

# Eurex Mid-Term Euro-BTP Futures: Completing the BTP yield curve – Increasing the alpha generating opportunities for the buy side

On September 19, 2011, Eurex will expand its suite of BTP fixed income futures contracts by launching a medium-term Euro-BTP Futures contract with a deliverable bond basket of between 4.5 and 6 years to maturity<sup>1</sup>. The buy side will now have at its disposal three exchange traded fixed income derivative instruments covering non AAA rated government debt from two years to ten years (in terms of maturity of the bond delivery baskets of the respective BTP Futures contracts) to complement the existing Eurex European benchmark fixed income futures products of Euro-Schatz, Euro-Bobl, Euro-Bund and Euro-Buxl<sup>®2</sup>.

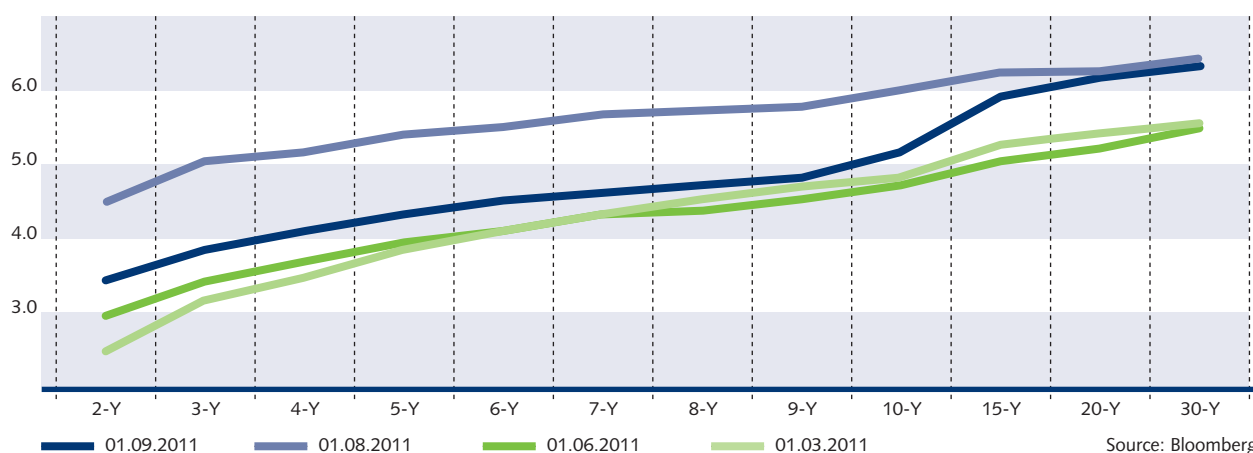
## Mid-Term Euro-BTP Futures – Increasing alpha generating opportunities

The launch of the new Mid-Term Euro-BTP Futures contract increases the opportunities to generate alpha for the buy side:

- BTP Yield curve opportunities:
  - The Two Year / Five Year / Ten Year BTP Futures Barbell.
  - Two Year / Five Year & Five Year / Ten Year BTP Futures yield curve spreads.
- European medium maturity “Credit Spread” – the Euro-Bobl / Medium-Term BTP Futures Spread.

- Portfolio overlay using Mid-Term Euro-BTP Futures.
- Capturing alpha outperformance in a medium-term maturity Italian corporate bond.
- Creating a synthetic medium-term maturity BTP cash investment.
- Mitigated counterparty risks through Eurex Clearing

## BTP yield curve opportunities Two Year/Five Year/Ten Year BTP Futures Barbell Diagram 1: BTP yield curve – Changes



<sup>1</sup> See Appendix 1 and 2 for the Medium-Term BTP Futures' contract specifications and delivery basket (for December 2011, March 2012 and June 2012 delivery months) respectively.

<sup>2</sup> See [http://www.eurexchange.com/trading/products/INT/FIX/products\\_en.html](http://www.eurexchange.com/trading/products/INT/FIX/products_en.html) for contract specifications of all Eurex fixed income futures products.

