comparable with no ambiguity

MYR Corporate Bond Indicative Bid/Offer

Instruments
Standardised Convention - MYR

Bonds Actual / 365 → IRS Actual / 365 → Z Spread Actual / 365

RATING	ISSUER	MATURITY / FIRST CALL	PRICE		Absolute Yield (YTM)		+ Z Spread using Mid-Swap Rate (bps)		+ Spread over MGS	
			BID	ASK	BID	ASK	BID	ASK	BID	ASK
AAA	CAGAMAS BERHAD	26-Oct-18	99.28	99.39	4.21%	4.17%	22.3	16.3		
AAA	AMAN SUKUK BHD	28-May-21	97.66	97.90	4.43%	4.38%	44.3	37.3		
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Compel your bank to honor credit spread quote like they do absolute yields

- Reference quote : spread not executable today
- Which MGS / GII benchmark to reference for each corporate bond tenor
- Within benchmark tenor, on the run off the run issues as benchmark MGS/GII age & drop off

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USD Bond Markets have Gone Through a Long Evolution Process from Pure Credit Spread, G Spread and now Z Spread

=> For Malaysia, Adopting Z-Spread will Avoid these Growing Pains

Markets	Corporate Bond Primary Pricing Benchmark	Corporate Bond Secondary Pricing Practice
SGD	SGD Swap Offer Rate (SOR)	Bond Price
CNH	China Govt Bond Offshore	Bond Price
IDR	Indon Govt Bond	Bond Price
THB	Thai Govt Bond	Absolute Yield ("AY")
MYR	Msian Govt Bond	Absolute Yield ("AY")
AUD	Australia mid swap rate	AY / Spread over Swap
Canada	Canadian Govt Bonds	AY / Spread over Govvies / Spread over Swap
Belgium	Euro mid swap rate	AY / Spread over Govvies / Spread over Swap
Netherlands	Euro mid swap rate	AY / Spread over Govvies / Spread over Swap
Germany	Euro mid swap rate	AY / Spread over Govvies / Spread over Swap
France	French Govt Bonds (OATS)	AY / Spread over Govvies / Spread over Swap
Italy	Euro mid swap rate	AY / Spread over Govvies / Spread over Swap
Japan	Ask side of Yen swap rate	AY / Spread over Govvies / Spread over Swap
UK	UK Govt Bonds (GILTS)	AY / Spread over Govvies / Spread over Swap
US	US mid swap rate	AY / Spread over Govvies / Spread over Swap

Supported by Deep Bond Futures or Deep Repo Markets

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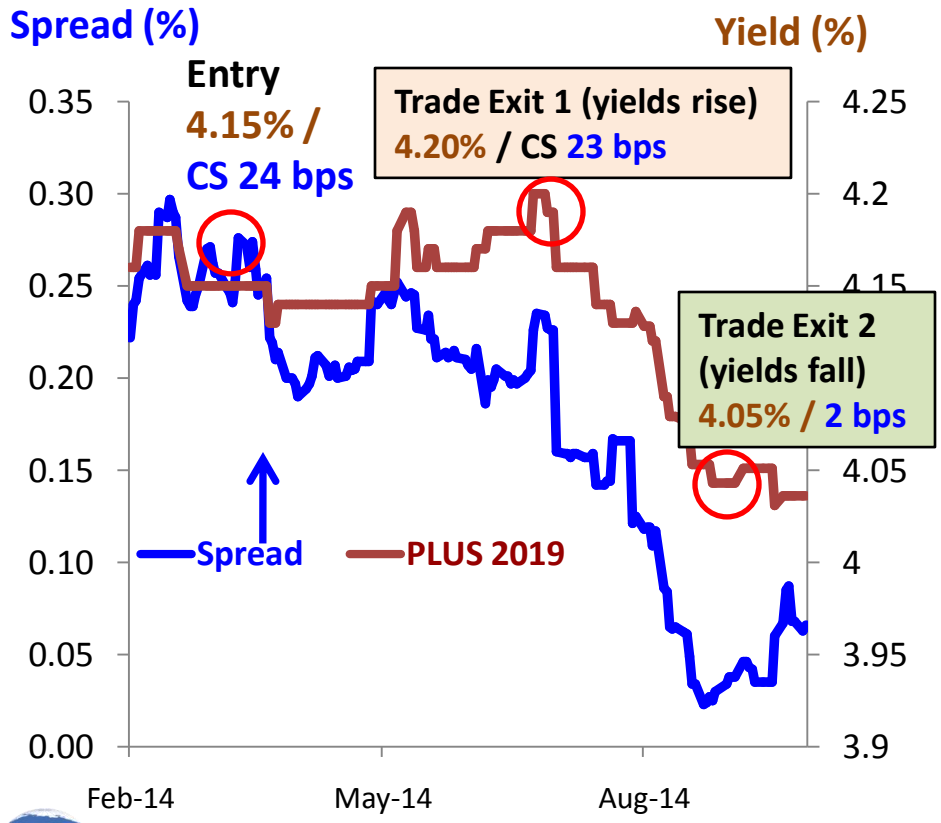
Credit Spread Markets will Open Up a Whole New Dimension

