GOVERNMENT FUTURES AND TRADING THE BOND BASIS

October 2010

Annapurna Valluri[AC]

J.P.Morgan

Agenda

GOVERNMENT FUTURES AND TRADING THE BOND BASIS

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How government bond futures work

- The Montreal Exchange lists futures contracts on 30-year, 10-year, 5-year and 2-year government of Canada bonds.

- **Standardized product:** Each contract has a "size" or notional principal amount which defines the par amount of the bond or note that is deliverable into the contract. This is C$100,000 for 30-, 10-, and 5-year futures, and C$200,000 for 2-year futures.

- Futures exchanges regulate the minimum amount by which the futures price is allowed to change. This minimum price change is 1/100th of a point for 30-, 10-, and 5-year futures, 1/2 of 1/100th of a point for 2-year futures.
    - An increase of 1/100th in the 10-year bond futures price produces a gain of $10 for the long and a corresponding loss for the short.

- **Deliverable basket:** Each contract has its own "contract grade" which defines the issues that are eligible for delivery into each contract. The shorts are required to make delivery (or close out their position before expiration); the longs are required to take delivery and pay the invoice price for the bond.

- **Option value:** The shorts can choose which bond (from the eligible basket) to deliver

- **Reduced credit risk:** Gains and losses are settled daily. Money is taken from the accounts of those with losses and paid through the clearing house to the accounts of those with gains

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Bond futures contract highlights*

Term	CGZ - 2Y Canadian Bond Futures	CGF - 5Y Canadian Bond Futures	CGB - 10Y Canadian Bond Futures	LGB - 30Y Canadian Bond Futures
Size	C$ 200,000 par value	C$ 100,000 par value	C$ 100,000 par value	C$ 100,000 par value
Contract months	March, June, September, and December	March, June, September, and December	March, June, September, and December	March, June, September, and December
Delivery standards	(1) Have a remaining time to maturity of between 1½ years and 2½ years as of the first day of the delivery month, calculated by rounding down to the nearest whole three-month period; (2) Have an outstanding amount of at least C$2.4 billion nominal value; (3) Originally issued at 2-year auctions; (4) Issued and delivered on or before the 15th day preceding the first delivery notice day of the contract.	(1) Have a remaining time to maturity of between 3½ years and 5¼ years as of the first day of the delivery month, calculated by rounding down to the nearest whole three-month period; (2) Have an outstanding amount of at least C$3.5 billion nominal value; (3) Originally issued at 5-year or 10-year auctions; (4) Issued and delivered on or before the 15th day preceding the first delivery notice day of the contract.	(1) Have a remaining time to maturity of between 8 years and 10½ years as of the first day of the delivery month, calculated by rounding down to the nearest whole three-month period; (2) Have an outstanding amount of at least C$3.5 billion nominal value; (3) Originally issued at 10-year auctions; (4) Issued and delivered on or before the 15th day preceding the first delivery notice day of the contract.	(1) Have a remaining time to maturity of between 21 years and 33 years as of the first day of the delivery month, calculated by rounding down to the nearest whole three-month period; (2) Have an outstanding amount of at least C$3.5 billion nominal value; (3) Originally issued at 30-year auctions; (4) Issued and delivered on or before the 15th day preceding the first delivery notice day of the contract.
Price quotation Tick size and value Daily price limit	Points and 100ths of a point 1/200th of a point = C$10 3 points	Points and 100ths of a point 1/100th of a point = C$10 3 points	Points and 100ths of a point 1/100th of a point = C$10 3 points	Points and 100ths of a point 1/100th of a point = C$10 3 points
Trading hours (Montreal time)	(1) Early session: 6:00am - 8:05am (2) Regular session: 8:20am - 3:00pm (3) Extended session*: 3:06pm - 4:00pm *some exceptions	(1) Early session: 6:00am - 8:05am (2) Regular session: 8:20am - 3:00pm (3) Extended session*: 3:06pm - 4:00pm *some exceptions	(1) Early session: 6:00am - 8:05am (2) Regular session: 8:20am - 3:00pm (3) Extended session*: 3:06pm - 4:00pm *some exceptions	(1) Early session: 6:00am - 8:05am (2) Regular session: 8:20am - 3:00pm (3) Extended session*: 3:06pm - 4:00pm *some exceptions
Last trading day	Trading ceases at 1:00pm (Montreal time) on the 7th business day preceding the last business day of the delivery month.	Trading ceases at 1:00pm (Montreal time) on the 7th business day preceding the last business day of the delivery month.	Trading ceases at 1:00pm (Montreal time) on the 7th business day preceding the last business day of the delivery month.	Trading ceases at 1:00pm (Montreal time) on the 7th business day preceding the last business day of the delivery month.
Delivery day	Any business day in the delivery month	Any business day in the delivery month	Any business day in the delivery month	Any business day in the delivery month

*All subject to revision

BASIC CONCEPTS IN BOND FUTURES CONTRACTS

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U.S. Government bond futures contract highlights

