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Multiple Criteria Decision Making and prospective scenarios model for selection of companies to be incubated

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Abstract: This paper proposes a model to evaluate business projects to get into an incubator, allowing to rank them in order of selection priority. The model combines the Momentum method to build prospective scenarios and the Multiple Criteria Decision Making (MCDM) method TOPSIS-2N to rank the alternatives. Six business projects were evaluated to be incubated. The Momentum method made it possible for us to create an initial core of criteria for the evaluation of incubation projects. The TOPSIS-2N method supported the decision to choose the company to be incubated by ranking the alternatives in order of relevance. Our evaluation model has improved the existing models used by incubators. This model can be used and / or adapted by any incubator to evaluate the business projects to be incubated. The set of criteria for the evaluation of incubation projects is original and the use of prospective scenarios with a MCDM method to evaluate companies to be incubated does not exist in the literature.

Keywords: Business incubators; Multiple Criteria Decision Making (MCDM); Prospective Scenarios; Hybrid Method.

1. Introduction

Potential entrepreneurs seek in business incubators the necessary help to achieve success in their ventures. One way to get into an incubator is through a process that evaluates the business plan or project of the company or future business. According to [1] (p. 227), "despite some differences, all incubators sought to identify the most promising and innovative enterprises to support and stimulate the creation of new businesses". The importance of having a consistent methodology for ordering projects is emphasized by [2].

Works on incubators have focused on performance and evaluation indicators of incubated proposals and companies, but when evaluating a business or project plan, they do not mention considering prospective scenarios in their evaluations. Thus, the following question is presented: How to model the business plans or projects candidate for incubation, considering prospective scenarios under a multicriteria approach?

We investigated how the terms "prospective scenarios", "multicriteria" and "business incubators" are related or not in the literature, searching for publications in the Scopus and Web of Science databases, in December 2020. Table 1 shows the research strategies used and the results found for title-abstract-keywords.

Table 1. Strategies and results.

Strategies	Articles	
	Scopus	Web of Science
"prospective scenario" AND *"business incubator"*	0	0
"prospective scenario" AND *" multicriteria"*	2	5
"business incubator" AND *" multicriteria"*	1	2
"prospective scenario" AND *"business incubator" AND "multicriteria"*	0	0

Therefore, we found 10 documents adding up the results of all strategies. Table 2 presents these results, not counting the repeated documents.

Table 2. Documents in the Scopus and Web of Science databases.

Title	Doc type	Reference	Source
Dynamic Simulation of Forest Management Normative Scenarios: The Case of Timber Plantations in Southern Chile	Article	[3]	Futures
Economic-Energy-Environment Analysis of Prospective Sugarcane Bioethanol Production in Brazil	Article	[4]	Applied Energy
Prospective and participatory integrated assessment of agricultural systems from farm to regional scales: Comparison of three modeling approaches	Article	[5]	Journal of Environmental Management
Modeling the potential benefits of catch-crop introduction in fodder crop rotations in a Western Europe landscape	Article	[6]	Science of the total Environment
The multicriteria incubator selection model by considering investor orientation	Conference Proceedings	[7]	11th International Conference on Industrial Management
Environmental assessment of future technologies: how to trim LCA to fit this goal	Article	[8]	Journal of Life Cycle Assessment
A Multidimensional Evaluation of the Effectiveness of Business Incubators: An Application of the PROMETHEE Outranking Method	Article	[9]	Environment and Planning C: Politics and Space

As can be seen, the publications in the literature are still incipient, in addition to being relatively recent, beginning in 2009. We did not find any publication that includes the subjects of prospective scenarios, business incubators and multicriteria.

In the light of these considerations, this paper aims to develop a model to evaluate business projects to get into an incubator. This model combines prospective scenarios with

a multicriteria method to rank the alternatives. We applied the Method Unified for Strategic Prospective Planning (Momentum), proposed by [10], with the TOPSIS-2N [11], a variation of the TOPIS method (Technique for Order Preference by Similarity to Ideal Solution). It can be used by managers of business incubators as a tool to support the evaluation of business projects to be incubated.

2. Background

The high mortality rate of companies of different branches in the first years of life has been discussed in the academic environment, especially the small and medium ones. In this context, the incubators of companies are inserted, which has the purpose of helping these new companies to enter the market, through an aid called consulting.

The incubation process is called the period in which the company stays inside the incubator receiving assistance, accompanied by the team that works to organize it managerially, and with that improve their chances of success and permanence, as well as good performance in the market [12].

Business incubators have several consultancies in specific areas, and in addition perform periodic performance evaluations in their incubated companies, using other resources and indicators. According to [13], the good performance of the incubators is considered a critical factor. The performance of companies during the incubation period can increase their chance of survival after its creation. In addition, "the extent and importance of firm activity during incubation period are also revealed by the records of inter-firm alliances and acquisitions" [14] (p. 573).