Making Possible New Portfolio Risk Return Trading Strategies Able to Capitalize on Specific Market Conditions and Views on Rates and Credits Plus Much Greater Hedging Alternatives To Reduce Risks

Example #1: Earning credit spread by hedging interest rates during period of uncertain or rising interest rate (in early 2014)

1. **Positive Credit View** on the AAA rated bond issuer
2. **Uncertain Rate View with Bias of Rising Rates**
3. On 24 Feb 2014, Credit Spread looks attractive vs historical Z spread level at 24bps over IRS



Trade Data

Date	Price	Yield	5 yr IRS	3M KLIBOR	Z Spread
Entry 24/2/2014	99.7	**4.15%**	3.91%	3.30%	**24 bps**
EXIT 1 26/6/2014	99.5	**4.20%**	3.97%	3.54%	**23 bps**
EXIT 2 25/8/2014	100.1	**4.05%**	4.03%	3.67%	**2 bps**

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Example #1: Trade Economics of RM100 million Notional of AAA PLUS 4.08 2019

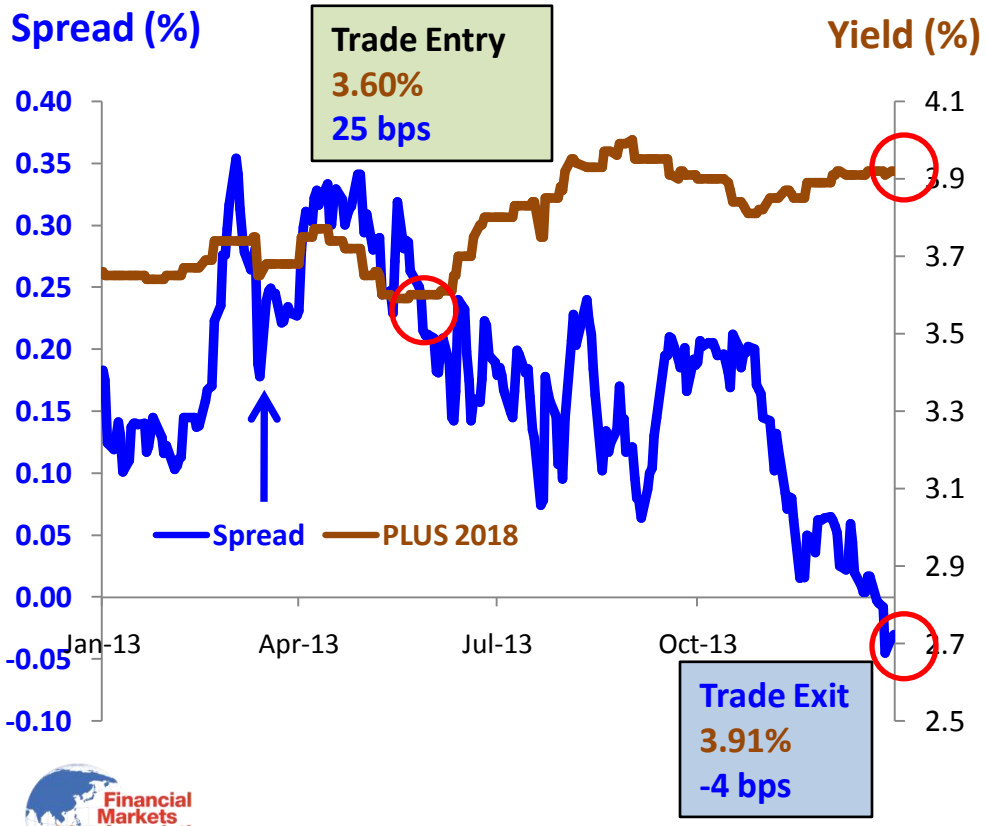
TOTAL RETURN

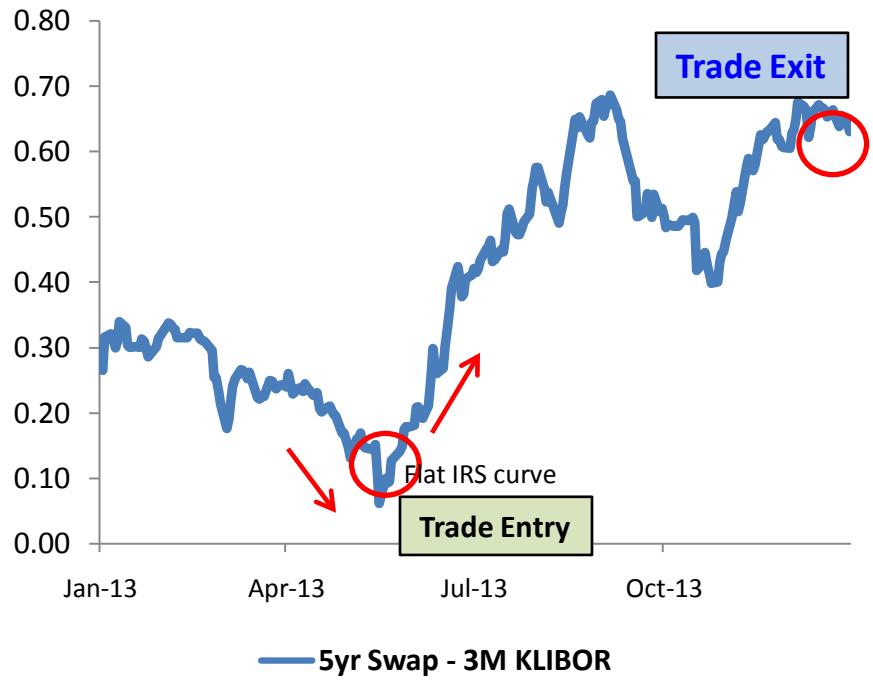
	Entry	Exit	Bond Only		Bond + IRS	
Rising Corporate Bond Yield	24/2/2015	26/6/2015	Trading Gain/Loss	(183,000)	Trading Gain/Loss	111,035
			Carry	1,363,726	Carry	1,200,614
			TOTAL RETURN	1,180,726	TOTAL RETURN	1,311,649
Falling Corporate Bond Yield	24/2/2015	25/8/2015	Trading Gain/Loss	413,000	Trading Gain/Loss	955,665
			Carry	2,034,411	Carry	1,832,632
			TOTAL RETURN	2,447,411	TOTAL RETURN	2,788,297