Term	Bond	10-year note	5-year note	2-year note
Size	$100,000 par value	$100,000 par value	$100,000 par value	$200,000 par value
Contract grade	U.S. Treasury bonds with at least 15 years remaining to maturity	Original issue U.S. Treasury notes with at least 6-1/2 years remaining to maturity	Original issue U.S. Treasury notes with an original maturity of not more than 5 years, 3 months and a remaining maturity of not less than 4 years, 2 months	Original issue U.S. Treasury notes with an original maturity of not more than 5 years, 3 months and a remaining maturity of not less than 1 year, 9 months from the first day of the delivery month but not more than 2 years from the last day of the delivery month. The 2-year note issued after the last trading day of the contract is also deliverable into that month's contract
Price quotes	Points and 32nds of a point	Points and 32nds of a point*	Points and 32nds of a point*	Points and 32nds of a point §
Tick size and value **Tick Value**	1/32 of a point ($31.250)	1/2 of 1/32 of a point ($15.625)	1/2 of 1/32 of a point ($15.625)	1/4 of 1/32 of a point ($15.625)
Daily price limit	none	none	none	none
Trading hours (Chicago time)	7:20 am - 2:00 pm (pit); 6:00 pm - 4:00 pm (electronic)	same	same	same
Delivery months	March, June, Sep, Dec	same	same	same
Last trading day	12:00 noon on the eighth to last business day of contract month	same	12:00 noon on the earlier of 1) the second business day prior to the issue day of the 2-year note auctioned in the contract month or 2) the last calendar day of the contract month	12:00 noon on the earlier of 1) the second business day prior to the issue day of the 2-year note auctioned in the contract month or 2) the last calendar day of the contract month
Last delivery day	Last business day of contract month	same	Third business day following the last trading day	Third business day following the last trading day

* The minimum price fluctuation is 1/2 of 1/32   § The minimum price fluctuation is 1/4 of 1/32

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Key concept review: conversion factor and invoice price

- ■ The conversion factor attempts to put all deliverable bonds on an equal footing when calculating the final invoice price.

- ■ Conversion factors are constant for a given bond and expiration month.

- ■ A bond's conversion factor is its approximate price at delivery, in decimal form, at which the bond would, as of the first delivery day of the contract month, yield 6% to maturity (rounded to whole quarters).

- ■ Conversion factors are:

  >1 for bonds with coupons > the 6% notional coupon, and

  <1 for bonds with coupons < the 6% notional coupon.

- ■ When a bond is delivered into the 10Y futures contract, the receiver of the bond pays the short an invoice price equal to the futures price times the conversion factor of the bond chosen by the short plus any accrued interest on the bond:

> **Invoice price$_i$ = Futures Settlement Price x Conversion Factor$_i$ + Accrued Interest $_i$**

- ■ Accrued interest is calculated for the period running from the last coupon date to delivery day.

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JPMorgan's basis reference sheet (BRS)

Chicago/New York
6 October 2010
Canadian Basis Reference Sheet

J.P. Morgan Futures Inc.
Futures and Options Research

JPMorgan

Derivatives Strategy   www.morganmarkets.com

(Pricing: Oct 6   Settlement: Oct 13)

	DECEMBER									MARCH								
				OA Duration		OA BPV		Basis	Opt.				OA Duration		OA BPV		Basis	Opt.
Futures	Price	Fair	R/C	//	B-adj	//	B-adj	IVol	IVol	Price	Fair	R/C	//	B-adj	//	B-adj	IVol	IVol
Canada	126.71	126.90	-19	7.48	7.48	94.82	94.82	N/A	8.50	125.64	125.75	-11	7.55	7.55	94.81	94.81	N/A	8.50
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

		December		March						December					March				
CTD	Issue	Basis	Factor	Basis	Factor	Price	Yield	BPV	M Dur	ImpRP	Carr	BNOC	OABNOC	Repo	ImpRP	Carr	BNOC	OABNOC	Repo
Canada Futures		*DEC (LTD: 12/20, 74 days; Carry to deliv on 12/31, 85 days)*							*MAR (LTD: 3/22, 166 days; Carry to deliv on 3/31, 175 days)*										
	CAN 3 1/2 Jun 20	240	0.8210	285	0.8244	106.43	2.736	873	8.10	-7.14	46	194	13	1.28	-2.51	97	188	4	1.30
ZH CAN 3 3/4 Jun 19		67	0.8519	117	0.8552	108.61	2.628	806	7.32	0.58	50	17	17	1.28	1.12	108	9	9	1.30
Canada Futures																			

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Buying and selling the basis

Definition

- A bond's basis is the difference between the price of a bond and the product of the bond's conversion factor and the futures price.

> ## Basis = Bond price – (Futures Price x Conversion Factor$_i$)

Basis Trading

- Basis trading is the simultaneous trading of cash bonds and bond futures to take advantage of expected changes in the relative prices of bonds and bond futures.

- In practice, traders can buy or sell the basis in one of two ways. The first is to "leg the trade" by executing the cash and futures trades separately. The second approach is to execute the trade as a spread in the EFP (exchange of futures for physicals) market.

Buying the Basis

- To buy the basis or go long the basis is to buy cash bonds and sell a number of futures equal to the bond's conversion factor for every C$100,000 par value of the cash bond.

Selling the Basis

- To sell the basis or go short the basis is just the opposite: selling or shorting the cash bond and buying a number of futures equal to the bond's conversion factor for every C$100,000 par value of the cash bond.

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Sample basis calculation

Market Data: COB Oct 6, 2010

- **Dec 2010 Canadian 10Y bond futures**: 126.71

- **Bond**: 3-3/4% of 06/01/19

- **Conversion factor**: 0.8519

- **Clean price**: 108.61

Basis	=	clean bond price - (futures price x conversion factor)
	=	108.61 − (126.71 x 0.8519)
	=	0.6658
	=	66.58 cents

INTRODUCTION TO THE FUTURES BASIS

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JPMorgan's basis reference sheet (BRS)

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Canada	126.71	126.90	-19	7.48	7.48	94.82	94.82	N/A	8.50	125.64	125.75	-11	7.55	7.55	94.81	94.81	N/A	8.50
Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

		December	March						December					March				
CTD	Issue	Basis	Factor	Basis	Factor	Price	Yield	BPV	M Dur	ImpRP	Carr	BNOC	0ABN0C	Repo	ImpRP	Carr	BNOC	0ABN0C	Repo

Canada Futures   *DEC (LTD: 12/20, 74 days; Carry to deliv on 12/31, 85 days)   MAR (LTD: 3/22, 166 days; Carry to deliv on 3/31, 175 days)*

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Canada Futures

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What drives the basis?

