

Behavioural Study of Financial Derivatives Investments in Hong Kong

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Introduction

The world stock markets have been increasingly volatile, especially during the European sovereign debt crisis starting in 2009. Likewise, the prices of derivatives products fluctuated wildly during this period. Unlike the institutional investors, such as mutual funds which use other people's money (OPM) for investment, small investors who invest with their own monies have incurred loss and risks in the volatile investment markets.

In the context of behavioural finance, small investors are considered to have behavioural biases, such as over-confidence and disposition effects, which may result in a huge loss of investments. This has drawn increasing attention from many small investors throughout the world. Also, the coverage of financial news and information in the press may affect their decisions. It is thus interesting to investigate how these investors allocate their investment portfolios and the correlation between their investment experience and average returns. The primary objective of this study is to discover the profile and attitudes of small investors towards financial derivatives in Hong Kong and their investing patterns for different financial derivatives. We formulate three hypotheses regarding the changes in the opinions and investment behaviours of small investors.

These hypotheses are then tested with the data collected from 1,130 respondents in Hong Kong via a survey questionnaire. By doing so, we contribute to the study of behavioural finance in the Hong Kong derivatives markets.

In the Hong Kong derivatives markets, various types of products, such as warrants, options, futures, callable bull/bear contracts and Renminbi non-deliverable forwards are traded. Trading of warrants, callable bull/bear contracts and options in Hong Kong is conducted in the Hong Kong Exchanges and Clearing Limited (HKEx), which is divided into the Securities Market and the Derivatives Market. The Securities Market is also known as the Stock Exchange, on which warrants and callable bull/bear contracts are traded. The Derivatives Market is further divided into the Futures Exchange and the Stock Options Exchange. Index futures and index options are traded on the Futures Exchange, while options on individuals stocks are traded on the Stock Options Exchange. Moreover, through the commercial banks in Hong Kong, trading of Renminbi non-deliverable forwards investment services is accessible to small investors. Small investors can open an investment services account for trading purpose, but must pass a risk aptitude test before trading.

The first warrant was listed in Hong Kong in the late 1970s. Since then, the market size of the Hong Kong derivatives market has grown and joined the top ten in Asia and top thirty in the world. A survey conducted by the HKEx (2013) revealed that in 2012/13, the market turnover volume decreased by 7 percent over the previous year. This decrease in market turnover reflected a decrease of 14 percent in the aggregate turnover volume of the Hang Seng Index products and a decrease of 12 percent in the stock options turnover volume. Due to the dominance of the stock options market segment in terms of contract volume, the overall trading composition of the HKEx derivatives market would be largely influenced by that of stock options, which is very different from that of index futures and options.

Research by the Securities and Futures Commission (2014) reported that the outlook for global economic growth remains uncertain. In Europe, the European Central Bank cut the benchmark interest rate twice in 2013, given concerns about deflation risks and high unemployment. Sovereign ratings are still susceptible to downgrades. During 2013, trading in derivative warrants increased in absolute terms, but dropped as a percentage of the total market turnover. Trading in callable bull/bear contracts decreased in both absolute terms and as a percentage of the total market turnover. Average daily trading in options rose by 9 percent in 2013. Stock options remained the most actively traded option product and the trading volume rose by 9 percent compared to the 2012 level.

The rest of the 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 findings; and Section 6 provides the conclusion.

Literature Review

Shefrin and Statman (1985) predicted that since 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. This behavioural bias is known as the disposition effect. Choe and Eom (2009) suggested that sophisticated investors with more trading experience and a better understanding of the market tend to have a lower disposition effect. Therefore, a smaller proportion of highly experienced small investors would suffer loss from their derivatives investments compared with the less experienced small investors. The disposition effect is one implication of extending Kahneman and Tversky's (1979) prospect theory to investments. Under the prospect theory, when faced with choices involving simple two- and three- outcome lotteries, people behave as if maximizing an S-shaped value function. This value function is similar to a standard utility function except that it is defined on the basis of gains and losses rather than levels

of wealth. The function is concave in the domain of gains and convex in the domain of losses. It is also steeper for losses than for gains, which implies that people are generally risk averse. There is a reference point from which gains and losses are measured. Usually, the status quo is taken as the reference point, but there are situations in which gains and losses are coded relative to an expectation or aspiration level that differs from the status quo. A person who has not made peace with his losses is likely to accept gambles that would be unacceptable to him otherwise (Kahneman and Tversky, 1979).

