

MONTREAL EXCHANGE

Reducing the duration of a bond portfolio

Situation

A portfolio manager forecasting a rise in interest rates intends to decrease the duration of his bond portfolio. Furthermore, the manager expects the yield curve to flatten with short-term yields rising faster than the rest of the curve.

Strategy

Using the 2-year Government of Canada bond (CGZ) futures contract, the portfolio manager can quickly decrease the duration of the bond portfolio.

Setting:

Value of bond portfolio	\$50,000,000
Total modified duration of the portfolio	3.775
Yield of the portfolio	2.85%
Targeted modified duration of the portfolio	2.5
Price of the CGZ futures	110.82
Cheapest-to-deliver bond	CAN 0,25% November 1, 2022
Facteur de concordance	0,9101
Conversion facto the cheapest-to-deliver bond (per \$100,000 notional amount)	20.19
Dollar value of a basis point (DV01) of the CGZ futures (per \$100,000 notional amount)	22.20

Step 1

The portfolio manager must determine the dollar value of a basis point.

For the current portfolio: $\$50,000,000 \times 3.775 \times 0.0001 = \$18,875$

For the targeted portfolio: $\$50,000,000 \times 2.5 \times 0.0001 = \$12,500$

Difference between the targeted and the actual BPV of the portfolio: $\$12,500 - \$18,875 = -\$6,375$

Step 2

He applies the following hedge ratio to determine the appropriate number of CGZ futures that must be sold to obtain the desired duration.

$$\frac{\text{Targeted portfolio DV01} - \text{Current portfolio DV01}}{\text{CGZ futures DV01}} = \text{Number of CGZ futures}$$

$$\frac{-\$6,375}{\$22.20} = -287 \text{ futures}$$

Number of CGZ futures to sell = 287

Adjusting the total modified duration of a portfolio to investor's specifications is quite simple with the help of futures. By selling (or buying) futures, it is possible to decrease (or increase) the total modified duration of the portfolio.