> **Basis = Bond price − (Futures Price x Conversion Factor$_i$)**

> **Basis = carry + delivery option value**

Carry

Carry is the difference between coupon income earned on the bond and the cost of financing the bond.

Delivery Option Value

Delivery Option Value is the value associated with the short's right to choose what bond to deliver and when to deliver it. The value of this option depends on the likelihood of shifts in the cheapest to deliver, which in turn depends on interest rate volatility.

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Sample carry calculation

Market Data: COB Oct 6, 2010;
Trade: Oct 7, 2010; Settle: Oct 13, 2010; Delivery: Dec 31, 2010

- Bond: 3-3/4% of 06/01/19

- Full price: 109.9867

- Days in coupon period: 183 (6/1/10-12/1/10)

- Financing rate: 1.28%

- Days from settle to Dec delivery: 79

$$\text{Coupon income} = \frac{3.75}{2} \times \frac{79}{183} = 80.9 \text{ cents}$$

$$\text{Fin cost} = 109.9867 \times 0.0128 \times \frac{79}{365} = 30.5 \text{ cents}$$

$$\text{Carry} = \text{coupon income - fin cost} = 80.9 - 30.5 = 50.4 \text{ cents}$$

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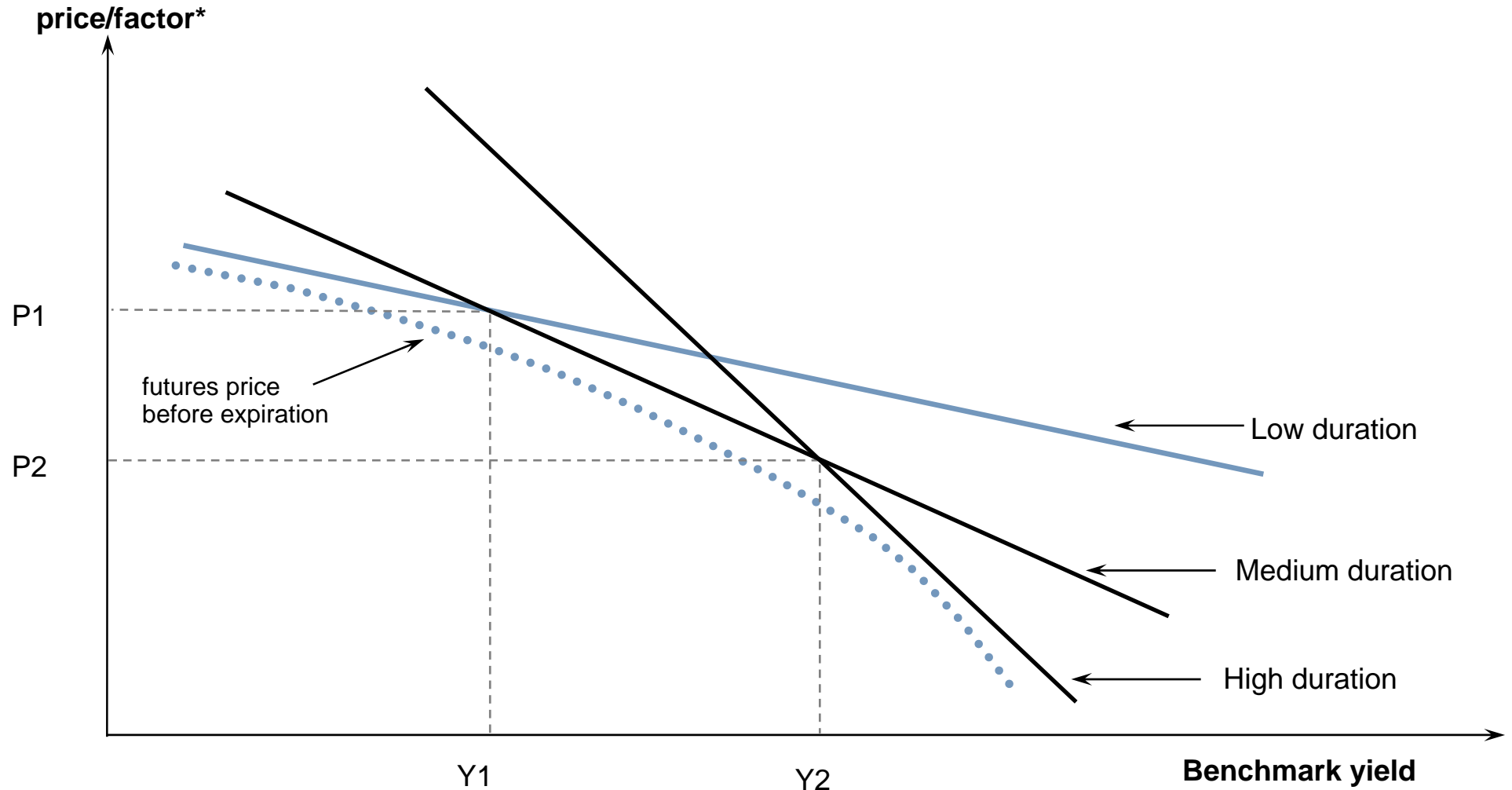**Derivatives Strategy**   www.morganmarkets.com

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Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

CTD	Issue	December Basis Factor	March Basis Factor	Price	Yield	BPV	M Dur	December ImpRP	Carr	BNOC	OABNOC	Repo	March ImpRP	Carr	BNOC	OABNOC	Repo
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Canada Futures																	

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Basis net of carry

> **Basis = carry + delivery option value**

> **Basis net of carry = Basis - carry**

- BNOC is the amount that the short is paying for (and the long is being paid for) the option to deliver any of the bonds in the deliverable basket.   The short also has a choice of when to deliver during the delivery month.

