

## **ANALYSIS OF DECISION MAKING INVESTMENT STOCK USING ANALYSIS HIERARCHY PROCESS (AHP)**

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**ABSTRACT:** *The capital market is one of the means for the company in improving the long term funding needs, capital markets also have linkages with the financial services sector, both on the level of domestic, regional and international level. This research aims to see how alternative strategies should be taken by investors to the stock investment decisions, so that the benefit is expected. This research using methods of Analysis Hierarchy Process (AHP) to be able to determine which alternative strategies can be made by investors to invest in shares. Results of the study showed that the highest priority that can be taken that is investors should behave rationally with priority registration (70.6%), the second priority is the investor being intuition with priority registration (15.3%) and the third priority is the investors behave in emotional with priority registration (14.1%).*

**KEYWORDS:** Capital Market, Stock Price, Analysis Hierarchy Process (AHP), Investors, Alternative Strategies

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### **INTRODUCTION**

The capital market is one of the means for the company in improving the long term funding needs, capital markets also have linkages with the financial services sector, both on the level of domestic, regional and international level. The capital markets have an important role in the economy of a country. Many people are interested to invest in the capital market as more promising profit to be had. Stock is one alternative in capital market instruments that are widely used to invest. Investment activity is generally done to be able to gain an advantage or profit in a certain amount. The intention of investing can be reflected with the rise of the stock price of a company (Septyanto,2013). If the stock price increase, the issuer is considered to have a good performance and prospects. The implication, investors will get a capital gain if the stock sale, or held to earn dividends or get both (Arrozi,2010). The stock is one of the many investment instruments chosen, but investment in the form of shares has high risks because the share price is highly sensitive to many factors.

Increased stock demand will lead to rising stock prices. Therefore, investors expect to get stock return in the form of capital gains or gains obtained due to rising stock prices. However, it is not followed by an increase in stock returns produced by the company. The condition of the return of the acquired shares are likely to fluctuate. Attention to investment issues may reflect attention to information in interpreting information for decision making (Septyanto,2013). Information for investors, is a signal that serves as a stimulus, because it can inform the financial performance of the company.

Based on problems that have been described, the researcher interested in conducting research on how the appropriate alternative strategies priority for investors in making investment decisions. The result of this study later, will be able to provide information to investors in making investment decisions any things that need to be considered in investing to get the

expected return. The purpose of this study is to see how the priority of alternative strategies that should be done by investors to be able to invest shares.

## LITERATURE

### Analysis of Hierarchy Process (AHP)

Analysis of Hierarchy Process is a method that can be used to be able to solve the problem of complex multicriteria into a hierarchy. According to Saaty (1991), the hierarchy is defined as a representation of a complex problem, it can be decomposed into a group that later formed into a hierarchy, so that the problem would appear to be more structured and systematically. According to Marimin (2013), AHP has a lot of advantages in conducting a decision due to be described graphically, making it easily understood by all parties involved in the decision-making. With the AHP, a complex decision process can be decomposed into smaller decision and can be handled easily. Hierarchy analysis process has several advantages (Saaty,1991), such as :

1. The existing structure of the hierarchy , as a consequence of the selected criteria to the deepest sub criteria.
2. Considering the validity up to the limit of inconsistency tolerance of various criteria and alternatives chosen by decision makers.
3. Considering the endurance of output sensitivity analysis of decision making.
4. Interdependence, the meaning of AHP, reflect the natural tendency of thought t sort through element in one system at different levels and grouping similiar elements in each level
5. Measurement, AHP produces a scale to measure things and the realization of a method for setting priorities.

Here some steps in AHP analysis :

### Hierarchy

The preparation of this hierarchy is done by identifying the observed information. The complication and determination of hierarchical components is based on the results of in-depth interview, literature studies and previous research.

### Priority

Each element contained in the hierarchy must be known relative weights of each other, its purpose is to know the degree of importance of the parties in the problem to the criteria and structure of the hierarchy or the system as a whole. The scale of comparison in the from of numeric scale to indicate the importance and dominance of one element to other elements. Table 2 shows the pairs of comparison scale in AHP.

