

The Investment Behavior of Small Investors in the Hong Kong Derivatives Markets: A Statistical Analysis

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Abstract:

In the present study, we attempt to analyse and study (1) what sort of events will initiate a psychological instead of rational response from small investors, (2) the decision making process when they are emotional, and (3) the differences between their less-rational actions and normal ones. The primary objective is to investigate the factors, investing characteristics, and decision making processes that affect Hong Kong's small investors who participate in derivatives markets. Informed by behavioural finance, we develop several hypotheses regarding the changes in the opinion and investment behaviour of small investors during global economic crisis. These hypotheses are then tested with the data collected from 524 small investors via a questionnaire survey. By doing so, we hope to contribute to the study of behavioural finance in the setting of an Asian financial centre, Hong Kong.

Keywords: Behavioural Finance, Overconfidence, Herd Behaviour, Mental Accounting, Disposition Effect, Derivatives Markets.

1. Introduction

The global economic crisis (especially in the U S. and Europe) has drawn increasing attention of many small investors throughout the world. The information and opinion will affect their decision in investing mostly. It is interesting to know how to allocate their investment portfolio and the correlation between investment experience and their average return. In the present study, we attempt to analyse and study (1) what sort of events

will initiate a psychological instead of rational response from Hong Kong's small investors, (2) the decision making process when they are emotional, and (3) the differences between their less-rational actions and normal ones. The primary objective is to investigate the factors, investing characteristics, and decision making processes that affect Hong Kong's small investors who participate in derivatives markets. Informed by behavioural finance, which is a new approach to the study of financial markets, we develop several hypotheses regarding the changes in the opinion and investment behaviour of small investors. These hypotheses are then tested with the data collected from 524 respondents via a survey questionnaire. By doing so, we hope to contribute to the study of behavioural finance in the setting of an Asian financial centre, Hong Kong.

In Hong Kong, there are many types of financial derivatives, including warrants, Heng Seng index futures, stock options, Heng Seng index options, callable bull/bear contracts, and Renminbi non-deliverable forwards. Trading of derivative warrants, callable bull/bear contracts and options in Hong Kong is conducted in the Hong Kong Exchange and Clearing Limited (HKEx), which is divided into the Securities Market and the Derivative Market. The Securities Market is also known as the Stock Exchange. For historic reasons, stocks, derivative warrants, and callable bull/bear contracts are traded on the Stock Exchange. The Derivatives Market is further divided into the Futures Exchange and Stock Options Exchange. Index futures and index options, among others, are traded on the Futures Exchange, while options on individuals stocks are traded on the Stock Options Exchange. In Hong

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Kong, banks provide trading of Renminbi non-deliverable forwards investment services to the small investors. Small investors must pass the risk assessment before trading. They also need to open an investment services accounts.

Since the first warrant was listed, Hong Kong organized derivatives market in the late 1970s. During the next decades, the market size of derivatives market in Hong Kong continued to grow. Today, its derivative market has been among the top ten in the region and among the top thirty in the world. The Hong Kong Exchange and Clearing Limited's (HKEx) survey (2011) revealed that in that in 2010/11, market turnover increased 27% to 127 million contracts from 2009/10. The increase in market turnover mainly reflected a significant volume growth in stock options as well as in Hang Seng index options. From July 2010 to June 2011, local retail investors contributed 20%, 17%, and 24% of trading volume in overall derivative markets, stock option market, and future and options (excluding stock options) market in Hong Kong. In other words, these local retail investors can have significant influence in the derivatives markets in Hong Kong. Securities and Futures Commission (2008) reported that Hong Kong warrant investors' risk perception of warrant derivatives is strongly positively related to their familiarity with warrant derivatives. 55.2% of Hong Kong warrant investors were either moderately or very familiar with warrant, and 89.6% of Hong Kong warrant investors were aware that the financial products they had invested in carried high risk. Securities and Futures Commission (2006) also revealed that Hong Kong warrant investors' trading decisions based on their own analysis and market commentators' recommendations in newspapers, TV or radio programs.

This paper is organised as follows: Section 2 reviews the related literature; Section 3 states the research questions and hypotheses; Section 4 explains the methodology of the present study; Section 5 reports the research findings; and Section 6 provides the conclusion.

