

EXAM FM QUESTIONS OF THE WEEK

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Week of April 16/07

A stock index is currently trading at $S_0 = 100$. A one-year forward contract is available for long or short position on the index with forward price \$105. The continuously compounded rate of interest is 6%. Suppose that the index pays continuous dividends at rate 2%. Find the profit on a cash-and-carry strategy for delivery of one unit of the index at the end of one year. Determine the implied repo rate.

The solution can be found below.

Week of April 16/07 - Solution

$$S_0 = 100, F_{0,1} = 105, r = .06.$$

The cash-and-carry strategy involves buying the index at time 0 and shorting the forward contract at time 0. This requires borrowing $100e^{-.02} = 98.02$ at time 0 to buy the index.

At time 1, the stock is sold for 105 and the loan has to be repaid.

The profit on the cash-and-carry strategy is $105 - 98.02e^{.06} = .92$.

The implied repo rate is r from the equation $F_{0,T} = S_0e^{-\delta T} \cdot e^{rT}$, so that

$105 = 100e^{-.02}e^r$, from which we get $r = .0688$. Note that since the rate at which we can borrow of .06, is less than the implied repo rate of .0688, so a cash-and-carry arbitrage is possible.