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# The Interaction between Repo and Bond Futures

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# Bond Futures Intro

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## ***Definition***

A bond future is a financial derivative that obliges the contract holder to purchase or sell a bond on a specified date in the future.

## ***Typical Usage***

- Hedging
- Speculation
- Country/Curve Exposure

## ***Benefits vs cash markets***

- Extremely liquid
- Off balance sheet

## ***Most Traded EGB Bond Futures***

	Germany	France	Italy
2y	Shatz (DU)		BTS
5y	Bobl (OE)		
10y	Bund (RX)	OAT	IK
30y	Buxl (UB)		



# Interaction with Cash Market

- At each IMM date during the year (Mar - H, Jun - M, Sep - U, Dec - Z), futures contracts must be closed through physical bond delivery
- Each futures contract has a number of bonds eligible to be delivered at expiry based on certain criteria being met – known as the ‘basket’ of bonds
- Within the basket there will be one bond most suited for delivery – known as the CTD (Cheapest to Deliver)

(into Bloomberg, <BTSU1 Comdty DLV>)

BTSU1 Comdty		Export		Settings			Cheapest-to-Deliver		
Short Euro-BTP Fu Sep21		Price	113.46	Trade	08/11/21	Delivery	09/10/21		
Sort By				Settle	08/13/21	Cheapest IRP	-0.683		
Implied Repo		Decreasing				Days	28	Act /	360
Cash Security		Price	Source	Conven Yield	Conver Factor	Gross Basis	Implied Repo%	Actual Repo%	Net Basis
Adjust Value									
1) BTPS 2.45 10/01/23		106.1785	BGN	-0.4279	0.933670	0.244	-0.683	-0.566	0.010
2) BTPS 0.65 10/15/23		102.3785	BGN	-0.4375	0.897535	0.544	-6.197	-0.566	0.449
3) BTPS 0 01/15/24		100.9030	BGN	-0.3706	0.872278	1.934	-24.648	-0.566	1.890
4) BTPS 4 ½ 03/01/24		112.4985	BGN	-0.3702	0.967897	2.681	-26.402	-0.566	2.287
5) BTPS 0 04/15/24		100.6420	MLIL	-0.2392	0.859638	3.107	-39.698	-0.566	3.063
6) BTPS 1.85 05/15/24		106.0950	BGN	-0.3491	0.900649	3.907	-45.452	-0.566	3.720

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**ARBITRAGE OPPORTUNITY**

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As you are trading an existing bond for future delivery, a relationship must exist to keep these products equivalent. Otherwise, futures contract cheaper than bond -> buy future and take delivery (or vice versa)

This relationship is maintained through funding markets, this where REPO comes in

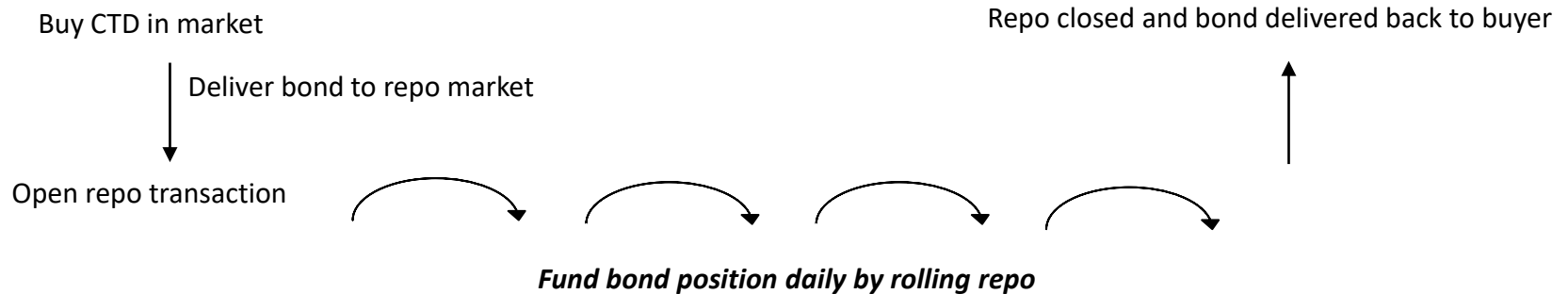


# Bond Future Interaction with Repo Market

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**Futures Market:** Buy bond future

Buying a futures contract and holding until delivery is the equivalent of executing the following transactions in the cash & repo markets:



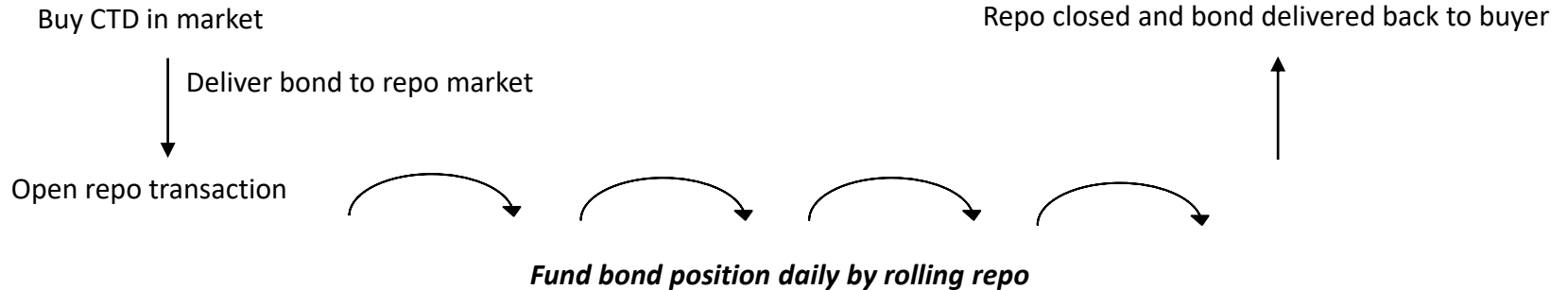
*The cost of funding the bond position daily up to the delivery date is accounted for in the bond future price*

**Risks:** Delta movements on the bond price  
Funding

# Bond Basis Trading – “Buying the Basis”

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## Cash Market:



## Futures Market:

Sell futures contracts to match delta risk of bond position

Result: ***Delta hedged***

Hold the bond up to delivery date

As the futures contract has a funding cost (repo rate) within the price, and through the cash market you physically own the bond, **you essentially have a reverse repo up to delivery date**

# Bond Basis Trading In Practice

Buying 100mm BTS in basis

100mm 2.45% 10/23 BTPS (IT0005344335) == 934 BTSU1 Contracts

(into Bloomberg, <BTSU1 Comdty DLV>)

BTSU1 Comdty		Export		Settings		Cheapest-to-Deliver			
Short Euro-BTP Fu Sep21		Price	113.49	Trade	08/12/21	Delivery	09/10/21		
Sort By				Settle	08/16/21	Cheapest IRP	-0.560		
Implied Repo		Decreasing				Days	25	Act /	360
Cash Security	Price	Chg	Conven Yield	Conver Factor	Gross Basis	Implied Repo%	Actual Repo%	Net Basis	
Adjust Value		Yld							
1) BTPS 2.45 10/01/23		106.1712	-.001	-0.4354	0.933670	0.209	-0.560	-0.569	-0.001

Basis trades are quoted in 'Gross Basis', derived from:

$$\begin{aligned} \text{Gross Basis} &= \text{Price of bond} - (\text{Price of future} * \text{Bond Conversion Factor}) \\ &= 106.1712 - (113.49 * 0.933670) \\ &= 0.20899 \end{aligned}$$

From this transaction you agree to buy the bond at 106.1712, and sell futures at 113.49

Result → Reverse repo of bond at -0.56% to delivery date (10 Sept 21)



# Basis Trading Opportunities/Risks

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In practice, the IRR *rarely* matches the actual repo level of a CTD



**\*\*\*ARBITRAGE\*\*\***

IRR above repo level    ->    Buy Basis, fund in repo  
IRR below repo level    ->    Sell Basis, borrow in repo

Reasons for divergence:

- Balance sheet cost
- Futures/cash market liquidity
- Requirement to physically fund





# Futures Delivery

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At the delivery date of the futures contract a trader with a bond basis position will have 3 options:

## **Make/Take Physical Delivery**

As the positions are in opposite directions, you can deliver/take delivery of the physical bonds to the exchange

Considerations/Risks:

- Ensuring the number of contracts matches the bond holdings, buying/selling additional contracts as needed
- 'Boxing' of the bond prior to delivery to ensure settlement/avoid failing to the exchange

## **Roll Futures Contracts**

You can extend your position to the following IMM date by closing your open contracts and entering a new position for the next delivery period

Considerations/Risks:

- If the CTD is the same, you'll have a new 'repo' to the back futures delivery date
- If the CTD is different, you'll now have a curve trade (steepener/flattener) between 2 bonds

## **Trade Out of Basis Position**

Find a market participant willing take your current position

Considerations/Risks:

- Liquidity cannot always be guaranteed, especially close to delivery date or during times of market stress (e.g. spring 2020)
- Cost to exit position can often equal or exceed accrued PnL since trade inception



# Summary

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- Bond futures have an inherent repo/funding element within the price of the contract
- Bond basis trading allows this repo rate to be traded without gaining exposure to the underlying bond i.e. it creates a synthetic repo position
- Basis traders will exploit any arbitrage opportunities between the Implied Repo Rate (IRR) of the bond basis and the actual bond repo rate
- The risks from basis positions mainly come from:
  - The liquidity required to enter/exit positions
  - The decisions required around delivery period
- This type of trading is popular with repo desks, cash desks and hedge funds as a way to exploit discrepancies between the products or to gain delta hedged leverage

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# Thank you!

## Please get in touch with any questions.

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