Although many factors can influence trading (e.g., tax-loss selling, rebalancing, changing risk preference, or superior information), Barber et al. (2009) argued that their empirical results are primarily driven by three behavioural factors: the representativeness heuristic, limited attention, and the disposition effect. When a purchase decision is made, similar beliefs about performance persistence in individual stocks may lead investors to buy the same stocks – a manifestation of the representativeness heuristic. Investors may also buy the same stocks simply because those stocks catch their attention. In contrast, when a selling decision is made, the extrapolation of past performance and attention play a secondary role. Attention is less of an issue for selling because most investors refrain from short selling and can easily give attention to the few stocks they own. If investors solely extrapolated from past performance, they would sell losers. However, they actually do not behave as expected due to the powerful countervailing factor – the disposition effect – a desire to avoid the regret associated with the sale of a losing investment. Thus, investors sell winners rather than losers. Barber et al. (2007) analysed all trades made on the Taiwan Stock Exchange between 1995 and 1999 and provided strong evidence that, in aggregate and individually, investors have a disposition effect, i.e., investors prefer selling winners and holding losers. The disposition effect exists for both long and short positions, and for both genders (to roughly the same degree), and it tends to decline following periods of market appreciation.

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.” Key components of mental accounting are account assignments, closure and evaluation. Traditionally, economists have assumed that funds are fungible (substitutable), but because of the silo approach created by mental accounting, this may not be so. The actual decisions people make indicate that money is not always fungible. While distortions and otherwise odd behaviour can result, mental accounting can have a beneficial side in that it may help people to exert self-control, encouraging the use of rules such as “don’t dip into retirement savings,” and “pay for luxuries (like vacations to Cancun or Crete) out of savings” (Shefrin and Statman, 1984). People may thus be encouraged to economize and save more.

An anchor indicates that people start with a benchmark value and adjust it in the obvious direction. However, this may not be the actual reality. There are two views as to why adjustment tends to be insufficient, with the first works best for relevant anchors and the second works best for irrelevant anchors (Chapman and Johnson, 2002). Anchoring and the base-rate underweighting variant of representativeness can at times appear to be in conflict. The latter normally says that people are too influenced by sample information, while anchoring can lead to people paying insufficient attention to sample data. Anchoring refers to the decision-making process in which quantitative assessments are required and where these assessments may be influenced by suggestions. People have in their minds some reference points (known as anchors), such as previous stock prices. When they receive some new information, they may adjust their reference points inadequately (i.e., under-reaction to the newly acquired information). Anchoring describes how individuals tend to focus on recent behaviour and give less weight to persistent trends (Tversky and Kahneman, 1974).

Research Questions and Hypotheses

The study of small investor behaviour in derivatives markets is relatively new. It is still controversial whether the relevant behavioural financial theory can be applied to the real setting. More theoretical development and empirical studies are therefore required, particularly in the Asian setting. Our research study aims to fill this research gap. In order to explain how Hong Kong small investors behave in the derivatives markets, three research questions (Q1 to Q3) based on the behavioural finance theories, namely the disposition effect, mental accounting and anchors, were discussed in the previous section. These questions will be addressed in this study. After discussing these questions with some theoretical justifications, we propose the corresponding hypotheses (H1 to H3) to be validated by empirical data.

Q1: Is there a correlation between the investment experience of small investors and their average returns on investment in financial derivatives in Hong Kong?

Behavioural bias caused by the disposition effect is considered to be the reason for sustaining loss (Choe and Eom, 2009). Small investors with prolonged investment experience may show a smaller disposition effect because they have a better understanding of the derivatives markets and are more aware of such behavioural bias, and hence they are more likely to avoid it. Therefore, highly experienced small investors may suffer a smaller loss from their investments in derivatives due to the disposition effect compared with less experienced investors.