**Table 2 Pairs of Comparison Scale in AHP**

Level of Confidence	Definition	Information
1	Just as important	Both elements have the same effect
3	Slightly more important than one over the other	Experience and judgement are one-sided to one's partner.
5	Quite important	Experience and decisions show success over one activity over another
7	Very important	Experience and decisions show a strong passion for one activity over another
9	Absolutely more important	An absolute element is preferred over the counterpart at the highest confidence level
2,4,6,8	The middle value between two adjacent decision values	A compromise is required between two considerations
The opposite	If for activity $i$ gets one number when compared with activity $j$ , then $j$ has the opposite value when compared to $i$	

Source : Saaty (1991)

The very first step that can be done in determining the priority criteria is to compile pairwise comparisons, comparing in pairs of all criteria for each hierarchical subdivision. The comparison is then transformed in the form of a paired matrix of comparisons for numerical analysis.

C	A1	A2
A1	$a_{11}$	$a_{12}$
A2	$a_{21}$	$a_{22}$
:	:	:
$A_m$	$a_{m1}$	$a_{m2}$

The value of  $a_{11}$  is the ratio value of the A1 element (row) to A1 (column) stating the relationship:

1. To see how far the importance of A1 (row) to criterion C is compared to A1 (column); or
2. To see how far the dominance of A1 (row) to A1 (column); or
3. To see how much of the C criterion character is found in A1 (row) as compared to A1 (column)

### Consistency Testing

The consistency of the expert's opinion can be measured using a consistency ratio that becomes the reference in the filling of pairwise comparisons matrix. Consistency ratio is set at 10%. The result of matrix filling by the expert's is stated consistent if the calculation of the

consistency ratio through the tools used in the form of expert choice software is smaller or equal to 10%. If larger than 10% , correction is made until a consistent charging is obtained. Expert opinions are combined and processed using expert choice software. The end result is the weight of each hierarchical level / component and the highest-weighted component is a priority component of each level of the hierarchy.

Many previous studies that try fatherly look at how the decision to be able to invest by using analytical hierarchy process (AHP). Oyatoye *et.al* (2010) conducted research on an application hierarchy process (AHP) to invesment portfolio selection in the banking sector of the Nigerian Capital Market, the research states that the investor will risk losing invesment returns during the financial crisis in nigeria, so investor fatherly suggested condusting short-term invesment and non-invesment medium to the long term.

Bolster *et.al* (2005), conducts research using analytical hierarchy process (AHP) to determine the factors that influence investor's decision to invest in a security. Research result generate patterns that invesment taken by an investor is based on the experience of investors in investing. Jayakumar *et.al* (2014) conducted research on a decision making framework for investment diversification using the analytic hierarchy pocess, produce research result that elections for investing is best done by the investor is investing in mutual funda, insurance , deposit in the bank , with a view criteria such as payback shape obtained, market and liquidity risk.

Cheung and Liao (2009), conducted a research on investing in Real-World equity markets with an AHP based decision framework. Produce research results that in doing fatherly decision to invest should be viewed rationally how the circumstances of a market, and how much capital to be invested in the market. Christanti and Mahastanti (2011) conducted a study on the factors that investors consider in making invesment, the research states that the factor which many considered by investors in making invesment is neutral information, accounting information and demographics also affect investors in making decisions invesment for investors. Jagongo and Mutswenje (2014), conducted a research on a survey of the factors influencing invesment decisions : The case of Individual Investors at the NSE. Results of the study stated that, the most important factor that affects the investor to invest is the reputation of the company, the company's status in the industry, the expected profits and the company's performance.

