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Objective

Accounting is defined in ASOBAT (A Statement of Basic Accounting Theory) as "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information". On the basis of this definition, accounting was required to provide useful information for information users' decision-making as its role. This concept is called "the useful approach of decision- making". Recently this approach is the main stream.

Accounting researchers were given two propositions after ASOBAT. One of them is the proposition, "Is accounting information useful?", which is a proposition related to disclosure, and the other is the proposition, "How does accounting provide useful information?", which is a proposition related to accounting treatment and the method of representation. Many accounting researchers announced a lot of research results to answer to these two propositions. I consider the proposition, "Is accounting information useful?" in this paper. I intend to refer to the extent to which individual investors consider accounting information important, when they carry out equity investment in particular. The reason is that the proposition, "How does accounting provide useful information?" is based on the assumption that investors consider accounting information to be important information and make use of it. If investors do not recognize accounting information as important information or if they do not use it, the disclosure of accounting information may become meaningless.

Many accounting researchers announce their research findings relating to the usefulness of accounting information on the premise that the securities market is efficient. Many of these findings confirm that "Accounting information is useful." However, these researchers assert that human beings are not necessarily reasonable in their researches relating to behavioral finance. These research results confirm that it is questionable not only that markets are efficient, but that people use information fully in the process of their decision making. As a result, I wonder if accounting information is really used or if accounting information is important information in equity investment. The objective of this paper is to carry out research into investors' attitude as a basic research of accounting and finance in order to

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answer my own question.

The structure of this paper is as follows. Firstly, I will discuss the reasonability of participants in the securities market. Next, I will discuss the method of research when I carry out research into the usefulness of accounting information. Thirdly, I will examine the results of the research that I made independently, and analyze the degree of importance of accounting information, using AHP. Lastly, I will refer to the attitudes of individual investors to information in accordance with the research results.

1. Efficient market hypothesis and individual investors' behaviors

1) Efficient market hypothesis

The efficient market means a market where the price always reflects obtainable information perfectly as at that point in the time. In other words, the price established in an efficient market is an amount formed on the basis of a correct evaluation of obtainable information as at that point in time. Accordingly, market participants understand the information instantly and accurately and act reasonably when they receive new information which is significant for a price formation of a security. This concept is called the "efficient market hypothesis".

The efficient market is classified into three forms, which are the weak form, semi-strong form, and strong form. These forms are defined by the scope of information perfectly reflected in the price. Firstly, the weak form is the state where all past information related to that security is perfectly reflected in the price established in the securities market. Next, the semi-strong form is the state where new information disclosed in the securities market is also perfectly reflected in the security price, in addition to the state which satisfies the weak form. Lastly, the strong form is the state where all information including internal information which has not been disclosed in the securities market is perfectly reflected in that security price, in addition to the state which satisfies the semi-strong form.

Three important premises exist in the efficient market hypothesis (the semi-strong form). Premise 1 is that market participants understand new information "instantly", "accurately" and "perfectly". Premise 2 is that market participants act "economically reasonably" on the basis of the information they understood. Premise 3 is that market participants' actions are "all" reflected in the price.

The semi-strong form of the efficient market hypothesis is broadly but not entirely supported by many research findings concerning the efficient market hypothesis. In other words, the market responds to new valuable information. However, it does not respond "instantly", "accurately" and "perfectly". The reason is generally explained by the limited reasonability of market participants. I will refer to limited reasonability later, and would like to explain another reason why the results support the semi-strong form of the efficient market hypothesis. In the test of the efficient market hypothesis, Researchers verify that the share price changes, at time that new information is disclosed. Researchers decide that the

market is efficient, if the share price has changed, but they decide that new information did not have information value for participants, if the share price has not changed, or they point out a defect of the research method, stating the limitation of the model and data. As a result, the contents of the verification findings broadly support the efficient market hypothesis.

The behavioral finance which I will mention below starts with limited reasonability, and raises questions to the first two premises out of the three premises in the efficient market hypothesis, presenting evidence.

2) Behavioral Finance

Behavioral finance explains the unreasonability of human behavior, and shows its evidence. The phenomena of such evidence that are often discussed are "heuristics (Representativeness, Availability and Adjustment)", "prospect theory" and "mental accounts". I will explain them in order.

