Studying the relationship between voluntary disclosure, decision-making styles, and information asymmetry in Tehran Stock Exchange

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Abstract: Disclosure of financial information in annual reports is considered as a key topic of research. This study set to check methods of investor's decisions and the relationship between the level of voluntary disclosure and information asymmetry on a listed company on Tehran Stock Exchange. In this regard, a research has been done on the methods of investors' decisions to test these hypotheses. In terms of subject, this study is in the field of research related to the Brunswik leans model in accounting treatment. This research is a field study and the purpose of this study is to take research sample from among masters, professors and PhD students in accounting and financial management. For purposes of this study, Sample members were divided into two groups (experimental and control) and four decision style inventory; Directive Style, Analytical Style, Conceptual Style, and Behavioral Style.

As an addition, investors are divided according to their brains' dominant style of decision-making and cognitive complexity so that uncertainties about the tolerance level are classified. Evidence shows that those who have their left brain as more dominant are likely to use more items, on average, to process information. The results of study show that the different styles of decision-making have significant differences in terms of volume and processing time. Also there is no significant difference was observed in terms of the accuracy of decision making between different styles of decision. It is expected to voluntary disclosure reduce the level of information asymmetry in the market.

Key words: voluntary disclosure, decision-making styles, the leans processing model, information asymmetry

1. Introduction.

In this section, to study when and how information overload can occur for different people by disclose information, decision-making styles may be a key factor. The theory of decision making styles has studied on collection patterns, and how to use classified information by individuals when they are in a position to make decisions (Driver, M., Svensson, K., Amato, R., Pate, L.,1996).

In this study, the behavioral model of Ulmann (1985) was used to determine the effective factors on the level of voluntary disclosure. In terms of subject, this study is in the field of research related to the Brunswik leans model in accounting treatment. Brunswick lens model as an analytical framework of the accounting treatment used in research. Through the lens and by using a series of basic data, we can predict the future based on that forecast.

In terms of subject, this study is in the field of research related to the Brunswik leans model in accounting treatment. Brunswick lens model as an analytical framework of the accounting treatment used in research. Through the lens and by using a series of basic data, we can predict the future based on that forecast. In this model a person's decision is on the one hand and on the other hand it is decided. In the middle of the model is also based information that helps decision-makers to use that information to decide the issue (Nikoo maram and Banimahd, 1388).

In this study the behavior of investors will be checked in the voluntary information disclosed by taking different decision-making styles. For this purpose, data for decision making styles was collected by decision style inventory Questionnaire (DSI) which is a standard questionnaire. It was developed by Alan J. Row (1983) with the aim of providing a way to evaluate and compare the preferences of people during the encounter of different decision-making positions.

2. Literature Review.

Uyar and Klich (2012) investigated the ability to create value by paying voluntary disclosure. They produced 129 companies listed on the Istanbul stock market for the 2010 fiscal year examined. The results showed that capital market participants to react voluntary disclosure by companies. In other words, companies that offer more voluntary disclosure, investors with more value, and this will increase the company's value.

Payne (2010) investigates the professional and amateur styles of investment decision and compares them. His evidence shows that significant differences between professional and amateur styles investment decision on the selection of investment options there.

Al Tamimi (2006), say that the analytical and perceptual decision making styles spend more time to process information before making a decision themselves. Investors do not have enough time to analyze all the investment options so they restrict them search to stocks that have attracted their attention. This could be a good or bad image in the minds of investors make. However, the coefficient on the annual report score is significantly negative.

Rowe & Boulgarides (1983) defined a cognitive and behavioural model which indicates four decision styles, which are determined by classification into two dimensions: high cognitive complexity (thinking) or low cognitive complexity (action) and brain hemisphere dominance (either task or people orientation). Cognitive complexity measures a person's capacity to cope with information. Cognitive complexity has also been equated to tolerance for ambiguity because these individuals are able to deal with information that is not sorted or structured. The other dimension in decision style according to this model is the brain dominance or the side of the brain with which people process the information. Brain dominance research helps towards the understanding of the dimension of decision-making style. The left side of the brain is the logical hemisphere. It focuses on the more technical aspects of the world. Conversely, the right side of the brain concentrates on the spatial, visual, or social aspects of our environment (Figure1).

