Quiz B: 7/13/16

Name ___Key___

Note: The following price and payoff information is on a per-share basis.

Assume the risk-free rates varies by maturity as follows: 1-year = 1.2%, 2-year = 1.6%, 3-year = 1.9%, 4-year = 2.1%, and 5-year = 2.2%.

Given the prices below, what set of transactions today will generate the <u>highest</u> possible arbitrage profit for you today. In your answer list all <u>transactions required today</u> and all <u>individual and total cash flows today, a year from today, and two years from today</u>. List also the <u>transactions two years from today</u> 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	Bid Price	Bid Number	Ask Price	Ask Number	Payments in one year if economy is Weak	Payments in one year if economy is Strong	Payments in two years if economy is Weak	Payments in two years if economy is Strong
Small Stock Index	$200	1000	$205	500	$5	$6	$190	$280
Large Stock Index	$115	5000	$117	2000	$20	$30	$110	$140
Chocolate Treats	$201	200	$202	300	$0	$1	$200	$290

Note: I recommend building a table like in the notes and old quizzes.

Equivalent to chocolate:

Buy small stock index, short-sell risk-free bond that matures for $5 in one year, + buy risk-free bond that matures for $10 in 2 yrs.

Bond prices: $1yr = \frac{5}{1.012} = 4.9407$; $2yr = \frac{10}{(1.016)^2} = 9.6875$

Possible directions of arbitrage:

X Short chocolate, buy portfolio: Profit = +201 - 205 + 4.9407 - 9.6875 = -8.7468

Buy chocolate, short portfolio: Profit = -202 + 200 - 4.9407 + 9.6875 = +2.7468 ✓

max shares = 300 ⟹ multiply all #s in following table by 300 +5

Transaction	CF_0	CF_1 W	CF_1 S	CF_2 W	CF_2 S	Transaction
+5 Buy Chocolate	-202^{+2}	0^{+2}	$+1^{+2}$	$+200^{+2}$	$+290^{+2}$	Sell chocolate^{+2}
+5 Short Sm. Indx	$+200^{+2}$	-5^{+2}	-6^{+2}	-190^{+2}	-280^{+2}	Buy to cover Sm. Indx^{+2}
+5 Buy 1yr rf	-4.9407^{+2}	$+5^{+2}$	$+5^{+2}$	0^{+1}	0^{+1}	Nothing^{+2}
+5 Short 2yr rf	$+9.6875^{+2}$	0^{+1}	0^{+1}	-10^{+2}	-10^{+3}	Buy to cover bond or pay cash to lender $^{+2}$
Total	$+2.7468$	$\emptyset$	$\emptyset$	$\emptyset$	⧗	
	$^{+2}$	$^{+1}$	$^{+1}$	$^{+1}$		