Interest Rate Derivatives

Complete Your Picture in Fixed Income Investment Management

eurex

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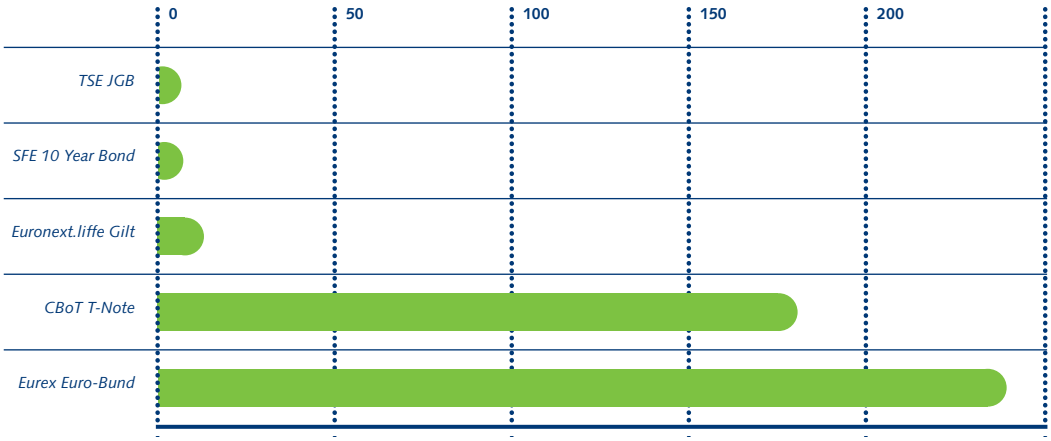
Introduction

Fixed income futures and options are standardized exchange traded derivatives. They are highly liquid, low cost products that enable fund managers to effectively and efficiently manage a fixed income investment portfolio. This booklet is a guide for trustees to fixed income derivatives, which explores the basic ways a fund manager can use these instruments.

There are fixed income futures and options based on every major government bond market in the world. The diagram below outlines the turnover in the benchmark 10 year fixed income futures. In fact, for Europe and the US, the range of fixed income futures and options covers the whole spectrum of the yield curve.

10 Year Fixed Income Futures – Traded Contracts (in Millions)[1]



Eurex's Euro-Bund (FGBL), Euro-Bobl (FGBM) and Euro-Schatz (FGBS) Futures are the world's most heavily traded fixed income futures. The most actively traded product amongst them, the Euro-Bund Future, had an average daily volume of approximately 1,000,000 contracts during 2004, in total approximately 240 million contracts changed hands. Open interest for the Euro-Bund Future at the end of 2004 was approximately 1,200,000 – an increase of four percent compared to 2003. Activity in the Euro-Schatz Future has increased by five percent in the volume of contracts traded during 2004 rising to 123 million contracts. Likewise, open interest rose by 20 percent in comparison to 2003.

[1] Based on January–December 2004 data

Fixed Income Futures

Fixed income futures are standardized forward contracts based on a basket of deliverable bonds, which have a remaining maturity within a predefined range. The contracts deliverable list contains bonds with a range of different coupon levels and maturity dates.

The concepts of notional yield and conversion factors are used to give deliverable bonds a common basis for delivery. Generally, when a futures contract is designed the notional yield is in line with the prevailing interest rate.

A conversion factor relates the coupon of each deliverable bond in the basket to the notional yield of the futures' contract specification. It is the price, per one unit, of each deliverable bond that generates the notional yield of the futures contract.

Contract Specifications

To further explain fixed income futures, the contract specifications of the benchmark fixed income futures for hedging Eurozone and Swiss government debt are outlined below:

Fixed Income Futures – Contract Specifications

	Euro-Schatz (FGBS)	**Euro-Bobl (FGBM)**	**Euro-Bund (FGBL)**	**CONF (CONF)**
Contract Standard	Notional government bond issued by the FRG[2] with 1.75–2.25 years to maturity and a (notional) 6% coupon	Notional government bond issued by the FRG[2] with 4.5–5.5 years to maturity and a (notional) 6% coupon	Notional government bond issued by the FRG[2] with 8.5–10.5 years to maturity and a (notional) 6% coupon	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 from the basket			
Price Quotation	In percent of par with three decimal places	In percent of par with two decimal places		
Minimum Price Change	0.005 percent, equivalent to EUR 5	0.01 percent, equivalent to EUR 10		0.01 percent, equivalent to a value of CHF 10
Delivery Day	Tenth calendar day of the delivery month			
Contract Months	March, June, September and December			
Last Tranding Day	Two exchange trading days prior to Delivery Day			
Trading Hours	08:00–19:00 CET			08:30–17:00 CET

2 FRG = Federal Republic of Germany

Delivery and Deliverable Basket

An important feature of fixed income futures is that, at delivery, the seller has the obligation to deliver and the right to choose which security to deliver.

