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A Decision Tree Approach for Investment Decisions in SMEs

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Abstract

Small and Medium Enterprises (SMEs) are the most widely encountered businesses in Indonesia with various kinds of business fields engaged in by the community. Investment decisions are part of the activities carried out by SMEs. In making investment decisions are often influenced and based on various factors. A qualitative analysis research method used in this study. The research mechanism constructed is in the form of literature study. The literature used for citation consist of textbooks, articles, and online literature sources linked to this study. This article aims to produce a model that explains the factors that need to be considered in making investment decisions based on the literature and the results of previous empirical studies. In addition, the model uses a decision tree approach in making investment decisions for Small and Medium Enterprises (SMEs). The model produced in this study is sourced from various literatures that are used as a reference in the formation of models related to factors that need to be considered in making investment decisions in SMEs.

Keywords
small and medium enterprises; decision tree; investment decisions

I. Introduction

Small and Medium Enterprises (SMEs) are the most widely encountered businesses in Indonesia with various kinds of business fields engaged in by the community. As we know that SMEs have a big role in the national economy. Even in some world countries such as China, it shows the large role of SMEs in the country's economy. SMEs are proven to help absorb labor, provide skills for these workers and provide income for them. Thus the existence of SMEs will clearly help improve the community's economy.

SMEs are also a training ground for workers and entrepreneurs. Lower costs of setting up small and medium scale enterprises for enterprising workers, providing them with a livelihood also offers jobs. Although often the workers in SMEs have a low level of education. Often they do not find safe and well-paying jobs in the labor market. more than that, the training and experience gained in operating a company will encourage SMEs to grow and expand their reach. Meanwhile, the rules for promoting entrepreneurship are closely related to SMEs.

The economic condition of the population is a condition that describes human life that has economic score (Shah et al, 2020). The positive contribution made by SMEs to society and the country's economy encourages the government and society to continue to support the sustainability of these SMEs. In its implementation, SMEs face numerous kinds of problems. These problems include those that are still traditional, managed by families, using old technology to produce cheap and low-quality products in a limited market. In addition, the most common obstacles faced by SMEs are insufficiency of access to credit, technology, management, skilled labor, raw materials, suitable locations and places to carry out operations (Asri, AM and Baker, MI 2000).

Investment decisions are part of the activitycarried out by SMEs. In making investment decisions are often influenced and based on various factors. Over time, investors often show irrational behavior by taking actions based on judgments that deviate far from the assumption of rationality. Daniel (1998) reveals that psychology influences investor behavior, which is subject to change at any time. When investors are faced with a situation that forces them to choose what type of investment they will choose, there may be an element of subjectivity, emotion and other psychological factors that are more dominant in influencing the reaction.

A decision tree is a presentation of numerous judgments, their feasible results and chances at different phases of the scheme. In drawing a decision tree, we assume that the result can take on discrete values. In reality, the results may not be distinct however extended. Second, it may be difficult to estimate subjective chances for all results. Likelihood is determined subjectively based on expert opinion and past experience (Viswanath, 2007: 220).

The results of the research by Wulandari and Iramani (2014), stated that the variables that had a significant effect on investment decision forming were risk tolerance and risk perception, while experienced regret and overconfidence had no effect.

According to Astuti et al (2019) Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual.

Subsequent research concludes that: Knowledge of Financial Feasibility Analysis has no effect on investment decisions. Gender has no effect on investment decisions. Education has an effect on investment decisions (Ernawati, et al, 2019). Meanwhile, according to the Knowledge Based View (KBV) approach, it states that the core of organizational resources is knowledge (Grand, 1996). Where there are differences in research results between Ernawati et al. (2019) which states that knowledge of financial feasibility analysis has no effect on investment decisions, while (Grand, 1996) with the Knowledge Based View approach states that the core of organizational resources is knowledge. Where knowledge is a very important factor for organizational success.

The differences in the results of these studies are interesting to examine, what factors are important to consider in making investment decisions in SMEs. Based on various previous research results. Next, forming a model that shows the factors that influence investment decision making based on various previous research results and make decisions using a decision tree approach.

II. Review of Literature

The decision tree is a presentation of all kinds of judgments, their potential final results and their chances at different phases of the scheme. The actions involved in representation a decision tree are: Identify the judgment points and the others actions applicable at every point. Recognize the points of unpredictability and the range of other result at every point. Approximate the chances, costs and benefits of numerous occurances also activities. Then analyze and choose actions (Vishwanath, SR 2007:219).

