Decision-Making in the Hong Kong Bank Stock Market

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Abstract. This paper investigates the decision-making of small investors in the Hong Kong bank stock market.The objective of this study was to search the factors, investing characteristics, and decision-making processes that affect Hong Kong small investors who participate in the bank stock market.The results suggest that we can derive the following ascending order of importance: reference group, stock nature, returns performance and bank performance. Reference group is the least important factor and bank performance is the most important factor. We used Kendall rank correlation coefficients to measure the different ranking of factors and are therefore attempting to give advice for financial advisers approaching target customers in Hong Kong.

Keywords. Decision-making, Small investors, Bank stock markets, Hong Kong.

JEL. G02, G10, G11.

1. Introduction

On 10 April 2014, the Securities and Futures Commission of Hong Kong and China Securities Regulatory Commission made a Joint Announcement regarding the in-principle approval for development of the Pilot Program (Shanghai-Hong Kong Stock Connect) for the establishment of mutual stock market access between Mainland China and Hong Kong. Under Shanghai-Hong Kong Stock Connect, the Stock Exchange of Hong Kong Limited (SEHK) and Shanghai Stock Exchange (SSE) established mutual order-routing connectivity and related technical infrastructure (Trading Links) to enable investors of their respective market to trades listed on the other's market. While all Hong Kong and overseas investor swere allowed to trade SSE Securities through Shanghai-Hong Kong Stock Connect, only mainland institutional investors and those individual investors who satisfy the eligibility criteria (i.e. individual investors who hold an aggregate balance of not less than RMB500,000 in their securities and cash accounts)were accepted to trade SEHK Securities through Shanghai-Hong Kong Stock Connect. In the initial phase, Hong Kong and overseas investors would be able to trade certain stocks listed on the SSE market (i.e. SSE Securities). Through Shanghai-Hong Kong Stock Connect, Mainland investors would be able to trade the constituent stocks of the Hang Seng Composite LargeCap Index and Hang Seng Composite Mid Cap Index, and all H shares (H simply represents Hong Kong. It

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was purely practical, to distinguish the Hong Kong listings with the listings on the Mainland exchanges for the convenience of investors) that are not included as constituent stocks of the relevant indices but which have corresponding shares in the form of SSE-listed Shares (HKEx, 2014). Given the growing connection between the economics of China and Hong Kong, the economic policy of the Chinese government have significant impacts on the Hong Kong economy and stock markets. This in turn affects Hong Kong stock prices. The interesting question is why would a small investor bother to choose to invest in particular Hong Kong bank stock? The Hang Seng Index (HSI) in Hong Kong has four sub-indexes which are finance, utilities, properties, and commerce and industry, and there are 50 constituent stocks in the index. The finance sector has 12 constituent stocks including 8 bank stocks in it. They are HSBC, Hang Seng Bank, Bank of East Asia, China Construction Bank, Industrial and Commercial Bank of China, BOC Hong Kong, Bank of Communications and Bank of China. All of these banks reported that they used at least one derivative for hedging the risks (Hon, 2013). They reduced borrowing cost and protected group's earnings or cash flows. That may be the reason why these banks can stably pay dividends to shareholders and the reason why small investors to choose to invest in particular Hong Kong bank stock. Economists view the movement of capital between countries as fundamentally no different from movement between regions of a country (or between industries), because the capital is moved in response to the expectation of higher rate of return in the new location than it earned in the old location (Appleyard et al., 2010). Investors can potentially benefit a great deal from international diversification. The actual portfolios that investor hold however, are quite different from those predicted by the theory of international portfolio investment (Eun et al., 2012). Recently, various researchers, such as French & Poterba (1991), Cooper & Kaplanis (1994), Tesar & Werner (1993), Glassman & Riddick (1993), and Chan, Covrig, & Ng (2005), documented the extent to which portfolio investments are concentrated in domestic equities (home bias in portfolio holdings). Hong Kong investors can invest in any stock in the world. However, they typically invest individual stocks in Hong Kong. In 2012/13, overseas investors (individual/retail investors residing outside Hong Kong or institutional investors (investors who are not individual/retail investors) operating outside Hong Kong, with the source of funds overseas) contributed 46% to total market turnover (similar to their contribution in 2011/12) while local investors' (individual/retail investors residing in Hong Kong or institutional investors operating in Hong Kong, with Hong Kong as the source offunds)contribution remained at a record low level of 38% (similar to their contribution in 2011/12). Overseas investor trading came mainly from institutions (41% of total market turnover vs 5% from retail). Local investor trading also came more from institutions (20% of total marketturnover) than from retail investors (investors who trade on their personal account (18%)). Global investors (including small investors in Hong Kong) are concerning to make profit opportunity. The Shanghai-Hong Kong Stock Connect would be the channel for thisopportunity. Especially, the bank stocks of constituent stocks of the Hang Seng Composite Index would be the best choice for them. If any, which of the above bank stocks do they invest in most frequently?