## **METHODOLOGY**

### **Types and Sources of Data**

The data used in this research is primary data derived from relevant sources related to stock invesment activity

### **Data Collection Technique**

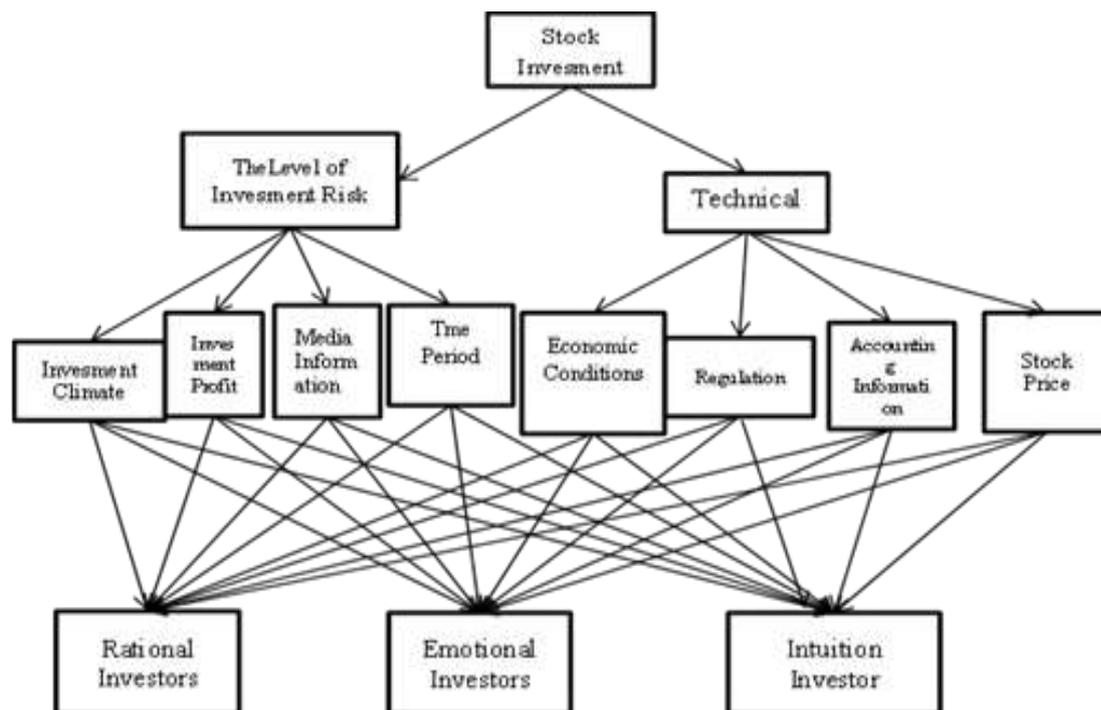
Data collection on this research was conducted through the collection of primary data through interview techniques (depth-interview) questionnaire and charging with expert who are experts in the areas of reserach are examined.

### **Analysis of Hierarchy Process (AHP)**

The growing invesment in capital market, making financial behavior is increasingly needed for an investor in making an invesment decision. Decision making for invesment will be pretty

much influenced by other matters that could affect future decisions. According to Christanti and Mahastanti (2011), the decision of an investor in making a decision can be seen from two sides, namely the extent to which decisions can maximize wealth and investment decisions based on psychological investors. Most investors in making an investment decision over see the things that are appropriate to the information but the fundamentals of the company, investors also need to pay more attention to things that are beyond the fundamental technical, because it can affect the return on investment will be achieved later.

Based on these considerations, it is necessary to do some of the steps that need to be considered by investors, in order to get the desired result. Analysis Hierarchy Process is used to look at other priorities in the strategy of hierarchial structure by using a questionnaire that had been developed . Assessment carried out by the three respondents whose results will produce a strategic priority that will be made that will be combined into a combined opinion matrix that result will be obtained priority strategy. Figure 2 shows the structure of the hierarchy has been compiled.