Heuristics

Heuristics is a decision-making method which human beings use as a convenient method under uncertainty. Heuristics is a psychological work which reduces a complicated work arising at the time of evaluating the probability of an uncertain event, in the formation of belief of an uncertain event which is shown in an objective probability shown in a numerical value or in a subjective probability, and in the decision-making based on it. Heuristics comprise three phenomena, i.e. "Representativeness", "Availability" and "adjustment".

"Representativeness"[1] indicates a state where, when people attempt to estimate or evaluate a certain event or object, they attempt to express a event or object that should be estimated or evaluated by the degree of the similarity, with the use of a event or object which is very similar to that event or object. Concretely, for example, one evaluates that he is a librarian because of a fixed concept or similarity of his occupation, for example, to a librarian against an introduction, "Steve is a very shy person of a retiring disposition. People always consider him useful but hardly have interest in him. He is essential for direction and organization thanks to his gentle and methodical character, and he also makes efforts in minute matters."[2] Nevertheless, such "Representativeness" raises systematic errors such as Insensitivity to prior probability of outcomes, Insensitivity to the sample size (conservatism), misconceptions of chance (the rule of a minority), Insensitivity to predictability, illusion of validity, and misconceptions of regression.

"Availability"[3] indicates a phenomenon of using the easiness of a case or event which comes to one's mind, when one evaluates the probability of one event. In equally memorized

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1) Kahneman, Slovic, Tversky [1982], pp.4-11
2) *Ibid.* p. 4
3) *Ibid.* pp.11-14

cases, the less the number of occurrence, the less the number of memorized cases, and the cases which occur in many cases are more easily recalled. For this reason, people evaluate that the more easily the cases call to remembrance, the higher the occurrence probability is. Nevertheless, events which have more recently occurred and cases which have occurred more closely to oneself tend to be more easily recalled. As a result, there may occur biases such as a bias caused by the possibility of recollection of cases, a bias of the possibility of recollection by analogizing relevant cases by mistake from recollected cases, and a bias of constructing a mutual relationship of a case and a case on the basis of a hallucination.

"Adjustment"[4] indicates a process where, people evaluate a certain event or object. When people evaluate a certain event or object, people form the first impression or the initial evaluation once, and is adjusting towards a correct and final evaluation by various information from that. Nevertheless, there is a tendency that only inadequate adjustment is carried out because of sticking to the initial evaluation due to the "anchoring effect," and a bias may occur by that means.

The Prospect Theory

The prospect theory explains the behavioral patterns of human beings under uncertainty. "People normally perceive outcomes as gains and losses, rather than as final state of wealth or welfare. Gains and losses are defined relative to some neutral reference point. The reference point usually corresponds to the current asset position."[5] In addition, the probability of uncertainty is not uniformly recognized differently, but is recognized in relation to its numerical value and the state. These are explained by "Certainty Effect"[6], "Reflection Effect"[7] and "Isolation Effect"[8], and are expressed by "Value Function"[9] and "Weighting Function"[10].

There is a tendency that people would like to select a choice where they can obtain a sure result, even if it is a smaller expecting value than a choice with uncertainty in its result, although the expecting value is greater. For example, in a choice of "A: 2,500 at the probability of 33%, 2,400 at the probability of 66% and 0 at the probability of 1%", the expected value of choice A is greater than the expected value of choice B. However, people tend to choose Choice B. This is called the Certainty Effect.

People tend to choose the risk avoidance type in the case of gains, and the risk lover type in the case of losses. For example, where one is given choices of "A 1,000 at the probability of 50% and 0 at the probability of 50%" and "B: 450 at the probability of 100%",

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4) *Ibid.* pp.14-18
5) Kahneman, Tversky[2000], pp.28-29
6) *Ibid.* p.20
7) *Ibid.* p.22
8) *Ibid.* p.25
9) *Ibid.* p.32
10) *Ibid.* p.34

in the case of the receiver, one tends to choose Choice B where one can receive a smaller expected value with certainty, and in the case of payer, Choice A where there is a probability that one need not to pay a larger expected value.[11] This is called the Reflection Effect.