The decision-making theory really has its roots in valuation theory (Lumby & Jones, 2011), because all the alternatives in any decision-making situation have to be valued in order to be compared. Therefore, although we can say that all types of decision-making involve the same fundamental process, each is given its own unique characteristics by the valuation base that it employs. Most scholars (Hirshleifer, 1958; 1961; Cantor & Lippman, 1995) agreed that when selecting amongst a set of investment projects, the decision-maker cannot act as if her

decision is made in isolation. The factors should play a role in the decision-making of the small investors. In this paper, we used Kendall rank correlation coefficients to measure the different ranking of factors for these bank stocks and are therefore attempting to give advice for financial advisers approaching target customers. The objective of this study was to search the factors, investing characteristics, and decision making processes that affect Hong Kong small investors who participate in bank stock market.

This paper is organized as follows. Section 2 reviews the related literature; Section 3 explains the methodology of the present study and the data; Section 4 reports the results; and section 5 provides the conclusion.

2. Literature Review

Cohen & Kudryavtsev (2012) found that with respect to decision about stocks, irrationality cannot be established. Investment in stocks was influenced by expectation, past experience in the capital market, and knowledge about the past performance of selected market indices. Understanding how people perceive the underlying risk of different financial instrument is the first step to understand how investment decisions are made, and to further help investors to avoid biases and make sensible decisions. Wang et. al. (2011) paper suggests that familiarity bias is common among private investors. Understanding investors' behavior will be useful in making decision about investments. Information on companies, the economic and financial environment, and technical analysis could be used to make better investment decisions (Fung et al., 2010). Women want the same attention, advice, terms, and deals that men get with advisors providing clear objective recommendations based on their goals and risk portfolios (Malhotra & Crum, 2010). Williams (2007) results show that investor characteristics as consumers and their general attitude toward the social aims of firms appear to influence their investment choices. Peterson (2002) draws on the psychology literature to show that anticipation of reward (price appreciation) generates a positive affect (emotion, mood, or attitude) that drives increased risk-taking behavior and buy trading. Then, following the anticipated event or news, there is a reduction in positive affect that produces more risk-averse behavior and drives sell trading. Lewellen et al. (1977) cover (1) basic portfolio objectives, (2) information collection and decision mechanics, (3) instrument selection and portfolio composition, (4) return perception and market attitudes. They regard these not only as the key behavioral dimensions but, in the hierarchy indicated, as a logical directional model of investment process.

3. Methodology and Data

Factor analysis is employed to identify the key factors that affect the decision-making of small investors in Hong Kongbank stock market. We create ranking order of factors that are common for all decision-making for bank stocks: reference group, stock nature, return performance and bank performance.Rotated principal component loadings, scree test, Kaiser-Meyer-Olkin (KMO) index, Bartlett's test of sphericity, reliability test are used to examine possible differences in the perceived importance of the key factors.This factor ranking is different for every small investor. We try to do that using the idea of ranking correlation developed by the British mathematician Kendall (1955) to measure these differences as differences between factors ranking orders. According to Abdi's paper (2007) in the "Encyclopedia of Measurement and Statistics" , when we are comparing two ordered sets we should look at the number of different pairs between the two sets which allow us to get something which is called the "symmetric difference

distance" between the two sets. The symmetric difference is a set operation which associates to two sets of factors that belong to only one set.

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

Where the symmetric difference of distance between two sets of ordered pairs P_1 and P_2 is presented as $d_\Delta(P_1, P_2)$. N is number of ranked factors, in our case N = 4. With N = 4 factors we assume arbitrarily that first order is equal to 1234. Therefore, with two rank orders provided on N factors, there are N! (i.e. N! = 4! = 4 x 3 x 2 x 1 = 24) different possible outcomes to consider for computing the sampling distribution of τ Kendall coefficient can have values between -1 and +1: $-1 \le \tau \le +1$ 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 factorsin the same order and the probability that they are in the different order. We use the Kendal coefficient between two ordered sets for selected three small investors: C, K and X. They represent different aspects of small investorsfor their decision-making.