Figure 1. The Cognitive-Contingency Decision Style Model

		Left Brain	Right Brain
Cognitive Complexity	Tolerance for Ambiguity	**Analytic** logical, abstract thinker	**Conceptual** broad, spatial creative thinker
	Need for Structure	**Directive** focused, rapid results	**Behavioural** support, empathy, listens
		Technical	Social
		Environmental Values	

Rowe & Boulgarides (1983)

3. Research Methodology.

3.1. Te decision making styles Assessment Questionnaire.

This research is the study of the behavior of investors in the territory subject under the company examines the impact of the disclosure. To achieve the study goals, the "decision making styles Assessment Questionnaire (DSI)" was used.

The samples tested in this study were divided into two groups. For the conventional treatment group financial statements and summary of accounting data samples over 3 years was compulsory. Then the respondents were asked on the basis of this information between two fixed amount X Rials of investment options or bonds with a guaranteed %16 profit (return on risk-free) and invest in a portfolio form. It also asked investors based on the information that is given to their company's stock price after a period of six months to purchase and maintain estimate. He must predict price for the company in six months (minimum price, maximum price possible). The triangular pattern is one of the most common forms of stock pricing. The average of these prices was calculated to be just an average price calculated for each investor. It was assumed that the company is divided into profit this year will be equal to last year's dividend. But in the control group, in addition to financial information related to financial reporting forced on to investors, a summary of important information voluntarily disclosed to investors samples were also (23 items of financial and non-financial reporting of Experimental Corporation (SAIPA Co.). Information on Saipa Co. contains 16 items about voluntary discloser and 7 items about financial statements). All the above instructions for the control group as well as groups standing .They are given the opportunity to view each piece of information as long as they like and return to a piece as many times as they like.

Information asymmetry in decision-making style is the dispersion (SD) estimated prices that style of decision-making by investors.

Several statistical methods parametric and nonparametric test was used to compare the mean of the two communities, including them the techniques, single-factor analysis of variance (ANOVA), the test compares the variances of two populations (Levin test) test, LSD, and so on.

3.2. Variables Measuring

Information Asymmetry Index: applied a fuzzy model

Information asymmetry of one decision-making style is an Average dispersion prices estimated by decision-makers. A fuzzy sets approach is used to estimate Information asymmetry index (Ahlers, David M., and

Vithala R. Rao, 1977, 1976, and 1975). Therefore, each investor is asked on estimated three prices: high (H), mod (M), and low (L). So we will have:

$$F(z)=\begin{cases} \left[\dfrac{2}{H-L}\right]\left[\dfrac{Z-L}{M-L}\right] & ; \quad L \leq Z \leq M \\ \left[\dfrac{2}{H-L}\right]\left[\dfrac{H-Z}{H-M}\right] & ; \quad M \leq Z \leq H \end{cases} \qquad \text{All for H-L} \geq 2$$

$$\text{Average} = \frac{H+M+L}{3}$$

$$\text{Variance} = \frac{L^2+M^2+H^2-LH-MH-ML}{8}$$

3.3. Decision Styles.

In measuring a person's decision style, DSI is used. The instrument determines one's preferences when responding to a series of 20 statements. Each question of the DSI instrument has four possible answers. The answers are most like you, moderately like you, slightly like you, or least like you. The questions are weighted exponentially. The most like you answer is weighted 8, the moderately like you answer is weighted 4, the slightly like you answer is weighted 2, and finally the least like you answer is weighted 1. Each answer can only be used once. The responses are ordered by decision style. The first response is the directive, the second is the analytic, the third is the conceptual and, finally, the fourth is behavioural. The responses are put in columns and summed to obtain the level of dominance of each style. The total for each question is 15 (sum of 8, 4, 2,1) and the total for the whole instrument is 300 (20 times 15). The maximum possible score for any one style is 160 (20 times 8) and the minimum is 20 (20 times 1) (Rowe & Boulgarides, 1983).

4. Experimental results.

Experimental research on voluntary disclosure is a long history, with research Cerf (1961) started and continued with the next wave of studies.

The introduction of lens model and policy capturing research in the mid 1970's has been a significant contribution to the auditing literature. This line of research has introduced new research techniques and methodologies to the literature and played a major role in the acceleration of the behavioural research in auditing.

The literature has shown that the more complex decision styles (Analytic and Conceptual)are less likely to suffer from information overload than the less complex decision styles (Directive and Behavioural). Rowe and Mason (1987) find that the left brain dominant styles (Analytic and Directive) focus on the task in a decision environment. Therefore, they perform better in the area of finance than the right brain dominant styles (Conceptual and Behavioural) so these styles process more firm voluntary disclosure than others.