People tend to ignore the ratio at which a choice is covered and reduce the probability of the event, in order to simplify the choices. For example, in the case where "There is a game with two stages. In the first stage, the game is over at the probability of 75%, and moves to the next stage at the probability of 25%. In the next stage, A: one obtains 4,000 at the probability of 75%, and B: one obtains at the probability of 25%. But You have to choose Choice B before You knows the result of the first stage". People tend to choose Choice B. This choice is equal to the choice of "A: 4,000 at the probability of 20%" and "B: 3,000 at the probability of 25%". People tend to choose Choice A in the choice of "A: 4,000 at the probability of 20%" and "B: 3,000 at the probability of 25%", and Choice B in the choice of "A: 4,000 at the probability of 80%" and "B: 3,000 at the probability of 100%". In other words, in this two stage game, people recognize the choice of "A: 4,000 at the probability of 80%" and "B: 3,000 at the probability of 100%", and ignore the first stage. Such a trend is called the Isolation Effect[12].

From these verification results, the Value Function (Figure 1) and Weighting Function (Figure 2) are shown.
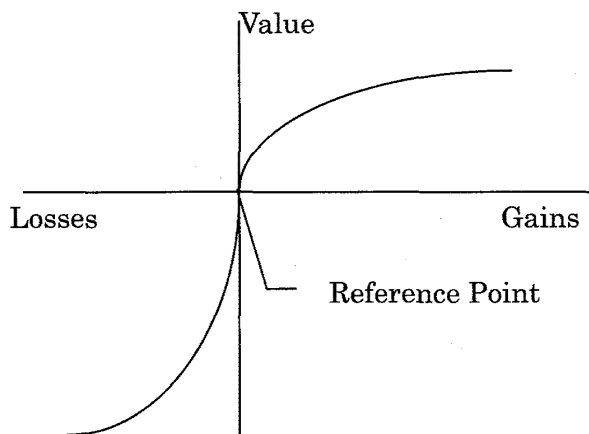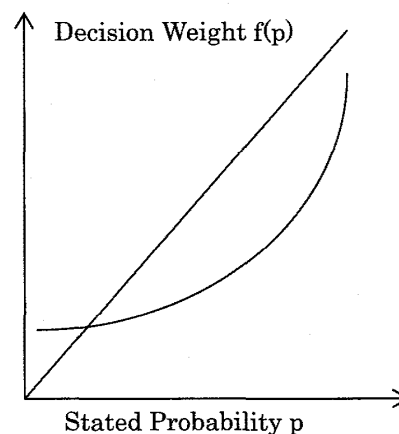

Figure 1 Value Function

Figure 2 Weighting Function

Mental Accounts

Mental Accounts are accounts in the mind which restricts human behavior. People have an accounts in their mind, and tend to calculate profit and loss by the each account. For

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11) *Ibid.* pp.22-23
12) *Ibid.* pp.25-26

example, to a question that "You have 5 million yen to acquire a house at present, and deposit it with a bank at the interest of 1%. And you now intend to purchase a car at the price of 3.5 million yen. The car loan is at 2.5% interest. When you purchase a car, do you use the cash to acquire a house? Or do you use a loan for the car?", people tend to answer that one will use a loan for the car. Because the interest rate of a loan for a car is higher than the interest rate of a deposit, it is reasonable to use the deposit. Nevertheless, people have an account in their mind that the deposit is "to purchase a house". A loan is used for a new account, which is "to purchase a car".

The above assertion of the behavioral finance shows a limitation to the premises of the efficient market hypothesis. Premise 1 of the efficient market hypothesis is that market participants understand new information "instantly", "accurately" and "perfectly". In the behavioral finance people tend not to understand new information "accurately" and "perfectly" due to the biases of heuristics, etc. As a result, people cannot act "economically reasonably".

3) Market Anomaly

In the efficient market hypothesis, "to the extent the some investors are not rational, their trades are random and therefore cancel each other without affecting price"[13], "to the extent that investors are irrational in similar ways, they are met in the market by rational arbitrageurs who eliminate their influence on price"[14]. As a result, no unreasonable price will be formed.

However, In the offsetting effect of unreasonable investors' actions, the investors' unreasonable actions must be random and independent. In other words, The size of the ratio of unreasonable investors' actions to the market does not have an effect on the formation of the efficient market price. However, where unreasonable actions are not random or where they are related to each other, the result of these acts are not offset in the market, and the generality of the efficient market hypothesis is limited[15]. If people's acts are in accordance with heuristics, systematic errors due to heuristics occur to a certain proportion of investors, and their acts are not independent and unreasonable, and an efficient market price is not formed as a result.

