

M = 1,000
100M = 100,000

Same as DV01

<HELP> for explanation, <MENU> for similar functions.
ENTER ALL VALUES AND HIT <GO>

N127 Govt FYH

Futures Yield-Shift (Duration) Hedging

BUY 1000(M) T 4 1/2 02/15/36 93-28+ 4.89% Risk 14.92 Set 4/3/06
Workout Dt 2/15/36 @100 YldC E/C Trade 3/31/06

Yield Beta 1.00

	Sell Futures Size Contract	Futures Price	Hedge Number of Futures	Proxy Security Issue	Yield	Risk	Valuation C Factor
US	100M CBT US 20yr 6%						
	USM6 Jun06	109-05	14.1	T 8 ¹ / ₈ 8/21	5.06	12.79	1.2083
	USU6 Sep06	109-06	13.9	T 8 11/21	5.06	12.87	1.1960
TY	100M CBT US 10yr 6%						
	TYM6 Jun06	106-12+	23.7	T 3 ⁷ / ₈ 2/13	4.86	5.59	.8870
	TYU6 Sep06	106-14	22.9	T 3 ⁵ / ₈ 5/13	4.84	5.70	.8737
FV	100M CBT US 5yr 6%						
	FVM6 Jun06	104-14	36.2	T 4 ¹ / ₈ 8/10	4.82	3.84	.9317
	FVU6 Sep06	104-13+	34.7	T 4 ¹ / ₂ 11/10	4.82	4.06	.9453
TU	200M CBT US 2yr 6%						
	TUH6 Mar06	101-30	44.1	T 4 ³ / ₈ 12/07	4.82	1.65	.9733
	TUM6 Jun06	101-30	38.9	T 4 ⁵ / ₈ 3/08	4.82	1.87	.9774

-> Choices: US TY FU ED TB TU MB RX DE DU A G L MN FM JB JJ N <help>

FX rates: \$=1.00 € .8253 £ 1.737 Ffr 5.414 ¥ 117.8 A\$.7163
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
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Bloomberg uses "Intrinsic" hedging. (See p916)

100 * PVBP in yield ←

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Govt **FYH**

HELP FOR FUTURES YIELD-SHIFT (DURATION) HEDGING

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How to Use FYH

Once you choose a security and enter FYH <Go>, the Futures Yield-Shift (Duration) Hedging screen appears. Enter the appropriate information in the highlighted fields and press <Go> to display the results.

Remember

To change your mortgage defaults, enter SDF <Go>. SDF <HELP> displays further information.

Australia 61 2 9777 8600

Brazil 5511 3048 4500

Europe 44 20 7330 7500

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Futures Yield-Shift (Duration) Hedging Screen

FYH displays four different futures contracts and their respective cheapest-to-deliver bonds. The following four sections appear on the screen for your analysis:

- Trade Scenario Details Section (title does not appear on screen)
- Sell Futures
- Proxy Security for Futures Valuation
- FX Rates

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HELP FOR FUTURES YIELD-SHIFT (DURATION) HEDGING

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- Trade Scenario Details Section (title does not appear on screen)

Some or all of the following fields appear at the top of the screen for setting up the trade scenario analysis:

BUY:

The face amount to be bought. Each [M] represents '000. The security's ticker symbol, coupon, maturity, current price, and yield may appear to the right.

Risk:

A measurement used by Bloomberg to indicate price sensitivity given shifts in interest rates. Risk is 100 times the price value of a basis point change in yield.

Remember

For Brady Bonds, blended yield risk is used. Blended yield is the conventional yield of the security's cash flows with no adjustments for guarantees that may exist.

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Set:

The settlement date, which is the date the securities must be delivered and paid for to complete a transaction.

WAM:

Appears for mortgage-backed securities. The weighted average maturity of the individual loans underlying the security, using the balance of each loan as the weights.

WAC:

Appears for mortgage-backed securities. The weighted average coupon of the individual loans underlying the security, using the balance of each loan as the weights.

