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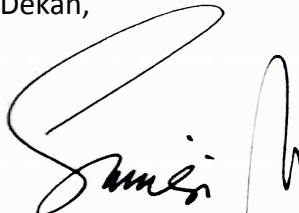
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The Use of Investment Assessment and Decision Systems: The Impact of Investor Characteristics

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ABSTRACT

This article discusses about the relationship between investor characteristics and investment decisions as well as the evaluation or valuation of information used. The method was used by conducting a literature review. Investigations were carried out on the relationship between investor characteristics and values in their dimensions. Investors who are anti-risk should use more information, especially the process-oriented information. Investors with a low tolerance for ambiguity will use more information, especially the financial, quantitative, and unique information. Investors with an external locus of control will use less information and need more external information. Investors with high performance requirements will use more information, especially quantitative information and processes. Investors who have experience in assessing the feasibility of investment projects will emphasize non-financial information, especially the process information.

Keywords: valuation system, investor characteristics, information dimensions, investment decisions.

1. INTRODUCTION

Individual behavior in utilizing their income is very diverse, especially in investment. As comparison, in Malaysia there were 3.8 million investors or 12.8% of the population, Singapore had 1.5 million investors or 30% of the population, and China had 100.4 million investors or 13.7% of the population [1]. The number of investors in Indonesia in 2017 was 1,122,668 investors or 0.43% of the population and in 2018 there were 1,617,367 investors 0.61% of the population [2]. The low portion of the number of investors in Indonesia to the total population shows that to make investment decisions in the Indonesian capital market for the people of Indonesia is not an easy economic activity.

The amount of funds circulating in the Indonesia Stock Exchange (IDX) is still dominated by foreign investor funds. The value of the securities stored in the Indonesian Central Securities Depository as of August 9, 2019 shows that foreign investors had securities valued at Rp1,907 trillion or equivalent to 51.46 percent of total equity. Meanwhile, the portion owned by domestic investors was Rp1,799 trillion or equal to 48.54 percent. Based on the statement of the Director of the Indonesian Central Securities Depository, Mr. Alec Syafruddin, although the value of securities controlled by foreigners was still dominant, the portion of foreign ownership fell compared to the position at the end of 2018. As of December 28, 2018, foreign investors controlled the value of securities of Rp1,857 trillion, equivalent to 52.17 percent of equity, while the domestic sector had Rp1,703 trillion, equal to 47.83 percent. This figure of 51 percent (ownership) is already smaller than that in a few years ago, which was still above 60 percent [3].

The impact of the dominance of foreign capital when it entered Indonesia made foreign exchange reserves increase

and the exchange rate of IDR against foreign currencies, especially US\$, appreciated. Similarly, the Composite Stock Price Index (CSPI) also increased. Conversely, if foreign investors leave Indonesia or the IDX, capital outflows will occur, this will cause the CSPI to fall and IDR to depreciate. However, this was not solely due to the movement of capital flows but also the influence of the global economy on companies listed on the IDX.

The Indonesian Central Securities Depository Director, Mr. Alec Syafruddin said, although foreign investors were dominant in terms of ownership, it turned out to be far less than local investors. Most foreign investors are institutional investors [3]. Based on information from the Head of the IDX Surakarta, M. Wira Adibrata, the number of investors in Soloraya in 2016 was 17,517 investors while in 2018 it rose to 27,940. The increase in the number of local investors, especially in Soloraya happened as a result of holding capital market classes and capital market material socialization on various campuses with a target market for millennials [4].

The increase in the number of investors is also due to the success of promoting the jargon "Let's Save Stocks", so as to eliminate the exclusivity of the capital market which is only for the upper-middle class [4]. A few years ago, to buy shares of at least 1 lot (500 shares) was changed into 1 lot (100) shares. This is a number of concrete steps taken by the IDX, so that investments in the capital market can be done by investors with limited capital as well as increasing the number of local individual investors.

Puspitaningtyas, developed a model of investor behavior in investment decision making. Investor behavior can be distinguished between rational and irrational. The results of his research show that investment decisions are generally rational investors and use accounting information even though personal signals are more dominant [5]. Falani, developed an investment decision support system based on fuzzy and non-fuzzy inputs.

