Chapter 3 - Example 1

Assume the risk-free rates (rates given on annual basis) vary by maturity as follows: 1-year = 1.3%, 2-year = 1.9%, 3-year = 2.1%, 4-year = 2.3%, and 5-year = 2.4%.

Given the prices below, what set of transactions today will generate an arbitrage profit for you today. In your answer list all transactions required today and all individual and total cash flows today, a year from today, and two years from today. List also the transactions two years from today that will be required to close out all of you arbitrage trades. Use a "+" for inflows of cash and " – "for outflows of cash. Note: I recommend setting up a table like is in the notes.

Security	Price	Payments in one year if economy is Weak	Strong	Payments in two years if economy is Weak	Strong
Large Stock Index	$117	$20	$30	$110	$140
Chocolate Treats	$113	$10	$20	$115	$145

Equivalent to Chocolate: Buy large stock index, short-sell risk-free bond that matures for $10 in one year, & buy risk-free bond that matures for $5 in two years.

Bond prices: 1-yr $= \frac{10}{1.013} = 9.8717$; 2-yr $= \frac{5}{(1.019)^2} = 4.8153$

NO arbitrage price $= 117 - 9.8717 + 4.8153 = 111.9436$

$\Rightarrow$ short-sell chocolate since price $= 113 > 111.9436$

	CF_0	W CF_1	S	W CF_2	S	$Trans_2$
$Trans_0$						
Short choc	+113	−10	−20	−115	−145	Buy to cover
Buy Index	−117	+20	+30	+110	+140	Sell or Payoff
Short Int rt	+9.8717	−10	−10	∅	∅	–
Buy 2-yr rf	−4.8153	∅	∅	+5	+5	Payoff
		∅	∅	∅	∅	
Total	+1.0564					