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The Dilemma of Investment Decision for Small Investors in the Hong Kong Stock Market

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Abstract

This paper examines the dilemma of investment decision for small investors in the Hong Kong stock market. The survey was conducted between October and November 2008. The data were collected from 1,199 respondents via a questionnaire survey. The objective of this study is to examine the key factors (determinants) and the dilemma of investment decision that affect Hong Kong small investors. This paper addresses the determinants of possible ways to measure the level of investment decision.

Keyword: Behavioural Finance, Small Investors, Stock Market, Hong Kong

Introduction

The financial markets are becoming more and more volatile at the presence of more heterogeneous groups of investors-informed, uninformed, large in size, small in size etc. Even in some advanced economies such as Hong Kong, the stock market has experienced wild fluctuation over the past decade. There are institutional investors, retail investors, small investors who put their money in the stock market. One important type is the large group of small investors. Small investors' investment decision is different from fund managers' and institutional investors' investment decision. With the ever increasing ranks of small investors in the participation of stock market, financial advisers ignore this tremendous client base at their own peril (Malhotra & Crum, 2010). Small investors want equal access to information and equal consideration. The objective of this study is to examine the key factors (determinants) and the dilemma of investment decision that affect Hong Kong small investors. For some small investors, they are easy-to-make investment decisions, but for other small investors, they are easy-to-make no investment decisions. The dilemma of investment decision is a problem offering two possibilities neither easy make investment decision nor easy make no investment decision. It means that a problem offers two possibilities neither of which is practically acceptable. Some determinants should play some role in the investment decision of the small investors. But how big or small this role should be, and how to measure the level of the investment decision? After a careful review of literature on investment decision, we found that a number of journal articles were written examining investment decision, but unfortunately, there is dearth of scholarly studies on dilemma of investment decision in regard to Hong Kong. This study aims to fill the literature gap.

The snowball method was adopted to select target small investors aged 18 or above in Hong Kong. Our students had different channels to contact with their friends; the first respondent referred a friend. The friend also referred a friend, etc. Students were also through their families' networks to contact with their family members' friends and colleagues. This sampling technique is often used in hidden populations which are difficult for us to access; snowball sampling uses a small pool of initial informants to nominate, through our students' networks, other participants who meet the eligibility criteria and could potentially contribute to this study. The term "snowball sampling" reflects an analogy to a snowball increasing in size as it rolls downhill (Morgan, 2008). The survey's observation period covers the Chinese government "through train" programme and sub-prime mortgage

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crisis of 2006-2008. The personal survey was conducted between October and November 2008. We conducted the survey from three classes of finance courses in Hong Kong Shue Yan University. There were about 40 students in each class. We distributed 1,200 questionnaires to our students. There were 1,199 selected respondents who completed and returned the questionnaires and this represents a response rate of 99.92 percent. We took an existing questionnaire developed by Johnsson *et al.* (2002) in Lund University, Sweden, and modified it for this study. Details of the survey and of the results are reported in two papers (Hon, 2011; 2012).

This paper is organised as follows. Section 2 reviews the related literatures. Section 3 explains the methods and data. Section 4 reports the results, and the last section contains the conclusion.

Literature Review

According to the Prospect Theory of Tversky & Kahneman (1974), the decisions made by decision-makers differ from the presumptions of economists, which they proved with the help of various experiments. Kahneman & Tversky (1979) illustrated that the investors usually try to avoid taking risk when they are gaining, however they might choose to take risk when they are with losing stocks. Previous studies revealed that interpersonal influence (Hoffmann & Broekhuizen, 2009), knowledge (Wang, 2009), and some other personal factors such as gender and personality traits (Durand *et al*., 2008) were crucial in explaining investor behaviour. However, it is important to explore the psychological processes (such as perception, attitudes, learning, and motivation) that affect an individual's decisions regarding an investment. For example, an investor's gender and educational level (i.e., individual factors) may affect his or her knowledge and orientation in investment, which then influence the risk perception, and finally his or her investment behaviour. Nihar & Narayan (2012) study conducted after the economic crisis attempts to understand preferred investment avenues for mutual funds and identify the significant factor using factor analysis. The factors identified in the study are preferred product features, portfolio of fund, credibility factor, regulatory body and investors' perceptions. Black (2012) revealed that there is an important implication of determining the underlying factor risks borne by their underlying hedge fund. Investors who understand the factors risks of their hedge fund portfolio will be better equipped to calculate the factor exposure at the total portfolio level, including both hedge funds as well as traditional stock and bond investment.

