

A faint, light blue world map is visible in the background of the slide, centered behind the main text.

eurex

***Eurex Bond Futures - Improving the
Efficiency of Fixed Income Fund
Management***

Bloomberg, London

10 May 2010

Fixed Income Markets in 2010 Facing Challenges

- Burgeoning government budget deficits – increased government bond issuance
- Exit to the quantitative easing (QE) policy by the Federal Reserve and Bank of England
- End of the ECB cheap loans liquidity policy
- Sovereign default risk
- Central Bank monetary policy

Agenda

- Introduction & basic bond futures mathematics
- Portfolio Overlay
- Adjusting Portfolio Duration
- Using Bond Futures as a synthetic cash instrument – Duration Targeting
- Pricing the bond futures roll at delivery
- Generating Alpha – Yield Curve/Bond Spread/Barbell Strategies
- Trading Bond Futures Strategies & Structures OTC
- Contacts
- Appendices

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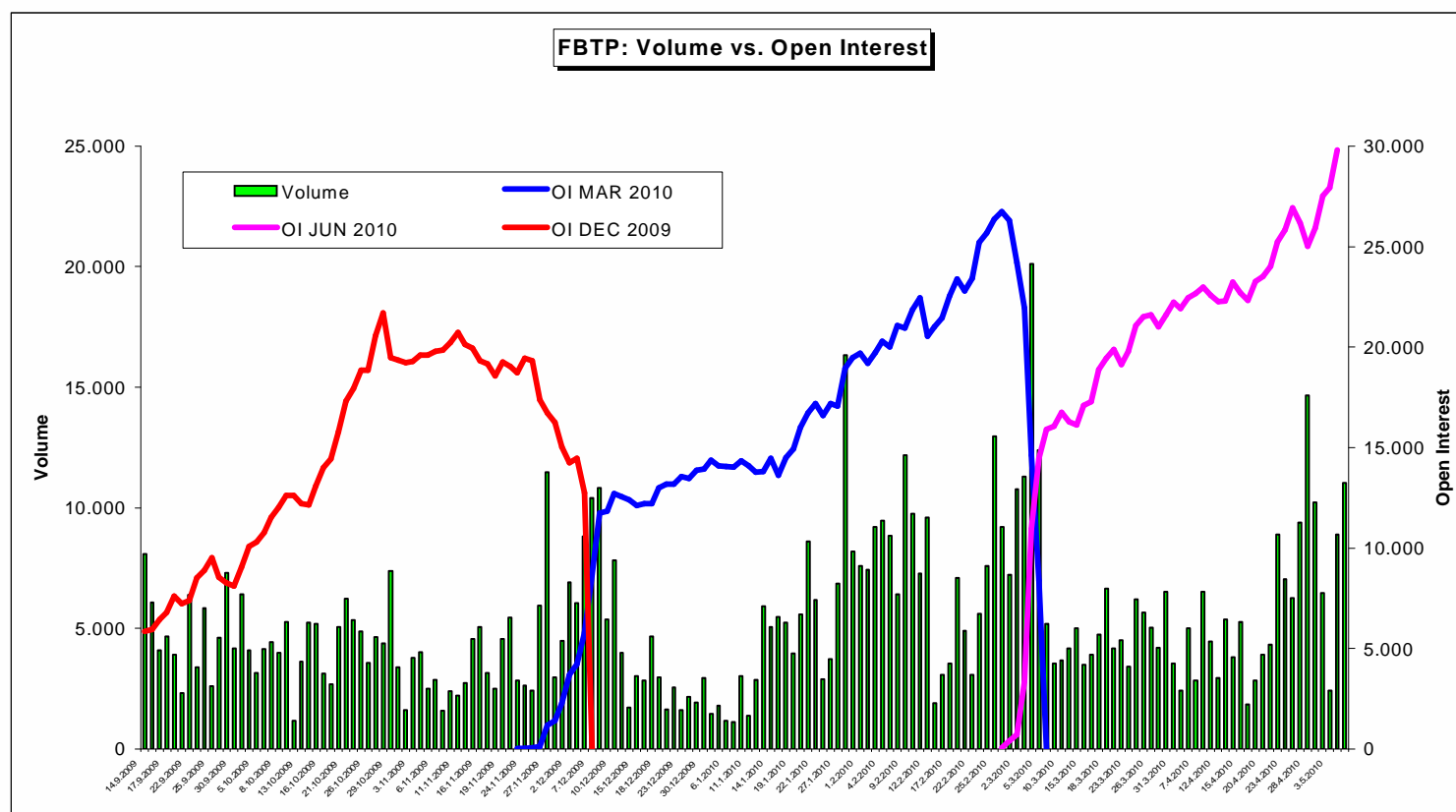
Global Bond Futures Contract Bloomberg WBF Page

15:15 WORLD BOND FUTURES									
P Price/Yield				Symbol		Trade			
1 North/Latin America				Exch		P Last	C Change	T Time	H High L Low
4	US	ULTRA BOND(CBT)	Jun10	CBT	WNMO	121-08y	n.a.	3/12	
5	US	LONG BOND(CBT)	Jun10	CBT	USMO	116-19d	- 11	14:36	117-01 116-19
6	US	10YR NOTE FUT	Jun10	CBT	TYMO	116-23d	- 02+	14:30	116-23 116-23
7	US	5YR NOTE (CBT)	Jun10	CBT	FVMO	115-10+d	+ 02+	12:27	115-10+ 115-10+
8	US	2YR NOTE (CBT)	Jun10	CBT	TUMO	108-13 ³ / ₄ y	n.a.	3/12	
9	CAN	10YR BOND FUT	Jun10	MSE	CNMO	117.97	+ .28	14:55	117.99 117.69
2 Europe/Africa									
10	EURO	BUND FUTURE	Jun10	EUX	RXMO	122.66	+ .10	15:00	122.77 122.52
11	EURO	BUXL 30Y BND	Jun10	EUX	UBMO	99.58d	+ .04	14:59	99.84 99.52
12	LONG	GILT FUTURE	Jun10	LIF	G MO	114.26	+ .32	15:00	114.40 113.91
13	EURO	BOBL FUTURE	Jun10	EUX	OEMO	116.590	+ .050	15:00	116.680 116.530
14	EURO	SCHATZ FUT	Jun10	EUX	DUMO	108.520d	+ .035	14:59	108.540 108.485
15	SWISS	FED BND FUT	Jun10	EUX	FBMO	137.02d	+ .09	13:26	137.11 137.00
16	Euro	BTP Future	Jun10	EUX	IKMO	115.50d	- .02	14:51	115.74 115.47
17	SWEDISH	5YR FUTR	Jun10	PMI	SKMO	2.705d	- .020	14:40	2.740 2.690
3 Asia/Pacific									
18	JPN	10Y BOND(TSE)	Jun10	TSE	JBMO	138.92s	+ .07	Close	138.99 138.79
19	KOREA	3YR BND FUT	Mar10	KFE	KEHO	111.55s	+ .04	Close	111.59 111.43
20	AUST	10Y BOND FUT	Jun10	SFE	XMMO	94.300y	n.a.	3/15	
21	AUST	3YR BOND FUT	Jun10	SFE	YMMO	94.700y	n.a.	3/15	
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P. 6430-460-0 15-Mar-10 15:15:13									

