Chapter 6

Suggestive measure for reducing transaction cost and Conclusion

Introduction

This concluding chapter discussed the main findings and suggestions of the study and draws conclusion as well. Final conclusion has been drawn on the basis of the summerised findings, and makes recommendation for further research.

Findings, suggestions and conclusion

In this research, further review of all three mathematical frameworks of IS and improving the analysis by providing further classification on opportunity cost that previous studies have not addressed. The model used by Kissell [2006] and attempt to further classify components of opportunity cost is closely followed. The study discovered two additional components that are not addressed by Kissell [2006] or others. These two subcomponents are, however, additional venues for traders to manage carefully in order to control transaction costs while trading. By further identifying these factors, the study contribute to the existing literature with a view that traders can now detect and manage these factors properly to reduce the IS of trading. As a result, along with stock picking ability, traders will be able to implement trading strategy by appropriately executing trades through controlling these two new factors that add to opportunity cost. In addition, using a numerical experiment, it is also shown that this model calculates ISs that are equal to all three existing models. To our knowledge, we

are the first to provide such calculations and to identify factors that contribute to the IS. By being able to detect and control these factors, traders will be able to reduce or eliminate these costs while executing trades.

Understanding and managing transaction cost is highly critical to portfolio performance in an environment in which more than half of mutual funds have consistently underperformed the S&P 500. Sophisticated investors, mutual fund managers, and hedge fund managers who have superior analytical ability in stock selection and follow optimal asset allocation techniques also must pay close attention to IS identified in the literature. IS is relevant especially for short-term traders (or day traders) and dynamic traders because these traders engage in trading quite frequently in a short period of time. Transaction cost from frequent trading can add up to a large amount and essentially eat up the profits if proper care is not taken to avoid or contain any the factors identified in the literature. Amihud and Mendelson [2013] emphasized that in today's decimalization era of high-frequency trading, transaction cost is an essential element of market microstructure that cannot be removed but can and should be managed. Transaction cost is also considered in recent research to evaluate the effectiveness of dynamic portfolio strategies (Kim and Viens [2012]) and optimal portfolio decisions (Garleanu and Pedersen [2013]). Understanding and measuring transaction cost accurately is undoubtedly an important issue for any trader or portfolio manager and has been a subject of research among academicians and practitioners.

In this research, the opportunity cost component is further investigated and classified. It is done in order to better understand elements of opportunity costs to enable traders to

notice and address them and thus minimize overall transaction cost. Accordingly, a subdivision is done of the trading-related opportunity cost of Kissell [2006] into two categories: (1) first trading–related opportunity cost and (2) residual trading–related opportunity cost. By appropriately setting the price for the first trade, if traders can execute all shares they will be better able to reduce these costs.

When transaction cost for this extended model is calculated, the result shows that one can reach the same transaction cost as Wagner and Edwards [1993] and Kissell [2006]. Exhibit 3.01 (in Appendix 3) displays the IS models based on Perold [1988], Wagner and Edwards [1993], Kissell [2006], and the present model. Before presenting this experiment in calculating IS, it would be useful first to provide the definition of each cost component of opportunity costs.

Again, it is beyond the scope of this study to pursue this calculation, and it remains a topic for future research. It should be noted that for a sequence of multiple trades, further extension based on second, third, and other trades is possible to add other sequential trading–related opportunity costs in a similar fashion. The residual trading–related opportunity cost is the difference between the closing price and the last executed trading price, which is also beyond the scope of this research.

Reduction of the opportunity cost can be attained by using this pre-trade analysis to approve orders sized properly for present market situations. For large orders, the investor must decide whether to risk market impact or spread the trade over several days, risking exposure to a price change. Setting price limits efficiently (so that the order is filled or almost filled) will ensure that the FTROC- and RTROC-related opportunity

cost will be as low as possible for the trader. If the price trend is higher, opportunity cost will be minimal from setting the price aggressively in the first trade so that all or almost all trading volume is executed, and residual trading cost will tend to zero. The opportunity cost, on the other hand, can be reduced by setting a passive pricing strategy and executing less in the first trade and more on the later trade if the price trend is downward.

In addition to setting the price limit, good communication between the broker (who executes the order) and trader is vital to permit swift execution and to alter any implementation strategy (if necessary). A trader must decide how to balance the costs of trading with the opportunity cost. It should be noted that there is a trade-off between trading rapidly and being persistent. Executing a full trade rapidly drops opportunity costs but increases probable market impact costs. Slower implementation, on the other hand, lowers market impact but increases opportunity cost because the full order may not be executed or the trade may be filled later at a disadvantageous (average) price.

Exhibit 3.04 (in Appendix 3) shows the calculation for each of the four models to give a clear picture of the cost. Any experienced trader can imagine that it is extremely challenging to accurately predict the market and make a choice between market impact and price impact; as such, accurately modeling transaction costs in a back test is also challenging. Although it is virtually impossible to account for every eventuality, it is worthwhile to explore multiple back tests assuming different turnover levels to better understand the balance between transaction and opportunity costs so that in future trade

a trader is able to reduce the first trade–related and residual trade–related opportunity costs as much as possible.

Transaction costs play a very significant role in affecting investment performance. Above and beyond the fixed charges (such as fees, taxes, and commission), other hidden or variable factors may adversely increase trading costs for traders. These factors, like delay cost, price appreciation cost, market impact cost, timing risk cost, and opportunity cost, can add to costs of transaction and reduce portfolio return.

