Nanyang Business School, NTU

BC3402: Financial Service Processes and Analytics

Tutorial 9: Algorithm Trading (I)

Question 1

Mr. A manages a hedge fund and actively uses DMA tools to execute some of his trades. The DMA tools have a built-in algorithm trading function of which Mr. A can utilize in better executing his trade in a crossing network. Below is a sample of a single block sell order he has executed in a particular trading day. An algorithm is used in executing this block trade.

Time of Day	Total Volume Traded in the market	Avg. Traded Price	No. of shares Mr. A sold (& price)
9:00am	100000	$4.50	10000 (@ $4.40)
10:00am	50000	$4.30	5000 (@$4.30)
11:00am	30000	$4.20	3000 (@$4.20)
12:00pm	30000	$4.10	3000 (@$4.00)

The trade is completed at 12:00pm. Note that the "average traded price" and "total volume traded" does not factor in Mr. A's trades. The crossing network charges $0.02 for each share sold in the network.

a) What algorithm do you think is being used in this case?

b) Compute the implementation shortfall at each hour of the day (starting from 9:00am – 12:00pm) and state the assumptions you have made.

Assuming Mr. A executed the same trade this time using a different algorithm. The outcome of the trade is shown below.

Time of Day	Total Volume Traded	Avg. Traded Price	No. of shares Mr. A sold (& price)
9:00am	100000	$4.50	7000 (@ $4.40)
10:00am	50000	$4.30	7000 (@$4.30)
11:00am	30000	$4.20	6000 (@$4.20)
12:00pm	30000	$4.10	1000 (@$4.00)

c) What algorithm do you think is being used in this case?

d) Compute the implementation shortfall at each hour of the day (starting from 9:00am – 12:00pm) and state the assumptions you have made.

Question 2

Read the following article, “Dark Algorithms Solving Fragmentation Issues” and answer the questions listed below.

a) In what ways do you think algorithm trading has helped in the growth of crossing networks?

b) The article argues that not all algorithms are well designed and some algorithms fail to mask the true intentions of the trader liken that of an “embarrassed” human trader. Do you think algorithm trading can replace human traders? In what areas (e.g. asset classes, trading characteristics) do you think such a replacement is possible or not possible?

c) Do you foresee algorithm trading to be a strong driving force in Singapore’s equity trading markets? Why or why not?