2. Review of Literature

According to Sewell (2010), Behavioural Finance is the study of the influence of psychology on the behaviour of financial practitioners and the subsequent effect on markets. This emerging area is of interest because it helps explain why and how market might be inefficient. Models about individual's investment behaviour are

developed that integrate insights from psychology with economics. These models also seek to understand and predict systematic financial market implications of the psychological decision-making processes, particularly in times of uncertainty. Below we outline some key concepts in this new area of research that are relevant to this study.

Overconfident investors tend to perceive themselves to be more competent, and thus are more willing to act on their beliefs, leading higher trading frequency. The classic study in overconfidence is provided by Lichtenstein, Fischhoff and Phillips (1977). Cohn-Urbach and Westerholm (2006) found that both the confidence effect and competence effect predict that certain investors believe their own abilities which are separated from their actual skill in investing. Therefore, these investors tend to trade more than they rationally should. Moreover, this theory also predicts that the investors who trade with low frequency can earn higher return than those with high frequency. In the paper of Baker and Nofsinger (2002), overconfidence is closely related to mood and optimism. It leads the investors to trade more and take more risk because they are too certain about their opinions and believe they can predict the winner.

Cognitive dissonance is the mental conflict that people experience when they are presented with evidence that their beliefs or assumptions are wrong. People have an incredible degree of self-denial. They will effectively jump through mental hoops in order to reduce or avoid mental inconsistencies. Thus, cognitive dissonance might be classified as a sort of pain of regret, or regret over mistaken beliefs (Shiller, 2001). It will affect an individual's subsequent decision making.

Herd behaviour means that small investors follow what the majority do in the market. Herding is closely linked to impact expectations, fickle changes without new information, bubbles, fads, or frenzies. However, herding requires a coordination mechanism. This mechanism could be a widespread rule to coordinate based on some signals in the market (e.g., price movement), or on an individual's ability to observe other decision-makers and the market trends (Salmon, 2001).

Framing, an important concept in behavioural finance, refers to the way a problem is posed for the decision-maker. In many contexts the decision-maker has flexibility in how to think about the problem. Individuals

usually understand and respond to events (e.g., make an investment choice) by relying on the collection of anecdotes and stereotypes that make up their mental and emotional filters. Liu and Wang (2006) showed that traders in option markets framed complicated investment decisions into simpler one, supporting the framing effect posed by Tversky and Kahneman (1981). One important feature of mental accounting is narrow framing, which is the tendency to treat individual gambles separately from other portions of wealth. In other words, when offered a gamble, people often evaluate it as if it is the only gamble they face in the world, rather than merging it with pre-existing bets to see if the new bet is a worthwhile addition (Barberis and Thaler, 2003). According to Thaler (1999), mental accounting is the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities.

Disposition effect means investors are reluctant to realize losses; they found that private retail investors, irrespective of nationality, are more prone to the disposition effect than domestic and foreign institutional investors. There is a negative relationship between the disposition effect and investment performance. Shefrin and Statman (1985) predicted that because people dislike incurring losses much more than they enjoy making gains, and people are willing to gamble in the domain of losses, investors will hold onto stocks that have lost value (relative to the reference point of their purchase) and will be eager to sell stocks that have risen in value. They called this the disposition effect. Choe and Eom (2007) expected that investors who are sophisticated and have more trading experience to have a lower disposition effect because they have a better understanding of the market, are more aware of such a tendency, and hence likely to correct it. Therefore, less proportion of well-experienced small investors would suffer loss from their derivatives investment comparing with the less-experienced small investors. Kaustia (2010) and Kumar (2009) found that disposition effect may affect the attitudes, behaviours and decisions of Hong Kong's small derivative investors. Barberis and Xiong (2009) results are relevant not only for trading of individual investors in the stock market, but also for the disposition-type effects that have been documented in settings as varied as the housing market, futures trading, and executive stock options.