Eurex European Bond Futures Contracts

	Euro Schatz (FGBS)	Euro Bobl (FGBM)	Euro Bund (FGBL)	Euro Buxl (FGBX)	Euro BTP (FBTP)
Contract Standard	Notional government bond issued by the FRG with 1.75-2.25 years to maturity and a (notional) 6% coupon	Notional government bond issued by the FRG with 4.5-5.5 years to maturity and a (notional) 6% coupon	Notional government bond issued by the FRG with 8.5-10.5 years to maturity and a (notional) 6% coupon	Notional government bond issued by the FRG with 24-35 years to maturity and a (notional) 4% coupon	Notional government bond issued by the Republic of Italy with 8.5-11 years to maturity and a (notional) 6% coupon
Delivery	Sellers obligation to deliver and the right to choose which security to deliver				
Price Quotation	In percent of par with three decimal places		In percent of par with two decimal places		
Minimum Price Change	0.005 per cent equivalent to EUR 5		0.01 per cent equivalent to EUR 10	0.02 per cent equivalent to EUR 20	0.01 per cent equivalent to EUR 10
Delivery Day	Tenth calendar day of the delivery month				
Contract Months	March, June, September and December				
Last Trading Day	Two Exchange trading days prior to Delivery Day				
Trading Hours	08:00 – 22:00 CET				08:00 – 19:00 CET

Eurex Euro BTP Futures Volume and Open Interest Development



Eurex Swiss Federal Bond (CONF) Futures Contract

	Swiss Federal Bond (CONF)
Contract Standard	Notional government bond issued by the Swiss Confederation with 8-13 years to maturity and a (notional) 6% coupon
Delivery	Sellers obligation to deliver and the right to choose which security to deliver
Price Quotation	In percent of par with two decimal places
Minimum Price Change	0.01 per cent equivalent to CHF 10
Delivery Day	Tenth calendar day of the delivery month
Contract Months	March, June, September and December
Last Trading Day	Two Exchange trading days prior to Delivery Day
Trading Hours	08:30 – 17:00 CET

Eurex Swiss Federal Bond (CONF) Future Bloomberg DES Function

GRAB		ComdtyDES	
		Futures Contract Description	
Notes			
Long term Swiss Government bonds with a fixed term of 8-13 yrs from the maturity of the contract.			
		25) View All Notes	
Contract Specifications		Trading Hours	
Name SWISS FED BND FUT Jun10		Exchange	Local
26) Ticker	FBM0 Comdty	08:30-17:00	07:30-16:00
27) Exchange	EUX-Eurex		
Notional	Swiss 10yr 6%		
Contract Size	100,000 Sfr		
Value of 1.0 pt	CHF 1,000		
Tick Size	0.01		
Tick Value	CHF 10		
28) Price	136.83 points		
Contract Value	CHF 136,830 @ 11:53:54		
Margin Limits		Related Dates	
	Speculator Hedger	First Trade	Wed Sep 9, 2009
Initial	1,770	Last Trade	Tue Jun 8, 2010
Secondary		First Notice	Tue Jun 8, 2010
		First Delivery	Thu Jun 10, 2010
		Last Delivery	Thu Jun 10, 2010
		Price Range	
		Up Limit	n.a. Life High 138.26
		Down Limit	n.a. Life Low 129.48
Cycle	- - Mar - - Jun - - Sep - - Dec		
1) Future	2) Option	3) Spread	4) Generic 6) Generic Spread
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P. SN 161285 2 14-Apr-10 12:14:43			

Eurex CONF Bond Future June '10 Delivery Basket Bloomberg DLV Function

GRAB Comdty**DLV**
Hit {NUMBER} <GO> to view Historical Basis/Repo
Cheapest to Deliver

SWISS FED BND FUT Jun10 **FBMO** 136.83 Trade 4/14/10 Dlv 6/10/10
Set 4/19/10 Cheapest IRP= .02

Order	DR	re-sort?	(Mid) Price	Source	Conv. Yield	C.Factor	DECIMAL Gross Basis	52 Days Implied Repo%	Act/360 Actual Repo%	DECIMAL Net Basis
		MASTER:							.13	
1)	SWISS	3	05/12/19	109.520	BGN	1.849	.797324	.422	.02	.13 .019
2)	SWISS	2 1/4	07/20	102.940	BGN	1.930	.723997	3.875	-23.52	.13 3.577
3)	SWISS	4	02/11/23	120.230	BGN	2.173	.825753	7.242	-38.20	.13 6.699

Eurex Euro-Bund Futures Bloomberg DES function

GRAB		ComdtyDES	
		Futures Contract Description	
Notes			
Euro - Bund Futures. RXA Comdty .Long-term notional debt securities issued by the German Federal Govt with a term of 8.5-10.5 yrs. Listed Oct 5, 1998 with March 99 contract. Prior history is DEM Bund. On LTD contract expires at 12:30 CET. Daily settlement at ~17:15 CET.			
25) View All Notes			
Contract Specifications		Trading Hours	
Name EURO-BUND FUTURE Jun10		Exchange 08:00-22:00 Local 07:00-21:00	
26) Ticker RXM0 Comdty			
Exchange EUX-Eurex			
Notional Euro-Bund 10yr 6%			
Contract Size 100,000 EUR			
Value of 1.0 pt € 1,000		Related Dates	
Tick Size 0.01		First Trade Wed Sep 9, 2009	
Tick Value € 10		Last Trade Tue Jun 8, 2010	
27) Price 123.01 €		First Notice Tue Jun 8, 2010	
Contract Value € 123,010 @ 09:07:08		First Delivery Thu Jun 10, 2010	
		Last Delivery Thu Jun 10, 2010	
Margin Limits		Price Range	
Speculator Hedger		Up Limit n.a. Life High 123.78	
Initial 1,870		Down Limit n.a. Life Low 119.52	
Secondary			
Cycle - - Mar - - Jun - - Sep - - Dec			
1) Future 2) Option 3) Spread 4) Generic 6) Generic Spread			
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000		Copyright 2010 Bloomberg Finance L.P.	
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000		SN 161285 0 14-Apr-10 9:23:07	

Eurex Euro-BTP Future Bloomberg DES Function

GRAB				ComdtyDES			
22) News				Futures Contract Description			
Notes							
Euro-BTP Italian Government Bond Futures							
Date of Introduction: 14th September 2009							
25) View All Notes							
Contract Specifications				Trading Hours			
Name Euro-BTP Future Jun10				Exchange		Local	
26) Ticker IKM0 Comdty				08:00-19:00		07:00-18:00	
Exchange EUX-Eurex							
Notional BTP 10yr 6.00%							
Contract Size 100,000 EUR							
Value of 1.0 pt € 1,000							
Tick Size 0.01							
Tick Value € 10							
27) Price 116.69 EUR/EUR							
Contract Value € 116,690 @ 09:09:56							
Margin Limits				Related Dates			
Speculator Hedger				First Trade Mon Sep 14, 2009			
Initial 1,300				Last Trade Tue Jun 8, 2010			
Secondary				First Notice Tue Jun 8, 2010			
				First Delivery Thu Jun 10, 2010			
				Last Delivery Thu Jun 10, 2010			
				Price Range			
				Up Limit n.a.		Life High 117.19	
				Down Limit n.a.		Life Low 113.57	
Cycle - - Mar - - Jun - - Sep - - Dec							
1) Future 3) Spread 4) Generic 6) Generic Spread							
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000							
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P. SN 161285 0 14-Apr-10 9:26:34							

