

Quiz A: 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 = 1.3%, 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 the highest possible 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	Bid		Ask		Payments in one year if economy is		Payments in two years if economy is	
	Price	Number	Price	Number	Weak	Strong	Weak	Strong
Large Stock Index	\$115	5000	\$117	2000	\$20	\$30	\$110	\$140
Small Stock Index	\$200	1000	\$205	500	\$5	\$6	\$190	\$280
Chocolate Treats	\$113	200	\$114	300	\$10	\$20	\$115	\$145

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

Portfolio that is equivalent to Chocolate:

Buy large stock index, short-sell risk-free bond that matures for \$10 in one year, + buy risk-free bonds that mature for \$5 in 2 years.

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

Possible directions of arbitrage:

Short chocolate, buy portfolio: Profit = $113 - 117 + 9.8717 - 4.8153 = 1.0564$ ✓

Buy chocolate, short portfolio: Profit = $-114 + 115 - 9.8717 + 4.8153 = -4.0564$ ✗

max shares = 200 ⇒ multiply all #s in following table by 200 +5

Transaction	CF ₀	CF ₁	CF ₂	Transaction
+5 Short Choc	+113 ⁺²	-10 ⁺²	-20 ⁺²	Buy to cover chocolate +2
+5 Buy Large Index	-117 ⁺²	+30 ⁺²	+110 ⁺²	Sell Large Index +2
+5 Short 1y rf	+9.8717 ⁺²	-10 ⁺²	0 ⁺¹	Nothing +2
+5 Buy 2y rf	-4.8153 ⁺²	0 ⁺¹	+5 ⁺²	Bond matures +2
Total	1.0564 ⁺²	0 ⁺¹	0 ⁺¹	