3. Research Questions and Hypotheses

The theories and concepts written on small investor behavior on derivatives markets are relatively new. Whether or not they can be applied to the real setting is still controversial. More theoretical development and empirical studies are needed, particularly in Asian setting. We try to fill this research gap. To explain how the Hong Kong's small investors behave in the derivatives markets, we set several research questions based on Behavioral Finance theories and the concepts (e.g. over-confidence, cognitive dissonance, herd behaviour, mental accounting and disposition effect) that were discussed in the previous section. The following questions are to be addressed in the present study. After discussing these questions with some theoretical explanations; we propose the corresponding hypotheses to be tested with empirical data.

- i. Is there a correlation between the small investors to invest same/similar types of financial derivatives and the global economics crisis (especially, in U.S and Europe) in recent year affected their desire on investing financial derivatives?

If the small investors think that they are affected by their desire on investing financial derivatives, they tend to be over-confident, which in turn affects their judgement about the type of financial derivatives they invest. The Hong Kong small investors are popular to invest in Callable Bull/Bear Contracts and warrants in recent year. The first question can be turned into the following hypothesis.

H1: A significant correlation exists between small investors to invest same/similar types of financial derivatives and the global economic crisis (especially, in U.S and Europe) in recent year affecting their desire on investing financial derivatives.

- ii. Is there a correlation between small investors' reasons to make change their decision investing financial derivatives and the global economic crisis (especially, in U.S and Europe) in recent year affecting their desire on investing financial derivatives?

When small investors have herd behaviour, they are likely to follow the commentators' recommendation in the global economic crisis environments. Herding is expected to affect current investment decision and the reason that an investor gave to justify this. Here, we put forward the following hypothesis.

H2: A significant correlation exists between small investors' reason to make change their decision investing financial derivatives and the global economic crisis (especially, in U.S and Europe) in recent year affecting their desire on investing financial derivatives.

- iii. Is there a correlation between small investors' less weight of investment portfolio in financial derivatives and the global economic crisis (especially, in U.S and Europe) in recent year affected their desire on investing financial derivatives?

Small investors may have mental accounting during the global economic crisis. They think naturally in terms of having a "safe" part of their portfolio that is protect from downside risk, and a "risky" part that is designed for getting rich. Based on the above reasoning, we propose the following hypothesis:

H3: A significant correlation exists between small investors' less weight of investment portfolio in financial derivatives and the global economic crisis (especially, in U.S and Europe) in recent year affected their desire on investing financial derivatives.

- iv. Is there a correlation between the investment experience of small investors and their average return on investment of derivative products?

Sophisticated and experienced small investors show less disposition effect because they have a better understanding of the market, are more aware of such a tendency, and hence likely to correct it. Therefore, less proportion of well-experienced small investors would suffer loss from their derivatives investment comparing with the less-experienced small investors. Based on the above reasoning, we propose the following hypothesis:

H4: A significant correlation exists between the investment experience of small investors and their average return on investment of derivative products.

4. Data and Methods

The data for the present study were collected from small investors in Hong Kong through a survey questionnaire. Its main purpose is to collect their opinions, investment behaviour, and financial decision making in the derivatives market. The questionnaire was designed to elicit information about demographics, investment experience and behaviour, and factors affecting financial decision-

making of the respondents. The first part of questionnaire focused on the investment experience, perceptions about the investment conditions, and factors that affect financial decision-making. The second part collected respondents' personal information, including gender, age, education level, employment status, and average monthly income. The survey was conducted during the period of January to March 2012. Since the majority of Hong Kong's population is Chinese, the questionnaire was written in Chinese. After a pilot test on nineteen respondents, some amendments (such as rewording of some questions to eliminate ambiguities) were made before we finalized the questionnaire. Since some respondents did not reply to all the questions in the questionnaire, we only used the number of replies (i.e., the questions that respondents did not answer were not counted) to calculate the total number of and the percentage of the total for the individual entries.