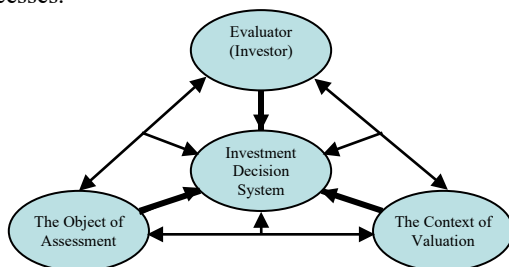
Fuzzy input includes micro and macro factors, while non-fuzzy input is related to technical aspects, namely stock price and CSPI. Based on these inputs, processing and output are carried out in the form of investment decisions [6]. The various models developed are still partial in nature, so a more comprehensive model will become renewed.

With the phenomenon of the remaining low number of residents in Indonesia becoming investors and the remaining dominance of foreign capital in the Indonesian capital market which has the potential for the instability of the IDR exchange rate indicator and the composite stock price index, as well as the absence of a comprehensive decision-making system model, it is interesting to conduct a deeper study about the title of this article. The purpose of this paper is to further explore the impact of investor characteristics in using a valuation system on investment decisions, which apparently are still rarely found.

2. THEORETICAL REVIEW

2.1 Investment decision system

Investment decision is a big step taken by investors, in which before doing it requires various activities that precede it. Figure 1 shows the investment decision system. The figure shows that the design and use of investment decision systems is determined by the characteristics of the assessor, the characteristics of the object to be assessed, the context of the valuation, and the interaction among these variables. The interaction between variables is not necessarily multiplicative. The design of an investment decision system will be determined by what is economically desired by investors. The context of valuation, for example investment strategies, environmental uncertainty (economic, political, legal, security), will have a large influence in making investment decisions. Furthermore, the way in which the system is expected to be used to make investment decisions becomes important, so as to avoid the irrational decision-making processes.



Source: Modification of Gelderman's opinion [22]

Figure 1. Investment Valuation Framework

Using an investment decision system requires the necessary information and formal guidelines on how this

information should be used. However, investment decision systems may be used differently by different investors, and the differences in usage can also be observed for different valuation objects or different valuation contexts. The use of investment decision systems will be determined by the privileges of the appraiser (investor). This article will discuss more on the characteristics of investment appraisers, which is still a relatively neglected area of research influence on investment decisions.

2.2 Dimensions underlying the use of investment decision systems

Figure 1 shows that the context of valuation, the characteristics of the valuation object, and the characteristics of the valuer (investors) determine the way the investment decision system is designed and used. The valuation context will be very important for design decisions, while the characteristics of investors will be relevant in assessing how the investment decision system will be used. The figure also indicates that the design and use of investment decision systems influence each other.

In principle, each investment asset has certain characteristics that can be identified from the level of risk and return. In financial management applies axioms: high risk high return, low risk low return [7]. Risk and return information needs to be obtained by collecting relevant data that can be related to the object of valuation data and the context of the valuation. The required data design will have a relationship with the characteristics of the investor. Related to the use of investment decision systems in Figure 1, the appraisers of investment projects in real assets and financial assets require information. Some of the results of previous studies related to the dimensions of the system can be seen in Table 1 below. There is a general approach introduced by Hopwood [8], that is when measuring performance, managers have several evaluation styles namely limited-budgeting style, profit-conscious style, and non-accounting style. In a restricted-budget style, managers when evaluating performance will be seen for their ability to meet the budget. In the earnings-conscious style, managers when evaluating performance emphasize the ability to increase the general effectiveness of unit operations in relation to the organization's long-term goals, so that accounting data must be used cautiously in rather flexible ways. And in the non-accounting style, managers when evaluating performance view accounting data as relatively unimportant and is used with other data.

Table 1. Relevant Dimensions Underlying Use of Investment Decision Systems

Authors	Dimensions
Hopwood [8]	Accounting-non-accounting, outcome-process, short-term long-term
Noeverman [9]	Quantitative-qualitative, flexibility-rigidity
Kaplan dan Norton [10]	Financial-non-financial, past-future, internal-external, outcome-process
Lipe dan Salterio [11]	Unique-general
Bone dan Sholihin [12]	Finance-nonfinance, unique-general
Handoyo [13]	Finance-nonfinance, unique-general

The two dimensions underlying the classification of each manager's style when evaluating performance, are namely the emphasis on accounting-non-accounting information and flexibility-rigidity. Flexibility is considered necessary to compensate for some of the shortcomings of accounting information, namely the incompleteness due to the lack of steps and comprehensive standards, the distortion due to the fact that the organization's cost function is not known with certainty, related to results that conflict with the process, and emphasis on short-term goals.