- In both scenarios, whether the absolute yield of AAA Plus goes up or down, you don't particularly care as MTM losses on the AAA Plus bond is offset by the IRS hedge
- In the interim, you have locked in the credit spread which you will now earn every day whether bond yields go up or down
- In this trade, what you worry about is the spread and whether the entry point of the spread trade is attractive enough at 24bps
- MTM risk applies to both strategies of bonds only (rates rising) and bonds + IRS (swap spreads widen) while interest income is earned over time

Example 2: Taking advantage of flat swap curve vs normal upward sloping bond curve (in mid 2013) [Note 2]

1. **Investors hold Positive Credit View on the AAA bond issuer**
2. **Credit Spreads widened significantly: Upward sloping corporate bond curve (cash credit market) while IRS flattened significantly** providing opportunity to **hedge rates cheaply** as differential between 5 yr swap rate and 3M KLIBOR was small vs historical ranges.
3. On 27 May 2013, investors could go long credit spread at 25 bps while hedging rates with IRS.





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Example 2: Trade Economics of 100 MM Notional of PLUS 3.99 2019

Trade Data

Date	Price	Yield	5 yr IRS	3M KLIBOR	Z Spread
27/5/2013	101.6	3.60%	3.35%	3.21%	25 bps
27/12/2013	100.3	3.91%	3.96%	3.30%	-4 bps

TOTAL RETURN

	Entry	Exit	Bond Only		Bond + IRS	
Flat Swaps Curve + Steep Bond Yield Curve	27/5/2013	27/12/2013	Trading Gain/Loss	(1,350,000)	**Trading Gain/Loss**	**1,346,761**
			Carry	2,339,342	**Carry**	**2,283,644**
			TOTAL RETURN	989,342	**TOTAL RETURN**	**3,630,405**

- Significant outperformance
- When reference curve (required to generate negative duration) is flat or inverted, relatively easy trade to enter into especially when cash markets have not developed credit spread trading technology and hence is upward sloping
- Bullets to hold on to bonds regardless whether rates going up or down, earning wide credit spreads every day on a strong credit in worst case scenario