- Example: market Data as of COB Oct 6, 2010

- Bond: 3-3/4% of 06/01/19
  - ➢ Dec basis: 67 cents
  - ➢ Dec carry: 50 cents

- BNOC   = basis - carry

  $$= (67) - (50) = 17 \text{ cents}$$

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Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

		December	March						December					March				
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Canada Futures																		

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Cash/futures price relationships

Futures price adjusted for conversion factor and cash prices (linearized)

price/factor*

P1

futures price
before expiration

P2

Low duration

Medium duration

High duration

Y1   Y2   **Benchmark yield**

* Data is illustrative

Basis of high duration bond is like a call option

Price/Factor

Basis*

Y₁ Y₂

Yield

Futures Price

High
Duration

Y₁ Y₂ Yield
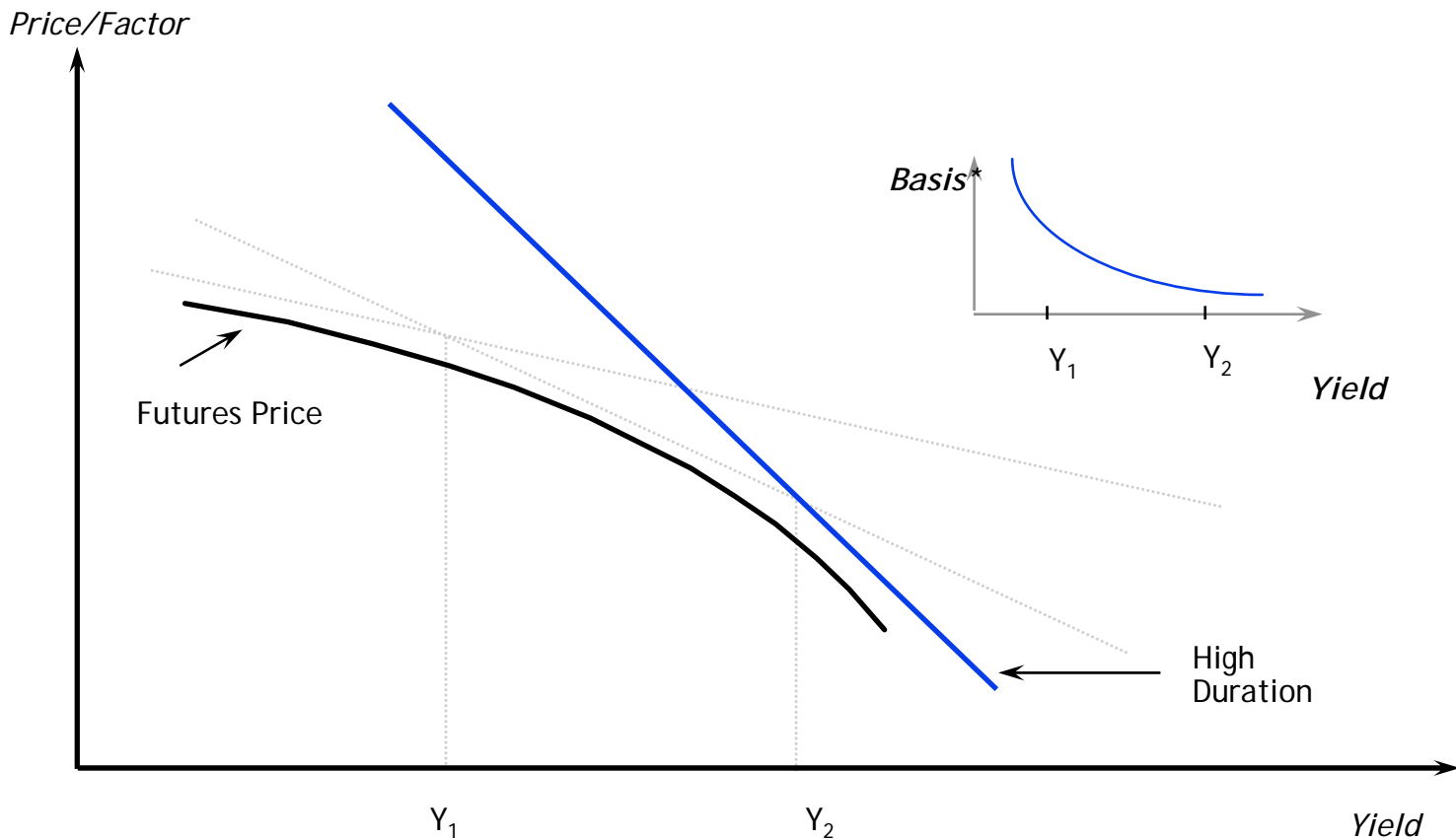
* Basis = Price - Factor x Futures