PSA:

Appears for mortgage-backed securities. The prepayment standard assumption, which is a percentage expression of the relationship between the actual and expected constant prepayment rate [CPR] based on the PSA prepayment assumption ramp.

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Workout Dt:

The workout date and price. The workout date is the most likely redemption date for the security given the current price and redemption schedule.

Yld:

The yield convention. The dropdown menu displays the following options:

- [E] bond-equivalent
- [C] conventional yields.

Remember

If you choose conventional, FYH calculates the yield ratio assuming that parallel yield-shifts are measured by conventional rather than equivalent yield. For example, a conventional yield hedge assumes that an annual-pay bond tracks basis-point for basis-point with a conventionally quoted semi-annual yield.

Trade:

The trade date, which is the day the transaction is negotiated and executed.

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HELP FOR FUTURES YIELD-SHIFT (DURATION) HEDGING

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Yield Beta:

The yield beta. Assuming parallel yield-shifts, the yield beta factor for one issue versus another is 1.00. If you select a yield beta other than 1.00, multiply the number of hedge futures by the assumed beta value. For example, if five-year Treasury yields are expected to move 120 basis points per a 100 basis point shift of long Treasuries, then the respective yield beta is 1.2, and the hedge value for the long bond futures contract is multiplied by 1.2.

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Sell Futures Section

The futures contracts base ticker symbol appears on the left side of the screen. You can change the futures contract by using one of the codes appearing to the right of the Choices field at the bottom of the screen, or you can use the base ticker symbol for any other futures code for which Bloomberg computes risk.

Remember

To determine if there is a Bloomberg risk value, enter (ticker symbol) <CMDTY> FRSK <Go> (Futures Contracts Risk).

Size Contract:

The face amount of the contract, the exchange on which the contract trades, the hypothetical underlying deliverable bond, and the contract's ticker symbol and expiration appear. Each [M] in the face amount represents '000. The Exchange Codes section of this guide displays further information.

Futures Price:

The most recent price for the futures contract.

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Hedge Number of Futures:

The number of futures contracts needed to break even on the hedge.

*Explains difference
between conventional risk [C]
& Average time Risk - [A]*

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Proxy Security for Futures Valuation Section **CTD**

The following fields appear:

Issue:

The ticker symbol, coupon, and maturity of the proxy issue appear if you choose [C] in the Risk field. The Euro\$ 3Mo rate may also appear.

Yld/Yield:

The yield of the proxy issue.

Risk:

The risk of the proxy issue. For corporate and government securities, enter [C] to display the risk value of the current cheapest to deliver issue or [A] to display average risk value over that time period. The Trade Scenario Details section of this guide displays a description of risk.

C Factor:

The conversion factor as specified by the exchange.

[C
A]

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- **FX Rates** Section

The bottom of the screen displays suggested choices of futures contracts that you may want to use to hedge the bond and their currency's exchange rate.

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CALCULATIONS

FYH hedge ratios are derived from duration, price value of an .01, yield value of a 32nd, or risk. Simply stated:

HEDGE ISSUE: buy issue ---duration ---> proxy issue---conv. factor---> future

FYH hedge ratios are verified using any of several methods. Results differ for pathological academic hedges where the resultant hedge is extremely convex. In such a case, the real-world usefulness of any specific hedge ratio is uncertain. You can verify the hedge results by hand, carefully applying any of the following measures:

- 1- (raw) Macauley duration
- 2- Modified duration
- 3- Price value of an .01
- 4- Yield value of a 32nd
- 5- Risk

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For example:

$100 * [\text{value of } .01] = [\text{risk}] = [\text{full price}] * [\text{mod. duration}] / 100$
 $[\text{mod. duration}] = [\text{raw duration}] / (1 + [\text{equiv yield}] / 200)$ [Yld value 32nd] =
 $1 / (32 * [\text{risk}])$

The default proxy issue is the current cheapest-to-deliver. Changing the proxy issue allows the sensitivity of the hedge ratio to be tested with respect to other deliverable bonds.