Eurex Euro-Bund Future June '10 Delivery Basket Bloomberg DLV Function

GRAB ComdtyDLV

Hit {NUMBER} <GO> to view Historical Basis/Repo

Cheapest to Deliver

EURO-BUND FUTURE Jun10 **RXMO** 123.01 Trade 4/14/10 Dlv 6/10/10
Set 4/19/10 Cheapest IRP= .38

Order	DR	re-sort?	(Mid) Price	Source	Conv. Yield	C.Factor	DECIMAL Gross Basis	52 Days Act/360 Implied Repo%	Actual Repo%	DECIMAL Net Basis
MASTER:									.47	
1)	DBR	3 $\frac{3}{4}$	01/04/19	105.320	BGN	3.044	.852328	.475	.38	.47 .014
2)	DBR	3 $\frac{1}{2}$	07/04/19	103.110	BGN	3.105	.828936	1.143	-4.19	.47 .717
3)	DBR	3 $\frac{1}{4}$	01/04/20	100.800	BGN	3.151	.803710	1.936	-9.98	.47 1.543

Eurex Euro-BTP Future June '10 Delivery Basket – Bloomberg DLV Function

GRAB

ComdtyDLV

Hit {NUMBER} <GO> to view Historical Basis/Repo

Cheapest to Deliver

Euro-BTP Future Jun10 IKMO 116.82

Trade 4/15/10 Dlv 6/10/10

Set 4/20/10 Cheapest IRP= -.50

Order	DR	re-sort?	(Mid) Price	Source	Conv. Yield	C.Factor	DECIMAL Gross Basis	51 Days Implied Repo%	Act/360 Actual Repo%	DECIMAL Net Basis	
MASTER:									.47		
1)	BTPS4	1/2	02/01/20	105.500	BGN	3.855	.897022	.710	-.50	.47	.147
2)	BTPS4	1/4	03/01/20	103.260	BGN	3.885	.878162	.673	-.57	.47	.154
3)	BTPS4	4	09/01/20	100.540	BGN	3.974	.854696	.694	-.98	.47	.208
4)	BTPS4	1/2	03/01/19	106.510	BGN	3.667	.904675	.826	-1.33	.47	.274
5)	BTPS4	1/4	09/01/19	104.040	BGN	3.768	.882877	.902	-2.11	.47	.383
6)	BTPS4	1/4	02/01/19	104.780	BGN	3.642	.888655	.967	-2.46	.47	.439

Determination of Cheapest to Deliver Bond for Bond Future

Duration, relative bond prices and yield levels determine which bond functions as the cheapest-to-deliver (CTD) bond:

- If the market yield is **above the notional yield** of the futures contract, the bond with the **longest duration** (low coupon / long maturity) will tend to be CTD.
- If the market yield is **below the notional yield** of the futures contract, the bond with the **shortest duration** (high coupon / short maturity) will tend to be CTD.
- If market yield is **below the notional yield** of the futures contract, there will be **no obvious preference for CTD status**.

Change in Cheapest to Deliver Bloomberg CMS Function

GRAB					ComdtyCMS				
CTD Scenario Analysis					CTD Basis 0. dec. Stl 5/ 7/10 Dlv 6/10/10				
VIEWS B-Basis, C-basis Chg H-Horizon bond price U-BPV S-CTD B.P. Spread P-P&L points					PARALLEL YIELD SHIFTS (BP) -100 -50 0 50 100 Price: 134.463 129.575 124.901 120.430 116.152 Chng: +9.883 +4.995 +.321 -4.150 -8.428 cRisk: 10.00 9.56 9.14 8.75 8.37				
RXMO Issue Price Src Yield Basis					CTD Basis Point Yield Spread				
1) DBR 3 3/4 01/04/19	106.520	BGN	2.887	.337	.0	.0	.0	.0	.0
2) DBR 3 1/2 07/04/19	104.360	BGN	2.949	1.091	14.9	12.4	9.9	7.3	4.7
3) DBR 3 1/4 01/04/20	102.110	BGN	2.993	1.984	30.6	25.7	20.7	15.7	10.7
4) DBR 3 07/04/20	99.590	BGN	3.046	2.683	43.1	36.0	28.9	21.8	14.6
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P. SN 161285 1 04-May-10 3:15:20									

Change in Cheapest to Deliver Bloomberg CMS Function

GRAB ComdtyCMS

CTD Scenario Analysis

CTD Basis 0. dec. Stl 5/ 7/10 Dlv 6/10/10

PARALLEL YIELD SHIFTS (BP)

	-100	-50	0	50	100
Price:	121.410	112.315	104.109	96.275	88.814
Chng:	+17.650	+8.555	+3.49	-7.485	-14.946
cRisk:	19.15	17.27	15.59	15.37	14.09

UBMO 103.76

Issue	Price	Src	Yield	Basis	CTD	Basis	Point	Yield	Spread
1) DBR 4 3/4 07/04/34	116.060	BGN	3.729	.421	.0	.0	.0	3.0	9.3
2) DBR 4 01/04/37	104.390	BGN	3.736	.650	10.6	6.1	1.7	.0	1.3
3) DBR 4 3/4 07/04/40	118.310	BGN	3.728	1.084	15.6	9.4	3.3	.1	.0
4) DBR 4 1/4 07/04/39	109.350	BGN	3.719	1.184	16.8	10.5	4.3	.9	.5

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P.
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Some Basic Bond Futures Mathematics.....

Because of cash and carry arbitrage, bond futures will track the cheapest-to-deliver bond so with bond futures having notional coupon and conversion factors relating the coupon on each deliverable bond to the notional coupon of the futures contract then the sensitivity of a bond futures can be expressed as:

$$dF = dCTD / CF_{ctd}$$

Where df = change in the bond future,
 $dCTD$ = change in the cheapest-to-deliver bond; and
 CF_{ctd} = conversion factor of the cheapest-to-deliver bond.

For small changes in yield the interest rate sensitivity of a bond future can be expressed:

$$\text{BPV Bond Future} = \text{BPV CTD} / CF_{ctd}$$

(Where BPV = Price change of an .01 change in yield)

Therefore, the number of bond futures to hedge a bond holding is:

$$\text{VBPV Exposure} / \text{VBPV CTD Bond} * CF_{ctd}$$

(Where VBPV is the monetary value of .01 change in yield)

When hedging the CTD the Hedge Ratio becomes the CF_{ctd} and the number of bond futures is determined by: **(Nominal Exposure / Nominal Size of Bond Future) * CF_{ctd}**

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Switching Investments between Fixed Income Markets Portfolio Overlay #1

Situation:

A European government bond portfolio manager has a €50 million holding in medium term European benchmark government bonds i.e. DBR 3.75% May 2019 (CTD of the June '10 Euro-Bund future contract) and has decided to switch the investment into Swiss government bonds of similar duration and maturity.

The fund manager can **EITHER** liquidate his holding in European government bonds and buy similar duration and maturity Swiss government bonds **OR** overlay a Short Euro-Bund Future / Long CONF future position to the existing portfolio. The CTD of the June '10 CONF future is the SWISS 3% January 2019 bond.