Furthermore, the existence of arbitrages means that because unreasonable investors purchase securities at a high price or sell securities at a low price, they can obtain lower returns than arbitragers, and that unreasonable investors therefore will lose money[16] and will be sifted from the market. However, reasonable investors who carry out arbitrages and should sift unreasonable investors cannot escape from the basic risks of the market and

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13) Shleifer[2000], p.2
14) *Ibid.* p.2
15) *Ibid.* p.3
16) *Ibid.* p.4

securities[17]. In addition, investors who carry out arbitrages bear risks arising from the unforseeability of a short-term future price and that price formation will further move in a wrong direction before the wrong price formation is resolved[18]. For that reason, even if an arbitrage bears a higher return than an unreasonable transaction, it may be impossible to keep that position until the arbitrage is carried out[19]. In a longer term view, because of the change in generations and the spread of various kinds of technologies, it is unavoidable that other unreasonable investors will participate in the market, replaced by new unreasonable investors who have lost money and get out of the market. As a result, unreasonable investors will never be sifted out of the market. Accordingly, it cannot be said that the existence of arbitrages will form an efficient market.

Accordingly, no prices are formed which assume an efficient market in the actual securities market. For example, a share price is formed, remaining at a higher or lower price than a fair price, as a security (or a company) is overrated or underrated. In addition, in some cases, new information is priced, and for a period until the price is adjusted into a fair price, that price remains deviated from a fair price, and the reaction is excessively shown for the period. The general term to indicate this abnormal return is called a "market anomaly".

Researchers who do not support the efficient market hypothesis assert that the market anomaly is the evidence that the market is not efficient nor reasonable. On the other hand, researchers who support the efficient market hypothesis assert that the market anomaly is simply an error of the price formation model or the analytical model, and that it will be resolved by a precision model. Both assertions are partly correct. This means that the former says that market participants do not have characteristics shown in the efficient market hypothesis, and that the latter says that the analytical model must be precise in the research of the price formation in the market. In the next section I will therefore examine the analytical method used at the time when the usefulness of accounting formation is tested.

2. Usefulness of accounting information

1) Event Analysis

In the semi-strong form of the efficient market hypothesis, when new information is disclosed to the market, the price is immediately adjusted on the basis of that information in the market. Accordingly, if the market price changes, when new accounting information such as financial information is disclosed, on the assumption of the efficient market hypothesis, accounting information is useful for the market. Such analysis is called event analysis.

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17) *Ibid.* p.14

18) *Ibid.* p.14

19) *Ibid.* pp.14-15

In the event analysis, the change in the share prices before and after an event occurs is used. In general, residual return is used as a replacement variable of excessive return for the measurement of the share price change. Excessive return and residual return are shown in the following formulae.

Investment return (R_{it}) = $(V_{it} + C_{it} - V_{it-1})/V_{it-1}$

V_{it} : the share price or the corporate value, C_{it} : cash flow

Excessive return = $R_{it+1} - E[R_i]$

$\qquad = (1 + E[R_i])(X_{it+1} - E_t[X_{it-1}])/E_t[X_{it+1}]$

X_{it} : Profit or Loss

Individual return by the market model

$E[R_i] = \alpha_i + \beta_i[R_m]$

R_m : market return

Individual return where market return is given

$E[R_i \mid R_m] = \alpha_i + \beta_i R_m$

Residual return $(e_i) = R_i - E[R_i \mid R_m]$

The residual return will be totaled in API (Abnormal Performance Index = $\Sigma \Pi (1+e_{it})/N$) in the case of the compounded calculation method, and in CAR (Cumulative Average Residual = $\Sigma \Sigma e_{it}/N$) in the case of the single interest calculation method.

The usefulness of the accounting information is judged by the form of API or CAR. If accounting information is useful, the share price will change because of that. The form of APR or CAR before the disclosure of the accounting information will be different from the form of APR or CAR after the disclosure of the accounting information. Many cases of the past research by the event analysis show that accounting information is useful.

2) Fundamental Analysis

If the market is efficient, information disclosed to the market should be all reflected. It is possible to calculate a theoretical share price of a company by analyzing the basic state of the company, using accounting and other financial information. It is possible to analyze the actual state of the share price of the company in comparison with the theoretical share price. Such analysis is called fundamental analysis. In addition, it is also possible to calculate the extent to which specific information in the accounting information is reflected in the share price by value relevance analysis.

The theoretical share price can be sought by the Discounted Dividend Model or the Ohlson Model. The Discounted Dividend Model is a model where future dividends are discounted in the present value, and that total is made the theoretical price.

