**Quiz: 1/18/12 (Annotated)** **Key**

**Quiz**: Assume the risk-free interest rate is 3% and that a risk-free bond that pays $1,000 one year from today trades for $980.

a. Calculate the no-arbitrage price for the bond.
b. What set of transactions today will generate an arbitrage profit today?
c. What individual and total cash flow will these transactions create today and a year from today?
d. What "events" will create the individual cash flows one year from today?

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**a.** PV(bond) = $1000 / 1.03^1 = \$970.87$

**b.** (1) Short-sell the bond for its FV in one year = $980

(2) Lend, at the risk-free rate of 3%, the amount of the PV(bond) = $970.87

**c.** $t = 0$: $CF_{bond}$ = +$980
$t = 0$: $CF_{lending}$ = -$970.87

Total (t = 0) = +9.13

$t = 1$: $CF_{bond}$ = -$1,000
$t = 1$: $CF_{lending}$ = +$1,000

Total (t = 1) = $0

**d.** $CF_{bond}$ = purchase bond, which we had previously shorted
$CF_{lend}$ = receive cash flow from our lending (investment) paying off

| **Transaction** | **CF0** | **CF1** |
|---|---|---|
| Short-sell bond | +$980 | -$1000 |
| Lend at risk-free rate | -$970.87 | +$1000 |
| **Total** | +$9.13 | $0 |