Switching Investments between Fixed Income Markets Portfolio Overlay #1 - Continued

Solution:

First, calculate the number of Euro-Bund futures to neutralise the €50 nominal holding of DBR 3.75% January 2019:

$$€50 \text{ million} / €100,000 * 0.852328 \sim 426 \text{ Euro-Bund futures}$$

Second, calculate the BPV ratio for Euro-Bund futures to Swiss CONF futures i.e. BPV Euro-Bund future: BPV CONF future:

With the BPV of Euro-Bund future is equal to 0.09292 or 9.292 futures ticks (which is worth €92.92) and the BPV of the CONF future equal to 0.1107 or 11.07 futures ticks (which is worth CHF110.7) and with a €/CHF exchange rate of 1.4370CHF per €, gives a ratio of:

1 Euro-Bund future : 1.12 CONF futures.

Bund Futures BPV Weighted Ratios Bloomberg PDG2 Function

GRAB ComdtyPDH2
Enter all values and hit <GO>.

POSITION DURATION MANAGEMENT Page 1 of 3

Mode: ☐ Cash, ☒ HEDGE, Aggreg. Settle 4/14/10
 "MACRO" Portfolio? ☐ N Recompute Fut/Opt Hedge ☐ N
 Inflation = 0.0 ? ☐ N Sfr 1.056 € .7349

Tkr	Cpn	Mty <Key>	Price	CnvYld	ModDur	Cvx	Val01	FX	M	Par	€ 1000MV	€ BPV
CASH												
			136.77		.00	.00						0
SUB-TOTAL												
Futures/Options			Price	Proxy Issue					Num	Contr		
RXMO			123.04	3 ³ / ₄ 1/19			.0917	€	100		n/a	9.17M
FBMO			136.77	3 5/19			.1099	Sfr	-120		n/a	-9.17M
											n/a	
											n/a	
											n/a	
TOTAL												-7.46

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2010 Bloomberg Finance L.P.
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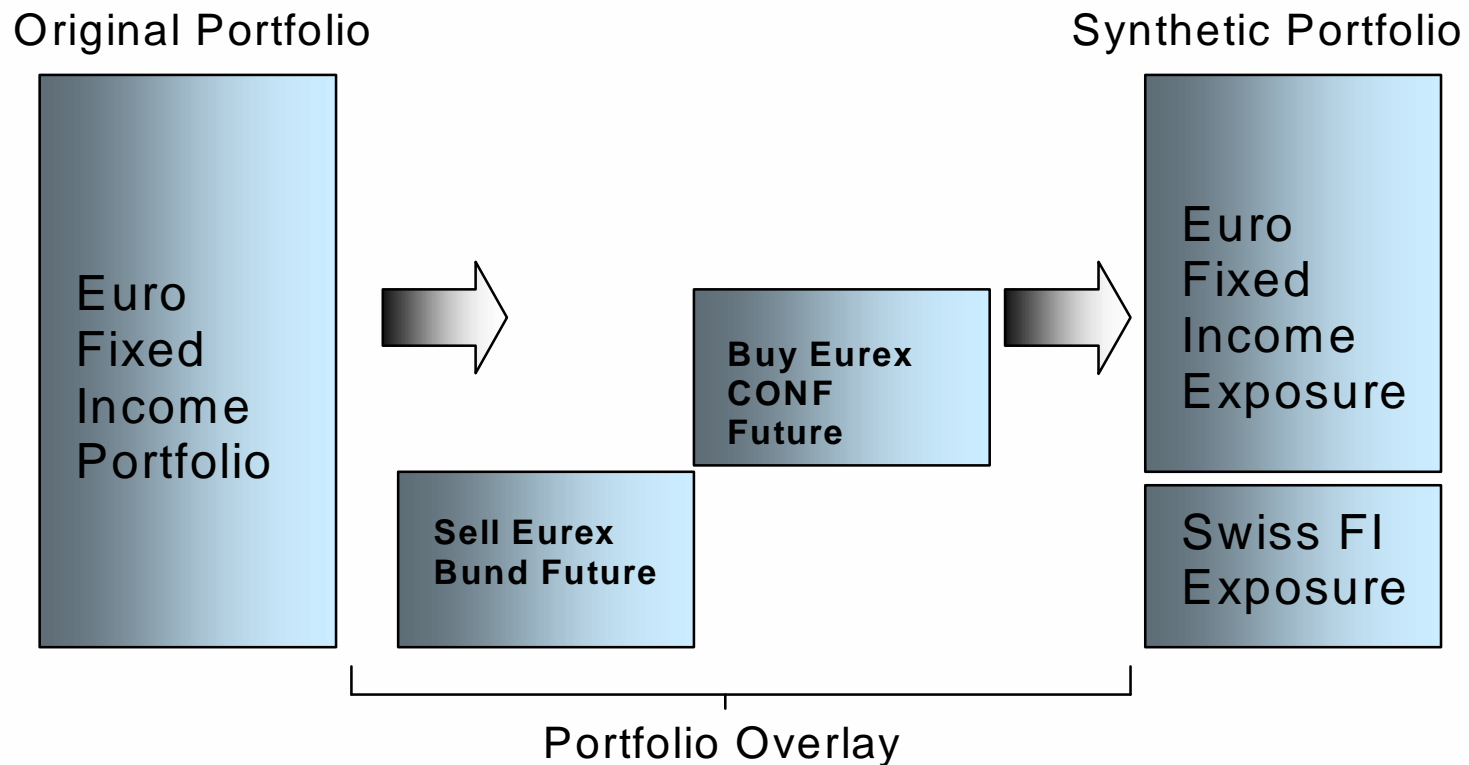
Switching Investments between Fixed Income Markets Portfolio Overlay #1 - Continued

Finally, based on a BPV weighted Euro-Bund:CONF ratio of 1:1.12, the portfolio manager calculates how many CONF futures to buy against a short 426 Euro-Bund futures position i.e. 426×1.12 .

Therefore, the fund manager ***sells 426 Euro-Bund futures and buys 477 CONF futures*** as a ***portfolio overlay strategy*** to synthetically create an asset allocation switch from European government bonds to Swiss government bonds. The existing portfolio of European government bonds have been left intact.

Portfolio Overlay

Switching from Fixed Income to Fixed Incomes



Changing the Composition of a European Bond Portfolio

Italian Ten Year Bond Yield Over Germany



Changing the Composition of a European Bond Portfolio Portfolio Overlay #2 Example

The introduction of the Euro-BTP Futures to Eurex's existing suite of European benchmark fixed income futures increases the fund managers' possibilities in effecting changes in portfolio asset allocation across European bonds, whilst leaving the existing core portfolio intact.

Situation:

A fund manager has a Euro 100 million European bond portfolio in core i.e. German European government bonds and wishes to switch 10% of the portfolio into Italian bonds as he feels that the yield spread over Germany is at its widest and is anticipating outperformance in Italian bonds relative to core European bonds. The current duration of the portfolio is 7.5years.

Portfolio Overlay Example #2 - Continued

Solution:

1. **Calculate the number of Eurex Euro-Bund Futures to be sold to reduce the core European Bond portfolio by 10%:**

$$\begin{aligned} & (\text{Duration} \times \text{Investment} \times 0.0001) / \text{BPV Euro-Bund Future} = \\ & (7.5 \times \text{€}10 \text{ million} \times 0.0001) / \text{€}92.92 = 79.91 \sim 81 \text{ Euro-Bund Futures} \end{aligned}$$

BPV of a Bond Future is BPV CTD/CD ctd which is currently for the Euro Bund Future is $(0.0792/0.852328) = 0.09292$ or 9.292 futures ticks which is €92.92.