Noeverman [9] explained that the non-quantitative accounting information might have shortcomings similar to the accounting information. The implication is that the rigidity-flexibility dimension needs to be applied in a way that performance information in general needs to be used not only for accounting information. This implicitly shows that the non-accounting style can be divided into two separate styles namely the non-accounting style which has the rigidity and the non-accounting style which has flexibility.

The balanced-scorecard implicitly also recognizes a number of dimensions that can be used by investment decision systems [10], namely the dimensions of financial-non-financial, past-future, internal-external, and process-results. Financial information is related to the past, internal, and focus on results. Non-financial information is future-oriented, external and process-focused. The use of financial information requires flexibility, while the use of non-financial information allows rigidity. Categories that tend to be absolute like this seem to be difficult to maintain, so it is better to treat the four dimensions separately while it is possible to have relationships among them.

In decision making, evaluators consider more general performance measures than unique performance measures [11]. When evaluating performance, evaluators consider the financial perspectives with common size types compared to the unique types of measurement and the non-

financial perspectives with general-size types compared to the unique ones [12]. Furthermore, Handoyo [13] in his dissertation showed the measurement of performance appraisal using a financial-non-financial perspective and types of unique and general measures. The financial dimensions are classified into two types, namely financial information with a unique type of size and a general type of size. Furthermore, the non-financial dimensions are classified into non-financial information with a unique type of measurement and a general type of measure.

Although various researchers emphasize the use of information by managers in conducting evaluations or assessments to assess their performance, the authors believe that the evaluation style and underlying dimensions can also be applied to investment decision systems. In this system, there is also a process of evaluating the feasibility of business projects as well as evaluating the performance of a division in an organization.

3. METHODOLOGY

To answer the purpose of writing this article, a literature review was conducted. Based on this review, an investment decision system and a dimension of information used for evaluating the feasibility of a business project are raised. Next, a proportion is drawn up which is limited from the perspective of the characteristics of the appraiser or investor. This limitation is done, because in this section, it is still rarely found the results of research.

4. RESULTS

The appraiser or investor characteristics can be classified based on demographics or psychology. In this article, the discussion is limited to the characteristics of investors based on psychology, namely: tendency to take the risks, tolerance for ambiguity, locus of control, the need for achievement, and investment experience.

4.1 Tendency to Take the Risks

The characteristic of investors when evaluating the feasibility of investment projects is the extent to which they are willing to take the risks. In general, investors can be categorized into: happy to face the risk, neutral against the risk, and anti-risk. Investors with a tendency to take low risk, will gather more information to reduce uncertainty [14]. Likewise, Lewin and Stephen [15] stated that CEOs, who tend to take low risk, will tend to apply centralized organization design with high intensity of control and direct supervision to minimize the uncertainty and avoid surprising things. Based on this opinion, it leads to the following propositions:

Proposition 1: Investors with low risk-taking tendencies will use more information than investors who have high risk-taking tendencies.

To avoid the uncertainty, investors who tend to take low risks are likely to dig deeper into detailed operational data than the final data. Based on these arguments, the next proposition can be stated as follow:

Proposition 1a: Investors with low risk-taking tendencies will use process information rather than yield information, compared to investors with high risk-taking tendencies.

4.2 Tolerance for Ambiguity

The types of investor characteristics can be observed from the level of tolerance for information ambiguity, namely: high, low, and between the two. The definition of tolerance for ambiguity is the subject of debate among experts [16] and [17]. According to Budner, who was followed by Das [18], the intolerance for ambiguity was defined as a tendency to understand or interpret ambiguous situations as a source of threat. But according to MacDonald [16], the more appropriate term for the construct of tolerance for ambiguity as assessed by Frenkel-Brunswik, is that the ability to understand that ambiguity will be rigid.