Basis of low duration bond is like a put option

Price/Factor

Basis*

Y₁ Y₂

Yield

Futures Price

Low Duration

* Basis = Price - Factor x Futures

Y₁ Y₂

Yield

Basis of medium duration bond is like a straddle on bond futures

Price/Factor

Basis*

Futures Price

Y_1 Y_2 *Yield*

Medium duration

Y_1 Y_2 *Yield*
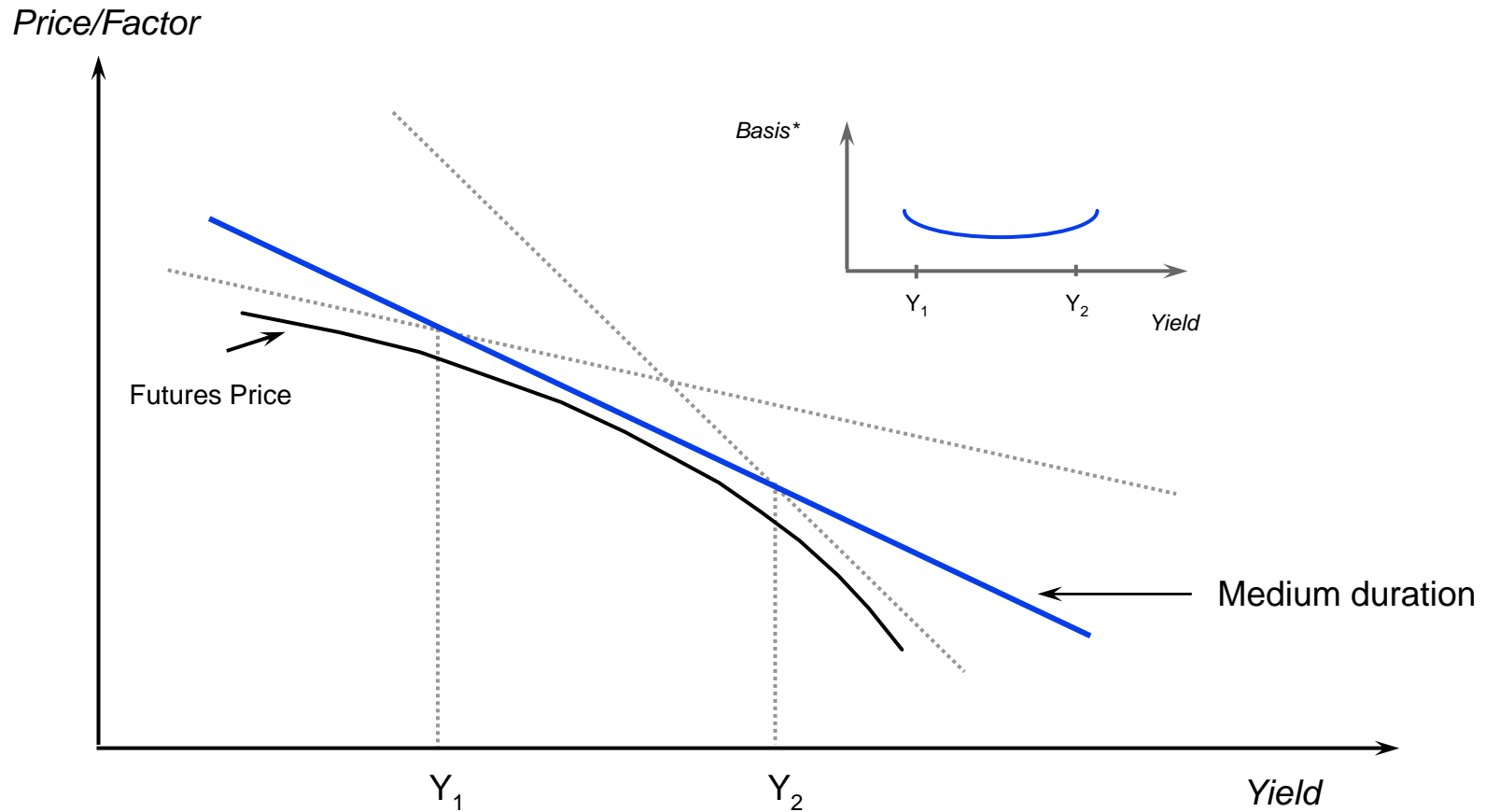
* Basis = Cash bond price – Futures price x factor

Basis reference sheet – page 2

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Canada	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00

					December				Issue is CTD if:				March			Issue is CTD if:		
		Full	Spot	Yield	Hedge Ratios		CTD	Yld Sprd	Baseline	Fut.	Hedge Ratios		CTD	Yld Sprd	Baseline	Fut.		
CTD	Issue	Price	BPV	Beta	Parallel	Beta Adj.	Prob%	Change	Yld Shft	Price	Parallel	Beta Adj.	Prob%	Change	Yld Shft	Price		
Canada Futures		DEC (LTD: 12/20, 74 days; Carry to deliv on 12/31, 85 days)									MAR (LTD: 3/22, 166 days; Carry to deliv on 3/31, 175 days)							
	CAN 3 1/2 Jun 20	107.7149	872.77	1.000	0.9205	0.9205	0.0	20.7			0.9206	0.9206	0.3	20.7	222.5	106.44		
ZH	CAN 3 3/4 Jun 19	109.9907	805.52	1.000	0.8495	0.8495	100.0				0.8496	0.8496	99.7					
Canada Futures																		

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Sources of delivery option value

- **SWITCH option**

    - ➤ Parallel changes in yield levels

    - ➤ Changes in yield spreads

        - − Systematic changes
            - • Tendency of yield curve to steepen in a rally, and flatten in a selloff
            - • Reduces the value of the switch option