Table 1: Demographic Characteristics of the Respondents

<i>Personal characteristics</i>	<i>No.</i>	<i>% of total</i>
Gender:		
Male	329	62.9
Female	194	37.1
Age group:		
Under 24 years old	172	33.0
25 – 34 years old	156	29.8
35 – 44 years old	76	14.5
45 – 54 years old	79	15.3
55 – 64 years old	34	6.5
over 64 years old	5	1.0
Education level:		
No school	6	1.1
Primary school	33	6.3
Secondary school	153	29.3
Tertiary education or above	330	63.2
Employment status:		
Employee	323	61.9
Self-employed	53	10.2
Retired	35	6.7
Others	111	21.3
Average monthly income:		
Below HK\$5,000	110	21.1
HK\$5,000 -HK\$9,999	71	13.6
HK\$10,000 - HK\$14,999	88	16.9
HK\$15,000 - HK\$19,999	94	18.0
HK\$20,000 - HK\$24,999	77	14.8
HK\$25,000 - HK\$29,999	32	6.1
HK\$30,000 - HK\$49,999	38	7.3
HK\$50,000 or above	12	2.3

Table 2: Responses to various items

<i>Items and responses</i>	<i>No.</i>	<i>% of total</i>
1. Did the global economic crisis (especially, in U.S and Europe) in recent years affect your desire on investing financial derivatives?		
Yes	287	68.7
No	131	31.3
2. Which type of financial derivative do you invest most frequency?		
Warrants	97	23.2
Hang Seng Index Futures	75	17.9
Stock Options	52	12.4
Hang Seng Index Options	35	8.4
Callable Bull/Bear Contracts	146	34.9
Renminbi Non-deliverable Forwards	8	1.9
Others	5	1.2
3. Which type of information and opinion will affect your decision in investing financial derivatives mostly?		
Nil	12	2.9
Newspaper, TV, magazine, etc.	108	25.8
Relatives and friends	43	10.3
Internet	158	37.8
Investment Consultant	72	17.2
Annual Report	20	4.8
Others	5	1.2
4. Comparing to the total amount in your investment portfolio, how much do you invest in derivative products.		
Less than 10%	92	22.0
10% to fewer than 30 %	192	45.9
30% to fewer than 50 %	91	21.8
50% to fewer than 100 %	31	7.4
100%	12	2.9
5. How long have you invested in financial market?		
Nil		
Less than 1 year	43	8.2
1 year to under 3 years	95	18.1
3 years to under 5 years	178	34.0
5 years to under 10 years	92	17.6
10 years or above	71	13.5
6. What is your average return on investment of derivative products?		
Loss	76	18.2
Average return less than 10%	143	34.2
Average return 10% to under 30%	137	32.8
Average return 30% to under 50%	48	11.5
Average return 50% to under 100%	12	2.9
Average return more than 100%	2	0.5

We selected the respondents using non-probability sampling. A group of undergraduate students helped to distribute the questionnaires to the respondents. The target population are the small investors in the Hong Kong derivatives markets. Finally, there were 524 selected respondents who completed and returned the survey. The respondents were requested to provide an estimated percentage breakdown of their average return on investment of derivative products under study during the study period.

The profile of the respondents is reported in Table 1. Among the respondents, 62.9% of respondents were male and 37.1% were female. The majority of them were under the age of 55 (92.6%), and only 7.4% were aged 55 or above. Regarding the education level, the majority of them was tertiary education or above (63.2%), while 36.7% was graduated from secondary school or below. Regarding their employment status, 61.9% of respondents were employee, 10.2% were self-employed, 6.7% were retired and 21.3% were classified as “others” which include housewives and students. Finally, the respondents’ median income was \$14,573.36. In view of the above demographic profile of the respondents, we believe that the respondents are representative of small investors in Hong Kong. To test hypotheses 1-4, we compare individual’s responses to different items in the questionnaire. The correlation of these responses is indicated by Cramer’s V and Chi-square (χ^2) test.

5. Results

The distribution of respondents’ answer to various question items in the question is showed in Table 2. The items were designed in a way to reflect some important concepts in behavioural finance. The response to one item is supposed to be related to the response to another item, as stated in the hypotheses.

To test Hypothesis 1, we compare the response to item 1 and item 2, which indicate the correlation between

overconfidence and cognitive dissonance. We expect a significant correlation between small investors’ desire to invest same/similar types of financial derivatives (i.e., overconfidence) and the global economic crisis in recent year affected their desire on investing financial derivatives (i.e., cognitive dissonance). As shown in Table 3, the Cramer’s V value is 0.158, and the correlation is not significant at 0.05 level. Contract to our expectation, no correlation is found between responses to item 1 and item 2, and the Hypothesis 1 is not supported.