The launch of the Mid-Term Euro-BTP Futures allows asset managers and hedge funds an inexpensive means of generating alpha from structuring strategies to benefit from changes in the shape of the BTP yield curve by initiating a **Short/Medium/Long BTP Futures Yield Curve Barbell** position. For example, a fund manager believes that “belly” i.e. five years of the BTP yield curve, is expensive, to the “wings” i.e. the two year and ten year maturity.

Firstly, the structure of the Two Year/Five Year/Ten Year BTP Futures Barbell needs to be determined by identifying the cheapest to deliver bond for each of the BTP futures contracts and their respective basis point values (“BPV”):

Therefore, the fund manager would construct the Short/Medium/Long BTP Futures Barbell in the **+3.48 Short BTP Future: –3.49 Medium BTP Future: +1.00 Long BTP Future ratio** to express his expectation that the middle of the BTP yield curve was expensive relative to the short and long end maturities of the BTP curve.

### Trading sectors of the BTP yield curve

The introduction of the Mid-Term Euro-BTP Futures contract increases the options to the buy side of generating alpha from trading expectations of changes in the slope of the 2-year/5-year and the 5-year/10-year sectors of the BTP yield curve.

**Table 1: BTP Futures and cheapest to deliver bonds**

Contract	CTD*	Conversion factor	BPV** CTD
Dec 11 – Short BTP	3.75% 12/2013	0.959449	0.0237
Dec 11 – Medium BTP***	3.75% 08/2016	0.913306	0.0451
Dec 11 – Long BTP	4.75% 09/2021	0.914858	0.0787

\* Cheapest to deliver bond. This will change due to changes in yield levels and relative yields of deliverable bonds in the basket.

\*\* Basis Point Value i.e. change in price due to an .01 change in yield, will change as yields change.

\*\*\* At time of writing, the Medium BTP Futures contract is not launched yet, the shortest maturity bond in the delivery basket was chosen for the example.

Secondly, the relative price sensitivities of the BTP Futures contracts needs to be calculated based on the following formula<sup>3</sup>:

$$\text{BPV Bond Future} = \text{BPV CTD} / \text{CF CTD}$$

Where:

BPV CTD = BPV of the cheapest to deliver bond; and

CF CTD = Conversion factor of the cheapest to deliver bond.

Table 2 below outlines the BTP Futures' contracts sensitivity values to a change in interest rates and the resulting ratio to structure a duration weighted BTP Futures Barbell:

**Table 2: BTP Futures' sensitivities & Barbell ratio**

Contract	Futures BPV	Value	Barbell calculation	Barbell ratio
Short BTP – Dec	0.0247	EUR 24.70	EUR +24.70 × 3.48 = EUR +86	<b>+ 3.48 Short BTP:</b>
Medium BTP – Dec	0.0493	EUR 49.30	EUR –49.30 × 3.49 = EUR –172	<b>– 3.49 Medium BTP:</b>
Long BTP – Dec	0.0860	EUR 86.00	EUR +86.00 × 1.00 = EUR +86	<b>+ 1.00 Long BTP</b>

<sup>3</sup> Formula is based on the assumption that bond futures will track the cheapest to deliver bond.

Diagram 2: BTPS 375% Dec. 2013 vs. BTPS 3.75% Aug 2016



Diagram 3: BTPS 3.75% Aug 2016 vs. BTPS 4.75% Sep 2021



Table 3: BTP yield curve spreads – Ratios

Contract	Futures BPV	Value	Ratios <sup>4</sup>
Short BTP – Dec	0.0247	EUR 24.70	1 Medium BTP: 1.99 Short BTP
Medium BTP – Dec	0.0493	EUR 49.30	
Long BTP – Dec	0.0860	EUR 86.00	1 Long BTP: 1.75 Medium BTP

Therefore, for example, if a hedge fund manager had the view that he expected the two year/five year sector of the BTP yield curve to flatten the manager would sell **Short BTP Futures/Buy Medium BTP Futures** in a **1.99:1.0 ratio**.

Likewise, for the five year/ten year sector of the BTP curve a structuring of a view looking for a flattening of this sector of the BTP curve would be initiated in a **- 1.75 Medium BTP Futures : +1 Long BTP Futures ratio**.