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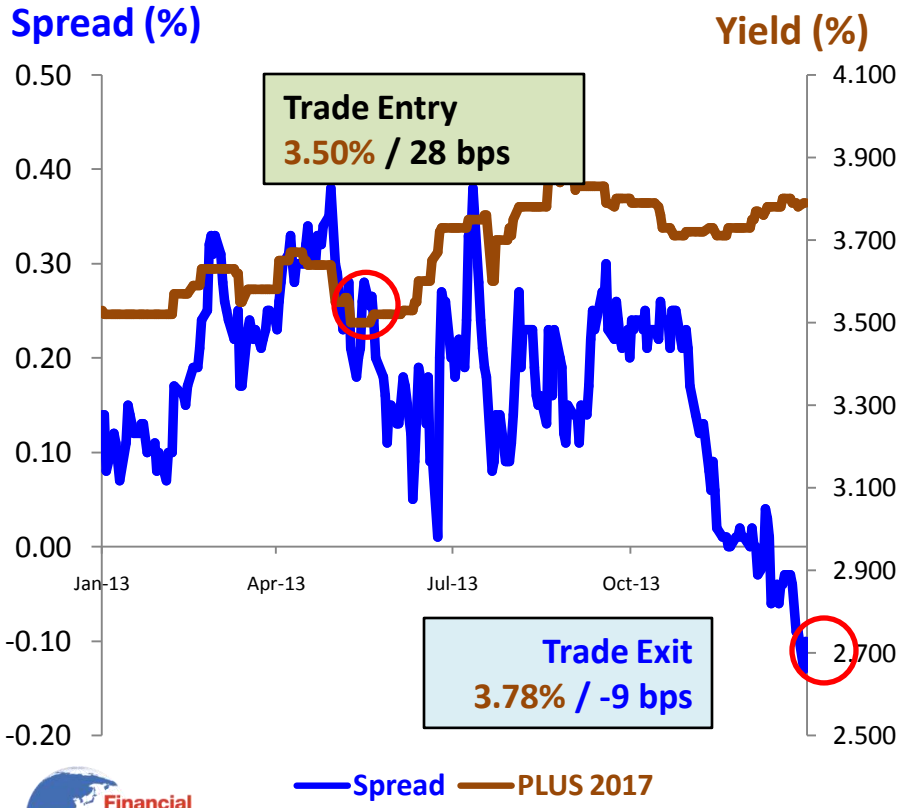
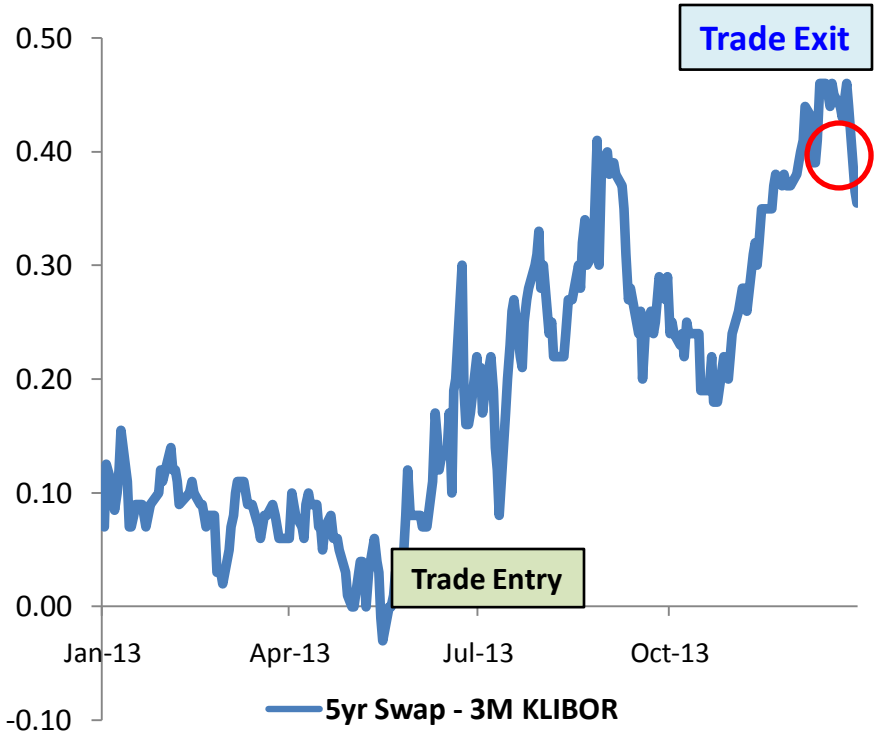
Example 2A: Going beyond Flat, Inverted swap curve – an even easier trade (mid 2013)

1. **Investors hold Positive Credit View on the AAA bond issuer**.
2. **Inverted swap curve** provides compelling trade to pay fix on IRS which is a **positive carry** trade. On 17 May 2013, when the 3 yr swap curve was inverted to KLIBOR, investors could go long credit spread at 25 bps while hedging rates with IRS **with positive carry**.
3. Seven months later (27 December), swap curve normalized and credit spread tightened





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Example 3: Trade Economics of 100 MM Notional of PLUS 3.90 2017

Trade Data

Date	Price	Yield	3 yr IRS	3M KLIBOR	Z Spread
17/5/2013	101.4	3.50%	3.18%	3.21%	0.28%
27/12/2013	100.3	3.78%	3.74%	3.30%	-0.09%

Inverted swap curve

TOTAL RETURN

	Entry	Exit	Bond Only		Bond + IRS	
Flat Swaps Curve + Steep Bond Yield	17/5/2013	27/12/2013	Trading Gain/Loss	(1,016,000)	**Trading Gain/Loss**	**545,752**
			Carry	2,589,808	**Carry**	**2,635,836**
Curve			**TOTAL RETURN**	1,573,808	**TOTAL RETURN**	**3,181,587**