This premise tested in an investing environment should answer the question as to how many information pieces an investor will view before making a decision. Therefore, it is hypothesized as follows:

H1: There is a significant relationship between investor's dominant styles and mean number of firm's voluntary disclosure items viewed.

Hypothesis H1 is subtracted to three sub-hypothesis H1a, H1b, and H1c:

H1a: Analytic and Directive (Left Brain) decision styles will have a higher mean number of firm's voluntary disclosure items viewed than Conceptual and Behavioural (Right Brain) styles.

H1b: Analytic and Conceptual (More Complex) decision styles will have a higher mean number of firm's voluntary disclosure items viewed than Directive and Behavioural (Less Complex) styles.

Hypothesis H1a is tested using two methods. First, it is tested by comparing the mean number of items viewed by each of the two groups.

$$\begin{cases} H_0: \mu_{left} \leq \mu_{right} \\ H_1: \mu_{left} > \mu_{right} \end{cases}$$

Before the mean compared measurer, the "Levin" test is done and Fisher's statistic is reviewed.

$$\begin{cases} H_0: \sigma^2_{left} = \sigma^2_{right} \\ H_1: \sigma^2_{left} \neq \sigma^2_{right} \end{cases}$$

Hypothesises H1a and H1b are tested using two methods. First, it is tested by comparing the mean number of items viewed by each member of the two groups. The respondents are grouped according to their brain dominance as determined by their DSI scores. An independent sample t-test, with the number of items viewed as the test variable and brain dominance as the grouping variable (Left or Right Brain), is run. The results reveal that from the 23 (16 items for voluntary disclosure) items available, the left brain dominant styles actually view more items than their right brain dominant counterparts. Therefore, H1a is supported and it should be noted that the difference between the two means is statistically significant, which is at 0.05.

Also, for testing H1b, cognitive complexity as the grouping variable (more or less complex), is run. The results reveal that from the 23 (16 items for voluntary disclosure) items available, the more complex styles actually do not view more items than their less complex counterparts. Therefore, H1B is not supported.

However, it should be noted that the difference between the two means is not statistically significant, which is at 0.05 .

Additionally, a one-way ANOVA test, with number of items viewed as the dependent variable as well as decision style (directive, analytical, conceptual, and behavioural) as the factor, is run. The results reveal no significant difference between the decision style groups (sig=0.251). This lack of variance in use of information among the four decision styles fails to support hypothesis H1.

Multiple Comparisons in amount of Voluntary Disclosure processed by different Decision Styles shows the results of a LSD test, which compares each style to the other three. There are no significant differences between most of groups but we have a significant difference between behavioural styles and directive and analytical styles.

Since the number of observations in behavioural style test is less than 30 cases, Therefore, Kruskal-Wallis test (test H) is used to test for significant mean differences. Kruskal-Wallis test results also confirm the statistical findings of the one-way ANOVA test. Because χ^2 and sig of this test are 3.970 and 0.265 respectively, the evidence to reject H0, which is based on the equal to average amount of information processed by the different styles, cannot be provided.

H2: There is significant difference in terms of the accuracy of decision between different styles.

This hypothesis has two sub-hypotheses. To test these two hypotheses, there should be a sub-test of equality of variance tests ("Levin") between the experimental group and control group using Fisher's F statistic. It is noted that the accuracy of one decision-making style is an Average dispersion prices estimated by decision makers. For example, information asymmetry theory is used to compare the style I and j group, which is designed as follows:

$$\begin{cases} H_0: \ \sigma_{i,j}^2 \ \geq \ \sigma_{i,j}^2 \\ H_1: \ \sigma_{i,j}^2 \ < \ \sigma_{i,j}^2 \end{cases}$$

H2a: Analytic and Directive (Left Brain) decision styles will have a higher accuracy than Conceptual and Behavioural (Right Brain) styles in decisions.

H2b: Analytic and Conceptual (More Complex) decision styles will have a higher accuracy than Directive and Behavioural (Less Complex) styles in decisions.

The results of t-test and Descriptive Statistics before Voluntary Disclosure processed shows Sig "Levin" test for both hypotheses. Because this figure is smaller than the %5 significance level, variance equality (H0) is not rejected. The Levine test results do not provide sufficient evidence to support the tests on H1.

Furthermore, in 95% confidence level, the claim hypothesis is not accepted. Therefore, there is no significant difference between different styles about information asymmetry.

H3: Voluntary disclosure of information by companies has increasingly valuable content for the accuracy of decision making between different decision-making styles.

