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Analysis of Business Decision-Making Approaches in the Era of Economic Globalization

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Abstract

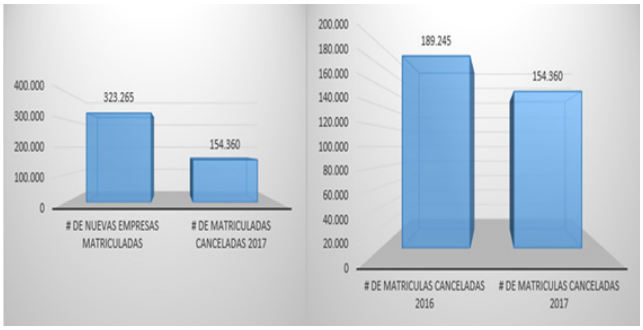
Objectives: When analyzing the impact of globalization on the generation of new companies, it can be found that aspects such as competitiveness and productivity have been greatly influenced by new dynamics that seek not only to ensure that companies better develop their processes, but also that they can respond appropriately to the great challenges involved in maintaining a current market or environment. The following is a review of three methods of decision making, with the aim of identifying the guidelines that can currently be useful for directors, managers and other people who have to make decisions on a daily basis. **Methods/Statistical Analysis:** The methodology used is descriptive in nature and is supported by the review of recent publications, in order to take into account, the advances that the scientific literature has been postulating for entrepreneurs in the global era. **Findings:** The final ideas suggest that decision-making models have been acquiring particular characteristics, adapting to the needs of constantly changing markets and in accordance with the expectations of the actors in each economy. **Recommendations:** The most important suggestions refer to observing the characteristics of each model and according to each organization apply the most convenient one.

Keywords: Business, Competitiveness, Decision-Making, Globalization, Productivity

1. Introduction

According to international organizations in Latin America and the Caribbean, the birth of new companies has been exponentially boosted in the last five years, as a response to levels of unemployment, innovation and the formalization of diverse activities, a notorious number of new organizations have been generated[1]. However, the same sources point out that the rate of premature closure is high, since many of the initiatives implemented do not take into account, among other factors, environmental risks, decision-making and technological innovation, as part of the components that must be strengthened in each new company[2].

In Colombia, this phenomenon has not been indifferent, since according to the National Confederation of Chambers of Commerce (Confecámaras)[3], it reported a total number of 154,360 cancellations of economic units between companies and individuals by 2016. Although there has been a decrease compared to 2015, the number of closures is still very high, as compared to the number of openings, it would represent 47.75%[4]. To illustrate the above information, the comparison in Figure 1 is presented.



Source: Confecámaras, 2017

Figure 1. Comparison of company openings and closures in Colombia.

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Due to the above-mentioned results, various governmental and non-governmental organizations have taken on the task of investigating how to promote the survival of new businesses in the country and, to this end, various initiatives have been promoted, among the most noteworthy of which are those related to training for entrepreneurs, since it is considered that as long as leaders can access information of value for their daily business life, they will be able to take on each of the challenges they face in a more competitive manner.

2. Mathematical Models for Decision Making

One of the aspects that most concern the entrepreneur is the making of timely decisions, for this reason, a large number of studies have taken the job of modeling a variety of methods in such a way that they contribute to the process. Next, we describe three theories or models that are considered relevant in the global economy that today marks a universal trend.

2.1 Theory of Real Options

The theory of real options is an excellent alternative for making business decisions, understanding the option as the right to buy or sell an asset within a certain period of time[5], applicable to decisions on the purchase or sale of companies, the development of a project, a patent, among others; seen in another way, it is the right to modify an investment project in consideration of the evolution of the uncertainty of the variables that impact its development[6].

As a result of the flexibility of the projects and the administrative capacity, several decision alternatives may be available[6]:

- Defer: When the investment does not require an immediate decision.
- Abandon: When a project can be abandoned or dismantled to recover part of the investment and avoid future losses.
- Building in stages: When there is the alternative of abandoning the project as its execution stages evolve.
- Expand: When investments can be made to increase the installed capacity in relation to the initial approach of the project.
- Contracting: When it is feasible to reduce the size of the operation or to subcontract certain activities related to the investment made.
- Exchange: When there is the possibility of exchanging inputs or mixtures of outputs in a production context.

In order to evaluate these options and make the decision about the best alternative, there are some methods that are the most commonly used, one of them is the Black - Merton -Scholes model, which uses stochastic differential equations in which the complexity and structure of the alternative are assessed, for which applications have been developed to simulate scenarios and estimate the probability distributions[7].