2. **Calculate the BPV weighted ratio of Euro-BTP Futures to Euro-Bund Futures:**

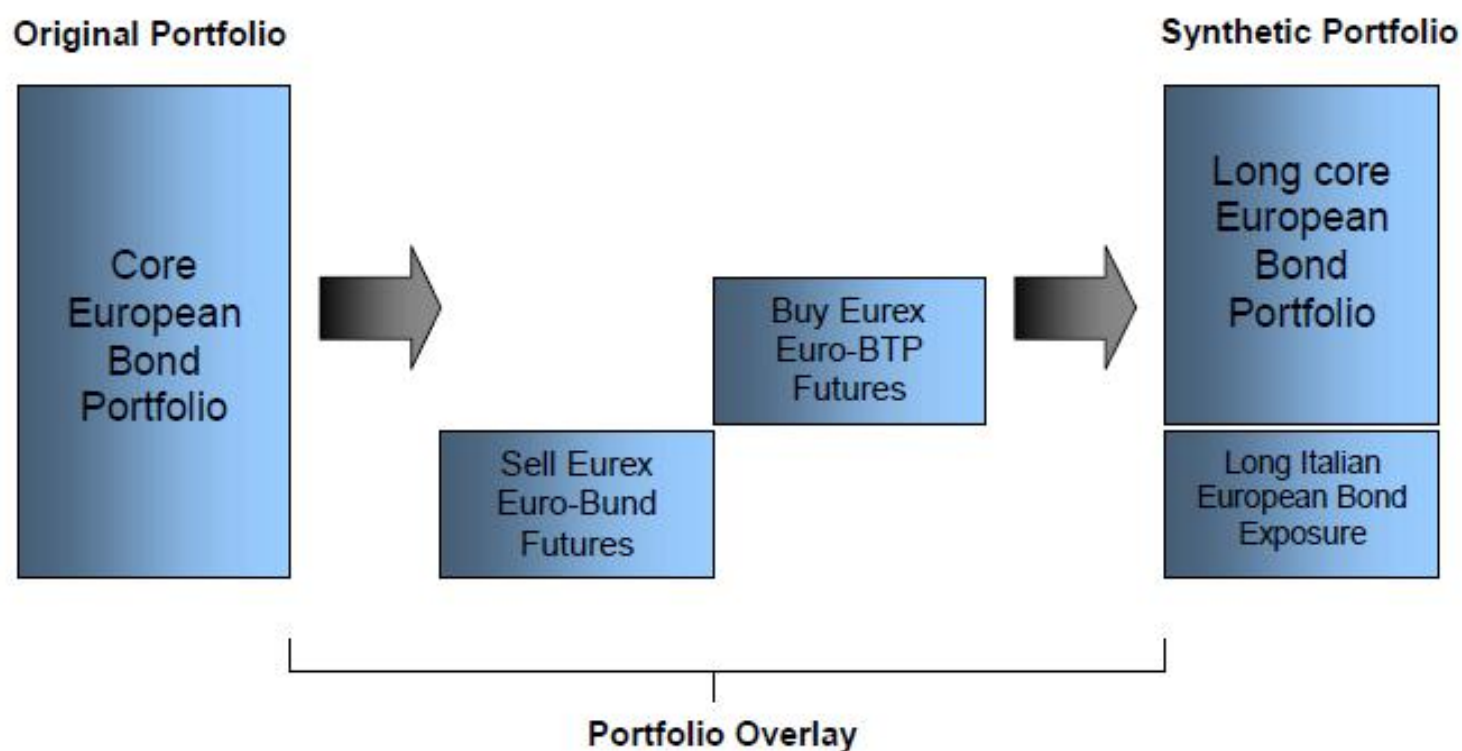
The BPV of the Euro-BTP Future, using the same calculation is €94.49

The ratio Euro-BTP to Euro-Bund Futures is: 1.0 BTP: 1.02 Bund.

Portfolio Overlay #2

Changing the Composition of a European Bond Portfolio

Switch from Core European Bonds to Italian Bonds



Switching Investments between Equity and Fixed Income Markets Portfolio Overlay #3 Example

Situation:

A pension fund manager decides to switch €50 mln. of a European equity portfolio into benchmark European government bonds. The equity portfolio has a beta of 1.15 to the Eurex STOXX 50® index future. The current cheapest to deliver for the Eurex Euro-Bobl June 2010 contract, the DBR 3.75% January 2015, has a duration of 4.33 years, very close to the current duration of 4.25 years for the fund managers' benchmark European government bond portfolio. The Eurex Euro Stoxx 50® index future is currently trading at 2,938.

The fund manager decides to sell Eurex STOXX 50® index futures and buy Euro-Bobl futures to facilitate the synthetic asset allocation switch from European equities to European government bonds.

Switching Investments between Equity and Fixed Income Markets Portfolio Overlay #2 Solution

Solution:

Firstly, calculate the number of Eurex Stoxx 50® equity index contracts to sell:

$(\text{Value of Equity Investment} / \text{Value of Eurex Stoxx 50®}) * \text{Portfolio Beta}$

$= (\text{€}50 \text{ mln.} / \text{€}29,380) * 1.15 \sim 1,957 \text{ Eurex Stoxx 50® contracts.}$

(An index price of 2,938 gives a contract value of €29,380 i.e. index price x €10).

Secondly, calculate the number of Euro-Bobl futures to buy:

$(\text{Duration} * \text{Investment} * 0.0001) / \text{BPV Bobl future}$

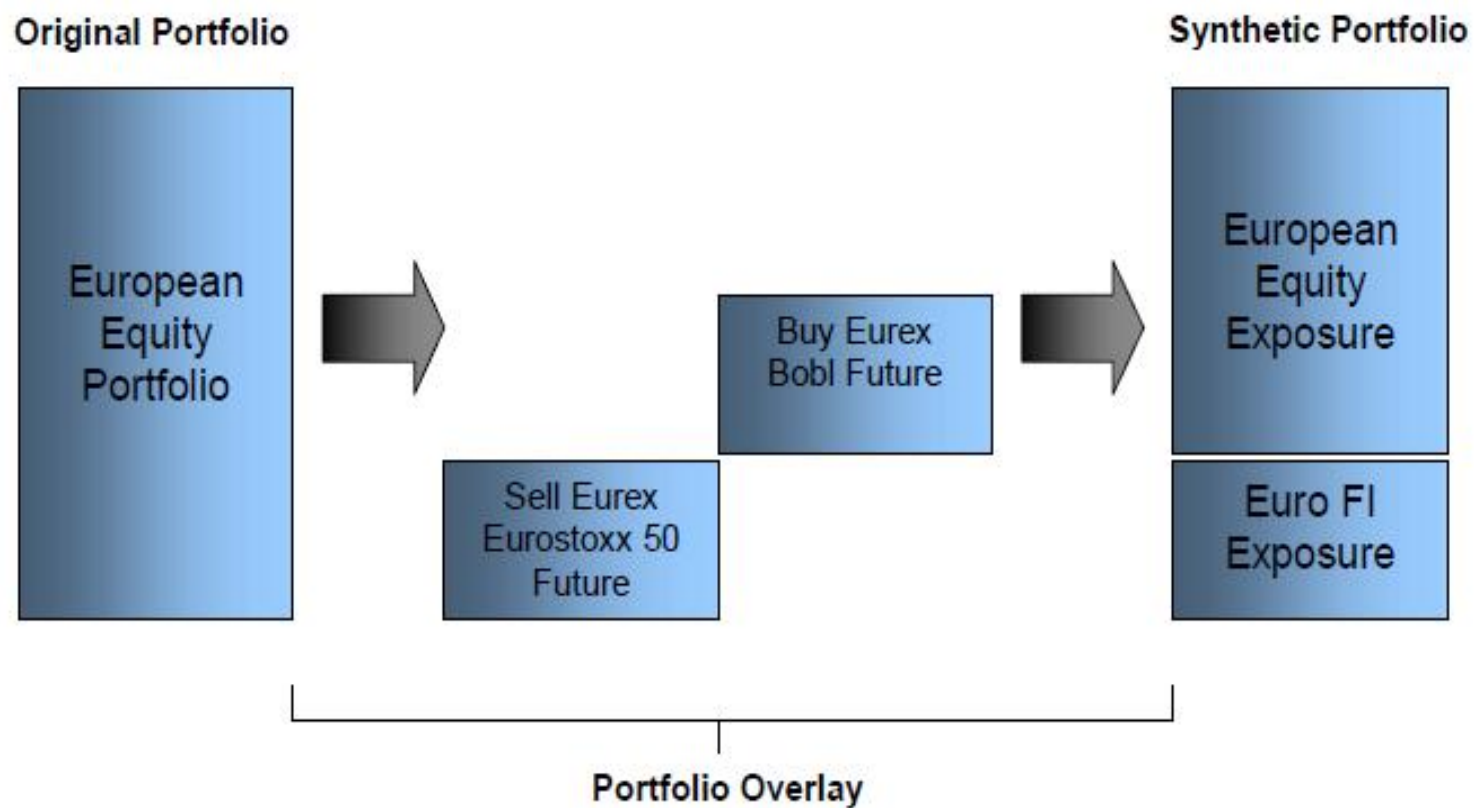
$= (4.25 * \text{€}50 \text{ mln.} * 0.0001) / \text{€}51.50 \sim 413 \text{ Euro-Bobl futures contracts.}$