Accuracy of decision making (variance of estimated prices by investors) is used between the experimental and control group. This hypothesis has four sub-hypotheses. To test these hypotheses, there should be a sub-test of equality of variance tests ("Levin") between the experimental group and control group using the Fisher's F statistic. It is noted that the information asymmetry of one decision-making style is an Average dispersion prices estimated by decision-makers. For example, information asymmetry theory is used to compare the style I and j group, which is designed as follows:

$$\begin{cases} H_0: \ \mu_{exper} \ = \ \mu_{control} \\ H_1: \ \mu_{exper} \ \neq \ \mu_{control} \end{cases}$$

H3a: After voluntary disclosure by firms, Analytic and Directive (Left Brain decision styles) will have a higher accuracy of decision making.

H3b: After voluntary disclosure by firms, Conceptual and Behavioural (Right Brain decision styles) will have a higher accuracy of decision making.

H3c: After voluntary disclosure by firms, Analytic and Conceptual (More Complex decision styles) will have a higher accuracy of decision making.

H3d: After voluntary disclosure by firms, Directive and Behavioural (Less Complex decision styles) will have a higher accuracy of decision making.

The results of asymmetry t-test and Descriptive Statistics in after and before Voluntary Disclosure processed show Sig "Levin" test for all of the above hypotheses are 0.124, 0.012, 0.095 and 0.020 respectively. Because these figures are smaller than the 5% significance level, variance equality (H1) is rejected. The Levine test results provide sufficient evidence to support the H0 tests.

Furthermore, in 95% confidence level, the claim hypothesis is accepted. Therefore, there is a slight difference among the different styles on accuracy of decision making ex-anti voluntary disclosure by firms.

Results of First Hypothesis

The more complex decision styles (Analytic and Conceptual) and Left Brain dominant styles (Analytic and Directive) are less likely to suffer from information overload than the less complex decision styles (Directive and Behavioural). The left brain dominant styles (Analytic and Directive) focus on the task in a decision environment. Therefore, they perform better in the area of finance than the right brain dominant styles (Conceptual and Behavioural) so these styles process more firm voluntary disclosure than others. Based on what said, when the decision environment is less complex and rapid processing is needed, less complex decision styles will outperform more complex styles. If cognitive complexity is a learnt characteristic, then, an individual's cognitive abilities should increase over time. These findings are consistent with other related research findings, such as Liang et al. (2006) as well as Payne (2010).

Results of second Hypothesis

It shown Analytic and Directive (Left Brain) decision styles have a higher accuracy in decisions than Conceptual and Behavioural (Right Brain) styles. However, there is no significant difference in terms of the accuracy of decision between more Complex decision styles (Analytic and Conceptual|) and less Complex decision styles (Directive and Behavioural). These results are consistent with other related research findings, such as Rowe & Mason (1987), Payne (2010) and Markham & Harty (2008).

Results of third Hypothesis

There is no evidence to confirming the voluntary disclosure of information by companies has increasingly valuable content for the accuracy of decision making between different decision-making styles (Left Brain or Right Brain and also More Complex and Less Complex). Although, previous researches has shown that by voluntary disclosure of information, more complex decision styles averages have been taken more accurate decisions (Gelb & Zarowin, (2002), Lundholm, & Myers (2002), Hope (2003)). But results of this research show that voluntary disclosure of information in decision-making all decision styles have been ineffective.

4. Conclusion.

Information asymmetry occurs when one or more investors possess private information about a firm's value. Asymmetry creates an adverse selection problem in the market as informed investors' trade on the basis of their private information. These trading activities manifest themselves as unusually large imbalances in the observed order flow; therefore, the extent of information asymmetry among investors can be characterized as the probability that a particular buy or sell order comes from an investor with private information. In this section, how a firm's choice of disclosure quality potentially influences the level of information asymmetry is discussed.

This premise tested in an investing environment should answer the question as to how many information pieces an investor will view before making a decision. In this study the behavior of investors will be checked in the voluntary information disclosed by taking different decision-making styles. For this purpose, data for decision making styles was collected by decision style inventory Questionnaire (DSI) which is a standard questionnaire. It was developed by Alan J. Row (1983) with the aim of providing a way to evaluate and compare the preferences of people during the encounter of different decision-making positions.

Evidence shows that people with dominant left side of the brain use more items, on average, to process information. In addition, Behavioural decision-making style uses the lowest items to process information. Indeed, the results show that all styles in the Experimental group have less information asymmetry than the control group. These findings support the voluntary disclosure of information by companies to reduce the level of information asymmetry the market offers.

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