The data for the present study were collected from small investors in Hong Kong via a questionnaire survey. Its main purpose is to investigate the decision-making of small investors in the Hong Kong bank stock market.The survey was conducted during September 23, 2013 to October 31, 2013. We distributed 1,150 questionnaires to our students and gave the similar topic for their research projects in their finance course. The students were eager to collect the data for their research.They got the marks for continues assessment for returning questionnaires. There were 1,054 selected respondents who completed and returned the questionnaires and this represents a response rate of 92%. The snowball method was adopted to select target small investors aged 18 or above in Hong Kong. Our students had different channel to contact with their friends, the first respondent referred a friend. The friend also referred a friend, etc. Student families' networks contacted with their family members' friends and colleagues. The first part of the questionnaire focused on the factors, investing characteristics, and decision making processes that affect Hong Kong small investors who participate in bank stock market. The second part collected respondents' demographic characteristics, including gender, age, education level, employment status, average monthly income, percentage of their average monthly income for stock investment, used the Internet or e-mail either at home or at work in the past six months, worked for a large for profit company with over 1,000 employees, family size and their favour investments.

4. Results

The profile of the respondents is reported in Table 1. Over half (56.2%) of respondents were male and the rest were female. The majority of the respondents were under the age of 54 (90.7%) only 9.3% were aged 55 or above. Regarding their education level, 26.4% had secondary school level, 27.2% had post-secondary level, and 37.9% had university or above level. Regarding their employment status, 60.9% of respondents were employee, 14.6% were self-employed, 5.9% were retired, and 18.7% were classified as "other", which includes housewives and students. The respondents' median income was HK $14,435.77 35% of the respondents answered the percentage of their average monthly income for stock investment. About 43.5% of the mused 10% or less for it. 87.3% of the respondents

used the Internet or e-mail either at home or at work in the past six month. 23.7% of respondents are working for a large for profit company with over 1,000 employees. 68.7% of respondents were 3-4 members in their family. The most frequent sector chosen by respondents for invest in the Hang Seng composite Index was finance (40.6%). HSBC was the most favorite bank stock; the results indicate that 27.0% of the respondents invested in it most frequently. The second frequently invested bank stock was China Construction Bank, with 15.0% of the respondents; the third frequently invested was Hang Seng Bank, with 14.2% of the respondents; the fourth frequently invested was BOC Hong Kong, with 11.9% of the respondents; the fifth frequently invested was Industrial and Commercial Bank of China, with 10.4% of the respondents; the least frequently invested was Bank of Communications only with 4.5% of the respondents. In view of the above demographic profile of the respondents, we believe that they are representative of small investors in Hong Kong bank stock market.

Table 1. *Demographic characteristics of the respondents*

Items and responses	No.	% of total
Gender:		
Female	457	43.8
Male	586	56.2
Age group:		
18- 24 years old	298	28.3
25 – 34 years old	254	24.1
35 – 44 years old	190	18.1
45 – 54 years old	212	20.2
55 – 64 years old	77	7.3
over 64 years old	21	2.0
Your education level is:		
Primary school	73	6.9
Secondary school	278	26.4
Post-secondary	286	27.2
University or above	399	37.9
others	17	1.6
Employment status:		
Employee	639	60.9
Self-employed	153	14.6
Retired	62	5.9
Others	196	18.7
Your average monthly income (including salaries, interest, rent and other earnings)		
Below HK$5,000	175	16.6
HK$5,000 -HK$9,999	171	16.2
HK$10,000 - HK$14,999	204	19.4
HK$15,000 - HK$19,999	224	21.3
HK$20,000 - HK$24,999	139	13.2
HK$25,000 - HK$29,999	68	6.5
HK$30,000 - HK$49,999	56	5.3
HK$50,000 or above	16	1.5
How many percentage of your average monthly income for stock investment?		
_____%	368	35.0
I don't know	683	65.0
Have you personally used the Internet or e-mail either at home or at work in the past six months?		
Yes	915	87.3
No	133	12.7
Do you or does someone in your household currently work for a large for-profit company with over 1,000 employees?		
Respondent does	249	23.7
Other household member does.	342	32.6
No	458	43.7
Items and responses	No.	% of total
How many members in your family (includes yourself)?		