$P_t = \Sigma(E[D_i]/(1+r)^i)$

P_t : share price D_i : dividend r : capital cost

On the other hand, the Ohlson Model is a mode where the theoretical corporate value is calculated by the net asset book value plus excessive earning power.

$$V_t = B_t + \Sigma(E[X_{t+1} - r_e B_{t+1}]/(1+r_e)^i)$$

V_t : corporate value B_t : net asset book value X_t : profit r_e : equity capital cost

Many other models are also used for fundamental analysis.

In cases of fundamental analysis, if the model is correct, the difference between the theoretical share price calculated by the model and the actual share price in the market shows that information is not reflected in the market. Accordingly, the extent to which the model is precise affects the result of analysis.

3) Analysis of decision-making process

Event analysis and fundamental analysis are the same in the sense that the market price is used. In other words, both analytical methods verify the relationship between accounting information as input and market price as output. Accordingly, neither analytical method verifies the process from input to output. They do not verify the decision-making process (weighting of each information, criteria, etc.) adopted by market participants, after they receive information. In this paper, I newly present analysis of the decision-making process.

I adopt AHP (Analytic Hierarchy Process) in the analysis of the decision-making process that I newly present. AHP is one of the decision-making techniques where the subjective judgment and system approach are mixed[20]. In the AHP, the problem element is taken as a relationship between the final target, criteria and alternative ideas, and a structure of stages is formed. The importance of criteria is sought from the viewpoint of the final target, and then the degree of importance of each alternative idea from the viewpoint of each criterion, and finally these are converted into evaluation of alternative ideas seen from the final target[21].

Abstraction of criteria and weight calculation of criteria are important in the AHP. Weight calculation of criteria is carried out by the following procedures. Firstly, the importance of criterion is compared with that of another criterion. For example, where profit (A_i) and the corporate size (A_j) are criteria, comparison that "profit (A_i) is important as the corporate size (A_j)" is carried out, and it is expressed in a numerical value (a_{ij}). After comparison is made as to all criteria, a matrix $A=[a_{ij}](a_{ji}=1/a_{ij})$ is prepared. Next, the line (a_{11}, a_{12}, ... ,a_{1n}) of the matrix will be geometrically averaged (I_i). Thirdly, the geometrical average (I_i) is totalized, and the weight ($W_i = I_i / \Sigma(I_i)$) is sought by each geometric average divided by that figure. Lastly, the coordination index (C.I. = (λ -n) / (n-1), λ is the greatest

20) Kinoshita[1998], p.74
21) *Ibid.* pp.74-75

characteristic value and n is the number of criteria) is sought. When the coordination index is sufficiently small, the weight to the evaluation criteria.

After the weight calculation of evaluation standards, alternative ideas are compared by each criterion. For example, the criterion, "profit", of Company S is superior to that of Company P. Then, that comparison result is calculated together with the weight of the criterion. The alternative idea where this result is the highest numerical value is the best choice by the subjective judgment.

In this paper, I will analyze the importance of information in the decision-making process of investors, using weight calculation of criteria. The usage of the AHP technique enables the subjective judgment of investors to be expressed in a numerical value, and the investors' subjective importance of criteria can be understood.

3. Investors' attitudes to information given to investors

1) Data

The objective of this paper is to examine individual investors' attitudes to information. I don't adopt share price analysis with Event Analysis, Fundamental Analysis, etc. In this research I carried out analysis of the investors' subjective judgment of information by a questionnaire research. The questionnaire research was carried out mainly on Kansai University in January 2006. As a result, 396 samples were collected. The questions by which samples are grouped are the following four questions.

1) Have you ever bought lottery tickets or have you gambled?
2) Are you interested in "corporate value"?
3) Do you think that you would like to carry out "equity investment"? Or, have you ever invested in equities?
4) Do you know the qualification and occupation of a "Certified Public Accountant(CPA)"?

Table 1 Samples

	Male	Female	No answer	Total
Whole	261	113	1	396
	Yes	No	No answer	Total
Gamble	273	107	1	396
Corporate value	210	122	0	396
Equity investment	254	186	1	396
CPA	329	67	0	396

The sample distribution of the above questions and answers to them is as shown in Table 1.

2) Information collection of investors

I carried out the following surveys to research into investors' attitudes to information. 1) by what kinds of media individual investors collect information, 2) how much time they spend collecting information, 3) expectations of reports and 4) what sort of image they have of newspaper information.

Media used and time spent

The testees chose the top three to the question of what media the individual investors use. The results are as shown in Table 2. In addition, the average time spent on information collection was 3.1 hours.

