CGZ™

Cash and carry trade

Situation

A bond trader notes that the price relationship between the cheapest-to-deliver 3% December 2005 Government of Canada (GoC) bond and the 2-year GoC bond (CGZ) futures contract is out-of-line.

The trader's observation is supported by:

1. An actual repo rate (2.24%) that is lower than the repo rate (2.39%) implied by the price of the CGZ futures. A condition that provides a trader an arbitrage profit by initiating a cash-and-carry trade, whereby the trader sells bond futures and finances the purchase of the cash bond at a rate below the rate implied by the futures price. The bond is then held until it is delivered to fulfill the obligation of the sale of the futures contract; and

2. A net basis (basis after carry) reflecting that the actual price of the CGZ futures is overpriced ("rich") relative to its theoretical fair value.

June 2004 CGZ Futures	Last delivery day 06/30/04	CGZ futures price 105.45	Valuation date 03/11/04

Coupon 3%	Maturity December 2005	Bond price 101.14	Conversion factor 0.95757	Implied Repo % 2.39%	Actual Repo % 2.24%	Net Basis -0.044

The trader realizes that the temporary mispricing offers an arbitrage opportunity. Consequently, he initiates a cash-and-carry trade consisting of the purchase of the cheapest-to-deliver bond in the cash market and the sale of CGZ futures, to lock-in a profit.

Strategy

The trader initiates a cash-and-carry trade that involves the following steps:

1. Pay for the purchase of the cheapest-to-deliver bond (bond price + accrued interest).

2. Finance the bond purchase at the current short-term financing rate (actual repo rate).

3. Receive any intervening coupon plus reinvestment income during the life of the futures contract.

4. Receive the futures invoice price + intervening coupon accrued interest from delivering the bond (i.e. collect the anticipated receipt from delivering bond to the buyer).

5. Repay the cash amount borrowed to purchase the cheapest-to-deliver bond plus interest.

6. Calculate arbitrage profit.

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SETTING:

Price of the cheapest-to-deliver bond CAN 3% December 1, 2005	101.14
Accrued interest (105 days = December 1 to March 15 settlement date)	0.863
Financing rate (actual repo rate)	2.24%
Conversion factor	0.95757
Price of the CGZ futures	105.45
Days from settlement to futures delivery (March 15 to June 30)	107
Days from next coupon to futures delivery (June 1 to June 30)	29

CASH-AND-CARRY TRANSACTION	AMOUNT (per $100,000 notional amount)	REMARKS
Purchase the CTD bond	$101,140 + $863 = $102,003	Price of bond + Accrued interest
Financing costs until CGZ futures delivery	$102,003 x 0.0224 x 107/365 = $670	Amount borrowed to buy bond x Short-term financing rate x Number of days/365
Income during the life of the CGZ futures (credit and reinvestment of the coupon: June 1 to June 30)	$1,500 + ($1,500 x 0.0224 x 29/365) = $1,503 x	Coupon income + (Coupon income Short-term financing rate x Number of days/365)
Total costs of the bond position	$102,003 + $670 - $1,503 = $101,170	Investment + Financing - Income
Delivery price of the deliverable bond at CGZ futures delivery	($105,450 x 0.95757) + $238* = $101,214 * $100,000 x 3% coupon x 29/365	Futures invoice price x Conversion factor + Accrued interest received by the seller from the bond buyer
Arbitrage profit (per CGZ futures)	$101,214 - $101,170 = $44	Delivery price of the deliverable bond - Total costs of the bond position

>> Using CGZ futures, the cash-and-carry strategy results in a profit of $44 per contract.

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