1	41	3.9
2	110	10.5
3	338	32.1
4	385	36.6
5 or above	178	16.9
Which of the following sector do you invest most frequency?		
Finance	387	40.6
Utilities	219	23.0
Properties	199	20.9
Commerce & Industry	141	14.8
Others (Please specify)_____	7	0.7
Which of the following bank stock do you invest most frequency? (Choose one alternative)		
HSBC (Stock code: 0005)	258	27.0
Hang Seng Bank (stock code: 0011)	135	14.2
Bank of East Asia (stock code: 0023)	60	6.3
China Construction Bank (stock code: 0939)	143	15.0
Industrial and Commercial Bank of China (stock code: 1398)	99	10.4
BOC Hong Kong (stock code: 2388)	114	11.9
Bank of Communications (stock code: 3328)	43	4.5
Bank of China (stock code: 3988)	87	9.1
Others (Please specify)	15	1.6

Table 2 shows the distribution of respondents' answers to various question items in the questionnaire. The items were designed to reflect some important concepts in decision-making theory. Relative high in profit growth rate (32.1%) is the relative importance criteria in representing the bank development capability; relative high in profit margin on total asset (28.0%) is the relative importance criteria in representing the bank profitability; relative high in dividend yield (34.1%)is the relative importance criteria in representing the profitability to shareholders; relative low in non-performing loan ratio (33.2%) is the relative importance criteria in representing the bank stability and safety.

Table 2. *Responses to various items*

Items and responses	No.	% of total
1. What is the relative importance of the following criteria in representing the bank development capability?		
Relative high in profit growth rate	306	32.1
Relative high in loan growth rate	212	22.2
Relative high in deposit growth rate	165	17.3
Relative high in asset growth rate	147	15.4
Cannot say	124	13.0
2. What is the relative importance of the following criteria in representing the bank profitability?		
Relative high in profit margin on total asset	267	28.0
Relative high in loan to deposit ratio	244	25.6
Relative low in cost to income ratio	204	21.4
Relative high in net interest margin	120	12.6
Cannot say	119	12.5
3. What is the relative importance of the following criteria in representing the profitability to shareholders?		
Relative high in dividend yield	325	34.1
Relative low in price / earnings ratio	203	21.3
Relative low in price / book ratio	151	15.8
Relative high in return on equity	162	17.0
Cannot say	113	11.8
4. What is the relative importance of the following criteria in representing the bank stability and safety?		
Relative high in provision coverage	215	22.5
Relative low in non-performing loan ratio	317	33.2
Relative high in capital adequacy ratio	263	27.6
Relative high in professionals confidence to the bank	54	5.7

Cannot say	105	11.0

5. What is your average return on bank stock investment in the past?

Loss	100	10.5
Average return less than 10% p.a.	378	39.7
Average return 10% p.a.to under 30% p.a.	307	32.2
Average return 30% p.a to under 50% p.a.	120	12.6
Average return 50% p.a to under 100% p.a	40	4.2
Average return 100% p.a or more	8	0.8

Items and responses	No.	% of total

6. Do you satisfy the average return of the bank stocks that you invested in the past?

Highly Satisfied	47	4.9
Satisfied	269	28.2
Normal	431	45.2
Dissatisfied	165	17.3
Highly dissatisfied	41	4.3

7. Which of the following bank stock do you invest most frequency?

HSBC (Stock code: 0005)	258	27.0
Hang Seng Bank (stock code: 0011)	135	14.2
Bank of East Asia (stock code: 0023)	60	6.3
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Bank of Communications (stock code: 3328)	43	4.5
Bank of China (stock code: 3988)	87	9.1
Others (Please specify)	15	1.6

8. Which of the following sector do you invest most frequency?

Finance	387	40.6
Utilities	219	23.0
Properties	199	20.9
Commerce & Industry	141	14.8
Others (Please specify)	7	0.7

9. What do you think the risk level in investing the Hong Kong bank stocks?

Very Low Risk	108	11.3
Low Risk	343	36.0
Medium Risk	405	42.5
High Risk	81	8.5
Very High Risk	16	1.7