H1: A significant correlation exists between the investment experience of small investors and their average returns on investment in financial derivatives.

Q2: Is there a correlation between small investors' lesser weight on financial derivatives in an overall portfolio and the effect of the recent European sovereign debt crisis on their desire to invest in Hong Kong financial derivatives?

Small investors may have two mental accounts: one with low risk portfolios (i.e., cash or bonds) for wealth protection from inflation and another one with risky portfolios (i.e., financial derivatives) designed for wealth accumulation. Such behavioural bias may be more common in the face of large price volatility after the European sovereign debt crisis when small investors, lacking the concept of integrated portfolio construction, were consciously avoiding investment loss.

H2: A significant correlation exists between small investors' lesser weight on financial derivatives in an overall portfolio and the effect of the recent European sovereign debt crisis on their desire to invest in Hong Kong financial derivatives.

Q3: Is there a correlation between the opinion of small investors on whether the derivatives markets will recover if there is an economic downturn and their opinion on the market value today?

Small investors often have some reference points or anchors. When they consider the market as under-traded currently, they may think that it will return in the next few years to levels that prevailed during the buoyant derivatives markets. Values in speculative markets, such as the stock market, are inherently ambiguous. It is difficult to judge what the value of the Hang Seng Index should be. There is no commonly agreed economic theory that would provide an answer to this question. In the absence of any better information, past prices are likely to be important determinants of prices today. Therefore, the anchor is the most recently remembered price. So, anchoring refers to the decision-making process in which quantitative assessments are required and where these assessments may be influenced by suggestions. People have in their minds some reference points (anchors), for example of previous price. When they get new information they adjust this past

reference insufficiently (under-reaction) to the new information acquired. Anchoring describes how individuals tend to focus on recent behaviour and give less weight to more prolonged trends.

H3: A significant correlation exists between the opinion of small investors on whether the derivatives markets will recover if there is an economic downturn and their opinion on the market value today.

Data and Method

The data for the present study were collected from small investors in Hong Kong through a survey questionnaire. The main purpose of the questionnaire study is to collect the opinions of small investors and to analyse their investment behaviour and financial decision-making patterns in derivatives markets. The questionnaire was designed to elicit information about demographics, investment experience and behaviour, and factors affecting the financial decision-making of the respondents. The first part of the questionnaire focused on investment experience, perceptions about the investment conditions and factors that affect financial decision-making. The second part collected respondents' personal particulars, including gender, age, education level, employment status and average monthly income. The survey was conducted during the period of January 21 to March 21, 2014. Since the majority of Hong Kong's population is Chinese, the questionnaire was written in Chinese. After a pilot test on ten respondents, some amendments (such as the rewording of some questions to eliminate ambiguities) were made before the questionnaire was finalized. Since some respondents did not reply to all the questions in the questionnaire, only the number of replies were used to calculate the total number and the percentage of the total for the individual entries (i.e., the questions that respondents did not answer were not counted).

We selected the respondents using the snowball sampling method. A group of undergraduate students helped to distribute the questionnaires to the respondents. The target population was small investors in the Hong Kong derivatives markets. We distributed 1,200 questionnaires to our students. A total of 1,130 respondents (a response rate of 94 percent) filled in and returned the questionnaires.

The profile of the respondents is reported in Table 1, which shows that 64 percent were male and 36 percent were female. The majority of them were under the age of 55 (94 percent). As for the education level, the majority of the respondents had undergone tertiary education (57.8 percent). Regarding their employment status, 73 percent of the respondents were employees, 15.8 percent were self-employed, 5.3 percent were retired and 5.9 percent were classified as "others", which included housewives and students. Finally, the respondents' median income was HKD 16,363.84. The results indicate that 24 percent of the respondents traded warrants most frequently. The second most frequently traded derivatives product was stock options, favoured by 23 percent of the respondents; the third most frequently traded product was Hang Seng Index futures, preferred by 19.3 percent of the respondents; the fourth most frequently traded was callable bull/ bear contracts, favoured by 17.6 percent of the respondents; the fifth most frequently traded product was Hang Seng Index options, preferred by 12.3 percent of the respondents; and the least frequently traded product was Renminbi non-deliverable forwards, favoured by only 3.7 percent of the respondents.