<sup>4</sup> Ratio will change as CTD and interest rates change.

## The European five year “Credit” spread strategy

The prospect of a Greek sovereign default, the subsequent Greek bailout, and contagion fears across other European countries has highlighted the spread between “core” European bond markets and the peripheral European bond markets. The launch of the Five Year BTP Futures offers more potential alpha generation opportunities for the fund manager trading the Mid-Term Euro-BTP Futures against the Euro-Bobl Futures as a medium maturity “credit trade” strategy:

maturity European benchmark bonds in the near term. The fund is EUR 100 million of 5 years duration; the fund manager decides to synthetically switch twenty percent of his portfolio to medium-term BTPs via portfolio overlay.

The steps in the portfolio overlay strategy to synthetically switch twenty percent i.e. EUR 20 million of medium maturity European government benchmark bonds to medium maturity BTPs are as follows:

**Diagram 4: Five Year Germany vs. Italy Government Bond yield curve spread**



Similar to that of structuring the BTP yield curve spreads outlined above, the relative price sensitivities of the two contracts needs to be calculated. Based on the DBR 4 % July 2016 as the cheapest to deliver for the December 2011 delivery month for the Euro-Bobl future, gives a BPV for the contract as:  $(0.0503/0.921933) = 0.0545 = \text{EUR } 54.50$  compared to that of a BPV of EUR 49.38 for the Mid-Term Euro-BTP Future (see above) generating a **BPV weighted ratio of 1.10 : 1.0 Medium-Term BTP Futures to Euro-Bobl Futures**. For example, if a hedge fund manager held the view that fears over European sovereign debt would shortly subside and therefore expected the spread between “core” European bonds and “peripheral” European bonds would narrow, the asset manager would sell Euro-Bobl Futures/buy Medium-Term BTP Futures in a 1.0 : 1.1 ratio.

### Portfolio overlay using Mid-Term Euro-BTP Futures

The introduction of the Five Year BTP Futures will allow bond fund managers to generate alpha through **portfolio overlay** – effecting changes in portfolio asset allocation whilst leaving the existing portfolio intact.

For example, a fixed income fund manager, managing a medium maturity European government bond portfolio feels that medium maturity BTPs will outperform medium

#### 1. Calculate the number of Eurex Euro-Bobl Futures to be sold to reduce the portfolio benchmark holding by twenty percent:

$$= (\text{duration} \times \text{investment} \times 0.0001) / \text{BPV Euro-Bobl Futures}$$

$$= (5.0 \times \text{EUR } 20 \text{ million} \times 0.0001) / \text{EUR } 54.50^5$$

$$= \mathbf{183 \text{ Euro-Bobl Futures.}}$$

#### 2. Calculate the BPV weighted ratio of Euro-Bobl Futures to Mid-Term BTP Futures:

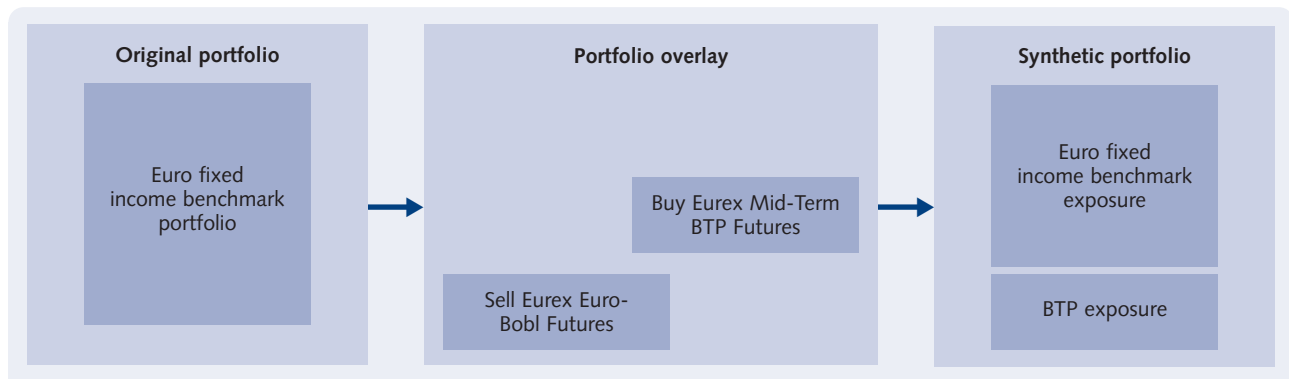
$$= \mathbf{1.0 \text{ Euro-Bobl Futures} : 1.10 \text{ Mid-Term BTP Futures}^6}$$