Methods and Data

Factor analysis is employed to identify the key factors (determinants) that affect the investment decisions of small investors on stock market in Hong Kong. Most scholars will agree that the pure investment decision and no investment decision are absolutely opposite to each other in terms of key factors. Let us create ranking order of determinants that are common for all investment decisions: reaction to announcements, personal background, monitor investment and reference group. But why are they so different? Rotated principal component loadings, scree test, Kaiser-Meyer-Olkin (KMO) and Bartlett's test, reliability test are used to examine possible differences in the perceived importance of the key factors. This ranking is different for every small investor. As a result, each small investor has used some key factors from the literature as potential determinants of the investment decision. We can say even more; in the case of pure investment decision and no investment decision these rankings are exactly opposite as we will show here. The dilemma for investment decision is popular for small investors. So, for some small investors, they are easy-to-make investment decision, but for other small investors, they are easy-to-make no investment decision. Can these differences be measured? Let try to do that using the idea of ranking correlation developed by the British mathematician Kendall (1955) to measure these differences as differences between determinants ranking orders. In order to compare two ordered sets (on the same set of objects); the approach of Kendall is to count the number of different pairs between the two ordered sets. The number that gives a distance between these sets is called the "symmetric difference distance" (the symmetric difference is a set operation which associates with two sets of elements that belong to only one set).

$$\tau = 1 - \frac{\mathbf{2 \times [d_{\Delta}(\mathscr{P}_1, \mathscr{P}_2)]}}{N\,(N-1)}$$

The symmetric difference distance between two sets of ordered pairs $\mathscr{P}_1$ and

$\mathscr{P}_2$ is denoted $_{\Delta}(\mathscr{P}_1, \mathscr{P}_2)$. **N** is number of ranked elements (i.e. determinants), in our case N = 4. With N = 4 elements we assume arbitrarily that first order is equal to 1234. Therefore, with two rank orders provided on N determinants, there are N! (i.e. N! = 4! = 4 x 3 x 2 x 1 = 24) different possible outcomes (each corresponding to a given possible order) to consider for computing the sampling distribution of τ . Kendall coefficient can have values between -1 and +1: $-1 \leq \tau \leq +1$ where -1 is the largest possible distance (equal to -1, obtained when one order is the exact reverse of the other order) and +1 is the smallest one (equal to +1, obtained when both orders are identical). The Kendall coefficient τ can be interpreted as the difference between the probability to have determinants in the same order and the probability that they are in the different order:

τ = P (same) – P (different).

Let us use the Kendal coefficient between two ordered sets for selected three small investors: B, F and X.

Results

Demographics are often used to profile conventional investors for marketing financial products. A number of characteristics appear to be common, for example, share ownership tends to be higher among men than women, and tends to increase with age, income, and educational attainment (ASX, 2005; ICI, 2005). The profile of the respondents is reported in Table 1. The majority of the respondents were under the age of 50 (85.6%), and only 14.4% were aged 51 or above. The median income was $11,660. 37.4% of the respondents monitored their investments with a short-term investment horizon the same today compared with the period before the market decline at the end of October 2007. Also, 47.2% of the respondents monitored their investments with a long-term investment horizon the same today compared with the period before the market decline at the end of October 2007.These groups may have superiority in strategy formulation in decision making than those who responded "Yes". These groups of small investors were overconfident. During the increases in equity prices from January 2006 up to the end of October 2007, 28% of the respondents at any point in time thought that they could forecast the future market development. This group of small investors were also overconfident. However, 40.9% of the respondents at any point in time thought that they could not forecast the future market development. This group of small investors were rational. 38.4% of the respondents thought that the market had, in general, performed poorly and made their investments less successful. In view of the above demographic profile of the respondents, we believe that they are representative of small investors in Hong Kong.