In view of the above demographic profile of the respondents, we believe that the respondents are representative of small investors in the Hong Kong financial derivatives markets. We estimated the correlation of the individual's responses to different items in the questionnaire to test the hypotheses H1 to H3 using Cramer's V and Chi-square (χ^2) test.

Table 1
Demographic Characteristics of the Respondents

Personal characteristics	Number	% of total
<i>Gender:</i>		
Male	709	64
Female	398	36
<i>Age group:</i>		
18-24 years old	213	18.9
25-34 years old	329	29.1
35-44 years old	281	24.9
45-54 years old	238	21.1
55-64 years old	55	4.9
65 years old or above	13	1.2
<i>Education level:</i>		
No school	14	1.2
Primary school	46	4.1
Secondary school	417	36.9
Tertiary education	652	57.8
<i>Employment status:</i>		
Employee	816	73.0
Self-employed	177	15.8
Retired	59	5.3
Others	66	5.9
<i>Average monthly income:</i>		
Below HK\$5,000	79	7.1
HK\$5,000 - HK\$9,999	80	7.2
HK\$10,000 - HK\$14,999	221	19.9
HK\$15,000 - HK\$19,999	265	23.9
HK\$20,000 - HK\$24,999	169	15.2
HK\$25,000 - HK\$29,999	141	12.7
HK\$30,000 - HK\$49,999	113	10.2
HK\$50,000 or above	43	3.9
<i>Which type of financial derivatives do you invest in most frequently?</i>		
Warrants	249	24.0
Hang Seng Index Futures	200	19.3
Stock Options	239	23.0
Hang Seng Index Options	128	12.3
Callable Bull/ Bear Contracts	183	17.6
Renminbi Non-Deliverable Forwards Contracts	38	3.7

Table 2
Responses to Various Items

Items and responses	Number	% of total
<i>1. Over what period have you invested in the financial markets?</i>		
Never invested	55	4.9
Less than 1 year	212	18.8
1 year to under 3 years	258	22.9
3 years to under 5 years	266	23.6
5 years to under 10 years	185	16.4
10 years or above	152	13.5
<i>2. What is your average return on investment in derivatives products?</i>		
Loss	149	14.3
Average return less than 10%	340	32.7
Average return 10% to under 30%	322	31.0
Average return 30% to under 50%	165	15.9
Average return 50% to under 100%	51	4.9
Average return 100% or above	12	1.2
<i>3. Did the European sovereign debt crisis in recent years affect your desire to invest in financial derivatives?</i>		
Yes	758	74.3
No	262	25.7
<i>4. As a percentage of the total amount in your investment portfolio, how much do you invest in derivatives products?</i>		
Less than 10%	267	25.7
10% to under 30%	416	40.1
30% to under 50%	261	25.1
50% to under 100%	78	7.5
100%	16	1.5
<i>5. If there was a significant downturn (i.e., the Hang Seng index had lost one-third of its market value as compared to its peak in the previous year) in the financial derivatives markets today, do you agree that the financial derivatives markets will return to their former level within a few years?</i>		
Strongly agree	64	6.2
Somewhat agree	328	31.6
Neutral	526	52.7
Somewhat disagree	84	8.1
Strongly disagree	15	1.4
<i>6. If you look at the trading volume of financial derivatives markets today, in your opinion, is it:</i>		
Over-traded by _____%	115	11.1
Under-traded by _____%	87	8.4
Traded at a fundamentally correct level	399	38.6
Cannot say	432	41.8

Results

The distribution of the respondents' answers to various question items in the questionnaire is shown in Table 2. The items were designed 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. The statistical results of the Cramer's V statistics with their corresponding significance levels are reported in Table 3.