Therefore, **the fund manager sells 183 Eurex Euro-Bobl Futures and buys 201** (i.e.  $183 \times 1.1$ ) **Eurex Mid-Term Euro-BTP Futures to synthetically switch 20 % of the portfolio from medium maturity European government benchmark bonds to similar duration medium-term maturity BTPs leaving the original portfolio intact**. When the fund manager believes the out performance of medium-term maturity BTPs has been completed the fund manager unwinds the short Euro-Bobl Futures / long Mid-Term Euro-BTP Futures position with the portfolio returning to a fully invested position in European medium maturity government benchmark bonds. Diagram five outlines the portfolio overlay strategy using Eurex Euro-Bobl futures and five year BTP Futures:

<sup>5</sup> See previous section above for determination of BPV of Euro-Bobl Future.

<sup>6</sup> See previous section above for the determination of the Euro-Bobl : Mid-Term BTP BPV weighted ratio.

**Diagram 5: Portfolio overlay using Mid-Term-Euro BTP Futures**



**Capturing alpha outperformance in a medium-term maturity Italian corporate bond**

The introduction of the Mid-Term Euro-BTP Futures allows asset managers to capture alpha outperformance of a medium-term maturity Italian corporate bonds without the exposure to the “beta” or market risk. A fixed income fund manager who manages a medium-term Italian bond fund of government and corporate bonds has the view that a particular corporate bond will outperform relative to the market. The fund manager buys the corporate bond and sells the required amount of contracts in Mid-Term Euro-BTP Futures to create a synthetic short position in

a similar maturity and duration BTPS government bond to capture the outperformance of the corporate bond without the “beta” or market risk.

For example, a fund manager buys EUR10 million notional of the ENELIM 4 % September 2016 corporate bond and sells 95 Mid-Term BTP Futures contracts<sup>7</sup> to create the EUR 10.433 million<sup>8</sup> notional synthetic short position in the BTPS 3.75 % August 2016 bond to structure a strategy looking for the outperformance of the ENELIM 4 % September 2016 corporate bond relative to the market without the “beta” risk.

**Diagram 6: ENELIM 4% Sep 2016 vs. BTPS 3.75% Aug 2016**



<sup>7</sup> The BTPS 3.75% August 2016 is the cheapest to deliver bond and therefore its hedge ratio is: nominal exposure/100,000 × CF CTD. See Appendix 3 for derivation of the hedge ratio.

<sup>8</sup> The differences in notional amounts reflect the slight differences in duration of the Italian corporate and government bond to manage the “beta” risk.

## Creating a synthetic medium maturity BTP cash investment

The introduction of a five year Euro-BTP Futures allows fund managers to create a synthetic medium-term maturity BTP cash investment. For example, a fund manager wants to go long medium-term maturity BTPs with a EUR 20 million investment and a duration of five years and create the synthetic maturity BTP investment using Mid-Term Euro-BTP Futures contracts:

$$= (\text{duration} \times \text{investment} \times 0.0001) / (\text{BPV CTD}/\text{CF CTD})$$

$$= (5.0 \times \text{EUR } 20 \text{ million} \times 0.0001) / (\text{EUR } 49.30^9)$$

$$= 202.84 \sim 203 \text{ Mid-Term Euro-BTP Futures.}$$

By buying 203 Mid-Term Euro-BTP Futures the fund manager has created, very quickly, a synthetic medium-term maturity BTP EUR 20 million five years duration cash investment<sup>10</sup>.