In reality, a very small proportion contracts go to delivery with the majority of contracts either closed out before delivery or rolled into the next contract month.

The potential for physical delivery, however, generates the close correlation between cash securities and fixed income futures which make fixed income futures such a powerful tool for hedging and active performance management.

The table below outlines the delivery basket and conversion factors for the December 2004 Eurex fixed income futures contracts.

Fixed Income Futures – Delivery Baskets & Conversion Factors

Contract	Deliverable Bonds			Conversion Factor
Euro-Schatz (FGBS)	DBR	6.00%	January 2007	0.999888
	OBL	4.00%	February 2007	0.959960
	BKO	2.50%	September 2006	0.942297
	BKO	2.25%	December 2006	0.938717
Euro-Bobl (FGBM)	DBR	4.50%	July 2009	0.941295
	DBR	4.00%	July 2009	0.921870
	DBR	5.375%	January 2010	0.973263
	OBL	3.50%	October 2009	0.897451
Euro-Bund (FGBL)	DBR	3.75%	July 2013	0.852400
	DBR	4.25%	January 2014	0.880175
	DBR	4.25%	July 2014	0.874942
	DBR	3.75%	January 2015	0.833404
CONF (CONF)	SWISS	4.00%	February 2013	0.873620
	SWISS	4.25%	January 2014	0.880970
	SWISS	3.75%	June 2015	0.828112
	SWISS	2.50%	March 2016	0.719378

DBR = Deutschland Bundesrepublik (10–30 y. govt. bond), OBL = Bundesobligationen (5 y.), BKO = Bundeschatzanweisungen (2 y.)

The amount the seller receives for delivering a bond and the amount the buyer has to pay to take delivery of the bond is determined by the formula:

Invoice Amount = Futures Settlement Price × Conversion Factor + Accrued Interest

Essentially, the conversion factor generates a price at which the deliverable bond would trade if its coupon were the notional coupon of the futures contract specification. Fixed income futures track the price of the deliverable bond that presents the short futures position with the greatest profit/least loss at delivery. This bond is called the "cheapest-to-deliver" (CTD) bond. The theoretical "fair value" of a fixed income futures contract would then be:

Theoretical Price of the Fixed Income Futures Contract
= Cash price CTD + Financing Cost – Coupon Income

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

- if the market yield is above the notional yield of the fixed income futures contract, bonds with a **long duration** (low coupon/long maturity) will tend to be the CTD;
- if the market yield is below the notional yield of the fixed income futures contract, bonds with a **short duration** (high coupon/short maturity) will tend to be the CTD;
- if the market yield is at the notional yield of the fixed income futures contract, there will be no obvious preference for CTD status.

Options on Fixed Income Futures

Fund managers can use options to hedge portfolio risk and to enhance portfolio returns. Options have a different profile than futures. Buying an option at a cost (the "option premium") gives the buyer the right, but not the obligation, to either buy (a "call" option) or sell (a "put" option) the underlying instrument at a predetermined price (the "exercise" or "strike" price) at a set maturity date (the "expiration" date).

The option premium (for options on futures) is usually paid in accordance with futures-style margining. In other words, the premium is not fully paid until the option expires or is exercised. Option exercise for options on fixed income futures is American-style, which means that the option can be exercised by the buyer at any time during the life-time of the option, as opposed to European-style, where options can only be exercised by the buyer on the day of expiration.

Buyers and sellers of options on fixed income futures have the following rights and obligations:

Call Option		**Put Option**	
Call Buyer	**Call Seller**	**Put Buyer**	**Put Seller**
The buyer of a call has the right, but not the obligation, to buy the futures contract at the exercise price.	In the event of exercise, the seller of the call is obliged to sell the futures contract at the exercise price.	The buyer of a put has the right, but not the obligation, to sell the futures contract at the exercise price.	In the event of exercise, the seller of a put is obliged to buy the futures contract at the exercise price.