Gveroski and Jankuloska (2017) state that the illiquidity of SME securities, problems related to the proper calculation of the cost of capital and limited access to other sources of capital in these companies are the main determining factors to hinder and complicate the process of evaluating the financial efficiency of investments. Thus the investment decision-making process becomes less certain, more complicated and can jeopardize the operating efficiency and future development of the company. They recommend several things: 1. Increasing the representation of the formal planning of investment activities. The need to make investment decisions as a projection of future inflows and outflows of funds requires proper documentation of these cash flows. 2. Greater knowledge acquisition for investment financing from external funding sources. 3. Application of various investment criteria No.3, when evaluating investment decisions and acquiring knowledge of techniques and problems in calculating the cost of capital. 4. Investment planning is based on quality and effective scanning of business environmental factors, because otherwise investment ambitions only revolve around the limit for smaller returns, where their main concern is how to survive and not how to develop.

Jonisiu et al, (2015) concludes that the main argues for the default of SMEs are improper financial management, disorganized, inadequacy capital and access to seek also inadequate training and education. From the survey, they have recognized that poor financial support and insufficiency managerial skills are the argues for the necessitous performance of SMEs.

Fatoki (2014) shows that a high rate of business failure will slow down economic growth and the rate of employment. He classified two reasons for failure namely; Internal reasons include lack of management experience, lack of functional skills and staff training and negative attitude towards customers. Their external reasons include lack of finance and unavailability of logistics and the increased cost of doing business. There needs to be training for managers on investment decisions.

Kalane, (2015) identified various reasons for the failure of SMEs in South Africa which include: Lack of control over cash flow and lack of knowledge of financial decision-making skills, poor cash flow management, high competition, poor working capital management and infighting among stakeholders, partners, lack of managerial skills and lack of planning, poor credit management and inappropriate use of business funds.

Vijayakumar & G Rajendra, (2015) found that many SMEs have few problems setting up a business, and eventually they have to liquidate the business at the initial stage of the business only. The various reasons for failure include financial, operational and managerial problems.

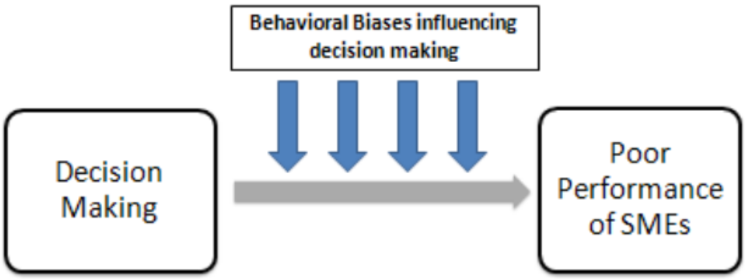
Hoque, (2017) the results of his research state that savings and loan financing from friends and relatives is the main source of financing while credit is a secondary source of financing. It is interesting to note that the income from the business is used to meet the family's expenses. So it is evident that the biased mental accounting has a significant effect on the financial management of SMEs.

Ahmad (2009) deficiency of research before investing is one of the bias behaviors connected with business collapse. Misunderstanding of market demand, office placement in wrong place, inability to find suitable business partners and inability to select reliable suppliers are some of the reasons for commerce failure.

Raveendra *et al* (2018) in his research found that the reasons behind the gap in achievement and were up to point out the behavioral matters involved in decision forming as one of the main obstacles that must be addressed. In order to have a sustainable growth of SMEs, the authors have suggested to provide a special training program to the Personnel involved in decision making. This will enable the personnel to increase episteme of the various biased behaviors involved in decision forming and be more careful when forming important decisions in the organization. This in turn leads to an increase in SMEs.

According to Roberts and Henneberry (2007), their research results show that the decision-forming process, as perceived by institutional investors, does not deviate significantly from the normative model. However, investors tend to "break down" the decision-forming process, by taking shortcuts to achieve (in some cases, predetermined) investment returns. These shortcuts have the potential to leave the decision-forming process open to the influence of bias, judgment, and sentiment.

Raveendra *et al* (2018) in his research proposes a conceptual framework that has been developed to explain how biased behavior affects the decision-forming process that leads to poor SME performance.



Source: Raveendra et al (2018)

Figure 1. *A Conceptual Framework Showing How Biased Behavior Affects Decision Making for Poor Performance.*

Financial theory needs to be appreciated and applied in financial judgments to get a gainful investment. This can work up the prosperity of shareholders and investors and also grow their potential to invest more. Behavioral finance theory provides a clear picture of the actual behavior of investors and the factors of investor behavior under dissimilar conditions. Knowing of these theories can reduce the company's actions to take unfavorable decisions. Investors can take advantage of gainful securities at a time when others do not have information about these opportunities (Zahera and Bansal, 2018).