        - − Non-systematic yield spread volatility
    - ➤ Anticipated new issues

- **END-OF-MONTH option**

- **TIMING option**
    - ➤ Carry
    - ➤ Wild card option

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Impact of systematic changes in yield spread on the basis

Yield spread 3-1/2% of 06/20 minus 3-3/4% of 06/19; Apr to Oct 2010; bp
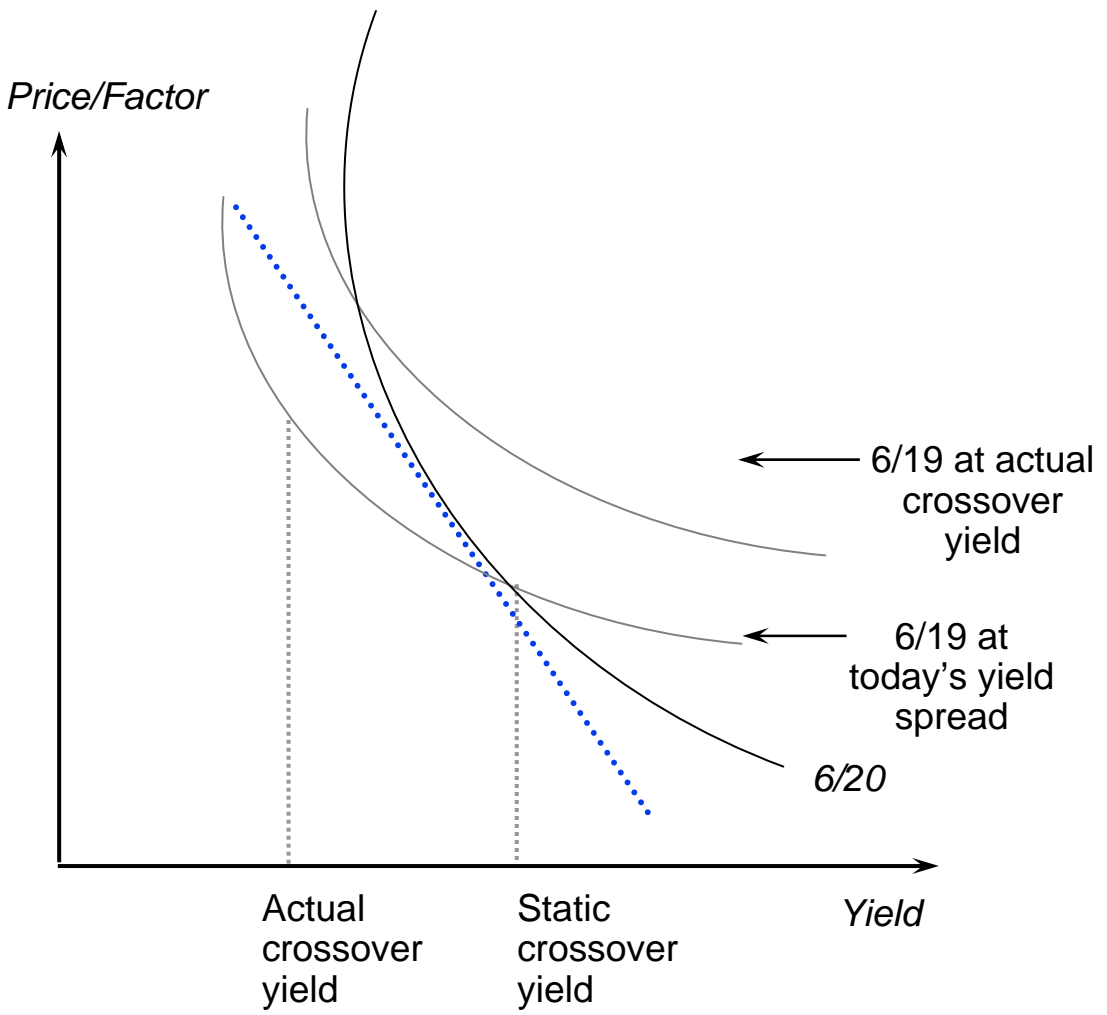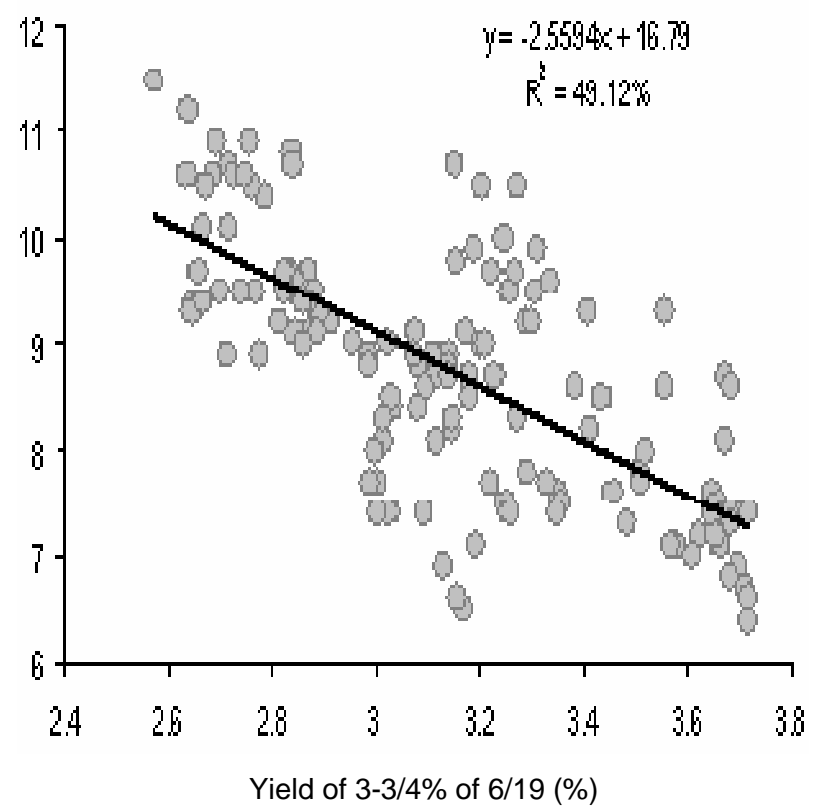
$y = -2.5594x + 16.79$