Table 1: Results of Small Investors' Behaviour in the Hong Kong Stock Market

	Items	*No.*	*% of total*
1.	When making investment decisions *today*, which of the following factors do you consider most important when making investments? Choose one alternative:		
	Information from the company as a basis for a fundamental analysis.	303	25.3
	Recommendations, advice and forecasts from professional investors.	221	18.4
	The overall past performance of the market seen from a historical perspective.	301	25.1
	Information from newspapers / TV.	113	9.4
	Information from the Internet.	47	3.9
	Discussion with personal friends.	85	7.1
	Information from colleagues at work.	30	2.5
	Own intuition of future performance.	99	8.3
2.	When you made investment decisions *during* the period from January 2006 to the end of October 2007, which of the following factors did you consider most important when making decision. Choose one alternative:		
	Information from the company as a basis for a fundamental analysis.	242	20.2
	Recommendations, advice and forecasts from professional investors.	265	22.1
	The overall past performance of the market seen from a historical perspective.	287	23.9
	Information from newspapers / TV.	125	10.4
	Information from the Internet.	58	4.8
	Discussion with personal friends.	89	7.4
	Information from colleagues at work.	38	3.2
	Own intuition of future performance.	95	7.9
3.	Do you monitor your investments with a short-term investment horizon more often today compared with the period before the market decline at the end of October 2007. Choose one alternative:		
	Yes	413	34.4
	No	222	18.5
	The same	448	37.4
	Cannot say	116	9.7

	Items	*No.*	*% of total*
4.	Do you monitor your investments with a long-term investment horizon more often today compared with period before the market decline at the end of October 2007. Choose one alternative:		
	Yes	383	31.9
	No	152	12.7
	The same	566	47.2
	Cannot say	96	8.0
5.	Please choose your relevant age group:		
	18 - 25 years old	397	33.1
	26 – 35 years old	297	24.8
	36 – 50 years old	332	27.7
	51 – 65 years old	148	12.3
	over 65 years old	25	2.1
6.	Your average monthly income (including salaries, interest, rent and other earnings):		
	Below HK$5,000	265	22.1
	HK$5,000 -HK$9,999	226	18.8
	HK$10,000 - HK$14,999	268	22.4
	HK$15,000 - HK$19,999	193	16.1
	HK$20,000 - HK$24,999	117	9.8
	HK$25,000 - HK$29,999	46	3.8
	HK$30,000 - HK$49,999	52	4.3
	HK$50,000 or above	32	2.7
7.	During the increases in equity prices from January 2006 up to the end of October 2007, did you at any point in time think that you could forecast the future market development?		
	Yes	336	28.0
	No	490	40.9
	Cannot say	369	30.8
8.	During the increases in equity prices from January 2006 up to the end of October 2007, how did you react to announcements and other information from companies? Choose one alternative:		
	I made changes in my portfolio after the first news announcements	182	15.2
	I made changes in my portfolio after a number of consequent news announcements that pointed into the same direction	465	38.8
	I was not concerned about news announcements	393	32.2
	I cannot say	158	13.2
9.	What do you think was the most important contributing factor to the *decline* in the market from the end of October 2007 up until today? Choose one alternative:		
	The news stories in the media.	120	10.0
	The forecasts of analysts.	95	7.9
	Loss of confidence among investors in the stock market.	391	32.6
	Earnings and profitability of the listed companies.	214	17.8
	Herd behaviour, i.e. small investors following the majority.	294	24.5
10.	According to you, what is generally the reason for your less successful investments? Choose one alternative:		
	Incorrect recommendations or advice from broker /analyst/ banker etc.	151	12.6
	Incorrect recommendations or advice from other sources	161	13.4
	The market has, in general, performed poorly	460	38.4
	Own errors	404	33.7
	Others (please specify):_____	22	1.8