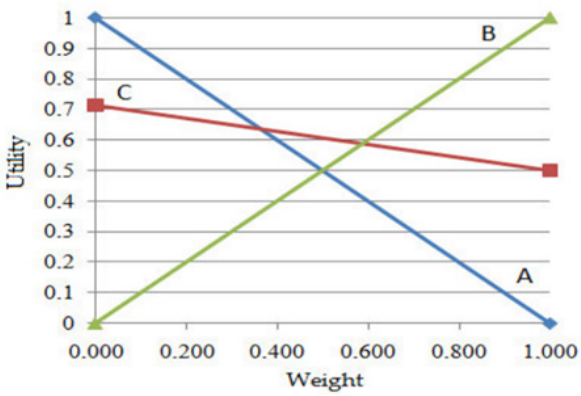
On the other hand, the binomial tree method is another of the valuation alternatives preferred by analysts, since it is based on elementary algebraic operations that allow the underlying asset to be valued in a discrete time, i.e. determining the random walk that an asset can follow in relation to the options available to it and then establishing the increases or decreases in its value according to the alternative taken[8].

2.2 Multi-criteria Decision Modeling

When decisions must be made based on multiple criteria, there are several mathematical methods under the MCDM model (Multicriteria Decision Model), which provides alternatives for problems where there is high or low uncertainty, or when the variables that compose it are of a discrete or diffuse type; this model basically consists of breaking down a complex problem into simpler parts so that the decision-maker can build a solution based on the alternatives available, valuing the criteria and objectives involved[9].

This model also has user preferences, where the most commonly used methods are the MAUT, the AHP, the first of which is defined as the Multiple Attribute Utility Theory, which consists of evaluating each alternative in relation to the risks of its execution and the uncertainty of the results, may have different criteria and therefore requires a large volume of information[10].

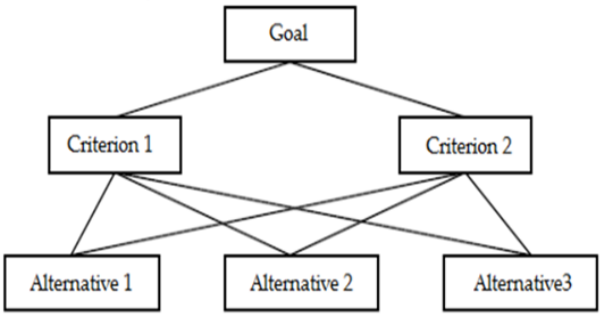
Figure 2 shows a graphical representation of this model; for each alternative A, B and C a minimum and maximum utility value is assigned, mediated with the criterion value by which it is evaluated, and finally a standardization vector is established[11].



Source: Velásquez, 2013

Figure 2. Modeling Chart of the MAUT Method.

The second most commonly used method of the MCDM is the AHP or hierarchical analytical process, which consists of comparing alternatives by pairs, evaluating each pair according to scales of established criteria, which together provide the opportunity to determine a weight coefficient and compare the alternatives with ease to choose the best one[9]. Figure 3 shows a graphical representation of this model that shows how the evaluation of the alternatives envisaged should be carried out.



Source: Penczynski, 2016

Figure 2. Hierarchical structure of the decision under the AHP method.

2.3 Game Theory

Game theory is presented as a mathematical branch by which different conflict situations between different agents can be studied, allowing interactions between groups involved in decision-making to be modelled[12]. It provides tools for making decisions in situations of competition or conflict through the construction and analysis of a matrix formed by the decisions of the other players and the characteristics of the problem concerned[13]. Depending on the criteria for assessing the situation, three types of games are considered[14]:

- Cooperative or non-cooperative games: games in which the players have the possibility of seeking to reach an agreement in order to achieve a higher profit than they would have obtained if they had worked individually, through the figure of the "coalition"[15].
- Static or dynamic games: static play occurs when players make decisions simultaneously without knowing how the rest of the players have acted. On the other hand, in dynamic play, decisions are made sequentially, i.e., one player participates individually, then another, and so on; the next player can learn about the moves of his predecessors[16].
- Games with complete or incomplete information: the game with complete information is when the players know which are the strategies that the rest of the players and their utilities can use; therefore[17], the game with incomplete information is when the strategies of the others are not known or are known in a partial way[18].

Nash sought to rationalize decision making by developing Nash's Balance, which looks for the best action a player can perform according to the actions of other players, applicable in static games with complete information[19]. For those static games of incomplete information, it is useful to use Nash's Bayesian Balance (EBN), in which each player must imagine the behaviour of the other players[20].

3. Conclusions

The way of making decisions becomes fundamental because according to the way a problem or situation is studied and evaluated, it determines the choice of the best possible solution or alternative. To the extent that this process is streamlined in most processes it is possible to ensure a favourable path for the resolution of situations.

The problems are not always fully known, or the alternatives considered in most cases are presented with a high degree of uncertainty, which is why it is useful to stop and analyse the situation to choose the best method to find the optimum solution. In this document only three ways of rationalizing a solution were reviewed, each of these models could be applicable in organizations according to the particularities of each company.

This type of review allows us to glimpse different options that can be used by the leader of each productive entity in search of a scenario where aspects such as competitiveness, productivity and participation can be benefited in an economic moment where the changes are constant and vertiginous.

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