$R^2 = 49.12\%$

Yield of 3-3/4% of 6/19 (%)

Price/Factor

6/19 at actual crossover yield

6/19 at today's yield spread

6/20

Actual crossover yield

Static crossover yield

Yield

DRIVERS OF THE BOND BASIS

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Sources of delivery option value

- **SWITCH option**

  - ➢ Parallel changes in yield levels

  - ➢ Changes in yield spreads

    - – Systematic changes
      - • Tendency of yield curve to steepen in a rally, and flatten in a selloff
      - • Reduces the value of the switch option

    - – Non-systematic yield spread volatility
  - ➢ Anticipated new issues

- **END-OF-MONTH option**

- **TIMING option**
  - ➢ Carry
  - ➢ Wild card option

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Delivery option value

- Delivery option value depends on the likelihood and size of CTD switches, which depends on the yield curve dynamics and volatility

- If you estimate the value of the delivery option, you are left with a measure of futures richness or cheapness, the OABNOC

OABNOC	=	BNOC – delivery option value
	=	measure of futures cheapness or richness

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GOVERNMENT FUTURES AND TRADING THE BOND BASIS

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Different ways of trading the basis

- **Sell the CTD basis**
  - ➤ Similar to selling out-of-the-money options

- **Sell the basis of non-cheap bonds**
  - ➤ Take advantage of mispricings on the yield curve

- **Buy/sell the on-the-run basis**

- **Trading the basis when the CTD is in short supply**
  - ➤ Sell the basis of an expensive to deliver bond
  - ➤ Buy the CTD or the futures on an asset swap basis
  - ➤ Buy the calendar spread

- **Enhanced basis trades via calendar spread positions**

- **To take advantage of term repo funding available in the futures market**

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Selling the CTD basis of 10Y Canadian government futures has tended to outperform in the long run

Cheapest to deliver 10-year basis

March 06 – June 10

Contract	3 Months to Expiration			At Expiration			Change in
	Basis	Carry	BNOC	Basis	Carry	BNOC	BNOC
Mar-06	14.2	10.6	3.6	1.6	0.6	1.0	-2.6
Jun-06	12.4	7.1	5.3	2.0	0.3	1.7	-3.6
Sep-06	9.7	0.4	9.3	0.7	0.0	0.7	-8.6
Dec-06	4.4	-0.3	4.7	2.0	0.0	2.0	-2.7
Mar-07	4.8	0.4	4.4	0.5	0.0	0.5	-3.9
Jun-07	3.9	0.5	3.3	0.3	0.1	0.2	-3.2
Sep-07	3.8	-2.6	6.4	-0.4	-0.5	0.2	-6.3
Dec-07	4.7	-6.3	11.0	-0.6	-0.6	0.0	-11.0
Mar-08	2.0	-6.3	8.3	-4.1	0.2	-4.2	-12.5
Jun-08	6.7	2.6	4.1	-1.7	0.6	-2.2	-6.3
Sep-08	-1.7	6.4	-8.2	10.4	0.5	9.9	18.1
Dec-08	5.2	4.1	1.1	1.0	1.9	-0.9	-2.0
Mar-09	23.0	19.7	3.3	-5.0	2.1	-7.1	-10.3
Jun-09	22.5	29.5	-7.0	0.4	2.3	-1.9	5.1
Sep-09	25.7	33.4	-7.8	2.8	2.4	0.4	8.2
Dec-09	34.6	33.5	1.1	3.2	3.1	0.0	-1.0
Mar-10	36.1	33.6	2.5	1.8	2.4	-0.7	-3.2
Jun-10	34.5	33.5	1.0	-0.7	2.2	-3.0	-4.0
					Average		-2.8

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Basis trading

4 main drivers

	Market level (parallel shifts)	Yield spread to CTD	Relative Value (oabnoc)	Funding rates
All Bonds	Curve shifts - duration effect long duration = call short duration = put med durn = straddle	Curve twists	CTD relative value Rollover New issuance, 1st notice day, market direction	Money mkt rates CTD specials
Bond Specific		Cheap/Dear bonds Benchmark premium CTD premium Bonds exiting basket. Squeezes.		Repo Specials

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Pricing anomalies offer scope for yield enhancement...

When futures are...	Hedging	Yield enhancement
Cheap	Buy futures to hedge future purchases (instead of buying forward)	Replace bonds with synthetic bonds (long futures and short-term investment)
Rich	Sell futures to shorten duration (instead of shorting cash bonds)	Replace short-term investments with synthetic money markets (buy bonds and short futures)

but altered risk profile must also be considered...

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Creating synthetic assets via selling the basis is a frequently employed yield enhancement strategy

- In a typical synthetic asset strategy, an investor replaces cash bonds with an equivalent risk position in government futures, and invests the cash in a short duration asset such as money market futures, Libor cash market, etc.