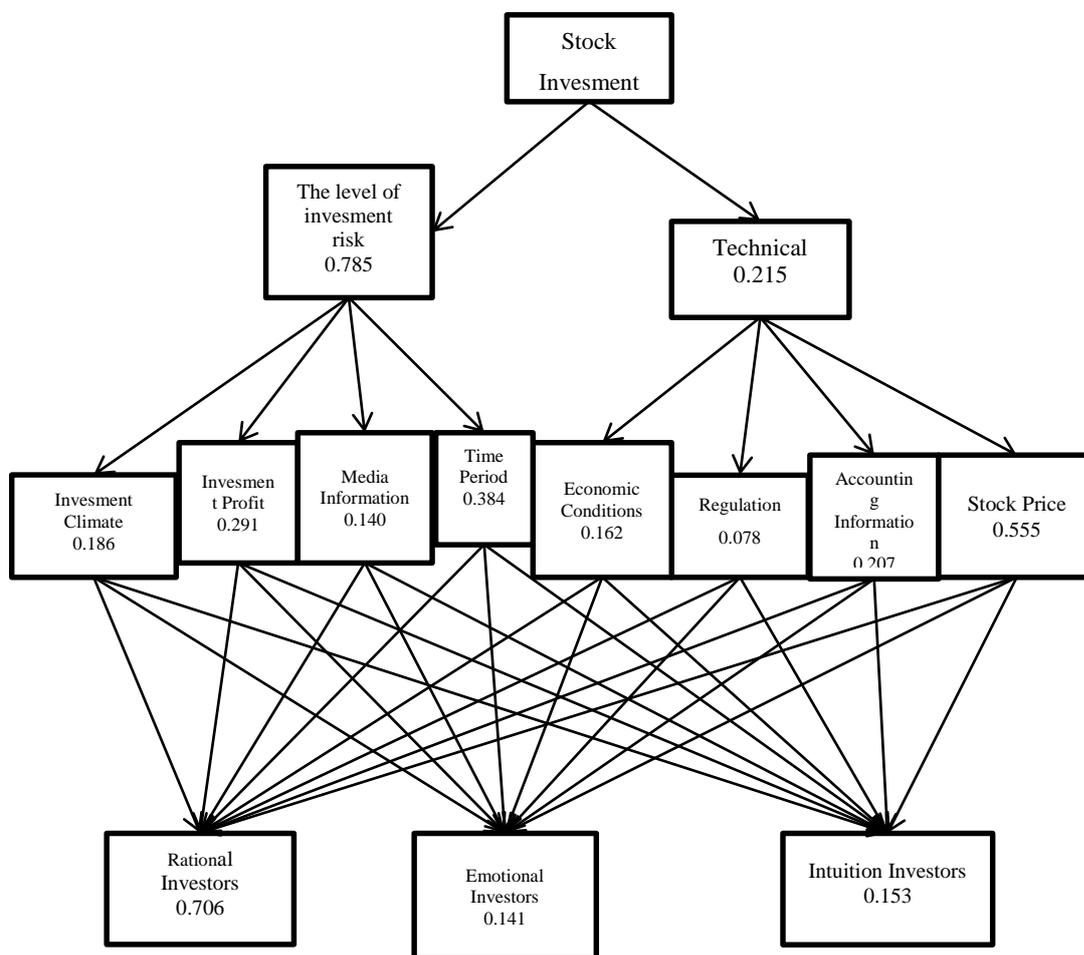


Strategy prioritization stock investments in the capital market are formulated based on several criteria that have been set. There are several components that form a hierarchy. The hierarchy consist of several criteria to be achieved , the criteria that influence achievement, sub-criteria that play a role and strategies that can be done to achieve the criteria that you want to target. Focus or goal to be achieved is the investment shares.

**RESULTS**

**Analysis of Hierarchy Process (AHP)**

Process hierarchy analysis is used to look at other priority strategies in hierarchical structures using the prepared questionnaire. Then, each element will be compared to each other at a certain level with a level above which is based on the base scale of importance rating. Assessment is done by three respondents whose results will produce a priority strategy that will be obtained. In the assessment process by the respondent, the individual opinion matrix should be seen the ratio of consistency is not more than 0.1. Results from the Hierarchy Analysis Process can be seen in Figure 3 below.



**Priority Criteria**

Based on expert judgment processed by using expert choice, obtained the result, priority or criteria that influence in the success of stock investment can be seen in table 3 .

**Table 3 Priority Criteria**

No	Criteria Factor	Priority Vector	Priority
1	Investment Risk Level	0.785	1
2	Technical	0.215	2

From the results of the processing that has been done, it is known that the criteria of the main determinants in the decision of investment stock is Investment Risk Level of 0.785 or 78.5%. The risk level factor in investment is very influential in making a decision to invest a stock. The higher the rate of return or the results that investors want to get is the greater the risk that will be accepted by an investor in making a decision to invest. The second determinant is technical criteria with a priority value of 0.215 or 21.5%. Technicality is one part of investment decisions that can be considered after the level of investment risk because by looking at some technical criteria such as corporate financial statements, government regulations as well as some parts of technical criteria will be able to affect the results to be gained.