People with low tolerance for ambiguity tend to reduce the complex problems into a simpler form by responding to the minimum available information and rejecting change [15]. Rigid people tend not want to see conflicting information. Budner, as cited by Lysonski and Andrews [19], defined an ambiguous situation as a situation that cannot be compiled or categorized adequately by individuals due to the lack of adequate instructions. Budner distinguishes ambiguous situations in 3 types: totally new situations, complex situations, and contradictory situations. Investors with low tolerance for ambiguity are more problematic by consistency than other investors who are more tolerant for ambiguity, so as to resolve the ambiguous situation by gathering more information [20]. People who are scored low for ambiguity tolerance will gather more information when they consider the information available to be ambiguous [21]. People who tolerate low ambiguity prefer financial information to non-financial information, and prefer unique information to general information [11].

Based on this opinion, it shows that investors who have low scores on tolerance for ambiguity need more information to reduce the ambiguity. Thus, the propositions can be stated as follows:

Proposition 2: Investors with low tolerance for ambiguity will use more information than investors with high tolerance for ambiguity.

Then, it is possible to formulate more specific proposals. Investors who are intolerant for ambiguity, tend to prefer financial data that communicates messages that are not ambiguous, compared to non-financial data in assessing the feasibility of investment projects.

Proposition 2a: Investors with a low tolerance for ambiguity will place more emphasis on financial information than non-financial information, compared to those with a high tolerance for ambiguity.

Qualitative information is potentially ambiguous information, so it is expected that individuals with low ambiguity tolerance prefer the quantitative information.

Proposition 2b: Investors with low ambiguity tolerance, emphasize the use of quantitative information more than qualitative information, than do investors with high ambiguity tolerance.

Unique information reflects information with a unique type of measure (detailed and complete), while general information presents an unspecified measure.

Proposition 2c: Investors with low ambiguity tolerance, place more emphasis on using unique information than general information, than do investors with high ambiguity tolerance.

4.3 Locus of Control

Locus of control is defined as the tendency of people to associate the results with internal or external causes [22]. People who have an internal locus of control, tend to attribute their success to their own efforts. Meanwhile, people who have an external locus of control, tend to associate their success with external contributions. Theoretically, a person who has an external locus of control, will want less information than that with internal one. Those who have an external locus perceive that success is beyond their control and assess the information they don't need. This is also reinforced by Fisher's empirical study [23], which shows the differences in the assessment of information between parties who have internal and external locus of control, ie those who have external control locus need more information to maintain their attribution or find circumstances in which they can provide contribution to success.

In the context of investment, generally investors with external locus of control will use less information. Their conception assumes that they have no influence on the results, so that the information is not useful for them. Based on this opinion, the following propositions can be put forward as follows:

Proposition 3: Investors with an external locus of control, will use less information, than do investors with an internal locus of control.

However, the information used by those who have an external locus of control, is mostly external. If this happens, the information that is internal is invalid. Based on this argument, the proposition can be arranged as follow:

Proposition 3a: Investors with an external locus of control, will place more emphasis on using external information rather than internal information, than do investors with an internal locus of control.

Someone with an internal locus of control has the ability to process information better and may also be able to use

broader information. Based on these arguments, the next proposition can be developed as follow:

Proposition 3b: Investors with an internal locus of control, will use information that has a broader scope, than do investors with an external locus of control.

4.4 Need for Achievement

Everyone has diverse needs for achievement. This characteristic is also inherent to investors. Investors with the need for high achievement, will view the achievement as intrinsic appreciation. Lewin and Stephens [15] stated that CEOs tend to set moderate goals, take moderate risks, and prefer frequent and concrete feedback about their performance. Performance-oriented CEOs must support highly-structured incentives, awards, and performance appraisals. CEOs are often faced with positions as investment decision makers who need information to achieve the stated achievements.

Based on this opinion, a proposition can be arranged as follow:

Proposition 4: Investors with high performance needs will use more information, than do investors who have low performance needs.

Furthermore, it is also possible to compile this proposition by expanding the use of quantitative and qualitative information, as follows:

Proposition 4a: Investors with high performance needs will use more quantitative information than qualitative information, than do investors who have low performance needs.

In addition, focusing on the relationship between process and results, investors who have high performance needs tend to want to know the process information besides the result information. On this basis, a proposition can be arranged as follow:

Proposition 4b: Investors with high performance needs will place more emphasis on process information rather than on yield information.

4.5 Experience in Assessing the Feasibility of Investment Projects

People who have experience in assessing the feasibility of an investment project will make decisions faster. Their experience provides a broad insight into project appraisal, so that there tends to not be too much information needed. The information needed has more emphasis on non-financial information and business processes.