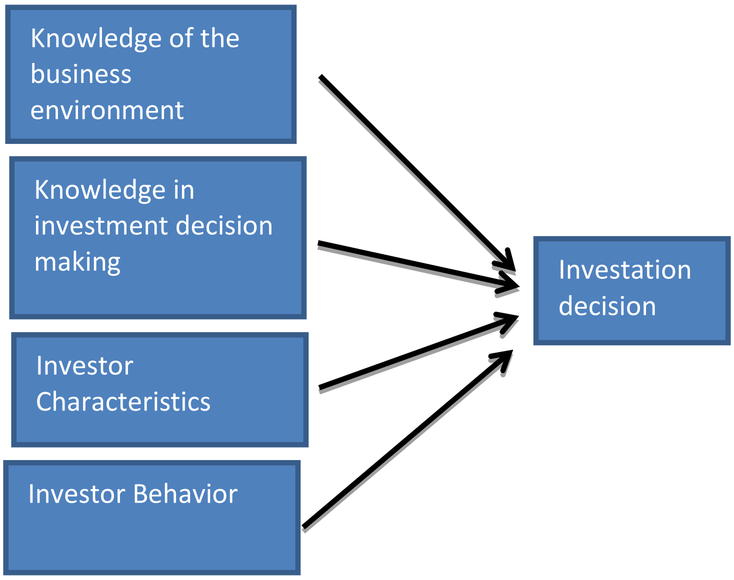
III. Research Method

A qualitative analysis research method used in this study. The research mechanism constructed is in the form of literature study. The literature used for citation consist of textbooks, articles, and online literature sources linked to this study.

IV. Results and Discussion

4.1 Factors Influencing Decision Making

Sources from various literatures explaining the factors that influence investment decisions provide a model related to the factors that influence and the process of making investment decisions in SMEs as follows:



Source: previous study

Figure 2. *Model factors that need to be considered in making investment decisions*

Knowledge of the business environment is very important to understand well before making investment decisions. This business environment includes the company's external and internal environment. The internal environment is the environment within the company that can be controlled by the company, so that it can be directed according to the wishes of the company owner. While the external environment is the environment outside the company that cannot be controlled by the owner of the company.

Elements that are in the company's internal environment such as labor, capital, raw materials, machinery and management. Where these five things also affect the success of business activities run by the company and can be controlled by the company. While the external environment of the company for example the economic and legal environment, technology, competition, the social environment related to the human population, density, and distinguish such as race, gender and earnings, as well as the global environment that cannot be avoided anymore along with the development of technology, transportation and communication. Where all elements of the company's internal and external environment will certainly affect the success of the business run by the company.

Companies that carry out business activitiesunder different industries may have different levels of organizational complexity as well as different environments. Knowing the strength of advantageousness in a specific industry is important (Argenti, 1976). The intensity of competition, concentration, strength of suppliers and customers, as well as the availability of substitute products in the market in the industry must be analyzed as a basis for making investment decisions.

Knowledge of investment decision making is important to understand in making investment decisions. Includes understanding of investment appraisal techniques, such as capital budgeting, cost of capital, risk, and cash flow estimates from investments to be undertaken.

Gveroski and Jankuloska (2017) some things that are recommended in investment decisions are increasing the representation of formal planning of investment activities, related to projections of future inflows and outflows of funds which require proper documentation of these cash flows. Then the use of knowledge in financing investments from external funding sources. Application of various investment criteria. Evaluate investment decisions and acquire knowledge of techniques and problems in calculating the cost of capital. As well as investment planning based on quality and effective scanning of business environmental factors.

According to the Knowledge Based View (KBV) approach, it also states that the core of organizational resources is knowledge (Grand, 1996). Knowledge in decision making is very important in making financial decisions, one of which is investment decisions. How an organization can create, integrate, and distribute its knowledge is very important. Because the success of an organization can be measured by its ability to build new knowledge based on the resources owned by the owner.

The characteristics of investors also affect the company's investment decisions. Investors who like risk tend to dare to take risky decisions. In accordance with the expected rate of return. Investors who dare to take risks tend to take bold decisions with careful consideration. While conventional investors tend to be careful in making decisions.

Investor behavior is also a factor that needs to be considered in making investment judgments. How the knowledge possessed, especially in forming investment judgments and the attitude of the investors in making investment decisions, financial theory needs to be well known with applied in financial judgments to get moneymaking investments.