Table 2 shows the combined cross tabulation results of item 3 and item 5 which states that 34.1% of the respondents under the age of 50 think that they monitor their investments with a short-term horizon more often today compared with the period before the market decline at the end of October 2007; whereas 36.4% of the respondents aged 51 or above think that they monitor their investments with a short-term horizon more often today compared with the period before the market decline at the end of October 2007. Comparing with those respondents under the age of 50, it is observed that a slightly higher percentage (+2.3%) of the respondents aged 51 or above think that they monitor their investments with short-term investment horizon more often today.

Table 3 shows the combined cross tabulation results of item 4 and item 5 which states that 31.3% of the respondents under the age of 50 think that they monitor their investments with a long-term horizon more often today compared with the period before the market decline at the end of October 2007; whereas 36.0% of the respondents aged 51 or above think that they monitor their investments with a long-term horizon more often today compared with the period before the market decline at the end of October 2007. Comparing with those respondents under the age of 50, it is observed that a slightly higher percentage (+ 4.7%) of the respondents aged 51 or above think that they monitor their investments with a long-term investment horizon more often today.

Table 2: Short-Term Investment versus Age Group Cross Tabulation

	Short-term investment	Yes (%)	No (%)	The same (%)	Cannot say (%)	Total (%)
Age Group	Under the age of 50	34.1	19.5	36.9	9.5	100
	Aged 51 or above	36.4	12.7	39.9	11.0	100

Table 3: Long-Term Investment versus Age Group Cross Tabulation

	Long-term investment	Yes (%)	No (%)	The same (%)	Cannot say (%)	Total (%)
Age Group	Under the age of 50	31.3	13.1	47.8	7.8	100
	Aged 51 or above	36.0	10.5	44.2	9.3	100

Table 4: Descriptive Statistics

Item	Item name	Mean	Std. Deviation	T	Df	Sig. (two-tailed)
1	Reference group affects investment decision today	3.2085	2.12346	52.320	1198	0.000
2	Reference group affected past investment decision	3.3219	2.09334	54.949	1198	0.000
3	Monitor short-term investments	2.2227	1.02780	74.882	1198	0.000
4	Monitor long-term investments	2.3133	1.00813	79.389	1196	0.000
5	Age	2.2552	1.10693	70.547	1198	0.000
6	Personal income	3.1476	1.81968	59.896	1198	0.000
7	Forecasting the future market development	2.0276	0.76791	91.276	1194	0.000
8	Announcements from companies	2.4399	0.90260	93.564	1197	0.000
9	Factor for bear market	3.4192	1.26079	90.516	1113	0.000
10	Reason for investment failure	2.9875	1.02468	100.913	1197	0.000

The importance of the influence of various items on the behaviour of small investors when they invested in stock market is presented in Table 4. All the items are statistically significant with high mean values.

The correlation analysis is employed to obtain a correlation matrix based on ten items for each dimension, which is then used as an input of the factor analysis (see Table 5).

Extraction method: principal component analysis, Rotation method: Varimax with Kaiser Normalisation,

Kaiser-Meyer-Olkin (KMO) index: 0.546, Bartlett's test of Sphericity: $\rho<0.000$.

Item name (see also Table 4): 1.Reference group affects investment decision today; 2. Reference group affected past investment decision; 3. Monitor short-term investments; 4. Monitor long-term investments; 5. Age; 6. Personal income; 7. Forecasting the future market development; 8. Announcements from companies; 9. Factor for bear market; 10. Reason for investment failure.