### Mitigated counterparty risks through Eurex Clearing

With Eurex Clearing being central counterparty to all trades, the buy side will benefit from mitigated counterparty risk. The new Mid-Term Euro-BTP Futures will be eligible for trading via the EurexOTC Block Trade facility<sup>11</sup>. This gives

asset managers the opportunity to bilaterally agree transactions in five year BTP Futures off exchange and novate the trade to Eurex Clearing. Eurex Mid-Term Euro-BTP Futures are subject to a minimum block trade threshold limit of 250 contracts<sup>12</sup>.

To facilitate basis and spread trading, the Exchange for Physical<sup>13</sup> (EFP) and Exchange for Swap<sup>14</sup> (EFS) functionalities allow for the simultaneous purchase (sale) of futures along with a sale (purchase) of the underlying bond, swap or another futures contract. Such transactions are not subject to a minimum number of contracts.

For example, for an asset manager wishing to execute the Euro-Bobl/Mid-Term BTP spread can agree the trade bilaterally and use the EFP Trade facility to novate the trade to Eurex Clearing. The prerequisite is that one side of the spread transaction (“underlying security”) has either been traded through the EurexOTC Block Trade facility or traded through the regular order book. In this example, a minimum trade of 250 Mid-Term BTP Futures could be entered into the EurexOTC Block Trade facility to allow for a qualifying transaction in the Euro-Bobl Futures leg via the OTC EFP facility.

## Appendix 1: Mid-Term Euro-BTP Futures – Contract specifications

Mid-Term Euro-BTP Futures	
Contract value	EUR 100,000
Fee and pricing	EUR 0.20 per contract; OTC: EUR 0.30 per contract
Price quotation Tick size/value	In percentage of the par value, with two decimal places; 0.01%/EUR 10
Settlement (via CBL)	Italian government bonds that have a remaining term of 4.5 to 6 years on the delivery day. Such debt securities must have a minimal issue amount of EUR 5 billion and a nominal fixed payment.
Delivery day	Tenth calendar day of the respective quarterly month (Mar, Jun, Sep, and Dec)
Last Trading Day	Two exchange trading days prior to the delivery day of the relevant delivery month. Trading in the maturing delivery month ceases at 12:30 CET.
Trading hours	08:00 to 19:00 CET
Market Making	09:00 to 17:30 CET for the first twelve months

Deliverable bonds: Italian government bonds that have an original maturity of no longer than 16 years and a remaining term of 4.5 to 6 years.

<sup>9</sup> See section on structuring BTP Barbell

<sup>10</sup> The position will require dynamic management – the fund manager will need to adjust the number of contracts because of yield/duration changes and thus changes in BPV values and any change in CTD.

<sup>11</sup> See [www.eurexchange.com/trading/wholesale\\_en.html](http://www.eurexchange.com/trading/wholesale_en.html) for an outline of EurexOTC Clear services including the OTC Block Trade facility.

<sup>12</sup> For OTC Block Trade limits for each contract see [www.eurexchange.com/trading/wholesale/block\\_trades\\_en.html](http://www.eurexchange.com/trading/wholesale/block_trades_en.html).

<sup>13</sup> See link [www.eurexchange.com/trading/wholesale/efp\\_en.html](http://www.eurexchange.com/trading/wholesale/efp_en.html) for outline of OTC EFP facility.

<sup>14</sup> See link [www.eurexchange.com/trading/wholesale/efs\\_en.html](http://www.eurexchange.com/trading/wholesale/efs_en.html) for outline of OTC EFS facility.

## Appendix 2: Mid-Term Euro-BTP Futures – Delivery baskets\*

Mid-Term Euro-BTP Futures – Delivery basket (4.50 – 6.00 years)						
Dec 2011	ISIN	Amt issued	Coupon	Conversion factor**	Issue Dt	Maturity
	IT0004019581	26,738,234,000	3.75	0.913306	01/02/2006	01/08/2016
	IT0004164775	24,209,900,000	4.00	0.916227	02/01/2006	01/02/2017
	IT0003242747	22,559,000,000	5.25	0.968523	01/02/2002	01/08/2017
<b>Total</b>		<b>73,507,134,000</b>				