10. How long have you invested in the financial market?

Never invested	102	9.7
Less than 1 year	241	22.9
1 year to under 3 years	234	22.2
3 years to under 5 years	202	19.9
5 years to under 10 years	141	13.4
10 years or above	134	12.7

11. When making bank stock investment decisions today, which of the following factors do you consider most important?

Information from the bank as a basis for a fundamental analysis.	195	20.4
Recommendations, advice, and forecasts from professional investors.	178	18.7
The overall past performance of the market seen from a historical perspective.	207	21.7
Information from newspapers / TV.	127	13.3
Information from the Internet.	103	10.8
Discussion with personal friends	60	6.3
Information from colleagues at work.	25	2.6
Own intuition of future performance.	58	6.1
Others (Please specify)	1	0.1

The importance of various items on the decision-making of small investors when they invested in bank stock is presented in Table 3. All the items are statistically significant with high mean values.

Table 3. *Descriptive statistics*

Item	Item name	Mean	Standard Deviation	t	d.f.	Sig. (two-tailed)
1	Development capability	2.25	1.407	55.993	953	0.000
2	Profitability to banks	2.56	1.345	58.798	953	0.000
3	Profitability to shareholders	2.51	1.408	55.102	953	0.000
4	Stability and safety	2.49	1.215	63.402	953	0.000
5	Average return	5.63	1.024	79.233	952	0.000
6	Satisfaction of average return	2.88	0.900	98.679	952	0.000
7	Favor bank stock	3.76	2.419	48.056	953	0.000
8	Investment sector	2.12	1.122	58.332	952	0.000
9	Risk level	2.53	0.864	90.430	952	0.000
10	Experience	3.42	1.521	72.959	1053	0.000
11	News	3.36	1.997	51.925	953	0.000

As shown in Table 4, the correlation analysis is employed to obtain a correlation matrix based on 11 items for each dimension, which is then used as an input of the factor analysis.The goal of factor analysis is to reproduce observed correlations among variables by identifying a smaller number of shared factors that account for the observed correlation. The correlations between the variables arise from the sharing of common factors. The common factors in turn are estimated as linear combinations of the original variables.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's test of sphericity ($\rho < 0.000$) and the Kaiser-Meyer-Olkin (KMO). KMO measure of sampling adequacy index (with a value of 0.636) confirmed the appropriateness of the data for exploratory factor analysis.

Table 4. *Factor correlation matrix*

Item	1	2	3	4	5	6	7	8	9	10
2	0.371**									
3	0.322**	0.265**								
4	0.308**	0.274**	0.278**							
5	-0.047	-0.088**	0.038	-0.052						
6	0.023	0.041	0.056*	-0.015	0.323**					
7	0.102**	0.092**	0.025	0.009	0.026	0.039				
8	0.018	0.048	0.030	-0.006	0.052	0.083**	0.093**			
9	0.092**	0.060*	0.097**	-0.051	0.050	0.077**	0.076**	0.050		
10	0.001	0.026	0.000	0.033	0.044	-0.039	0.053	0.030	-0.039	
11	0.059*	0.107**	0.032	0.053	0.029	-0.022	0.031	-0.033	-0.304	0.027

Notes: *,** Significant at the 5% and 1% levels (one-tailed), respectively. Extraction method: principal components analysis, Rotation method: Varimax with Kariser Normalization, Kaiser-Meyer-Olkin (KMO) index: 0.636, Bartlett's test of sphericity: $\rho<0.000$. Item name (see also Table3) 1. Development capability; 2. Profitability to banks; 3. Profitability to shareholders; 4. Stability and safety; 5. Average return; 6. Satisfaction of average return; 7. Favor bank stock; 8. Investment sector; 9. Risk level; 10.Experience; 11.News.

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 standardized variable. As shown in Table 5, all items had communality above 0.25.Item 11 (news) has the lowest communality (0.251). The eigenvalue for a given factor measures the variance in all the items which is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the items. Eigenvalues measure the amount of variation in the total sample accounted for by each factor. Factor A, B, C, and D had eigenvalues above 1.000 (1.973, 1.338, 1.191 and 1.067

respectively). The four factors, collectively, accounted for a satisfactory 50.6% of the variance.