Conversely, people who lack the experience in assessing investment projects, will need a lot of information and to gather complete information requires more time. The information needed emphasizes more on financial information and yield information. Financial information can reflect the information from all activities, because it is almost certain that all activities lead to financial statements. Besides, financial information is information that presents

the results of transformation activities. Result information is more necessary than process information, because the outcome information certainly reflects the input and process of information.

This is in line with the findings of Beyer et al. [24], showing that planners who have functional experience tend to narrow their cognitive processing, so that the information is noticed and the number of identified problems is reduced. As a result, although the amount of information needed can be reduced, the proportion of non-financial information used will increase. Based on these findings, the following proportions can be arranged as follow:

Proposition 5: Investors who have experience in assessing the feasibility of investment projects will emphasize non-financial information rather than financial information, compared to those who have no experience.

Furthermore, experienced investors place more emphasis on using process information rather than yield information, so that the following proportion can be arranged as follow:

Proposition 5a: Investors who have experience in assessing investment projects place more emphasis on the use of process information rather than yield information, compared to those with no experience.

5. DISCUSSION

This article intended to find an explanation for the differences in investment decision system practices by looking at the possibility of investor differences in certain information choices when making investment decisions. Various information choices can be categorized by dimensions into: process-outcome, quantitative-qualitative, unique-general, internal-external, and how much information is used.

Discussions are generally conducted and proportions are prepared based on the characteristics of investors in using the information dimension to make investment decisions. However, empirical research related to this field is still very scarce. Generally, this research is linked to investor characteristics such as tendency to take the risks, ambiguity tolerance, locus of control, the need for achievement, and experience with investment interests and / or investment decisions. Investors who have a risk-taking character, high ambiguity tolerance, internal locus of control, high need for achievement, and experience, have a positive influence on investment decisions.

In terms of investment decision making, it requires the stages of data collection and processing for the purpose of decision making. Data is processed into information, and information can be categorized into various dimensions. This article intended to provide contribution to researchers in order to broaden and deepen the research in particular about the influence of investor characteristics associated with various dimensions of information on the use of investment decision systems, that gave birth to these various propositions.

Anti-risk investors need more information, and in particular, is process information. Risk has a positive

effect on investment decisions. Investors who have a low tolerance for ambiguity need more information, especially financial, quantitative, and unique information. High tolerance for ambiguity has a positive influence on investment decisions. Investors with external locus of control need less information and need external information. The locus of internal control has a positive influence on investment decisions. Investors with high performance requirements will use more information, especially the quantitative information and processes. The need for achievement has a positive influence on investment decisions. Investors who have more experience, emphasize on non-financial information and especially the information on processes. Experience has a positive influence on investment decisions.

This article is limited to discussing the effect of investor characteristics on the use of investment decision systems, and does not discuss about the effect of investment object characteristics, investment context, and the relationship among characteristics in investment decision systems as presented in Figure 1. The results of this discussion can contribute to the development of subsequent research related to empirical testing against the proposition and inspire to conduct further research related to the decision making system.

6. CONCLUSION

Based on this explanation to achieve the objectives of this paper, the relationship between investor characteristics and investment decisions and information evaluation can be summarized as follows. In making decisions, anti-risk investors use more information than do the risk-taking investors. Anti-risk investors will use the process information rather than the yield information, compared to the risk-taking investors. In making decisions, investors with low ambiguity tolerance will use more information than do investors with high ambiguity tolerance. Investors with a low tolerance for ambiguity place more emphasis on financial information than non-financial information, compared to those with a high tolerance for ambiguity. Investors with low ambiguity tolerance emphasize the use of unique information rather than general information compared to those with high ambiguity tolerance. In making decisions, investors with external locus of control use less information than do investors with internal locus of control. Investors with external locus of control emphasize more on the use of external information than internal information compared to those with internal locus of control. Investors with internal locus of control use information that has a broader scope than do investors with external locus of control. In making decisions, investors with high performance needs use more information than do investors with low performance needs. Investors with high performance needs will use more quantitative than qualitative information compared to those with low performance needs. Investors with high performance needs emphasize process information rather than outcome information. In making decisions, investors who have

experience in assessing the feasibility of investment projects place more emphasis on non-financial information than financial information compared to those with no experience. Investors who have experience in assessing investment projects place more emphasis on using process information rather than yield information compared to those with no experience.

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