Mar 2012	ISIN	Amt issued	Coupon	Conversion factor**	Issue Dt	Maturity
	IT0004164775	24,209,900,000	4.00	0.919733	02/01/2006	01/02/2017
	IT0003242747	22,559,000,000	5.25	0.969711	01/02/2002	01/08/2017
	IT0004273493	22,636,256,000	4.50	0.930521	01/08/2007	01/02/2018
<b>Total</b>		<b>69,405,156,000</b>				

Jun 2012	ISIN	Amt issued	Coupon	Conversion factor**	Issue Dt	Maturity
	IT0004164775	24,209,900,000	4.00	0.923293	02/01/2006	01/02/2017
	IT0003242747	22,559,000,000	5.25	0.970900	01/02/2002	01/08/2017
	IT0004273493	22,636,256,000	4.50	0.932998	01/08/2007	01/02/2018
<b>Total</b>		<b>69,405,156,000</b>				

plus new issues & tappings during this time

\* According to the current issuance policy of the Tesoro delivery baskets will always contain one five year on-the-run bond.

\*\* Conversion factors calculated with **Cross True Yield** (payments are moved from holidays and weekends to the next trading day).

## Appendix 3: Derivation of fixed income futures hedge ratios

When hedging a bond exposure with fixed income futures contracts a fund manager is trying to equate a movement in fixed income futures to a movement in the underlying bond holding.

Therefore, the hedge ratio (HR) is:  $dC/dF$

Where:

$dC$  = Change in the bond holding; and

$dF$  = Change in fixed income futures

It is assumed, because of cash and carry arbitrage, that fixed income futures will track the cheapest to deliver bond, that is:

$dF = dCTD/CFctd$

Where:

$dCTD = dCTD/CFctd$ ; and

$CFctd$  = conversion factor of the cheapest to deliver bond.

Substituting  $dCTD/CFctd$  for  $dF$  gives HR  
 $= dC/dCTD \times CFctd$

Therefore, for small changes in yield:

$HR = BPV \text{ bond to be hedged} / BPV \text{ CTD} \times CFctd$   
 (Where BPV is the value of an .01 change in yield).

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

**$(BPV \text{ bond to be hedged} / BPV \text{ CTD} \times CFctd) \times$   
 **$(\text{Nominal bond exposure} / \text{nominal size of bond future}).$****

**When hedging the cheapest to deliver bond the expression,  $BPV \text{ bond to be hedged} / BPV \text{ CTD}$ , cancels out and the HR becomes:  $CFctd$ . Therefore, the number of bond futures to hedge the cheapest to deliver bond becomes:  $CFctd \times (\text{Nominal bond exposure} / \text{nominal size of bond future}).$**

---

**For further information please contact**

**Sales Americas**

Vassilis Vergotis T +1-312-544-1058  
Vassilis.Vergotis@eurexchange.com

**Sales Asia & Middle East**

Roland Schwinn T +65-63 04-52 52  
Roland.Schwinn@eurexchange.com

**Sales France**

Paul Beck T +33-1-5527-6772  
Paul.Beck@eurexchange.com

**Sales Germany**

France Schuster T +49-69-211-152 38  
France.Schuster@eurexchange.com

**Sales Italy and Switzerland**

Markus-Alexander Flesch T +41-58-854-29 48  
Markus-Alexander.Flesch@eurexchange.com

**Sales United Kingdom**

Stuart Heath T +44-20-78 62-72 53  
Stuart.Heath@eurexchange.com

**Order Number:** E1E-024-0911

**ARBN Number:** Eurex Frankfurt AG ARBN 100 999 764

Neither Eurex Frankfurt AG (Eurex), nor its servants nor agents, is responsible for any errors or omissions contained in this publication which is published for information only and shall not constitute an investment advice. Any information herein is not intended for solicitation purposes but only for the use of general information. Eurex offers services directly to members of the Eurex market. Those wishing to trade in any products available on the Eurex market or to offer and sell any such products to others should consider both their legal and regulatory position in the relevant jurisdiction and the risks associated with such products before doing so.