The objective of evaluating the performance of an incubated company goes beyond knowing its results, it is necessary to improve the incubation practices and the way to identify actions of continuous improvement in the management.

In a competitive and dynamic market, evaluating performance becomes increasingly necessary in the search for organizational efficiency. Contemporary society is facing a critical scenario due to the adoption of unsustainable development models [15].

It is considered of great importance to identify a method for the evaluation of the incubated companies, and especially of the candidate companies for incubation. That is, what incubators consider important when evaluating a project or business plan of a company hiring candidate. What criteria and / or alternatives are considered for evaluating proposals?

In addition to these issues, common to companies hiring candidates, it should be noted that the scenario in which these new companies will be inserted has dynamic and unstable characteristics. In this context, considering prospective scenarios as one of the items of the evaluation of the hatching proposals becomes of extreme importance to guide the present, aiming to obtain possible and desirable futures.

The methodology of prospective scenarios can be used in any situation of uncertainty, since its objective is to identify early warning signals, to evaluate the robustness of the organization's key competencies, to generate better strategic options and to evaluate risk / return of each option [16].

Also, regarding the method of evaluation of this proposal, it is important to know what tools the incubators use to aid the decision. One of the most effective ways is to use the already widespread Multicriteria Decision Support Methods (DSM).

For [17], in the life of organizations, innumerable are the complex decision problems that belong to their managerial body, considering that most real situations are characterized by the existence of several goals to be achieved. Economic, industrial, financial, political or social problems are part of this approach. When the choice of certain alternatives depends on the analysis of different points of view, called criteria, the decision problem is considered a multicriteria problem.

DSM has a focus used as the central element of decision analysis. As such, it makes use of information about the problem (in this case, the evaluation instrument of the proposal), having as main characteristic the analysis of several alternatives or actions, under

various points of view or criteria. To make this analysis, decisions (managers of incubators and / or consultants) often must compare the alternatives present in the decision-making process [17]. DSM proposes to clarify the problem and attempt to provide answers to the issues raised in a decision-making process, according to clearly defined models.

3. Materials and Methods

3.1. Momentum method

We used the Momentum method elaborated by [10] to build scenarios. Momentum aggregates the main concepts of the methods found in the literature and includes the use of multicriteria methods for strategic decision. The Momentum method is developed, considering the following steps:

1. System overview;
2. Mapping of relevant actors;
3. Identification of variables;
4. SWOT analysis;
5. Elucidation of uncertainties;
6. Selection of relevant variables;
7. Definition of key indicators;
8. Definition of the scenarios;
9. Definition of criteria;
10. Elicitation of alternatives;
11. Definition of the weights for each criterion of all the scenarios;
12. Evaluation of the alternatives from the point of view of each criterion;
13. Application of the classification algorithm for the collected data.

This method has been adapted to our research problem. We follow all these steps; however, we propose a new combination: Momentum with TOPSIS-2N. For model validation, Momentum with TOPSIS-2N was applied to a real problem to select the companies to be incubated. In addition, the weights of each criterion were established by incubator managers.

3.2. Technique for order of preference by similarity to ideal solution (TOPSIS)

The decision-making process generally involves a choice between several alternatives. The feasible alternatives of meeting the objective, and selected for evaluation, are compared according to criteria and under the influence of attributes [18]. The Multi-criteria Decision Making (MCDM) methods are very useful to support the decision-making process in these cases because they consider value judgments and not only technical issues, to evaluate alternatives in order to solve real problems, presenting a highly multidisciplinary [19]. The MCDM methods have been employed to support the decision-making process in several recent complex problems, as presented in [20]–[24].

TOPSIS is a method of aiding in the solution of multicriteria problems, known as the order-of-preference technique by resembling an ideal solution. This method can be approached individually, based on precise input data previously determined by the decision makers, as well as with other methods in the literature. In situations where the lack of information is present in the problems, TOPSIS should be integrated with other approaches to its application [25].

TOPSIS is a method that, after being applied in solving problems of the multicriteria type, results in an ordering of the existing alternatives. This ordering is based on the idea that the best alternative should be the one that presents minimum distance to the ideal

solution "PIS" and maximum distance to the solution anti-ideal or "NIS". The method aims to generate a decreasing ordering of the coefficients of the calculated distances. This coefficient is known in the literature as relative proximity. Several problems of decision can be solved with TOPSIS, being these of the only type decider or decision in group [25].

The following steps should be performed for the application of the TOPSIS:

- Preliminaries (objectives, matrix, weights and impacts);
- Standardization of data;
- Data weighting;
- Determination of ideal solution (PIS) and anti-ideal solution (NIS);
- Calculations of the distances D + and D- for each alternative;

$$D^{+} = \sqrt{\sum_{j=1}^{n} w_j (d_{ij}^{+})^2} \quad (1)$$

$$D^{-} = \sqrt{\sum_{j=1}^{n} w_j (d_{ij}^{-})^2} \quad (2)$$

$where: d_{ij}^{+} = P_j^{+} - P_{ij}$, with i $= 1, \dots, m.$ $e\ d_{ij}^{-} = P_j^{-} P_{ij}$, with i $= 1, \dots, m.$

- Calculation of the coefficients C for each alternative;

$$C = \frac{D_i^{-}}{D_i^{+} + D_i^{-}} \quad (3)$$

- Sorting of alternatives by coefficients.

