University of Texas at Austin

Quiz 4

Transaction costs. Short sales.

Please, read the following lecture note prior to attempting the following two problems:

`https://www.ma.utexas.edu/users/mcudina/m339d-lecture-two-transaction-costs.pdf`

Note: After this assingment, we will – as a rule – assume that there are no transaction costs or bid-ask spread in our problems!

Provide your **final answer** only for the following problems.

Problem 4.1. (5 pts) Assume that an investor opens a 100 share short position in Jiffy, Inc. common stock at the bid-ask price of \$32.00-\$32.50. When the investor closes his position the bid-ask prices are \$32.50-\$33.00. If there is a commission rate of 0.5%, calculate the investor's profit on the short investment (assume $r = 0$)?

(a) About \$32.50 gain

(b) About \$16.25 loss

(c) About \$132.50 loss

(d) About \$100 gain

(e) None of the above

Solution: (c)
The commission needs to be paid for both transactions, so the total outcome for the short-seller is

$$100(32 \cdot 0.995 - 33 \cdot 1.005) = -132.50.$$

Problem 4.2. (5 pts) Assume that you (an investor) open a 300−share short position in XYZ common stock at \$30.19 with commission of 0.5%. When you close your position the stock price is \$29.87 and you have to pay a commission rate of 0.5%. Calculate your profit on this short investment (assume $r = 0$)?

(a) About \$12.50 gain

(b) About \$5.91 gain

(c) About \$5.91 loss

(d) About \$12.50 loss

(e) None of the above

Solution: (b)
A short sale of XYZ entails borrowing shares of XYZ and then selling them, receiving cash. Therefore, initially, we will receive the proceeds from the sale of the asset, less the proportional commission charge:

$$\begin{aligned} 300 \times (\$30.19) - 300 \times (\$30.19) \times 0.005 &= \$9{,}057 \times 0.995 \\ &= \$9{,}011.72 \end{aligned}$$

When we close out the position, we will again incur the commission charge, which is added to the purchasing cost:

$$\begin{aligned} 300 \times (\$29.87) + 300 \times (\$29.87) \times 0.005 &= \$8{,}961 \times 1.005 \\ &= \$9{,}005.81 \end{aligned}$$

Finally, we subtract the cost of covering the short position from our initial proceeds to receive total profits: $\$9{,}011.72 - \$9{,}005.81 = \$5.91$.

Please, provide the **complete** solution to the following problem. Final answer only, even if correct, will earn zero points.

Problem 4.3. (5 points) Bertram shorts (i.e., short sells) 100 shares of a non-dividend-paying stock at the initial stock price of \$50 per share. He invests the proceeds a the continuously compounded risk-free interest rateof 0.04 in a savings accout. He does not make any subsequent withdrawals from or deposits to this account until the short sale is closed. When Bertram closes the short sale, six months later, the stock price is \$55. Does he have enough money in the savings account to be able to close the short sale without using additional funds?

Solution: The initial deposit in Bertram's savings account is $100 \times 50 = 5000$. So, the balance in the account at time$-\frac{1}{2}$ equals

$$5000e^{0.04/2} = 5000e^{0.02} = 5101.067.$$

On the other hand, Bertram needs $100 \times 55 = 5500$ to buy back the shares required to close his position. So, he does **not** have enough in his savings account.