DLV <Go> (Cheapest-to-Deliver Analysis) and F3 <Go> (Cheapest-to-Deliver Summary) can provide insight into the futures proxy selection process. These functions display the cheapest-to-deliver rankings for futures with deliverable bonds.

Hedge Assumptions and Mechanics

The resulting hedge is the result of a double-hedge. The first step is to determine which proxy security is the best for each of the futures contracts. This is assumed (and generally accepted) to be the current cheapest-to-deliver issue for a futures contract. It is also assumed that

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the best futures hedge ratio for the proxy security is the issue's own conversion factor. The second step hedges the security with the futures proxy issue, depending on yield type and settlement date you select.

The two-step composite hedge ratio is then adjusted for the respective par amounts of the buy security and each future's contract size to determine the appropriate number (to the nearest tenth of a contract) of futures contracts to hedge.

Investor Hedge Objectives and Arbitrage

In essence, an investor's hedging action replaces raw price-level risk with the presumed less volatile, more controllable risk of a hedged position. In the extreme, the hedge-basis risk can itself be the object of interest of an arbitrageur who seeks to profit from a forecast of a yield-spread, rather than price levels. The hedge-basis risk thus represents the profit and loss potential (i.e. one person's risk is another person's opportunity).

FYH hedge-basis risk includes both yield-spread risk ("BUY" vs. Proxy) as well as cash/futures-basis risk (proxy vs. futures). The cash/futures-basis risk is assumed to be minimized when you select the cheapest-to-deliver issue as the futures proxy.

Australia 61 2 9777 8600

Brazil 5511 3048 4500

Europe 44 20 7330 7500

Germany 49 69 920410

Hong Kong 852 2977 6000

Japan

B1

3

3201

8900

Singapore

65

6212

1000

U.S.

1

212

318

2000

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There are 2 types of hedging techniques. Both are explained on this page. (actually there are several more hedging techniques. See the 3rd edition of the Bond Basis Book.)

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Hedging Techniques and Related Functions

There are generally two types of hedging techniques - intrinsic and historical. Intrinsic hedging focuses on the attributes (coupon, maturity, etc.) of the target issue and prospective hedging candidates. Hedge factors are computed according to the mathematics implied by those attributes and a presumed explicit scenario (e.g., parallel yield shifts). This scenario dictates "what should be". FYH hedges intrinsically. → NOTE

Historical hedging essentially ignores the attributes of all issues. Instead hedge ratios are based upon actually observed historical data (e.g., prices and/or yields). There is no notion of "what should be". This technique is usually implemented as a regression analysis seeking the best price or yield fit of an issue versus a hedging vehicle. PRH <Go> and YRH <Go> (Price/Yield Regression Hedge) hedge historically.

Simple price data fitting is found to be highly sensitive to specific periods of history. Also, from the arbitrageur's vantage point, historical price fitting is usually irrelevant since they are making a specific yield spread forecast, often independent of any recent trend.

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Hedging Deliverables

Hedging a deliverable issue requires special attention. For the futures proxy, the hedge calculation reflects the conversion factor. For a non-cheapest-to-deliver issue, however, the hedge ratio generally differs from that issue's own conversion factor. This reflects the different assumptions of how the issue tracks the futures contract, as indicated in the following diagram.

FYH: buy issue ---duration ---> proxy issue---conv. factor---> future
Own Conv. Factor: buy issue ---conv. factor---> future

Which method is better cannot be known ahead of time. However, analyzing recent hedge basis tracking can prove helpful. To view the conversion factors and graph the cash/futures basis (unadjusted for carry) enter DA3 (Historical Basis/Implied Repo Graph). To test the duration (parallel-shift) and graph the appropriate call/maturity yield spread, enter SS <Go> (Spread Summary).

Butterflies

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Fly's

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A butterfly futures hedge can be constructed by taking appropriate proportions of the hedge values. For example, if the analysis indicated that 10 long bond or 40 eurodollar contracts are appropriate for \$2 million five-year Treasuries, then a 50/50 butterfly would be five bond futures and 20 eurodollar contracts. Another valid butterfly would be seven bonds and 12 eurodollar contracts (70%/30%).

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