From table 2, it can be seen that the media that they used were mainly TV, Internet and newspapers. In addition, it can also be seen that the testees who chose TV as the first choice spend 3.2 hours, those who chose the Internet as the first choice spent 3.7 hours, and those who chose newspapers as the first choice spent 2.1 hours respectively.

In the combination of the first and the second choice, the combinations chosen by the greatest number of testees (the first choice, second choice, the number of answers) were (TV, the Internet, 67), (the Internet, TV, 66), and (TV, newspapers, 61), and the combinations chosen by the second greatest number of testees were (newspapers, TV, 37), (the Internet, newspapers, 30), and (newspapers, the Internet, 24). In addition, the average number of hours spent by the testees who chose these combinations were, 3.3 hours, 4.3 hours, 2.8 hours, 2.1 hours, 3.0 hours and 1.9 hours respectively. Their information collection is classified into the information collection method centering on the Internet and the information collection method centering on newspapers.

Table 2 Used media

	First	Second	Third
Newspaper	67	95	80
Magazine	11	29	65
TV	183	117	61
Radio	5	10	12
Internet	114	111	101
Acquaintances	8	26	69
Others	3	2	1
No response	5	6	7
Total	396	396	396

Expectations and image of the report

I carried out a questionnaire research on testees to carry out research into their expectations and image of the report. Tables 3 and 4 are the results of the totalization.

Question 1 Expectations on the attitudes of the report
    1) Explanation of the facts on the basis of a fair and neutral standpoint
    2) Principle and assertion on the basis of the freedom of faith, speech and behavior.
Question 2 Expected standpoint of the person who provides the report
    1) The standpoint independent from anybody
    2) The stable standpoint belonging to somewhere
Question 3 Expectations on the contents of the report
    1) Accurate contents despite their difficulty to understand
    2) Easily understandable contents despite their some inaccuracy
Question 4 Image of economic reports of the Nikkei
Question 5 Image of economic reports of the nationwide newspapers other than the Nikkei
Question 6 Image of economic reports of Tabloid newspapers
    1) Reliable reports which are mostly correct
    2) Reliable reports although some of them may not be correct
    3) Slightly unreliable reports although they are easy to read
    4) Interesting reports, although they are not trustworthy

Most investors demand "fairness and neutrality", "independence" and "accuracy" of

Table 3 Expectations on reports

	1)	2)	No answer	Total
Question 1	317(80%)	73(18%)	6	396
Question 2	300(76%)	91(23%)	5	396
Question 3	278(70%)	111(28%)	7	396

Table 4 Image of reports

	1)	2)	3)	4)	No answer	Total
Question 4	134(34%)	223(56%)	18(5%)	14(4%)	7	396
Question 5	72(18%)	164(41%)	127(32%)	26(7%)	7	396
Question 6	12(3%)	24(6%)	122(31%)	232(59%)	6	396

the reports. However, approximately 30% of investors demand "understandability" than "accuracy". In addition, they feel that the Nikkei and the nationwide newspapers are more reliable than Tabloid newspapers. The same tendency was seen in the testees who carry out information collection centering on the Internet and those who carry out information collection mainly from newspapers.

Investors collect information through the Internet or newspapers. Information collection by the Internet is more timely and it is possible to have more positive and easier access to information. As a result, They need much time to collect information. In addition, investors require understandability of information contents to some extent, but they differentiate the extent of the reliability of information depending on the reporting body. Investors attempt to understand "accurately", if not "instantly".

3) Reference information in equity investment

I carried out research into information which individual investors use for reference purposes, when they carry out equity investment and decide the names of the shares that they will purchase. In this research, the testees chose the top 5 items. The results are shown in Table 5. Table 5 shows the results of the points and the top 3 items chosen as each rank of the choice. In the point calculation, the total scores were calculated, making it 5 points when chosen as the first from the top, 4 points, when chosen as the second from the top, 3 points, when chosen as the third from the top, 2 points, when chosen as the fourth from the top and 1 point, when chosen as the fifth from the top.

