Q1a: What are some shortcomings of your broker’s strategy? Explain the reasons.

Note: The answer to this question assumes that LK Holdings shares are trending negatively towards a price point which is the rationale behind selling the shares.

Given that the broker is intending to trade 200,000 units per hour from 9am to 12pm, he is utilising a TWAP approach to selling the shares. TWAP, although being a simple strategy to implement has the following shortcomings because of its linear execution as compared to the market’s non-linear volume.

Firstly, TWAP has subpar execution quality because of its strict compliance to the predetermined time schedule. This shortcoming is magnified when prices become unfavourable (which could be the case given that the prices of LK Holdings shares is predicted to trend negatively. Moreover, the 30-day average for LK Holdings shares reflect a non-linear intraday hourly trading volume for the shares. This means that the broker’s strategy does not take into consideration the prices of LK Holdings shares while selling. Thus, TWAP does not react to the market price of LK Holdings shares well.

Secondly, it leaks information easily to the market. Since the TWAP strategy in question does not have an element of randomization, it is very obvious and predictable to other traders in the market, hence posing a high signalling risk. Other traders or even algorithms can take advantage of this signal and leave me vulnerable while selling the shares.

Conclusively, the broker’s intended execution strategy leaves me at risk of selling LK Holding shares at suboptimal market prices and signalling to the market what my moves are so they can leverage upon it.

Q1b: Suggest 2 algorithms that can execute the trades in place of my broker and argue why the proposed algorithms are better.

Since the 30-day average hourly trading volume for LK Holdings share is known to myself, I would implement a VWAP (assuming the VWAP CI is low and I am able to accept it). Unlike TWAP, VWAP and POV tries to minimize market impact. I would also combine an adaptive shortfall price algorithm to VWAP to optimise my trading strategy while recognising that there is a negative trend in LK Holdings shares price. In this case, given that 4 days can be considered a short-term period, I would use an AIM (Aggressive) approach to my adaptive shortfall strategy and sell the LK Holdings shares.

In this case, this algorithm would respond better to the intraday trading volumes as compared to a TWAP. Modifying and combining it with an adaptive shortfall, since I have information that in the short run the prices of LK Holdings shares will fall would help my algorithm determine the best timing to sell my shares at the best prices available on the market based on the volume traded. Additionally, this algorithm reduces the signalling risks that TWAP is vulnerable to.

Secondly, in the case where the confidence intervals for the historical 30-day average trading volume is too high for my liking, I may choose to adopt a POV rather than VWAP algorithm (with an adjustment formula to stop dilution). Also, if I am very certain about the information provided to me regarding LK Holdings shares negative price trend, I could also use a price inline algorithm in combination with POV. This is because price inline is more sensitive as compared to adaptive shortfall which can result in more favourable prices for my shares sold.

Q2a: How will the shortening of the settlement cycle prevent a similar “GameStop” saga from occurring in the future?

The current 2 days gap between the trade and settlement of equities causes a settlement risk. In the 2 days, clearinghouses like the DTCC transfer and allocates ownership of the traded shares to the correct owners. When the transfers are not completed as expected, it gives rise to settlement risks. This can be attributed to credit, liquidity, systematic and operational risks. The argument is that the longer the gap, the higher the risks as there is more time for the parties involved in transactions to default. Thus, when “meme stocks” are traded at high volumes, the sell-side brokers and clearinghouses have to post a much larger margin and default account due to the perceived higher risks. This places a higher credit and liquidity risk which was evident in at the time where Robinhood had been caught off guard and was unable to meet these heightened requirements, thus halting the trading of certain stocks on its platform.

The proposed shortening of the settlement cycle would reduce the settlement risks that comes along with transactions as the sell-side would alleviate their liquidity or credit concerns. With a shorter settlement cycle, they would not be required to post as large of a margin or default account and thus would have less liquidity issues since they would not be required to scramble for funds. In the case of the volatile GameStop saga, when sell-side brokers were at their limits trying to post increased margins calls, there could have been a disaster if the risks overrun the accounts and the funds of the sell-side and clearinghouses were not sufficient. Should Robinhood been unable to meet the margin call, a systematic crash may have occurred. It had struggled to draw on its credit lines to avoid an adverse market reaction. Thus, the shortening of the settlement cycle seeks to reduce such risks by lowering the liquidity demands of clearinghouses and sell-side brokers.

Lastly, with a shortened settlement cycle, operational efficiency is increased which could prevent a similar saga from happening from now on.

Q2b: Suggest ways to make the shortening of the settlement cycle to T+1 a possibility by 2023.

In light of the benefits and lowered risks in shortening the settlement cycles, the following are ways to possibly shorten the current period from T+2 to T+1 by 2023.

As the financial network is a web of exchanges, clearinghouses, sell-side broker and other participants, these interconnected participants have to align and agree to the reducing of the settlement cycle first. Firstly, the relevant authorities must be engaged to change the settlement cycle. Secondly, the participants should be prepared to be more liquid to provide the shares and post the margins required of a shortened settlement cycle as a shorter gap between trade and settlement would mean less time to allocate the shares to the rightful owners. Equities would not be conveniently accessible for shorts by the institutional investors in this case. Interestingly enough, the heavy short positions of some were the cause of the entire GameStop saga in the first place.

Secondly, the back office of the brokers would have to have the technical capacity to process these transactions at a quicker pace. Electronic processing would facilitate the transition to a shortened T+1 settlement period. This would involve funding to improve the current systems to be able to deal with the shortened settlement period. This would also require some form of backward compatibility to ensure a smooth transition from the older systems to the new shortened settlement cycle.

The distributed ledger technology could provide impetus for the push to a T+1 settlement period. The decentralized information regarding the trades on a distributed ledger technology platform would increase the flow of information as well as the speed of transactions since all parties to the transaction would have access to it. This could possibly speed up the settlement process by allowing seamless communication between parties and concurrent exchange of information, two pillars of straight through processing which can speed up the trade and thus settlement cycle.

Another possibly of decreasing the settlement cycle would be the use of Direct Market Access (DMA) tools. DMA tools can be tailored to integrate with settlement and clearing systems to facilitate the process.

Lastly, some level of real-time processing could be used to increase the speed at which transactions are processed and settled.