The importance of strategy trading in Eurex fixed income options combined with the general dispersion of liquidity in options trading are two of the most decisive factors that have shaped the market structure in these products. Today, over 50 percent of the total volume in Eurex fixed income options is executed via option strategies across a full range of exercise prices with average trade sizes well beyond 250 contracts in Options on Euro-Bund, Euro-Bobl and Euro-Schatz Futures.

This development combined with the long history of floor-based options trading have favored the evolution of a professionals' market in Eurex fixed income options where prices are primarily, but by no means exclusively, negotiated bilaterally over the phone by market participants and then entered into the Eurex system via OTC trading facilities.

Therefore, the market for Eurex fixed income options is primarily driven by professional Market Makers and brokers although a wide array of end users also trade these products. Amongst others, end users include hedgers such as insurers and funds who, for example, are looking to lock in interest rates until the next futures roll as well as speculators from hedge funds and investment banks' proprietary trading desks.

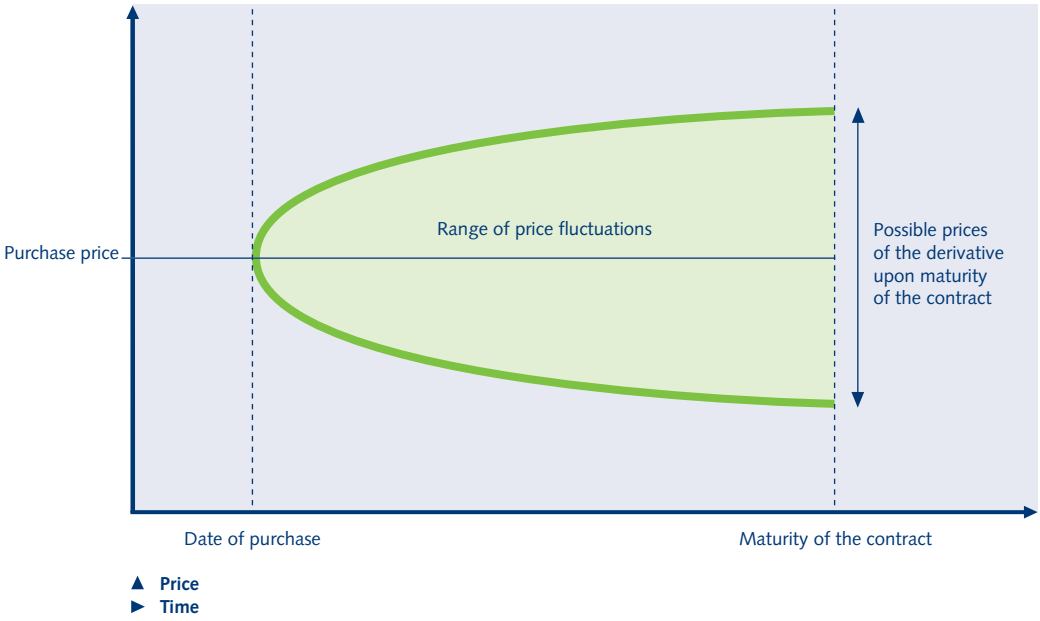
Margin for Futures and Options on Futures

When a position in futures or options on futures is created, cash or other collateral (margin) needs to be deposited by the clearing member at the clearing house of the derivatives exchange. The clearing house provides a guarantee to clearing members of the exchange in the event of a member defaulting, acting as the ultimate counterparty to all derivatives transactions.

There are two types of margin requirement:

- Initial Margin (called "Additional Margin" at Eurex) can be regarded as a "good faith deposit" on the initiation of the position. This is intended to cover the day's expected price movement based on the historical price volatility of the contract.
- Variation Margin is the contracts profit or loss, which is paid and received each day a position is left open.

Price Development until Maturity of the Contract



The daily adjustment of margin requirements poses no problem because exchange-listed, standardized futures, bonds and equities enable prices to be continuously monitored (see diagram above). The profits and losses arising from intra-day price movements are compensated either by cash being exchanged between the counterparties (variation margin) or in the form of higher margin payments from the seller being deposited with Eurex's clearing house Clearing AG (premium margin).

Uses of Fixed Income Derivatives in Portfolio Management

The following applications investigate in more detail how fixed income derivatives can be used by fund managers.