The items under the point rank are all financial values except for "Name of Company". "Preferential treatment of shareholders" is not a financial value, but can be considered as a "dividend" which is not money. In addition, in the top 3 items chosen as each rank, "Name of Company" is the top, followed by financial values. Concretely, they are "dividend",

Table 5 Reference information in equity investment

		Top 3 items in each rank		
	Point rank	First	Second	Third
First	Dividend	Name of Company	Dividend	Profit
Second	Name of Company	Dividend	Stability	Profit
Third	Profit growth	Dividend	Profit growth	Preferential treatment of shareholders
Fourth	Complimentary treatment of shareholders	Growth rate of Div.& profit	—	Preferential treatment of shareholders
Fifth	Safety	Preferential treatment of shareholders	Profit stability	Safety

"profit" and "profit growth", "profit stability" and "safety". The question choices include equity information such as equity price charts and transaction volume and information which helps investors to imagine companies such as CM and products. Nevertheless, most of the items chosen are financial values. Furthermore, numerical values such as sales and net assets were not chosen among the financial values.

It is natural to recall the Discounted Dividend Model from the choices chosen by the testees. The reason is the following four points. 1) The Discounted Dividend Model produces the total of the amount where future dividends are discounted by the present value. 2) The source of dividends is profit. 3) Future dividends are affected by the profit growth rate. 4) The accuracy of future dividends are affected by the safety and profit stability.

Firstly, Investors screen by "Names of Companies". Next, they decided the names of the stocks in which they invest with using "Dividend", "Profit", "Profit Growth". However, these results do not show that investors decide names of the stocks in which they invest by the Discounted Dividend Model. These results show that investors use information necessary for calculation by the Discounted Dividend Model.

4) Analysis of importance of information used in equity investment

I carried out a research to compare the importance of various types of information, where individual investors carry out equity investment and decide the names of shares that they purchase. Information for the comparison is "business lines", "accounting information", "share price trends" and "reputation". Comparison 1: "Business lines are xx than accounting information," Comparison 2: "Business lines are xxx than share price trends," and Comparison 3: "Business lines are xx than reputation," Comparison 4: "Accounting information is xx than share price trends," Comparison 5: "Accounting information is xx than reputation," and Comparison 6: "Share price trends are xx than reputation." "xx" means "1) more important, 2) a little more important, 3) equally, 4) are not a little more important, and 5) not more important". The results are shown in Table 6 under the whole and the group (mentioned above, gamble, corporate value, equity investment, CPA, media of information collection, and information collection time).

Upon the results in Table 6, I calculated in the AHP. AHP is a method to reflect the comparison by individual, and cannot reflect the average values as Table 6. The reason is that the average tends to be concentrated in "3) equally". There are two methods to resolve this problem. One of them is a method where AHP is applied to each testee and their results are totalized. The other of them is a method to convert the totalization results for the use of AHP. The latter is adopted in this resarch.

Conversion of the totalization results into numerical values for the use of AHP is carried out via the following two steps. In the first step, again "3 (equally)" is subtracted from each average value (calculation of the numerical value of deviation). The next step is to allot again "1) important, 2) a little important, 3) equally, 4) not a little important, and 5) not important" on the basis of the numerical value of deviation. In this research, I allotted "1)

Table 6 Comparison of the degree of importance of used information (Average)

Comparison	1	2	3	4	5	6
Whole	3.3	3.3	2.8	2.8	2.4	2.4
Gamble						
Yes	3.4	3.3	2.8	2.8	2.3	2.3
No	3.1	3.2	2.8	2.8	2.6	2.4
Corporate value						
Yes	3.3	3.3	2.8	2.7	2.3	2.3
No	3.2	3.3	2.9	2.8	2.5	2.4
Equity investment						
Yes	3.4	3.3	2.8	2.7	2.3	2.3
No	3.1	3.3	2.9	2.8	2.5	2.4
CPA						
Yes	3.3	3.3	2.8	2.7	2.3	2.3
No	3.2	3.2	2.8	2.9	2.6	2.5
Media						
Newspapers	3.2	3.0	2.6	2.6	2.3	2.5
TV	3.2	3.3	3.0	2.8	2.4	2.4
Internet	3.5	3.4	2.7	2.8	2.3	2.2
Time						
0-1 Hours	2.9	2.8	2.6	2.4	2.4	2.9
2-3 hours	3.3	3.3	3.8	2.7	2.4	2.4
4-6 hours	3.3	3.4	2.8	2.8	2.3	2.3
6 or more hrs	3.5	3.3	3.2	3.1	2.8	2.3

important" to a deviation of less than -0.6, 2) a little important" to -0.6 of greater and less than -0.25, "3) about the same" to -0.25 or greater and less than 0.25, "4) not a little important" to 0.25 or greater and less than 0.6, and "5) not important" to 0.6 or greater.