The unidimensionality is the extent to which the items are strongly associated with each other, and represent a single factor, which is a necessary condition for Bartlett test of Sphericity ($\rho < 0.000$) and the Kaiser-Meyer-Olkin (KMO). KMO measure of sampling adequacy index (with a value of 0.546) confirmed the appropriateness of the data for exploratory factor analysis.

The communality measures the percent of variance in a given variable explained by all the factors jointly and may be interpreted as the reliability of the indicator. Hence, the higher the communality, the more the common factors can explain the variance of the standardised variable. As shown in Table 6, Factors (Components) 1, 2, 3, 4 and 5 had communality above 0.7 (0.813, 0.811, 0.716, 0.704 and 0.720 respectively). The eigenvalue for a given factor measures the variance in all the variables which is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances

Table 5: Factor Correlation Matrix

Item	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	1.000									
2	0.615**	1.000								
3	0.067*	0.035	1.000							
4	0.045	0.045	0.444**	1.000						
5	0.062*	0.057*	-0.014	-0.047	1.000					
6	-0.043	-0.020	-0.060*	-0.036	0.315**	1.000				
7	-0.002	0.022	0.104**	0.081**	0.002	-0.089**	1.000			
8	0.120**	0.092**	0.257**	0.195**	-0.023	-0.085**	0.206**	1.000		
9	-0.009	0.012	-0.025	0.049	-0.031	0.049	0.023	-0.020	1.000	
10	0.032	0.054*	0.055*	0.087**	-0.066*	0.058*	0.071**	0.059*	0.021	1.000

*Notes: *Correlation is significant at the 0.05 level (one-tailed) and **Correlation is significant at the 0.01 level (one-tailed)*

Table 6: Principal Component Analysis

Item	*Item name*	*Communality*	*Factor (Component)*	*Eigenvalue*	*Percent of variance*	*Cumulative percent*
1	Reference group affects investment decision today	0.813	1	1.877	18.768	18.768
2	Reference group affected past investment decision	0.811	2	1.545	15.451	34.219
3	Monitor short-term investments	0.716	3	1.268	12.678	46.897
4	Monitor long-term investments	0.704	4	1.052	10.520	57.417
5	Age	0.720	5	1.013	10.130	67.547
6	Personal income	0.700				
7	Forecasting the future market development	0.786				
8	Announcements from companies	0.513				
9	Factor for bear market	0.534				
10	Reason for investment failure	0.459				

in the variables and may be ignored as redundant with more important factors. Eigenvalues measure the amount of variation in the total sample accounted for by each factor. Factors1, 2, 3, 4 and 5 had eigenvalues above 1.000 (1.877, 1.545, 1.268, 1.052 and 1.013 respectively). The five factors, collectively, accounted for a satisfactory 67.547% of the variance. The following scree plot graphically displays the eigenvalues for each factor and suggests that there are five factors. Fig. 1 demonstrates that a five-factor (component) solution was obtained.

Complex variables may have loadings on more than one factor, and they make interpretation of the output difficult. Rotation may therefore be necessary. Varimax rotation is most frequently chosen. Ordinarily, rotation reduces the number of complex variables and improves interpretation (see Table 7).