Hedging the Value of a Fixed Income Portfolio

Taking a short position in fixed income futures allows the portfolio manager to protect the value of a fixed income portfolio. When hedging a bond investment with fixed income futures the user seeks to equate a movement in a fixed income futures contract to a movement in the value of the bond holding so that any adverse movement in the value of the bond holding is offset by the increase in value of the short futures position. A "perfect hedge" is where the decrease in the value of the bond holding is completely offset by an increase in the value of the short position in fixed income futures.

Entering into a long position in fixed income futures allows the portfolio manager to hedge incoming funds.

Determination of the Hedge Ratio[3]

In order to hedge a bond holding with fixed income futures, the hedge ratio is $\Delta C/\Delta F$ where ΔC is the change in the value of the bond and ΔF is the change in the value of the fixed income futures. The relative movement of the fixed income futures to the cheapest-to-deliver bond (CTD) can be shown as $\Delta F = \Delta$CTD bond/CFctd, where ΔCTD bond is the change of value in the CTD bond and CFctd is the conversion factor of the CTD bond.

Substituting ΔCTD bond/CFctd for ΔF gives the ratio:

$\Delta C/\Delta$CTD bond $\times$ CFctd

For small changes in yield the hedge ratio becomes:

BPV bond to be hedged/BPV CTD $\times$ CFctd where BPV is the basis point value of a .01 change in yield.

When the bond to be hedged is the cheapest to deliver, $\Delta C/\Delta$CTD bond cancels out and the hedge ratio becomes the CFctd. Therefore, the number of contracts to hedge the cheapest-to-deliver bond is:

CFctd $\times$ Bond Exposure/Contract Value.

[3] The Hedge ratio formula outlined is the "Perturbation" or Basis Point Value (BPV) method. There are other approaches, such as the Nominal Value, Modified Duration and the Sensitivity methods.

The case study below outlines the calculation of the appropriate number of fixed income futures to hedge a given bond holding:

Case Study

A fund manager is holding EUR 100 million in DBR 4.25 percent July 2014 and is worried that interest rates will rise and wants to protect the value of the bond investment by selling Euro-Bund Futures. By hedging the bond holding with a short position in fixed income futures, losses in the bond holding will be offset by a profit from the short futures position.

Solution

Currently, the DBR 3.75 percent July 2013 is the CTD and has a BPV of EUR 74.1 per EUR 100,000 (size of futures contract) and a conversion factor of 0.8524.
The bond to be hedged, the DBR 4.25 percent July 2014, has a BPV of EUR 82,500 per EUR 100 million.

The number of Euro-Bund Futures to hedge a EUR 100 million holding of DBR 4.25 percent July 2014 is:

EUR 82,500/EUR 74.1 × 0.8524 = 949.02 ~ 949 Euro-Bund Futures.

In practice, hedging a bond position with fixed income futures is unlikely to produce the "perfect hedge" where the fall in the value of the bond holding is completely offset by a profit in the futures position. We already know that fixed income futures track the cheapest-to-deliver bond. Hedging with fixed income futures transfers outright cash market risk to "basis risk". Basis risk reflects the over- or underperformance of a hedge, and is due to the nature of the relationship of the futures contract vis-à-vis the underlying bond to be hedged.

Portfolio Overlay Applications with Futures

Fixed income (and equity index) futures can be used to enhance tactical asset allocation by taking short- to medium-term positions, deviating from the strategic benchmark to benefit from the relative over-/undervaluation of assets.

Trading in the cash market can be expensive and disruptive to the existing portfolio. Furthermore, it takes time to implement asset allocation shifts of significant size. Using fixed income (and equity index) futures speeds up the process and reduces execution costs.

In addition, decisions to shift exposure between asset classes and geographical regions can be implemented immediately and simultaneously. The following portfolio overlay case studies are presented:

- adjusting portfolio duration with fixed income futures
- using fixed income and equity index futures in asset allocation shifts

Case Study

A fund manager has a EUR 50 million government bond portfolio and decides to increase portfolio (modified) duration from 4.3 to 7.9. The alternatives the fund manager faces are either to switch out of the current bond holdings to longer duration bonds or to overlay the current bond holdings with Euro-Bund Futures.

Solution

First, calculate the BPV of the current bond portfolio:

Portfolio BPV = Portfolio modified duration × Portfolio value × 0.0001
= 4.3 × EUR 50,000,000 × 0.0001 = EUR 21,500.

Second, calculate the portfolio BPV with the higher duration target.
The target portfolio BPV = 7.9 × EUR 50,000,000 × 0.0001 = EUR 39,500.
The number of fixed income futures to overlay the bond portfolio to increase portfolio duration is calculated using the following formula:

(Target portfolio BPV – Portfolio BPV)/BPV Euro-Bund Futures where BPV Bund Futures = BPVctd/CFctd.