The weighing of each criterion ("Business lines", "accounting information", "share price trends" and "reputation") in the AHP are shown in Table 7. In addition, Table 7 also shows the calculation where the greatest number of answers was made the answer of the whole.

Firstly, "business lines" and "reputation" are relatively low weight, and "accounting information" and "share price trends" are relatively high weight. Next, "business lines" tend to be highly weighted between "business lines" and "reputation". Thirdly, testees who

Table 7 The degree of importance of used information

	Business lines	Accounting info.	Share price trend	Reputation	C. I.
Whole	0.155	0.433	0.306	0.108	0.040
Whole (Conversion)	0.155	0.368	0.368	0.109	0.020
Gamble					
Yes	0.155	0.368	0.368	0.109	0.020
No	0.245	0.291	0.291	0.173	0.020
Corporate value					
Yes	0.155	0.368	0.368	0.109	0.020
No	0.190	0.319	0.379	0.113	0.020
Equity investment					
Yes	0.153	0.433	0.306	0.108	0.040
No	0.231	0.327	0.327	0.116	0.082
CPA					
Yes	0.153	0.433	0.306	0.108	0.040
No	0.231	0.327	0.327	0.116	0.082
Media					
Newspapers	0.272	0.385	0.229	0.114	0.020
TV	0.190	0.379	0.319	0.113	0.103
Internet	0.182	0.364	0.364	0.091	0.000
Time					
0-1 Hours	0.265	0.445	0.157	0.132	0.061
2-3 Hours	0.153	0.443	0.306	0.108	0.040
4-6 Hours	0.155	0.368	0.368	0.109	0.020
6- Hours	0.165	0.278	0.392	0.165	0.061

consider "accounting information" of high importance tend to belong to groups of the "whole", "equity investment, Yes", "certified public accountants, Yes", "newspapers", "TV", and the time of information collection being relatively short. On the other hand, testees who consider "share price trends" of high importance tend to belong to the group of "corporate value, No" and "6 or longer hours". Lastly, testees whose first information collection medium

is "TV" did not show coordinated answers (C.I.>1.0)[22].

When investors selected names of shares, they tend to give importance to "accounting information", "share price trends", "business lines" and "reputation" in this order. In addition, depending on the attribute, some investors do not have coordinated (logical) decision-making process. Investors who have no interest in "corporate value" and "equity investment" tend to give relative importance to "share price trends".

4. Accounting information considered important

I carried out research into individual investors' attitudes to information. The limitation of this research is the following four points. Firstly, it cannot be denied that sample biases have occurred in the questionnaire collection process. Next, application of the AHP has not been seen in any other research of this kind, and there is a possibility that the decision-making process was not fully expressed. Thirdly, the subject of the research was not the actual investment activities. Lastly, the result of the decision-making process was assumed to be equal to the actual acts. However, this research showed adequate results beyond this limitation.

Investors distinguish the reliability of reports by medium. When they select names of shares, they use "dividends", "profit", "profit growth and stability" after selecting "names of companies". They emphasize "accounting information" and "share price trends", and consider "accounting information" a little more important than "share price trends". They sometimes do not have any coordinated (logical) decision-making process.

Literatures on equity investment emphasize "accounting information" and "share price trends" and explain them, but these have never been treated at the same time. The reason is that both believers consider the other's concept to be non-sense. However, in reality, it was clarified that both are used. However, investors not only change the importance of information depending on the situation and attribute but also have non-coordination in the decision-making process.

As reference information, They use items used in a model to calculate a theoretical amount of a corporate value or a share price. In that point, their acts are "economically reasonable" and accounting information is therefore useful. In addition, they attempt to understand obtained information "accurately". However, because they change importance depending on the kind of information, they have accurate and perfect understanding of biases. In addition, they are often illogical. As a result, they do not necessarily take "economically reasonable" actions. Accumulation of these actions of theirs sometimes brings

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22) Table 7 shows calculation of 5 points. However, I calculated by 7 points separately. Calculation by 7 points show clearer results. On balance, weighting is high in "accounting information". In addition, C.I. tends to be high. "Yes in gamble", "No in corporate value", "No in equity investment", "2 or longer hours in time" were uncordinated answers. This suggests that testees interested in corporate value and equity investment gave co-ordinated answers and carried out relatively logical decision-making.

about a "market anomaly".

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