Fig. 1: A Scree Plot

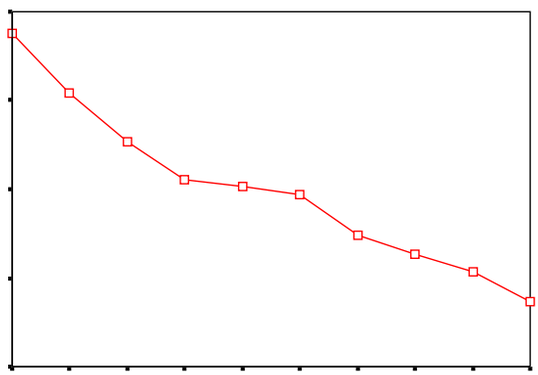

Table 7: Varimax-Rotated Principal Component Loadings

	Factor						
Item	*A*	*B*	*C*	*D*	*E*	*Item name*	*Factor*
1	0.900					Reference group affects investment decision today	A
2	0.898					Reference group affected past investment decision	A
3		0.836				Monitor short-term investments	B
4		0.828				Monitor long-term investments	B
5			0.817			Age	C
6			0.799			Personal income	C
7				0.877		Forecasting the future market development	D
8				0.594		Announcements from companies	D
9					0.722	Factor for bear market	E
10					0.651	Reason for investment failure	E

Factor names are A: reference group; B: monitor investments; C: personal background; D: reaction to announcements; E: cognitive style.

The cumulative factors revealed that the first factor accounts for 18.768% of the variance. The second factor accounts for 34.219% of the variance. The third factor accounts for 46.897% of the variance. The fourth factor accounts for 57.417% of the variance. Finally, the fifth factor accounts for 67.547% of the variance. There were no negative loadings of any consequence on factor A, factor B, factor C, factor D or factor E after the rotation. We found five factors affecting the behaviour of small investors in the Hong Kong stock market, as follows: factor A might be interpreted as reference group which comprises commentators' recommendations from

Table 8: Internal Consistency and Related Decisions of First Structure

Factors and items	*Item-total correlation*	*α value*	*Decision*
Factor A (Reference Group)			
Reference group affects investment decision today	0.6155	0.7619	Retained
Reference group affected past investment decision	0.6155		
Factor B (Monitor Investments)			
Monitor short-term investments	0.4436	0.6145	Retained
Monitor long-term investments	0.4436		
Factor C (Personal Background)			
Age	0.3149	0.4370	Eliminated
Personal income	0.3149		
Factor D (Reaction to announcements)			
Forecasting the future market development	0.2060	0.3380	Eliminated
Announcements from companies	0.2060		
Factor E (Cognitive Style)			
Factor for bear market	0.0214	0.0410	Eliminated
Reason for investment failure	0.0214		

Table 9: Internal Consistency of Final Revised Structure

Factors and items	*Number of items*	*Item-total correlation*	*α value*
Factor A (Reference Group)			
Reference group affects investment decision today	2	0.6155	0.7619
Reference group affected past investment decision		0.6155	
Factor B (Monitor Investments)			
Monitor short-term investments	2	0.4436	0.6145
Monitor long-term investments		0.4436	
Factor C (Personal Background)			
Age	2	0.3149	0.4370
Personal income		0.3149	
Factor D (Reaction to Announcement)			
Forecasting the future market development	2	0.2060	0.3380
Announcements from companies		0.2060	
Factor E (Cognitive Style)			
Factor for bear market	2	0.0214	0.0410
Reason for investment failure		0.0214	

newspapers/TV/magazines, relatives/friends, the Internet, investment consultants, and companies' annual reports; factor B as monitor investments which comprise the monitor short-term and long-term investments; factor C as personal background which comprises age, personal income; factor D as reaction to announcements which comprise announcements and other information from companies, forecasting the future market development, and factor E as cognitive style which comprises factor for bear market and reason for investment failure.

A final step would be to determine Cronbach's alpha coefficient of internal consistency to ensure that the items comprising the factors produce a reliable scale. The reliability test is reported in Table 8. This was undertaken to further reduce the number of factors. The internal reliability of the first structure was tested and the decision results provide evidence as to the weakness of the structure since two factors (factor A and B) exceeded the adopted criteria. The cut-off value adopted was 0.5 and the acceptable level of item-to-total correlation was set above 0.3 (Nunnally, 1978). It was found that factor A contains two items and relates to "reference group". Factor B is made up of two items and refers to "monitor investments". An examination of the factors comprising the attitudes to help-seeking scale indicates that factors C, D and E have the lowest corrected item-total correlations. If these three factors were removed from the scale, the alpha if item deleted column shows that overall reliability would increase slightly (see Table 9).