4.2 Investment Decision Making in SMEs with a Decision Tree Approach

Approach to investment decisions on SMEswhen planning to create a new product:

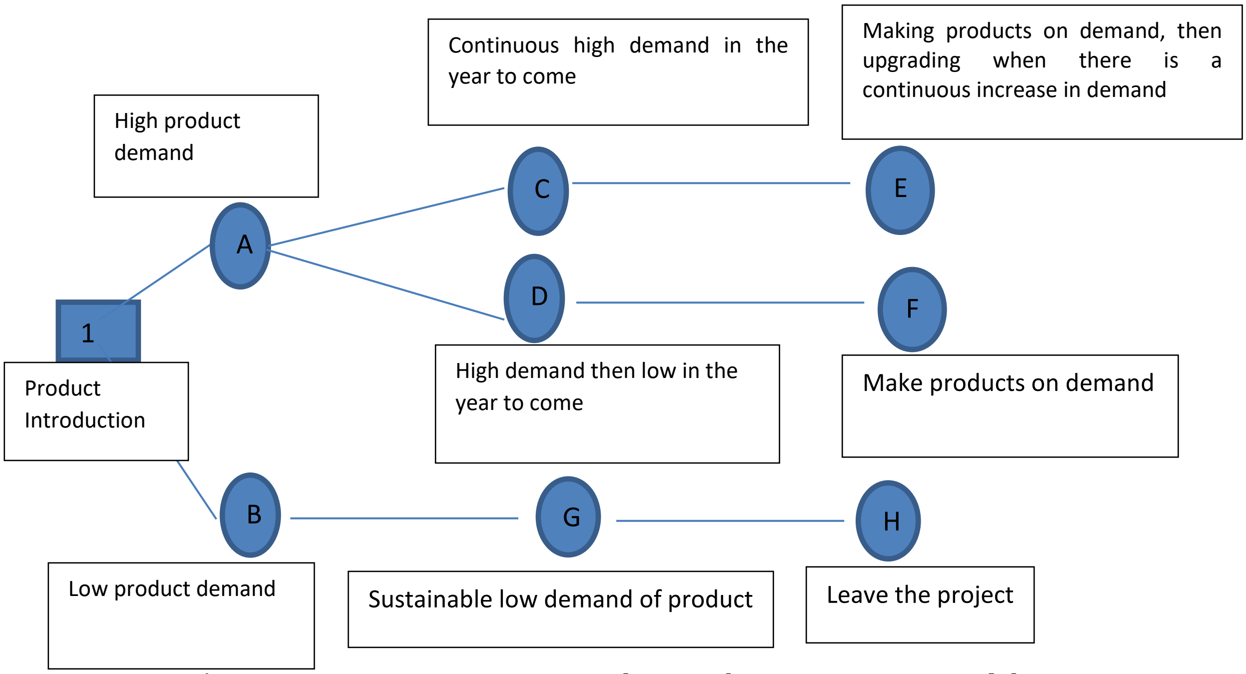


Figure 3. *Investment Decision Making with Decision Tree Model*

The picture in figur 3 explain that when demand is high and followed by a decrease because customers do not find satisfaction so that the average incoming demand is low, the company makes products according to incoming demand. Furthermore, when the demand that comes to the company is low, the company can decide to leave the project. Because when demand is low, the sales will not be able to cover the operational costs incurred by the company. The decision forming is of course based on careful analysis based on data and information owned by the company. Information on investment provisions, market situations, etc. can derive from many sources such as operations research, public opinion research departments, research and development , money management, with business person. A cross-functional team can be entrusted with the task of expanding all preferences and expanding them. The company must recognize what preferences and unpredictable continue at the moment and hereinafter, approximate the anticipated costs, demand, payments, and aggressive actions based on the others.

The decision-making process based on the decision approach is when the introduction of a new product then the demand for products that come to the company is high and followed by a high subsequent demand so that the average demand is high, the company makes products according to demand plus increased inventory to anticipate additional demand and in accordance with available resource capabilities. owned by the company both the availability of raw materials, capital adequacy, professional workforce, appropriate levels of wages or salaries for workers as determined by the government in the minimum average wage (UMR), and where to obtain the equipment or machinery needed to company operating activities.

According to (Ishak, Efendi 2005) that in making investment decisions, the availability of raw materials, capital, professional labor, a decent level of wages or salaries for workers, and where to get the tools or machines needed for the company's operating activities are matters. that need to be considered.

The decision tree approach is a method alike to energetic programming, is a good technique for representing and evaluating a series of investment judgments. Each decision is indicated by a number in the box located at the fork or node in the decision tree. Every limb that extends shows one alternative that can be selected at the decision point (Hespos, FC et al, 1965).

V. Conclusion

The model produced in this study is sourced from various literatures that are used as a reference and is expected to provide an overview of the factors that need to be considered in making investment decisions in SMEs.

The model in decision making with the decision tree approach in this study will be expected used as a guide that systematically considers various alternative investment decisions that companies will take with various considerations. In addition, it is hoped that it will help decision makers and small business support groups to give support and guidance to help untrained entrepreneurs, in that way enlarge their possibility of having a successful business.

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