The study by Perold [1988] was the first to formally identify this as IS, which traders and fund managers must consider while analyzing portfolio performance. Once security selection is done, prompt action in taking a position, avoiding price run in executing transaction, and ability to complete total transaction are equally important to performing well. Partial trade or adverse price effect due to front run may lower the return of investment. Although various factors are beyond the control of the trader, such as ability to trade at the right price and complete the total transaction, traders must be prompt in executing investment decisions and should review carefully those factors that are part of opportunity costs, as identified in the literature and extended in our research, so they can avoid or reduce these costs of investing.

Although these costs may not be such a significant factor for long-term traders who wish to buy and hold assets for a long time, they are highly important for day traders and dynamic portfolio managers. The work of Wagner and Edwards [1993] extended the transaction cost by incorporating various factors, such as price impact, timing cost, opportunity cost, and commission, that add up to total transaction costs, which can

significantly affect portfolio performance. The model proposed by Kissell [2006] further modified cost elements that Wagner and Edwards [1993] incorporated.

The study closely follow and extend the Kissell [2006] model by further identifying trading-related costs that consist of opportunity costs. Our research contributes to the existing literature by extending the opportunity cost subcomponents that traders or fund managers can identify and, by taking an appropriate trading implementation strategy, reduce or eliminate from total transaction cost. Our innovative sub classification of opportunity costs is one of the key contributions of this research because these subcomponents have not been discovered in previous literature.

To validate this proposed framework, the study provide a single numerical experiment of calculating IS for all three existing models along with our model and show that all four models provide the same IS. Traders and fund managers now have two additional factors they can identify that adversely affect IS; they can control these factors by identifying their sources and creating implementation strategies to remove or reduce them while executing trades. As a result of lower IS, portfolio or fund performance can be improved. TCM is the key to reducing first trading– and residual trading–related opportunity costs, which require a balance with market impact and price impact cost. After thorough back testing, market price trend, and pretrade analysis, setting price limits efficiently (so that the order is filled or almost filled) will ensure the first trading–related opportunity cost and residual trading–related opportunity cost are as low as possible for the trader. If the price trend is higher, opportunity cost will be at a minimum from setting price aggressively in the first trade so that all or almost all trading volume

is executed (so that residual trading cost will tend to zero). The opportunity cost, on the other hand, can be reduced by setting a passive pricing strategy and executing less in the first trade and more on the later trade if the price trend is downward.

In addition to setting the price limit, good communication between the broker (who executes the order) and trader is vital to permit swift execution and to alter any implementation strategy (if necessary). Readers can pursue future research focusing on testing portfolio performance with IS for day traders and dynamic portfolio managers using a benchmark portfolio for comparative evaluation. This research can provide further insight into whether there is any relationship between higher performance and lower IS via carefully controlling extended components of opportunity cost. In addition, a further extension of TCA should incorporate both buy and sell trading for all sequential trades (not only buy-side analysis, as has been done in previous research) and further test the relationship between IS and trading performance.

The research investigate whether there is any relationship between implementation shortfall and trading day of the week. There are five trading days in a week. The result shows that Fridays and Mondays are significantly affecting negatively on the transaction cost. However, since the coefficient for Monday is not significant, it is difficult to argue in its favor as opposed to Fridays. The study further analyze the relationship by dividing the trading day into three trading hours, namely, FPT (First Phase Time-9:30-12 noon), MPT (Mid Phase Time -12noon-2pm) and LPT (Last Phase Time -2pm-4pm). The findings indicate that transaction on Fridays, LPT (from 14:00 to 16:00) is significant to reduce the transaction cost. It clearly implies that the best time to execute the stock

transaction is Friday and at LPT. On Monday, Thursday, and Friday total execution costs are little and have negative relationship with transaction cost. So, the study can conclude that transaction at eleventh hour on Friday is highly desirable as it gives the lowest transaction cost and possibly improves return as a result.

It implies that if anybody wants to acquire more profit/less transaction cost it is better to trade on Fridays and Mondays. Transect in LPT of Friday to get rid of high transaction cost. Besides, it will be better to transect on Monday, Thursday and Friday to avoid High execution cost.

The study also investigate whether implementation shortfall has any impact on relative portfolio performance. From regression analysis one can inferred that there is a relationship between RPM and Imp_shortfal, ABS_RPM, VWAP, TWAP and OHLC individually. So the relative performance of stock trade is highly associated with these variables. All of these independent variables did not get long run impact with RPM; only two variables (e.g. IMP_SHORTFAL, VWAP) have long run association. In addition, Wald test identifies that the coefficients for all variables are significant and have short run relation. At last my focus is to find out the best time and the best seconds for transection. Based on the frequency of the transection of 734 trading days it reveals that transection within the first minute is the best for transecting at low cost while the last trading hours are best for overall transaction cost.

So, if anybody wants to get better price s/he must try to transect within on minute, but s/he wants to get best price, transect with in first half second.

Scope of Further Research

The study/research focused only buy side trade and trades of only one trader. An interesting future extension of the research would be to expand the analysis taking into consideration of sell-side analysis. If short selling is allowed, does implementation shortfall matter? The study hope that such research will further enhance the depth of understanding of portfolio performance and impact of implementation shortfall in portfolio analysis.