Table 5. *Principal component analysis*

Item	Item name	Communalities	Eigenvalue	Factor	% of Variance	Cumulative %
1	Development capability	0.552	1.973	A	17.9	17.9
2	Profitability to banks	0.499	1.338	B	12.2	30.1
3	Profitability to shareholders	0.484	1.191	C	10.8	40.9
4	Stability and safety	0.493	1.067	D	9.7	50.6
5	Average return	0.718				
6	Satisfaction of average return	0.670				
7	Favor bank stock	0.462				
8	Investment sector	0.398				
9	Risk level	0.557				
10	Experience	0.485				
11	News	0.251				

The following scree plot (see Figure 1) graphically displays the eigenvalues for each factor. In reference to the eigenvalues, we would expect four factors to be extracted because they have eigenvalues greater than 1.
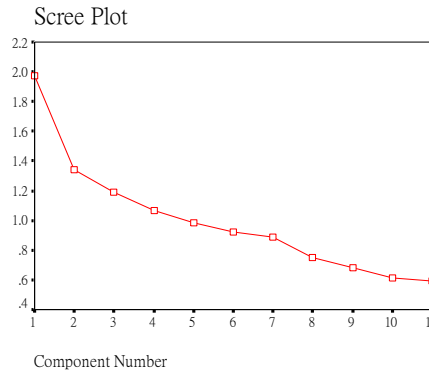

Figure 1. *Scree Plot*

Complex variables may have loadings on more than one item, 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 6).

Table 6. *Varimax-rotated principal component loadings*

Item	A	B	C	D	Item name	Factor
1	0.738				Development capability	A
2	0.677				Profitability to banks	A
3	0.673				Profitability to shareholders	A
4	0.654				Stability and safety	A
5		0.830			Average return	B
6		-0.779			Satisfaction of average return	B
7			0.663		Favor bank stock	C
8			0.626		Investment sector	C
9				-0.626	Risk level	D
10				0.601	Experience	D
11				0.475	News	D

After the rotation, there are no negative loadings on any consequence on either factor A or factor C. The rotated factors that represent the meaningful constructs ordinarily should not exhibit these large negative loadings. Thus, we eliminated

item 6 in factor B and item 9 in factor D. Finally, we found four factors affecting the decision-making of small investors in the Hong Kong bank stock market as follows: factor A might be interpreted as bank performance which include development capability, profitability to banks, profitability to shareholders, stability and safety; factor B as return performance which include average return, satisfaction of average return; factor C as stock nature which includes favor bank stock and investment sector and factor D as reference group which includes recommendations from professional investors, information from newspapers/ TV/Internet, discussion with personal friends and colleagues, information from the bank and the overall past performance of the market seen from a historical perspective. The specific name given to each factor is designed to reflect an item or notion that conceptually relates to the rest of the items under a particular factor.

Table 7. *Internal consistency and related decisions of first structure*

Factors and items	Corrected item-total correlation	α value	Decision
Factor A (Bank Performance)			
Development capability	0.4666	0.6348	Retained
Profitability to banks	0.4149		
Profitability to shareholders	0.3911		
Stability and safety	0.3884		
Factor C (Stock Nature)			
Favor bank stock	0.0990	0.1405	Eliminated
Investment sector	0.0990		
Factor D (Reference Group)			
Experience	0.0261	0.0483	Eliminated
News	0.0261		

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 7. This was undertaken to further reduce the number of factors. The cut-off value adopted was 0.5 and the acceptable level of corrected item-to-total correlation was set above 0.3 (Nunnally, 1978).The internal reliability of the first structure was tested and the decision results provide evidence as to the weakness of the structure since one factor (factor A) exceeded the adopted criteria. It is found that factor A contains four items and relates to "bank performance". Factor C is made up of two items and refers to "stock nature". Finally, factor D comprises two items and deal with "reference group". The derived scales appear to possess moderate to weak internal consistency. So, we eliminated both factors C and D (see Table 8).

Table 8. *Internal consistency of final revised structure*

Factors and items	Number of item	Corrected item-total correlation	α value
Factor A (Bank Performance)			
Development capability	4	0.4666	0.6348
Profitability to banks		0.4149	
Profitability to shareholders		0.3911	
Stability and safety		0.3884	
Factor B (Return Performance)			
Average return	1		

To examine possible differences in the perceived importance of the four factors, our analyses indicate that out of four criteria (i.e., rotated principal component loadings, scree test, KMO and Bartlett's test of sphericity, reliability test) examined, only two factors (bank performance, returns performance) are

significant. Based on these results, we can derive the following ascending order of importance:

1. Reference group (Group)
2. Stock nature (Nature)
3. Returns performance (Return)
4. Bank performance (Bank)

Reference group is the least important factor and bank performance is the most important factor.