The number of Euro-Bund Futures required to overlay the EUR 50 million bond portfolio to increase portfolio duration from 4.3 to 7.9 is:

EUR 18,000/EUR 86.93 = 207.06 ~ 207 Euro-Bund Futures.

In addition to using fixed income futures as an overlay to adjust portfolio duration, fixed income and equity index futures can be used to quickly and cheaply bring about a change in portfolio asset allocation from equities to fixed income (or vice versa).

Case Study

A fund manager decides to switch EUR 50 million of his European equity portfolio into benchmark European government bonds. The equity holding has a beta of 1.15 to the Dow Jones EURO STOXX^{SM} 50 Index Futures contract. The fund manager decides to sell Dow Jones EURO STOXX^{SM} 50 Index Futures and to buy Euro-Bobl Futures to quickly and cost effectively bring about the asset allocation switch. The cheapest-to-deliver bond for the Euro-Bobl Futures contract, the 4.5 percent July 2009, has a duration of 4.19, very close to the current duration of 4.25 for the fund managers' benchmark European government bond portfolio.

Solution

First, calculate the number of equity index futures to sell:

(Value of equity holding/Value of equity index futures) × Portfolio beta
= (EUR 50,000,000/EUR 26,440) × 1.15 = 2,174.7 ~ 2,175 equity index futures
(Value of equity index futures = Index × EUR 10 = EUR 10 × 2,644 = EUR 26,440)

Second, calculate the number of Euro-Bobl Futures to buy:

(Duration × Investment × 0.0001)/BPV Euro-Bobl Futures
= (4.25 × EUR 50,000,000 × 0.0001)/EUR 48.76 = 435.8 ~ 436 Euro-Bobl Futures

The fund manager sells 2,175 Dow Jones EURO STOXX^{SM} 50 Index Futures and simultaneously buys 436 Euro-Bobl Futures to quickly switch a EUR 50 million investment in European equities to benchmark European government bonds.

As there are fixed income futures based on every major government bond market in the world, the fund manager is also able to implement a fixed income futures bond overlay strategy with two fixed income futures that enables an efficient switch from one government bond market to another.

Fixed Income Futures as Synthetic Cash Market Instruments

Due to their liquidity and close correlation to the underlying bond market, fixed income futures can be used in a number of situations by the fund manager as a synthetic cash market instrument.

Two cases are outlined:

Case Study

A fund manager has EUR 25 million to invest in European government bonds and wants to achieve a specific modified duration target of 4.25.

Solution

The DBR 4.5 percent July 2009 is the CTD of the Euro-Bobl Futures contract and has a duration of 4.28, very near to the duration target of the intended investment. The number of Euro-Bobl Futures to buy to create a EUR 25 million synthetic cash investment with a 4.25 duration is as follows:

Duration × Investment × 0.0001/BPV Euro-Bobl Futures
= (4.25 × EUR 25 million × 0.0001)/(EUR 45.9/0.94125) = 217.9
~ 218 Euro-Bobl Futures

Case Study

A fund manager considers a newly issued corporate Euro bond "cheap" to its benchmark Euro-Bund.

Solution

The fund manager buys the corporate Euro bond issue and sells the appropriate number of fixed income futures to create the synthetic short in European Benchmark government bonds.

By using fixed income futures in this way, the fund manager is able to negate market risk and structure the investment strategy on the relative outperformance of the corporate bond to the market.