#### Priority Sub Criteria based on Investment Risk Level Criteria

In this study also conducted an analysis of priority strategy sub criteria of stock investments based on each of the criteria that influence the selection of priority investment strategy shares. For sub criteria based on investment risk level can be seen in the following table 4.

**Table 4 Sub Criteria based on Investment Risk Level Criteria**

No	Sub Criteria	Priority Vector	Priority
1	Time Period	0.384	1
2	Profit Investment	0.291	2
3	Investment Climate	0.186	3
4	Media Information	0.140	4

The results of weight calculation and priority in the table above shows that the sub criteria that became the first priority in stock investment decisions is the time period of 0.384 or 38.4%. Then the second sub criteria that becomes decisive in stock investment decision is profit investment of 0.291 or 29.1%. The third sub criteria that determines stock investment decision is investment climate of 0.186 or 18.6%. The current investment climate in a capital market can affect the decision to invest. The fourth sub criteria that determines stock investment decisions is the media information of 0.14 or 14 %.

#### Priority Sub Criteria based on Technical Criteria

Based on sub criteria of technical criteria, the most influencing strategic priorities in stock investment decisions can be seen in table 5 below.

**Table 5 Sub Criteria based on Technical Criteria**

No	Sub Criteria	Priority Vector	Priority
1	Stock Price Movements	0.554	1
2	Accounting Information	0.207	2
3	Economic Conditions	0.162	3
4	Regulation	0.078	4

Based on the results of calculations and preparations using expert choice can be seen in the table above, that sub criteria based on technical criteria which become the first priority in stock investment decision is stock price movements of 0.554 or 55.4%. The second sub criteria that plays an important role in investment decisions is the accounting information of 0.207 or 20.7%. Accounting information is important to be noticed by investors, because the regulation itself is a regulatory provision made by the government which must be followed by the rules. The third sub criteria that play an important role in investment decisions is the movement of stock prices with a priority value of 0.129 or 12.9%. Stock prices are an important part of investment, by looking at the stock price movements of a company or issuer can be a benchmark for investors whether worth investing or not. Stock prices will surely fluctuate in price, where fluctuations in stock prices are influenced by several things such as the performance of listed issuers, macroeconomic conditions, and market forces. The fourth sub criteria that plays an important role in investment decisions is an economic condition with a priority value of 0.074 or 7.4%. Economic condition becomes a fairly important benchmark, because in this case the investor before making a decision to invest need to see in advance how the economic condition of a market.

### Alternative Strategy

There are several priority strategies that can be considered for investors in making stock investment decisions. Here are some strategies that can be done by investors to make investment decisions in table 6 below.

**Table 6 Alternative Strategy**

No	Sub Criteria	Priority Vector	Priority
1	Rational investors	0.706	1
2	Emosional Investors	0.141	2
3	Investor Intuition	0.153	3

Based on the opinions of experts with reference to the existing hierarchy, the best strategy that can be done by investors in making stock investment decisions is that investors should behave or think rationally with a priority value of 0.706 or 70.6%. Making an investment decision by being rational is one of the best ways that can be done to avoid the losses that will be obtained. Rational attitude itself is important because with investors think rationally or with logic in accordance with market circumstances that occur, can keep investors from risks or things that are not desirable. This rational attitude is preferable to investors and a first priority in making stock investment decisions compared with investors who are intuition in the second priority of 0.153 or 15.3%, meaning investors are still groping about the market conditions that occur. The intuition attitudes shown by these investors are more to the decision taken in a hurry not to pay attention to the market conditions that occur.

### CONCLUSION

For investors who engage in stock investment activities in Indonesia capital market must be able to make investment decisions rationally, based on current market conditions, by making investment decisions rationally assessed one alternative strategy appropriate for investors in making investment decisions. It should also look at how much time you want to get invesment

taking into account the level of risk will occur by considering the level of risk that will occur. The greater the profits, the greater the risks to be borne by investors.

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