Based on these results, we deleted the weakest factor (factor E: cognitive style) in our analysis. So, we can derive the following ascending order of importance:

1. Factor D: Reaction to announcements (Announcements)
2. Factor C: Personal background (Background)
3. Factor B: Monitor investments (Investments)
4. Factor A: Reference group (Group)

Let create ranking orders of the four determinants that are common for all investment decision and respectively for all small investors. To get the determinants ranking orders for each small investor, we should follow ascending order of importance.

The determinants order the pure investment decision: [Announcements, Background, Investments, Group] with the following ranking: $\mathscr{R}_1$ = [1, 2, 3, 4,].

This ranking is different for every small investor. As an illustration, Table 10 shows the entire N! = 4 x 3 x 2 x1= 24 possible rank orders for a set of N = 4 determinants along with its value of τ with the "canonical order" (i.e., 1234). As a result, each small investor has different level of investment decision. Let us find the Kendall rank

Table 10: The Set All Possible Rank Orders for N=4, Along with Their Correlation with the "Canonical" Order 1234.

	Rank Orders											
	1	2	3	4	5	6	7	8	9	10	11	12
Small investor	A	B	C	D	E	F	G	H	I	J	K	L
	1	1	1	1	1	1	2	2	2	2	2	2
	2	2	3	3	4	4	1	1	3	3	4	4
	3	4	2	4	2	3	3	4	1	4	1	3
	4	3	4	2	3	2	4	3	4	1	3	1
t	1	0.67	0.67	0.33	0.33	0	0.67	0.33	0.33	0	0	-0.33

	Rank Orders											
	13	14	15	16	17	18	19	20	21	22	23	24
Small investor	M	N	O	P	Q	R	S	T	U	V	W	X
	3	3	3	3	3	3	4	4	4	4	4	4
	1	1	2	2	4	4	1	1	2	2	3	3
	2	4	1	4	1	2	2	3	1	3	1	2
	4	2	4	1	2	1	3	2	3	1	2	1
t	0.33	0	0	-0.33	-0.33	-0.67	0	-0.33	-0.33	-0.67	-0.67	-1

correlation coefficients for small investor using initially the pure investment decision ranking order as the standard, and later we will do the same using the no investment decision ranking order as the standard.

Choice of small investors: B, F, X

Small investor B: [Announcements, Background, Group, Investments]

with the ranking: $\mathscr{R}_2$ = [1, 2, 4, 3].

We are comparing two ordered sets. We should look at the number of different pairs between two sets which allow us to get to something which is called the "symmetric difference distance" between these two sets.

$$\tau = 1 - \frac{\mathbf{2 \times [d_{\Delta}(\mathscr{P}_1, \mathscr{P}_2)]}}{N\,(N-1)}$$

The symmetric difference distance between two sets of ordered pairs $\mathscr{P}_1$ and

$\mathscr{P}_2$ is denoted $\mathbf{d_{\Delta}(\mathscr{P}_1, \mathscr{P}_2)}$. **N** is number of ranked determinants, in our case N = 4. Kendall coefficient of correlation is obtained by normalizing the symmetric difference such that it will take values between -1 and +1 with -1corresponding to the largest possible distance (equal to -1, obtained when one order is the exact reverse of the other order) and +1 corresponding to the smallest possible distance (equal to +1, obtained when both orders are identical).

The Kendall coefficient of correlation of determinants ranking for the small investor B and the pure investment decision is 0.67:

$\mathscr{P}_1$ = {[1, 2], [1, 3], [1, 4], [2, 3], [2, 4], [3, 4]}.

$\mathscr{P}_2$ = {[1, 2], [1, 4], [1, 3], [2, 4], [2, 3], [4, 3]}.