Portfolio Put Protection

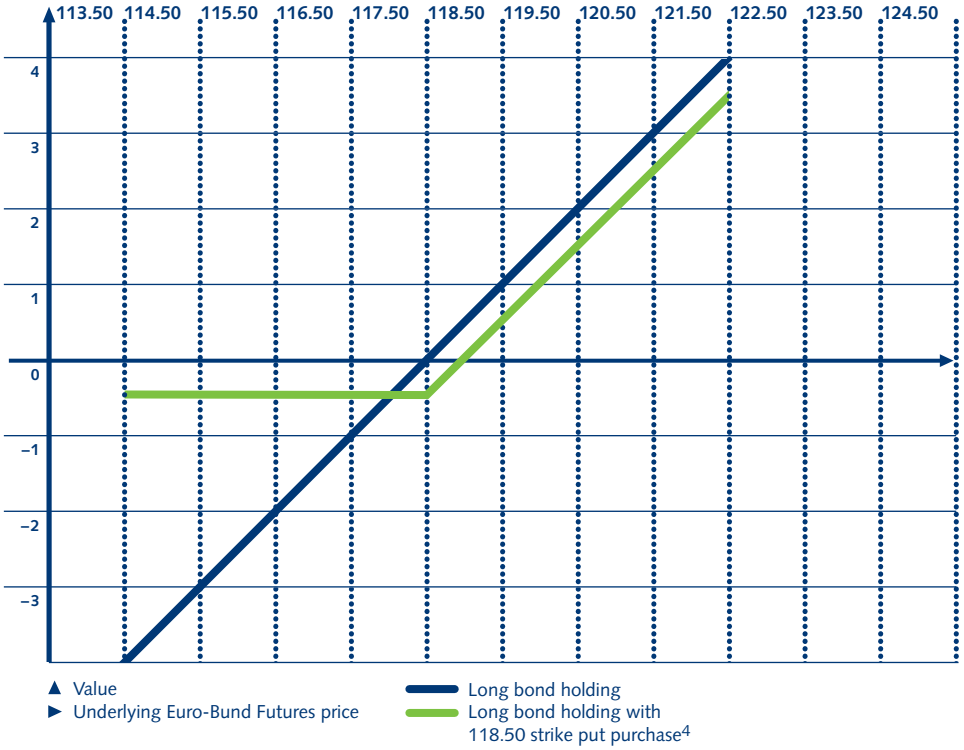
One alternative to selling fixed income futures to protect a bond holding would be to buy put options, outlined by the following case study:

Case Study

A fund manager has a EUR 100 million holding of the DBR 3.75 percent July 2013, currently the cheapest-to-deliver bond into the Euro-Bund Futures contract, and is worried that interest rates will rise and wants to protect the value of the bond investment by buying 118.50 strike put options on Euro-Bund Futures contracts. The Euro-Bund Futures contract is currently trading at 118.50.

The graph on page 13 looks at the profit and loss profile of protecting a fixed income bond investment with the purchase of the Euro-Bund 118.50 strike put option for a premium cost of 0.50:

Portfolio Management – Put Protection



The purchase of a put option to protect a bond investment creates a floor (at the exercise price less the option premium) to the value of the bond holding. Moreover, the long put position still allows the bond investment to benefit from a rise in bond prices. This contrasts to hedging a bond holding with fixed income futures. While receiving complete protection to a downside move, hedging a bond holding with short fixed income futures gives up any opportunity to benefit from a rise in bond prices. Volatility plays an important part in the cost of an option and therefore the cost of portfolio put protection. Generally speaking, the lower the level of implied volatility, the lower the cost of an option and thus the lower the cost of protection.

Portfolio Yield Enhancement with Options

Options on fixed income futures can also be used to enhance portfolio returns. One of these techniques is to sell out-of-the-money call options against the bond holding, a technique known as "covered call writing", outlined by the following case study:

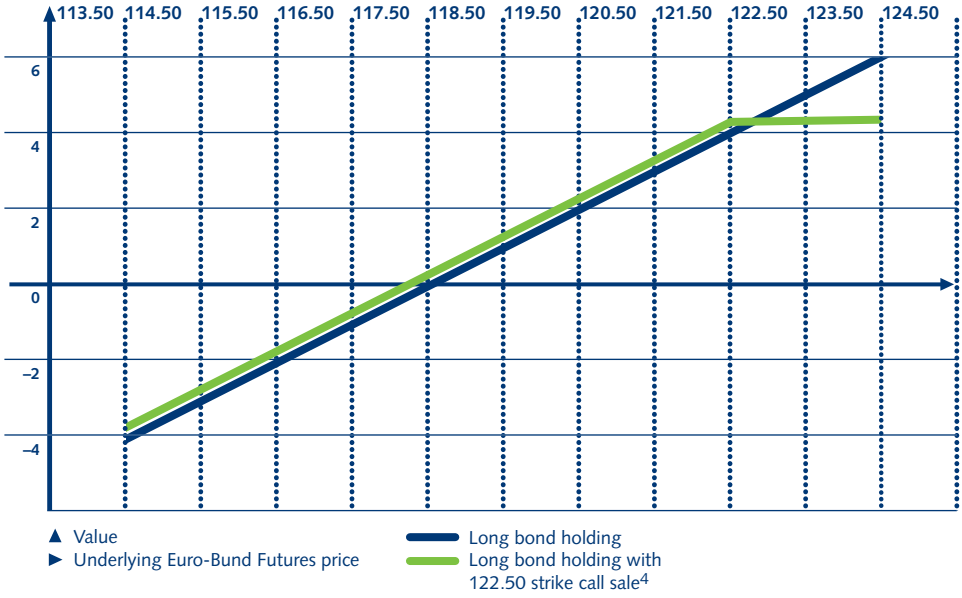
4 Options contract is an option on fixed income futures. It is assumed, because of cash and carry arbitrage, that fixed income futures will track the cheapest-to-deliver bond. The diagram above assumes no change in cheapest-to-deliver across the range of prices.