The BPV of Euro-Bobl future = BPV ctd / Price Factor, so with the DBR 3.75% 01/15 as CTD this gives $0.047/0.912067=0.0515$ or €51.50.

Therefore, the fund manager sells 1,957 EURO Stoxx 50® contracts and buys 413 Euro-Bobl futures to synthetically switch €50 mln. holding of European equities to medium term European government bonds.

Portfolio Overlay # 3

Switching from Equity to Fixed Income



Agenda

- Introduction & basic bond futures mathematics
- Portfolio Overlay
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Adjusting Portfolio Duration with Fixed Income Futures

Situation:

A fund manager has a €50 million European government bond portfolio and has become very positive to the outlook to European bonds and wants to increase exposure and decides to increase portfolio duration from its current 4.3years to 7.9years.

The alternatives facing the fund manager are either to switch out of the current bond holdings to longer duration bonds **OR** to overlay the current bond holding with fixed income futures contracts.

Adjusting Portfolio Duration with Fixed Income Futures Solution

First, calculate the BPV of the current portfolio:

$$\begin{aligned}\text{Current Portfolio BPV} &= \text{Portfolio Modified Duration} * \text{Portfolio Value} * 0.0001 \\ &= 4.3 * \text{€}50,000,000 * 0.0001 = \text{€}21,500.\end{aligned}$$

Second, calculate Portfolio BPV with the higher portfolio duration target:

$$\text{Target Portfolio BPV} = 7.9 * \text{€}50,000,000 * 0.0001 = \text{€}39,500.$$

Finally, calculate the appropriate number of fixed income futures contracts to reach the target portfolio duration:

Number of Fixed Income Futures to adjust Portfolio Duration =

$$\text{Target Portfolio BPV} - \text{Current Portfolio BPV} / \text{BPV Euro Bund future}$$

(where BPV Euro Bund future = $\text{BPV}_{\text{ctd}} / \text{CF}_{\text{ctd}}$).

$$(\text{BPV Euro-Bund Future} = \text{€}92.92).$$

Therefore, the number of Euro Bund futures to overlay the bond portfolio to increase portfolio duration from 4.3years to 7.9years = $\text{€}18,000 / \text{€}92.92 = 193.71 \sim 194$ Euro-Bund futures contracts.

Adjusting Portfolio Duration with Bond Futures

Benefits:

- No disruption to the existing portfolio when bond futures are overlaid with the existing holdings
- Smaller capital outlay
- Quicker to attain portfolio duration target

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Using Bond Futures as a Synthetic Cash Instrument Duration Targeting

Situation:

A pension fund manager has €25 million to invest and wants to achieve a specific portfolio modified duration target of 15 years. The Eurex Euro-Buxl contract is an ideal instrument to create synthetic long duration investments. The deliverable bonds for the Euro-Buxl contract is 24 to 35 years – currently the June 2010 delivery basket consists of bonds with maturities between 24 and 30 years to maturity. The CTD, DBR 4.75% July 2034, has a duration of 14.69 years.

Solution:

The number of Euro-Buxl® Futures contracts to buy to create a €25 million nominal synthetic fixed income investment with a specific modified duration of 15 years is determined by the following formula:

$$\begin{aligned} & \text{Target Duration} * \text{Investment} * 0.0001 / \text{BPV Euro-Buxl® Futures} \\ & (\text{BPV Euro-Buxl® Futures} = \text{BPV CTD} / \text{CF ctd} \\ & \quad = 0.1716 / 1.114483 = 0.1540 = 7.7 \text{ futures ticks} = \text{€154.00}) \end{aligned}$$

$$\begin{aligned} & = (15 * \text{€25million} * 0.0001) / (\text{€154.00}) \\ & = 243.51 \sim 244 \text{ Euro-Buxl® futures contracts.} \end{aligned}$$

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Fixed Income Futures Calendar Rolls Improving Strategy Efficiency

Changes in the *spread* between between the two futures delivery months of the debt futures contract will affect the effective performance of the futures strategy.

Factors affecting a debt futures calendar roll (spread):

- Repo rate of CTD bonds to each deliverable month;
- Closeness of deliverable bonds – degree of optionality of possible CTD change;
- CTD in each deliverable month – duration and maturity differences will give a market direction bias to the roll / spread

Fixed Income Futures Roll Analysis Bloomberg CBSD Function

GRAB

ComdtyCBSD

BOND SPREAD VALUATION

RX - EURO-BUND FUTURE

IMPLIED REPO RATES (Act/360)

SHORT :	RXM0 Jun10	RXU0 Sep10	RXZ0 Dec10
Dlv date	6/10/10	9/10/10	12/10/10
Deliver	DBR 3 ³ / ₄ 01/19	DBR 3 ¹ / ₂ 07/19	DBR 3 ¹ / ₂ 07/19
Dlv price	105.712	102.686	102.842
Factor	.852328	.832496	.836047
Swap spread	n.a.	6.8 b.p.	n.a.