Table 3
Statistical Results

Hypotheses	Cramer's V Value	P values
Hypothesis 1 (correlation of responses to items 1 and 2)	0.130	0.000
Hypothesis 2 (correlation of responses to items 3 and 4)	0.219	0.000
Hypothesis 3 (correlation of responses to items 5 and 6)	0.155	0.000

H1 is tested by comparing the responses to item 1 and item 2. It specifies the correlation between the investment experience of small investors and their average returns on their financial derivatives investments. The existence of such a correlation implies that Shefrin and Statman's (1985) disposition effect may exist among the less experienced small investors. The result indicates that the Cramer's value is 0.130, and the correlation is significant at the 0.01 level. Given this finding, H1 is supported.

Also, H2 is tested by comparing the responses to item 3 and item 4. Item 4 concerns the weight allocated to financial derivatives within the respondents' investment portfolios. H2 is backed by the mental accounting theory. Small investors who tended to be affected by the recent European sovereign debt crisis might be concerned about risk control. Rather than combining risky and riskless assets into an overall portfolio for portfolio management, small investors may however attempt to adjust the investment risk level by simply allocating the risky and riskless assets into two mental accounts, that is, more on riskless portfolios and less on risky ones. According to the data from the questionnaires, 74.3 percent of the respondents were influenced by the European sovereign debt crisis; 65.8 percent of the respondents revealed that they allocated less than 30 percent of the total investment portfolio to derivatives products. The Cramer's value is 0.219, with a 1 percent significance level. In other words, there is a significant correlation between the responses to item 3 and item 4, and thus H2 is supported.

H3 is tested by comparing the respondents' answers to item 5 and item 6. The comparison was used to determine whether there was a correlation between over-confidence and over-optimism on one hand, and anchoring on the other hand. A small investor who considers the derivatives markets to be under-traded today is likely to believe that the derivatives markets will recover in a few years to levels that prevailed during the buoyant stock market. This belief is expected to be related to his or her opinion regarding the value of the derivatives today. H3 is supported, as the Cramer's V value is 0.155 with a 1 percent significance level.

Conclusion

The primary objective of this research study was to discover the profile and attitudes of small investors towards financial derivatives in Hong Kong and their investing patterns for different financial derivatives. Based on several key concepts in behavioural finance, including the disposition effect, mental accounting and anchoring, we proposed three hypotheses to be tested with a data set of a survey questionnaire collected from 1,130 small investors in Hong Kong. Several findings emerged from the study. Firstly, we explored the trading patterns and performance of the small derivatives investors. We found that small investors traded mostly warrants (24 percent) and stock options (23 percent). Small investors have more experience in warrant markets. These warrants are attractive investment vehicles 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. The Cramer's V statistics indicated a significant correlation between the investment experience of small investors and their average returns from derivatives investments. Small investors who have more trading experience may have a lower disposition effect because they have a better understanding of the market and are more aware of such a tendency, and hence they are more likely to correct it. Therefore, highly experienced small investors would suffer a smaller amount of loss from their derivatives investments compared with the less experienced ones.

Secondly, we observed that the European sovereign debt crisis affected the desire to invest in financial derivatives of 74.3 percent of the small investors in the study. As a result, most of them took a put position on derivatives, with a small proportion in their portfolio; 40.1 percent of them took a put position on 10 percent to less than 30 percent of derivatives investments in their portfolios. We found a significant correlation between small investors having a smaller proportion of their investment portfolio in financial derivatives and the European sovereign debt crisis in recent years, which apparently affected their desire to invest in financial derivatives. This may be explained by the high sensibility to loss during the European sovereign debt crisis which meant that they allocated risky and riskless assets to two separate mental accounts.

Finally, we found a significant correlation between the opinion of small investors on whether the derivatives markets would recover in the event of an economic downturn and their opinion on the value of the derivatives today. This finding suggests that small investors have some reference points (i.e., anchors) in mind when they make their investments in the derivatives markets. For example, a small investor who believes the derivatives markets are under-traded in volume today may plausibly think that the derivatives markets will recover in a few years to levels that prevailed during the time of buoyant derivatives markets.

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