- Interest income with hedging is actually higher than without hedging. Being paid to hedge as opposed to paying to hedge – "cheap" rates hedge
- **Regardless of where the fixed rates are, the floating short end of 1 & 3 Month Klibor will only decline if OPR declines which in this instance the yields in the cash bond markets are also likely decline – for short rates, OPR gravitational pull**

Example 3: Benefits to Issuers IRS Rate Lock vs Bought Deal (Credit & Rate Lock)

- USD primary bond market: common for issuers to lock in Treasury levels through Treasury Rate lock (T Lock) prior to book closure / price fixing and avoid the uncertainty of where Treasury is heading (leaves the credit spread component open)

Primary Markets New Issuance

5Y USD Bond (T Lock)	**=**	**USD Treasury Level** Fixed Earlier **T Lock**	**+**	Credit Spread at Book Closure Based on Prevailing Treasury at Book Closure
5Y MYR Bond (IRS Lock)	**=**	**IRS Level** Fixed Earlier **IRS Lock**	**+**	Credit Spread at Book Closure Based on Prevailing IRS at Book Closure
5Y MYR Bond (Bought deal)	**=**	**Interest Rate** **=** Absolute Yield/Price certainty	**+**	**Credit Spread Lock**

- **With MGS Lock, like T Lock, there is minimal cost as it is just bid offer spreads on MYR IRS / USD Treasury**
- **Sometimes locking in credit spreads as well can be more expensive. But it comes with outright absolute yield certainty to the issuer – another option to consider**

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Industry Support

- FMA PPKM needs support from market players to make this a success:

  - Bursa Malaysia - ETP Reporting to include Credit Spreads
  - Bond Pricing Agency Malaysia – To reflect a valuation based on credit spread of bonds
  - Broking Market – to reflect bid/offer credit spreads on its bond screen and daily quotes
  - Interbank Market – to add the bid/offer credit spread on its secondary trading axes

- We could work with LIAM, MAAM, MACT on introducing credit spread quotation in addition to absolute yields

- PPKM will update syllabus on the PKMC Bond Module to improve members' understanding on credit hedge and deriving credit spreads

Other issues - Documentation

In order to initiate and execute a credit hedge spread,

1) Funds' mandate needs to be expanded to include interest rate hedging:

- Necessary to protect funds in rising interest rate environement – sitting duck otherwise with selling bonds as the only risk reduction alternative
- Benign rates environment for very long time since 1998
- Needs to put in place collateral structure using bonds or cash

2) ISDA Documentation needs to be executed:

- Asset Manager – Tri-Party ISDA involving the Trustee needs to be executed on each of the funds

- Insurers & Pensions – General ISDA needs to be in place

Conclusion

- ✓ Banks to start publishing credit spreads in addition to absolute yields (not take them away) in their daily axis
- ✓ To employ standardised methodology and convention where credit spread quotation from banks are on same basis, are easily comparable with no ambiguity
- ✓ FMA encourages member banks to quote credit spreads with same integrity as absolute yields – executable into real prices and not just a number
- ✓ Facilitates the decomposition and pricing of interest rate versus credit spread term structure risk and return
- ✓ **Ringgit Bond and Sukuk Market becomes less vulnerable when interest rates / profit term structure rates are rising or fear of rising**
- ✓ Allows much greater hedging / risk reduction strategies (beyond selling bonds to reduce rate duration/PV01)
- ✓ Will expand universe of targeted rates and credit term structure risk return profiles

Conclusion

- ✓ Expand for issuers option to lock in just rates versus bought deal which is a lock on both rates and credit
- ✓ Facilitates credit spread pricing comparison for issuers/bank borrowers between bond markets and bank term loans
- ✓ Once the repo / reverse repo and/or MGS bond futures are developed, FMA will certainly want member banks to quote MGS + credit spread (duration matching) where quotes should be of same integrity as absolute yields – executable into real prices and not just a number

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