The set of pairs which are in only one set of ordered pairs is {[3, 4], [4, 3]}. So, the value of $\mathbf{d_{\Delta}(\mathscr{P}_1, \mathscr{P}_2) = 2}$. That means that the value of the Kendall rank correlation coefficient between two orders of investment decision is:

$$\tau = 1 - \frac{2 \times 2}{4 \times 3} = 0.67$$

Small investor F: [Announcements, Group, Investments, Background]

with the ranking: $\mathscr{R}_3$ = [1, 4, 3, 2].

$\mathscr{P}_1$ = {[1, 2], [1, 3], [1, 4], [2, 3], [2, 4], [3, 4]}.

$\mathscr{P}_3$ = {[1, 4], [1, 3], [1, 2], [4, 3], [4, 2], [3, 2]}.

The set of pairs which are in only one set of ordered pairs is {[2, 3], [3, 2], [2, 4], [4, 2], [3, 4], [4, 3]}. So, the value of $\mathbf{d}_{\Delta}(\mathscr{P}_1, \mathscr{P}_3) = \mathbf{6}$. That means that the value of the Kendall rank correlation coefficient between two orders of determinants is:

$$\tau = 1 - \frac{2 \times 6}{4 \times 3} = 0$$

Small investor X: [Group, Investments, Background, Announcements]

with the ranking: $\mathscr{R}_4$ = [4, 3, 2, 1].

$\mathscr{P}_1$ ={[1, 2], [1, 3], [1, 4], [2, 3], [2, 4], [3, 4]}.

$\mathscr{P}_4$ ={[4, 3], [4, 2], [4, 1], [3, 2], [3, 1], [2, 1]}.

The set of pairs which are in only one set of ordered pairs is {[1, 2], [2, 1], [1, 3], [3, 1], [1, 4], [4, 1], [2, 3], [3, 2], [2, 4], [4, 2], [3, 4], [4, 3]}. So, the value of $\mathbf{d}_{\Delta}(\mathscr{P}_1, \mathscr{P}_4) = \mathbf{12}$. That means that the value of the Kendall rank correlation coefficient between two orders of determinants is:

$$\tau = 1 - \frac{2 \times 12}{4 \times 3} = -1$$

Because the determinants ranking order of the no investment decision is extremely opposite to the determinants ranking order of the pure investment decision. The Kendall rank correlation coefficient between them is $\tau = \mathbf{-1}$. Respectively for the above discussed small investors, the Kendall rank correlation coefficients with the no investment decision order would be: -0.67 for small investor B; +1 for small investor X, and 0 for small investor F. We can conclude that small investor B is the closest to the pure investment decision setting priority and small investor X is the farthest from the pure investment decision among them. Small investor F is a classic case of dilemma for investment decisions.

Conclusion

The objective of this study is to examine the key factors (determinants) and the dilemma of investment decision that affect Hong Kong small investors. Using factor analysis, we identify four key factors (determinants) that capture the investment decision of small investors in the stock market in Hong Kong. Their investment decision has uniform views as to the ascending order of importance of reaction to announcements, personal background, monitor investments and reference group. To get the determinants ranking orders for small investor in the pure investment decision, we should follow ascending order of importance. This ranking is different for every small investor. As a result, each small investor has different levels of investment decision. We have reported evidence from three small investors (B, F, X) that the determinants ranking order of the no investment decision is extremely opposite to the determinants ranking order of the pure investment decision. The Kendall rank correlation coefficient between them is $\tau = \mathbf{-1}$. Respectively for the above discussed small investors, the Kendall rank correlation coefficients with the no investment decision order would be: -0.67 for small investor B; +1 for small investor X and 0 for small investor F. We can conclude that small investor B is the closest to the pure investment decision setting priority and small investor X is the farthest from the pure investment decision among them. Small investor F is a classic case of dilemma for investment decision.

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