Hypothesis 2 is tested by comparing the responses to item 1 and item 3. It is a more wide-ranging concerning the composition and characteristics of investment and is based on a theory of herd behaviour as a cause of global economic crisis. We expect a significant correlation between small investors’ reasons to make change their decision investing financial derivative (herd behaviour) and the global economic crisis in recent year affected their desire on investing financial derivatives (cognitive dissonance). For example, if a small investor believed that the forecasts by Internet were important to the downturn, that investor would plausibly focus on Internet’s forecast today in order to be well-informed about important new stories that may affect his or her decision in investing financial derivatives. The Cramer’s V value for the two is 0.125, which is not significant at 0.05. Contrast to my expectation, no correlation is found between response to item 1 and item 3, and Hypothesis 2 is not supported.

The next hypothesis, Hypothesis 3, is tested by comparing the responses to item 1 and item 4. Item 4 pertains to the weighted of investment portfolio. Behind this item is mental accounting theory. The comparison between the two items gives an exploration of the linkage between the concepts of mental accounting and cognitive dissonance. Small investors tend to focus on recent behaviour and give less weight to longer time trends. We thus expect a significance correlation between small investors’ less weight of investment portfolio in financial derivatives (mental accounting) and the global economic crisis in

Table 3: Statistical Results

<i>Hypotheses</i>	<i>Cramer's V Value</i>	<i>Approx. Significance</i>
Hypothesis 1 (correlation of responses to item 1 and 2)	0.158	0.107
Hypothesis 2 (correlation of responses to item 1 and 3)	0.125	0.364
Hypothesis 3 (correlation of responses to item 1 and 4)	0.196	0.003
Hypothesis 4 (correlation of responses to item 5 and 6)	0.135	0.043

recent year affected their desire on investing financial derivatives (cognitive dissonance). The Cramer's value is 0.196, and the correlation is significant at 0.05. In other words, there is a significant correlation between response to item 1 and item 4, and thus Hypothesis 3 is supported.

Hypothesis 4 is tested by comparing the responses to item 5 and item 6. It specifies the correlation between the investment experience of small investors and their average return of their financial derivative investment. The existence of such a correlation implied that Shefrin and Statman's disposition effect is correct. The result indicates that the Cramer's value is 0.135, and the correlation is significant at 0.05 level. Given this finding, Hypothesis 4 is supported.

6. Conclusion

The primary objective of this study was to identify some factors and decision-making processes that affect the investment behavior of small investors in the Hong Kong's derivatives markets. Based on some key concepts in behavioural finance (e.g. overconfidence, cognitive dissonance, herd behaviour, mental accounting and disposition effect), we developed four hypotheses and tested with a data set collected from 524 small investors in Hong Kong. Several findings came out from the study. First of all, we studied the trading pattern and performance of the small derivatives investors. We found that small investors mostly traded Callable Bull/Bear Contracts (34.9%) and warrant (23.2%). This may possibly due to small investors buy the Callable Bull Contracts in the bull market and buy the Callable Bear Contracts in bear market during the fluctuation of global economic environment. Also, small investors have long experience in warrant markets. These warrants are attractive investment vehicle for two reasons: their leveraging effect and limited loss feature make them attractive to aggressive investors; and they can serve as hedging instruments to reduce the risk exposures arising from other related investments. However, there is no significant correlation exists between small investors' to invest same/similar types of financial derivatives and the global economic crisis in recent year affected their desire on investing financial derivatives. This means no overconfidence for the small investors.

Second, we studied the investment attitude and behavior of the small investors on derivatives markets in Hong Kong. We found that the most decisive factor that could

influence small investor's decision making was highly accessible and updated. 37.8% and 25.8% respectively respondents considered Internet and news/ magazines/ newspaper were the decisive factors. However, there is no significant correlation exists between small investors' reason to make change their decision investing financial derivatives and the global economic crisis in recent year affected their desire on investing financial derivatives. This means no herding behaviour for small investors.