Case Study

A fund manager has a EUR 100 million holding of the DBR 3.75 percent July 2013, the cheapest-to-deliver bond for the Euro-Bund Futures contract, and anticipates in the short term that the market has limited upside and wishes to enhance portfolio returns by selling 122.50 out-of-the-money call options on Euro-Bund Futures contracts. Volatility has been high and is expected to decline. The Euro-Bund Futures contract is currently trading at 118.50.

The graph below looks at the example of a long bond holding compared to a long bond holding combined with the sale of the Euro-Bund out-of-the-money 122.50 call options at 0.25:

Enhancing Portfolio Returns – Covered Call Writing



Selling out-of-the-money call options against a bond investment enhances the portfolio return by the amount of the premium received. The graph above shows that the long bond holding combined with short out-of-the-money calls outperforms the long bond investment up to the exercise price where the call was written plus the premium received. Above this price level the long bond holding would outperform the covered call strategy. Therefore, a covered call writing strategy enhances portfolio returns but it also creates a ceiling on portfolio returns. This underlines the importance of choosing an appropriate exercise price such that it will not be breached during the life of the option. Covered call writing strategies are usually initiated on short dated options with the greatest time decay, that is the value of option premium erodes most quickly and when volatility has been high and is expected to decline.

[4] Options contract is an option on fixed income futures. It is assumed, because of cash and carry arbitrage, that fixed income futures will track the cheapest-to-deliver bond. The diagram above assumes no change in cheapest-to-deliver across the range of prices.

Summary

The following table summarizes the many uses of exchange traded derivatives in fund management, some of which have been more fully explained in the case studies while the others are relatively self explanatory after reading this booklet:

Uses of Derivatives in Fund Management

Application	Description
Cash Equitization	Reinvestment of coupon and dividend income and investment of new flows or funds generated via asset sales by purchasing equity index/fixed income futures.
Hedging Portfolio Value	Sale of futures/buying of puts or collars to protect portfolio value.
Transition Management/Tactical Asset Allocation	Sale of equity index and simultaneous purchase of fixed income futures to assist in the reallocation of funds from equities to bonds (or vice versa).
Portfolio Beta/Duration Adjustment	Purchase/sale of equity index/fixed income futures to adjust portfolio beta/duration.
Sector Overlay	Purchase/sale of sector index futures to increase/decrease exposure to the sector within the equity portfolio.
Bond/Stock Picking	Sale of fixed income/equity index futures against purchase of cash bonds/equity to isolate or negate market risk.
Portfolio Yield Enhancement	1. Sale of out-of-the-money equity index/fixed income calls, anticipating limited market upside. 2. Sale of out-of-the-money equity index/fixed income puts, anticipating limited market downside. 3. Sale of out-of-the-money equity index/fixed income calls and puts, anticipating range bound market conditions.

Exchange traded fixed income derivatives are generally highly liquid instruments, enabling portfolio managers to protect their portfolios in falling markets and provide better returns without significantly changing the existing portfolio and thus making fund management much more efficient. Moreover, exchange traded derivative products offer specific benefits over OTC derivative products:

- price transparency;
- daily mark-to-market valuation;
- central counterparty substantially reducing credit risk;
- liquid contracts ensuring quick opening and closing of positions.

Glossary

Additional Margin (or Initial Margin)

The collateral to be deposited by the clearing member at the clearing house when an open position in a futures contract, either long or short, is initiated.

American-Style Option

An option that can be exercised at any time before expiration.

At-the-Money Option

An option whose exercise price is at or near to the price of the underlying instrument.

Basis

The difference between the price of the underlying instrument and the corresponding futures price. In the case of fixed income futures, the futures price must be multiplied by the conversion factor.

