Quiz: 1/18/12 (Annotated)  

**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. \[ PV(bond) = \frac{1000}{1.03} = 970.87 \]

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. \( t = 0: \ CF_{bond} = +980 \)
   \( t = 0: \ CF_{lending} = -970.87 \)
   
   \[ \text{Total } (t = 0) = +9.13 \]

t = 1: \( CF_{bond} = -1000 \)
   t = 1: \( CF_{lending} = +1000 \)
   
   \[ \text{Total } (t = 1) = 0 \]

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

<table>
<thead>
<tr>
<th>Transaction</th>
<th>CF0</th>
<th>CF1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-sell bond</td>
<td>+980</td>
<td>-1000</td>
</tr>
<tr>
<td>Lend at risk-free rate</td>
<td>-970.87</td>
<td>+1000</td>
</tr>
<tr>
<td>Total</td>
<td>+9.13</td>
<td>0</td>
</tr>
</tbody>
</table>