Third, we observed that majority of them, 68.7% were affected their desire on investing financial derivatives during the global economic crisis. As a result, most of them put a small proportion of derivatives investment in their portfolio; with 45.9% of them put 10% to few than 30% derivatives investment in their portfolio. This may be explained by the high sensible to loss during the global economic crisis. We find a significant correlation between small investors' less weight of investment portfolio in financial derivatives and the global economic crisis in recent year affected their desire on investing financial derivatives. This means that small investors have mental accounting.

Finally, we find a significant correlation between the investment experience of small investors and their average return of their financial derivative investments. Small investors are sophisticated and have more trading experience to have a lower disposition effect because they have a better understanding of the market, are more aware of such a tendency, and hence likely to correct it. Therefore, less proportion of well-experienced small investors would suffer loss from their derivatives investment comparing with the less-experienced small investors.

In view of the preliminary findings we obtained, it seems that more studies should be conducted in order to enhance our understanding of the investment behaviour of small investors in Asian countries. Based on behavioural finance, more theoretical work could be developed so as to inform the empirical investigation.

References

- Barberis, N. & Thaler, R. (2003). A Survey of Behavioral Finance. In: Constantinides, G.M., Harris, M., Stulz, R. (Eds.), *Handbook of the Economics of Finance* (pp. 1051-1121). Elsevier North-Holland, Amsterdam.

- Barberis, N. & Xiong, W. (2009). What Drives the Disposition Effect? An Analysis of a Long-Standing Preference-Based Explanation. *The Journal of Finance*, 64(2), pp. 751-784.
- Barker, H. K. & Nofsinger, J. R. (2002). Psychological Biases of Investors. *Financial Services Reviews*, 11, pp. 97-116.
- Choe, H. & Eom, Y. (2007). *The Disposition Effect and Investment Performance in the Future Market* (pp. 1-45). Working Paper, The College of Business Administration, Seoul National University.
- Cohn-Urbach, B. & Westerholm, J. (2006). Trading Frequency, *Investor Returns & Behavioral Biases* (pp.1-53) Working Paper, Faculty of Economics and Business, University of Sydney.
- Hong Kong Exchanges and Clearing Limited. (2011). Derivatives Market Transaction Survey 2010/11. *Research & Corporate Development*, pp. 1-26.
- Kaustia, M. (2010). Prospect Theory and the Disposition Effect. *Journal of Financial and Quantitative Analysis*, 45(3), pp. 791-812.
- Kumar, A. (2009). Hard-to-Value Stocks, Behavioral Biases and Informed Trading. *Journal of Financial and Quantitative Analysis*, 44(6), pp. 1375-1401.
- Lichtenstein, S., Fischhoff, B. & Phillips, S. (1977). *Calibration of Probabilities*. In Kahneman, Slovic and Tversky, 1982.
- Liu, Y. J. & Wang, M. C. (2006). *Narrow Framing: Professions, Sophistication and Experience* (pp. 1-40). Working Paper, Department of Finance, National Chengchi University, Taipei, Taiwan.
- Salmon, M. (2001). *Behavioral Finance and Market Psychology*. Working Paper.
- Securities and Futures Commission. (2006). *Warrant Investor Survey*. March, pp. 1-13.
- Securities and Futures Commission. (2008). *Key Findings of Retail Investor Survey*. December, pp. 1-20.
- Sewell, M. (2010). *Behavioural Finance* (pp. 1-13). Working Paper, University of Cambridge.
- Shefrin, H. & Statman, M. (1985). The Disposition to Sell Winners too Early and Ride Losses too Long: Theory and Evidence. *Journal of Finance*, 40, pp. 777-790.
- Shiller, R. J. (2001). *Human Behaviour and the Efficiency of the Financial System*. In Taylor J. B. and Woodford, M. (eds.) *Handbook of Macroeconomics* (1, pp. 1305-1314), Elsevier Science.
- Thaler, R. H. (1999). Mental Accounting Matters. *Journal of Behavioral Decision Making*, 12, pp. 183-206.
- Tversky, A. & Kahneman, D. (1981). The Framing of Decisions and the Psychology of Choice. *Science*, New Series, 211(4481), pp. 453-458.