Call Option

A right to buy an asset at a certain price at or up to a certain date. In the case of options on fixed income futures, the contract gives the buyer the right to enter into a long position in the underlying futures contract at a set price on or up to a given date.

Cheapest-to-Deliver ("CTD")

The deliverable bond for which delivery is most attractive from a total cost point of view. The cheapest-to-deliver bond will have the highest implied repo rate (return earned from buying a deliverable bond and making delivery against a short futures position) of the deliverable basket.

Conversion Factor (or Price Factor)

The adjustment factor used to compute the proper futures invoice price for bonds with differing coupons/maturities deliverable into the same futures contract. The conversion factor allows the different deliverable bonds with different coupons and maturity dates to be put on a common basis for physical delivery.

Daily Settlement Price

The daily valuation of futures and options, on which the determination of the daily (variation) margin requirement is based.

Delta

The change in the option price in the event of a one point change in the underlying instrument.

European-Style Option

An option that can only be exercised on the Last Trading Day.

Exercise

The option holder's declaration to either buy (for a call) or sell (for a put) the underlying instruments at the conditions set in the option contract.

Exercise Price (Strike Price)

The price at which the underlying instrument is received or delivered when an option is exercised. Also known as the strike price.

Expiration

The date on which the option right expires.

Financial Futures

A standardized contract for the delivery or receipt of a specific amount of a financial instrument at a set price on a certain date in the future.

Hedge Ratio

The number of futures contracts required to hedge underlying exposure.

Hedging

Protecting an existing portfolio or planned investments with futures.

In-the-Money Option

An option in which the price of the underlying instrument is above the strike price of a call option or below the strike price of a put option.

Intrinsic Value

The intrinsic value of an option is equal to the difference between the current price of the underlying instrument and the option's exercise price. The intrinsic value is always greater than or equal to zero.

Invoice Amount

The amount (including accrued interest) that is paid to the holder of a short position in a fixed income futures contract upon delivery of a cash bond against that position.

Option

The right (but not the obligation) to buy (a call option) or to sell (a put option) a specific quantity of a specific underlying instrument, at a fixed price, on, or up to, a specified date.

Option Premium

The amount of money that the option buyer must pay the options seller.

Out-of-the-Money Option

An option in which the price of the underlying instrument is below the strike price of a call option or above the strike price of a put option.

Put Option

A right to sell an asset at a certain price at or up to a certain date. In the case of options on fixed income futures, the contract gives the buyer the right to enter into a short position in the underlying futures contract at a set price on or up to a given date.

Variation Margin

The profit or loss arising from the daily revaluation of futures.

Appendices

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Further Information

Eurex Website

On the Eurex website **www.eurexchange.com** a variety of tools and services are available, a selection is given below:

Brokerage Services – Investors can inquire online to find appropriate brokerage services (Investors > Institutional Investors > Member & Vendor Search > Brokerage Service Search).
E-News – Register in the MyEurex section to automatically receive information about Eurex and its products by e-mail.
Margin Calculation – Eurex offers the Eurex MarginCalculator (Clearing & Settlement > Risk Based Margining > Eurex MarginCalculator) which allows users to determine margin requirements for all products cleared by Eurex Clearing AG.
Price Information – Look up delayed price information (Quotes) for all Eurex derivatives.

Publications

Eurex offers a wide variety of publications about its products and services including brochures about derivatives trading strategies, contract specifications, margining & clearing and the trading system. Furthermore, Eurex offers information flyers which provide a brief overview about specific products traded at the exchange.

Selected brochures:

- Equity and Equity Index Derivatives – Trading Strategies
- Interest Rate Derivatives – Fixed Income Trading Strategies
- Products
- Risk Based Margining

All publications are available for download on the Eurex website **www.eurexchange.com** (Knowledge Center > Publications). The "Publication Search" facility (About Eurex > Press & Communication > Publications > Publication Search & Ordering) provides a keyword search for all Eurex publications.

Print versions are available via the Eurex Publications Service:

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Trainingscenter

The Learning Portal **trainingscenter.deutsche-boerse.com** gives you one-stop access to all Eurex training sessions and exams to satisfy your individual training needs.
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The following educational tools can be ordered on CD via the Learning Portal:

- All about Eurex Futures
- All about Eurex Options
- Eurex StrategyMaster
- Eurex MarginCalculator
- Eurex OptionAlligator (option price calculator)

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