- Replacing cash positions with futures involves an implicit sale of the basis
  - As with any option, the basis must converge towards zero as "option expiry" (i.e., the futures delivery date) approaches (assuming the option is not in the money) …
  - … so, as time passes, the basis converges towards zero assuming a CTD shift does not occur
  - If a CTD shift does occur, this strategy produces a loss

- The coupon income from the short duration investment also adds to the return

TRADING THE BASIS

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In practice, indexed money managers can use a combination of futures to replicate a portion of their government bond index risk exposure

6 October 2010

J.P. Morgan Securities LLC
Derivatives Strategy
Fabio Bassi (44 20) 7325 8615

JPMorgan Global Bond Index Replication Report

Futures Contracts per USD 1 billion Global index (built from local indices)

	Global Weight Actual	Adjusted	Number of Futures			Global Weight Actual	Adjusted	Number of Futures
Australia Index	0.007	0.007		**Italy Index**	0.073	0.073	
Aus 10Yr		Dec10	– 38	Bund		Dec10	– 345
Aus 3Yr/ Aus 10Yr		Dec10	– 14/ 33	Schatz/ Bobl/ Bund		Dec10	– 105/ 105/ 268
Belgium Index	0.020	0.020		Schatz/ Bobl/ Bund/ Buxl		Dec10	– 105/ 105/ 72/ 101
Bund		Dec10	– 84	**Japan Index**	0.310	0.310	
Schatz/ Bobl/ Bund		Dec10	– 34/ 47/ 52	JGB		Dec10	– 141
Schatz/ Bobl/ Bund/ Buxl		Dec10	– 34/ 47/ 15/ 19	Euro-Yen Strip/ JGB		Dec10	– 120/ 132
Canada Index	0.019	0.019		**Netherlands Index**	0.018	0.018	
Canada		Dec10	– 131	Bund		Dec10	– 82
Germany Index	0.070	0.082		Schatz/ Bobl/ Bund		Dec10	– 32/ 36/ 56
Bund		Dec10	– 371	Schatz/ Bobl/ Bund/ Buxl		Dec10	– 32/ 36/ 17/ 20
Schatz/ Bobl/ Bund		Dec10	– 127/ 155/ 264	**United States Index**	0.311	0.311	
Schatz/ Bobl/ Bund/ Buxl		Dec10	– 127/ 155/ 76/ 97	Note		Dec10	– 2199
Spain Index	0.030	0.030		Euro Strip/ 5-Year/ Note/ Bond		Dec10	– 196/ 509/ 801/ 415
Bund		Dec10	– 133				
Schatz/ Bobl/ Bund		Dec10	– 49/ 56/ 94				
Schatz/ Bobl/ Bund/ Buxl		Dec10	– 49/ 56/ 23/ 36				

Recent performance of synthetic assets

Quarterly returns of the synthetic asset, the J.P. Morgan Government Bond Index, and the outperformance of the synthetic asset; bp of Index notional

	Syn Asset	Index	Diff
Q1 2009	406	285	121
Q2 2009	-321	-225	-96
Q3 2009	168	167	1
Q4 2009	145	135	10
Q1 2010	-39	-17	-22
Q2 2010	176	195	-19
Q3 2010	373	319	54

* Synthetic replication strategy is constructed from a duration neutral position in 10-year Treasury futures; returns assume cash is invested in 3-month LIBOR.

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TRADING THE BASIS

They synthetic replication strategy has outperformed the Bond Index as the belly of the yield curve has richened

Cumulative excess returns of the synthetic replication strategy over the Bond Index versus the 2s/10s/30s government butterfly
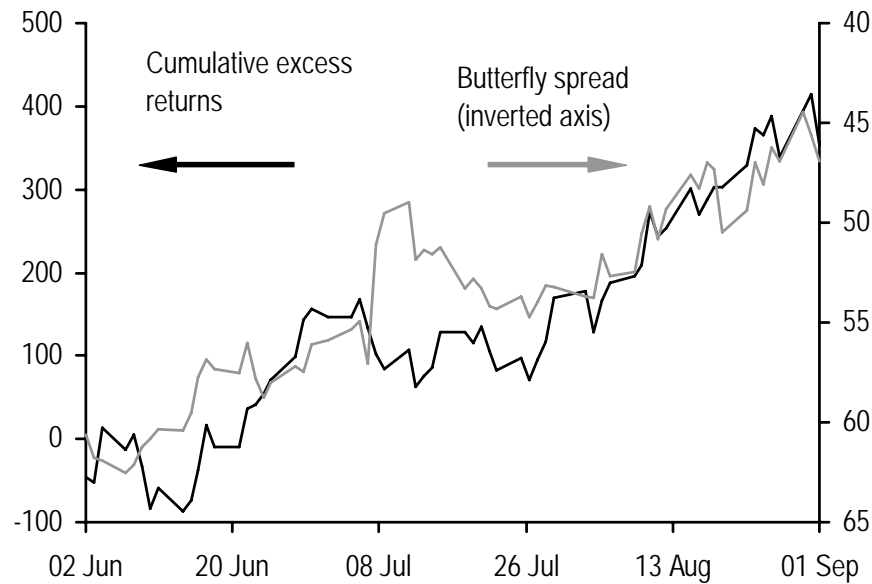
- The Bond Index typically has bonds ranging in maturity from 2- to 30-years

- The synthetic replication strategy replaces the Index with a single 10Y futures contract

- Therefore, belly richening environments are good for replication strategies

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