LONG : 4/28/10

DBR 3 ³ / ₄ 01/19	106.120	.26 43 Days	.31 135 Days	1.77 226 Days
RXM0 Jun10 SPREAD	124.027		.33 92	2.13 183
RXU0 Sep10	+.68 123.347			3.94 91
RXZ0 Dec10	+.34 123.010			

SWAP AT DELIVERY WORKSHEET

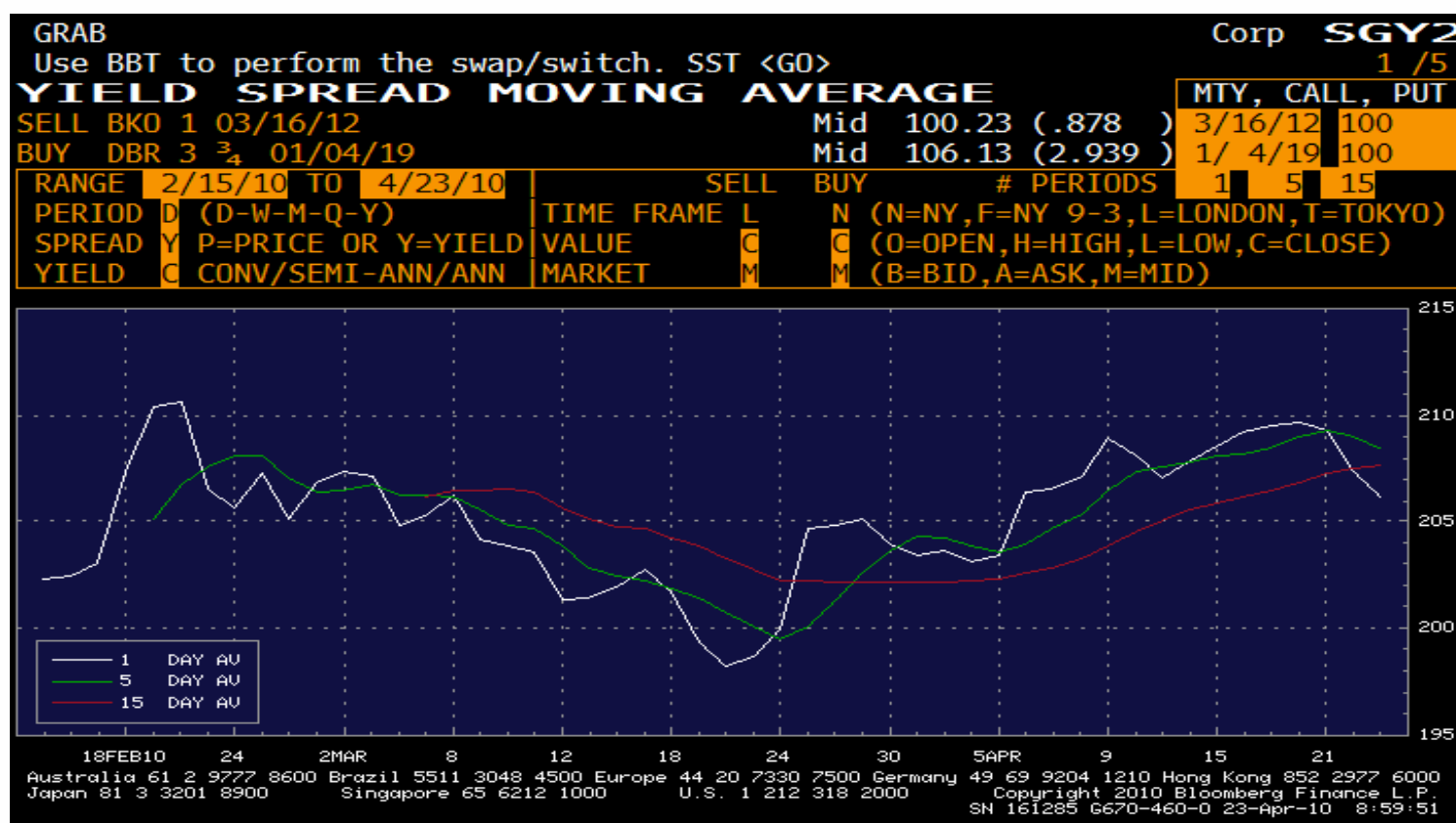
	4/28/10	9/10/10
DBR 3 ³ / ₄	106.120 2.940	104.857 3.078
DBR 3 ¹ / ₂	103.890 3.008	102.686 3.145

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000
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Euro-Schatz / Euro-Bund CTD Spread Bloomberg SGY2 Page



Euro-Schatz / Euro-Bund Yield Spread Ratio Bloomberg PDH2 Page

GRAB

ComdtyPDH2

Enter all values and hit <GO>.

POSITION DURATION MANAGEMENT Page 1 of 3

Mode: ☒ Cash, ☒ HEDGE, ☐ Aggreg. Settle 4/26/10

"MACRO" Portfolio? ☐ N Recompute Fut/Opt Hedge ☐ N

Inflation = 0.0 ? ☐ N

Tkr	Cpn	Mty	<Key>	Price	CnvYld	ModDur	Cvx	Val01	M	Par	1000MV	BPV
CASH												
				124.08		.00	.00					0
SUB-TOTAL												
Futures/Options				Price	Proxy Issue			Num Contr				
DUMO				108.915	1 3/12			.0203Long	100	n/a	2.03M	
RXMO				124.08	3 ³ / ₄ 1/19			.0923Shrt	-22	n/a	-2.03M	
										n/a		
										n/a		
										n/a		
TOTAL											3.41	

CB

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000

Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000

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Eurex Euro-Schatz / Euro-Bobl / Euro-Bund Barbell

Situation:

A fund manager believes that the two year and ten year maturity sectors of the European government bond yield curve will underperform relative to the five year maturity sector. The fund manager decides to structure a Barbell position using the Eurex Euro-Schatz, Euro-Bobl and Euro-Bund futures contracts.

Solution:

Determine the monetary value of an .01 change in yield of each of the bond futures contracts in the barbell structure:

- VBPV Euro-Schatz Futures is €20.50
- VBPV Euro-Bobl Futures is €51.50
- VBPV Euro-Bund Futures is €92.92