We create ranking orders of the four factors that are common for all decision-making and respectively for all small investors. To get the factor ranking orders for each small investor, we should follow ascending order of importance.

The factor order for the pure decision-making: [Group, Nature, Return, Bank] with the following ranking: $R_1 = [1, 2, 3, 4,]$.

This factor ranking is different for every small investor. As an illustration, we show the entire N! = 4 x 3 x 2 x1 = 24 possible rank orders for a set of N = 4 factors along with its value of τ with the "canonical order" (i.e., 1234). As a result, each small investor has different ranking of factors for their decision-making. We find the Kendall rank correlation coefficients for small investor using initially the pure decision-making ranking order as the standard.

Choice of small investors: C, K, X

Small investor C: [Group, Return, Bank, Nature]

with the ranking: $R_2 = [1, 3, 2, 4]$.

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.

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

The symmetric difference distance between two sets of ordered pairs P_1 and P_2 is denoted $d_\Delta(P_1, P_2)$. N is number of ranked factors, 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 -1 corresponding 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 factor ranking for the small investor C and the pure decision-making is 0.67:

$P_1 = \{[1, 2], [1, 3], [1, 4], [2, 3], [2, 4], [3, 4]\}$.

$P_2 = \{[1, 3], [1, 2], [1, 4], [3, 2], [3, 4], [2, 4]\}$.

The set of pairs which are in only one set of ordered pairs is $\{[2, 3], [3, 2]\}$. So, the value of $d_\Delta(P_1, P_2) = 2$. That means that the value of the Kendall rank correlation coefficient between two orders of decision-making is:

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

Small investor K: [Return, Bank, Group, Nature]

with the ranking: $R_3 = [2, 4, 1, 3]$.

$P_1 = \{[1, 2], [1, 3], [1, 4], [2, 3], [2, 4], [3, 4]\}$.

$P_3 = \{[2, 4], [2, 1], [2, 3], [4, 1], [4, 3], [1, 3]\}$.

The set of pairs which are in only one set of ordered pairs is $\{[1, 2], [2, 1], [1, 4], [4, 1], [3, 4], [4, 3]\}$. So, the value of $d_\Delta(P_1, P_2) = 6$. That means that the value of the Kendall rank correlation coefficient between two orders of factors is:

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

Small investor X: [Bank, Return, Nature, Group]

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

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

$\mathbf{P}_4$ = {[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 $\mathbf{d}_\Delta(\mathbf{P}_1, \mathbf{P}_4) = 12$. That means that the value of the Kendall rank correlation coefficient between two orders of factors is:

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

Respectively for the above discussed small investors, the Kendall rank correlation coefficients with the decision-making order would be: 0.67 for small investor C; -1 for small investor X, and 0 for small investor K. We can conclude that small investor C is the closest to the pure decision making (small investor C makes investment decision easily) and small investor X is the farthest from the pure decision-making among them (small investor X does not make investment decision). Small investor K is a classic case of dilemma for decision-making (small investor K has great difficulty making investment decision).

5. Conclusion

Using factor analysis, we create four factors that capture the decision-making of small investors in the Hong Kong bank stock market. Their decision-making has uniform views as to the ascending order of importance: reference group, stock nature, return performance and bank performance. Reference group is the least important factor and bank performance is the most important factor. To get the factor ranking orders for small investor in the decision-making, we should follow ascending order of importance. This factor ranking is different for every small investor. As a result, each small investor has different factors of ranking for decision-making. We have reported evidence from three small investors (C, K, X) that the factor ranking order of the farthest from the pure decision-making is extremely opposite to the factor ranking order of the pure decision-making. Respectively for the above discussed small investors, the Kendall rank correlation coefficients with the decision-making order would be: 0.67 for small investor C; -1 for small investor X and 0 for small investor K. We can conclude that small investor C is the closest to the pure decision-making and small investor X is the farthest from the pure decision-making among them. Small investor K is a classic case of dilemma for decision-making. This implies that financial advisors can approach the customers with Kendall rank correlation coefficients greater than zero. These customers are relatively easy to make investment decision in the Hong Kong bank stock market.

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