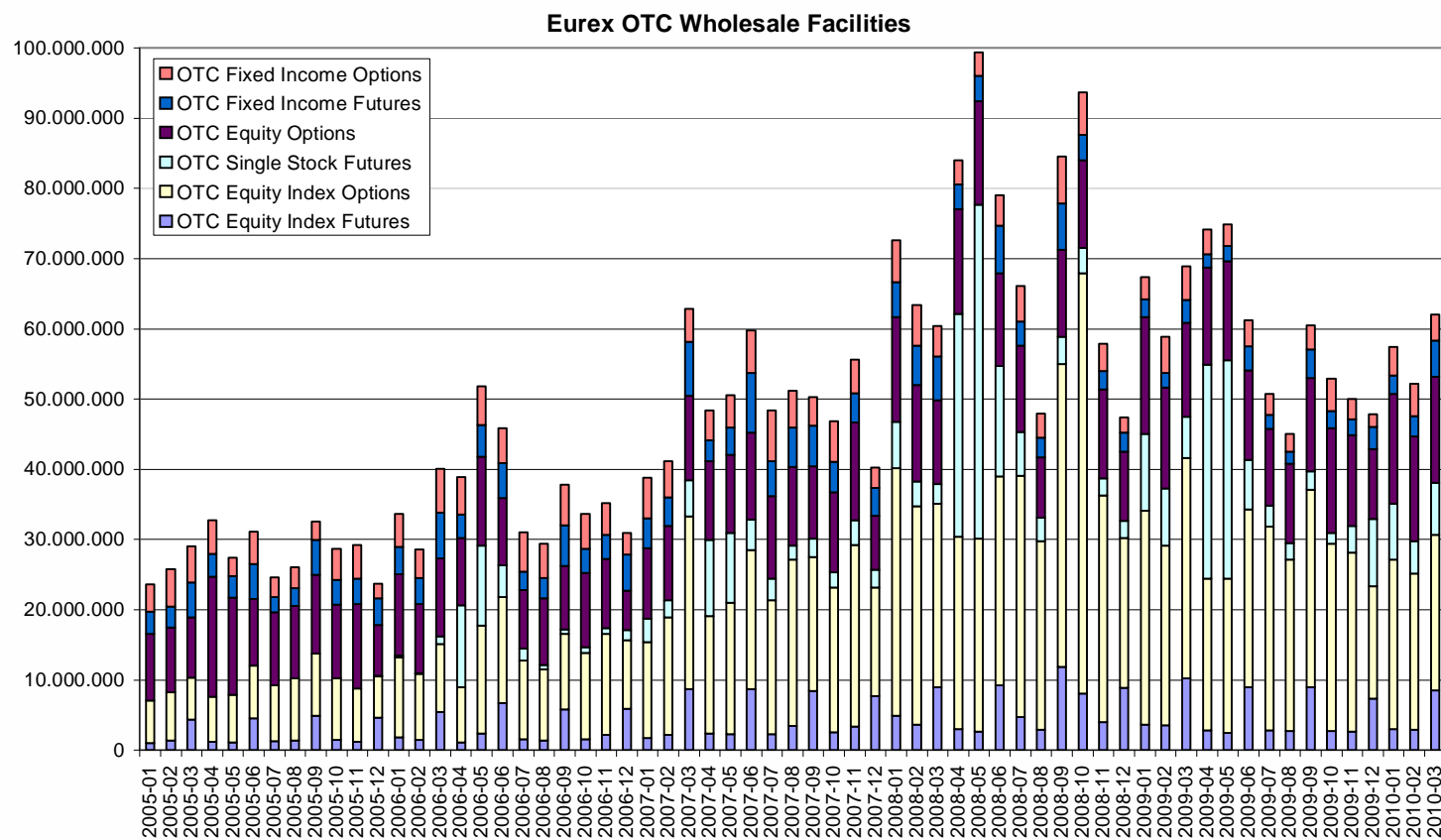
Therefore, the fund manager initiates a Barbell structure in the following ratio:

Sells 4.53 Euro-Schatz Futures contracts : Buys 3.60 Euro-Bobl Futures contracts : Sells 1 Euro-Bund Futures contract

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Eurex OTC Wholesale Facilities



Eurex OTC Block Trade Facility

- An OTC Block Trade is a trade in a standardized Eurex product where the price has been negotiated off-exchange.
- The exchange defines a minimum number of contracts for an OTC Block trade for each product admitted to Block trading.
- The OTC Block Trade Facility gives asset managers and market makers the ability to trade Eurex Bond Futures bilaterally off exchange and novate the transaction to Eurex Clearing.

OTC Block Trade minimum size :

Euro-Schatz – 4,000

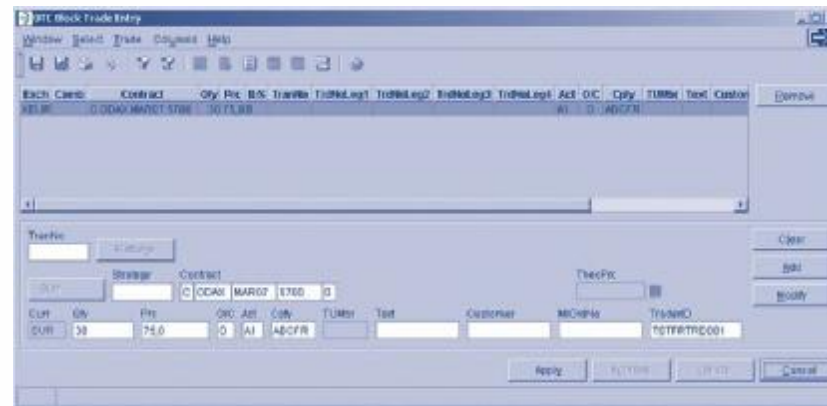
Euro-Bobl – 3,000

Euro-Bund – 2,000

Euro-Buxl – 100

Euro-BTP – 250

CONF - 500



Exchange for Physicals Fixed Income Futures

- The other OTC EFP-Fin functionalities enable the purchase or sale of fixed income futures contracts and simultaneously the sale or purchase of the underlying, defined as debt securities, money market or other fixed income futures which show a price correlation to the exchange-traded futures contract so that the futures contract describes an appropriate hedge instrument.
- The underlying for the EFP-Fin facility can be a any kind of debt instrument, money market or other fixed income futures. Transactions are not subject to a minumum number of contracts.



OTC EFP-Fin Trade Entry

Window Select Trade Help

TranNo: 28

TrdNo:

ISIN	Nominal	StlDate	CshPrc	Issuer/SecuName	Coupon	CpnFrq	Maturity	Curr
DE0001788517	1.000	18.12.2006	99.9800		6,000	1	10.01.2016	EUR

Exch	Contract	Qty	Prc	O/C	Act	Hdg	ExchRate	Curr
XEUR	FGBL MAR07	10	118,00	O	P1	NOM	1,0000000000	EUR

Cpty	TUMbr	Text	Customer	MIOrdNo	SI	TraderID
ABCFR					BC	TSTFRTRD001

XEUR 90239 EFP-FIN TRADE ENTERED

* The delivery confirmation must clearly state that the cash transaction has been concluded in conjunction with the corresponding EFP Trade's future transaction.

Exchange for Swaps (EFS Trade)

- The OTC EFP facility allows participants to organize and execute transactions involving an interest rate swap or swaption and interest rate futures
- Cash transactions in EFP trades must have the following characteristics:
 - EFS for Fixed Income: interest rate swap or swaption
 - EFS for Credit: OTC Credit Default Swap (CDS) or iTraxx Index or Single Reference Entity
 - EFS for Inflation: all versions of inflation swaps are eligible (Zero Coupon Inflation Swaps, Multiplicative Inflation Swaps, Inflation linked Annuity Swaps...)



The screenshot shows the 'OTC EFS Trade Entry' window with the following fields populated:

Trade Info		Swap Info		Dates		Currency	
TradeNo	RefNo	SwapCust1	SwapCust2	SwapType	BSDate	Start	End
30		ABC Corp.	Brown Ltd.	swap	15.12.2008		
Contract		Notional		Rate		Term	
Exch	Contract	Qty	Pct	Rate	Term	Start	End
EUR	FGEL MAR07	10	118.00	0	P1	15.12.2008	15.12.2009
Currency		Rate		Term		Term	
Curr	Rate	Term	Term	Term	Term	Term	Term
EUR	1.00000000	1	EURBOR-1M	1.0000	15.12.2008	15.12.2009	EUR
Customer		TradeID		TradeID		TradeID	
Cpty	Txntr	Text	Customer	TradeID	TradeID	TradeID	TradeID
ABCPR							TSTFATRD001

Buttons: Modify, Delete, Cancel

Status: XEUR 90232 EFS TRADE ENTERED

- Proof of the swap transaction must be faxed to Eurex market Supervision upon request

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CBL Account / Clearstream

BTP Futures will be physically settled via Clearstream Banking Luxembourg (CBL) and therefore an international CBL account is necessary. For opening an international account to settle Italian Government Bonds or other questions please contact our Clearstream Client & Relations Department:

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