3.3. Technique for order of preference by similarity to ideal solution with two normalization procedures (TOPSIS 2N)

As the decision matrix has data from different sources, and even from different scales, it should normally be normalized to transform it into a dimensionless matrix, which allows the comparison between the various existing criteria.

The TOPSIS 2N model proposed by [11] performs two normalization procedures during its execution. The authors compare the methods, identifying two methods of normalization, as more appropriate, for generating coherent results.

The four standardization procedures most used in the literature are described by [11] as explained below:

- Standardization procedure N_1: by using the maximum value of the scores.

$$p_{ij} = \frac{x_{ij}}{\max x_{ij}} \text{ where i} = 1, m \dots, ; and\ , j = 1, \dots, n \quad (4)$$

- Standardization procedure N_2: by using the ratio between the difference of the scores and the minimum value of the scores, and the difference between the maximum value and the minimum value of the scores.

$$p_{ij} = \frac{x_{ij} - \min x_{ij}}{\max x_{ij} - \min x_{ij}} \text{ , where } i = 1, \dots, m \text{ ; and , } j = 1, \dots, n \quad (5)$$

- Standardization procedure N_3: by using the sum of the scores.

$$p_{ij} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \text{ , where } i = 1, \dots, m \text{ ; and , } j = 1, \dots, n. \quad (6)$$

- Normalization procedure N_4: by using the square root of the sum of the squares of the scores.

$$p_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=0}^{m} x_{ij}^2}} \text{ , where } i = 1, \dots, m \text{ ; and , } j = 1, \dots, n. \quad (7)$$

The TOPSIS 2N model considers the standardization procedures N_2 and N_4.

There is a need to establish a synthesis function by aggregating the ranking of all alternatives into the criteria into a compensatory function. The TOPSIS-2N Method allows this requirement to be met; as well as generating two sorts generates a sensitivity analysis.

4. Results

4.1. Step 1 – system overview

The concept of incubation seeks an effective means of linking capital, technology and know-how in order to leverage entrepreneurial talent, accelerate the development of new enterprises and thus the speed of technology exploitation. Incubators assist emerging companies by providing a variety of support services such as: assistance in business development and marketing planning, construction of management teams, raising capital and access to several other more specialized services [26]. In this way, the incubated companies enjoy all the necessary infrastructure for their development so that, when competing in the market, they have the necessary knowledge and experience to an emerging company [27].

According to [28], the strongest upward curve in the growth path of incubated companies is mainly due to four factors: (i) the development of credibility; (ii) shortening the learning curve of the entrepreneurs; (iii) faster problem solving; and (iv) access to a network of entrepreneurial relationships.

It can be said that companies that undergo incubation programs are better able to survive in the high competition market since, in qualifying entrepreneurs and enterprises, the graduated companies (which have already gone through the incubation process) have competitive differentials that provide greater survival capacity over time. Incubator managers point out that access to knowledge, mentoring, technology and management skills form the most successful entrepreneurs and companies [28].

4.2. Step 2 – mapping of relevant actors

The main actors of the system under analysis are the stakeholders who participate and maintain links with the incubator and the incubated companies. Table 3 shows the main stakeholders and their respective influences and expectations about the system.

Table 3. Main stakeholders.

Stakeholders	Description
Entities and regulatory companies	Incubator SEBRAE

	ANPROTEC
Universities	Technology Sources Search sources Brands and patents
Government	Development News
Local community	Community Involvement to Promote Entrepreneurship
"Mentors"	Partnerships with the private sector in the areas of mentoring (marketing / mentoring) and marketing Accelerators Investor angels

4.3. Step 3 – identification of variables

We identified the variables of the system (business incubation), considering the literature review, as well as steps 1 and 2 of the Momentum method:

- V_1 - Economic / political crisis;
- V_2 - Access to specific edicts for development;
- V_3 - Exchange variation;
- V_4 - Access to specific credit sources / partnerships;
- V_5 - Initial financial investment;
- V_6 - Strategic relations with universities and research sources;
- V_7 - Patent development;
- V_8 - Incentives from agencies like SEBRAE and ANPROTEC;
- V_9 - Number of clients;
- V_{10} - Infrastructure and quality services offered by the incubator.

4.4. Step 4 – SWOT Analysis

The SWOT matrix is basically the general analysis of the internal environment (strengths and weaknesses) and the external environment (opportunities and threats) of an organization. Based on the knowledge about incubated companies, a SWOT matrix was a framework for a better understanding in order to allow the formulation of possible strategies.

Table 4 does not represent the SWOT matrix of a specific company, but rather, in general, the main strengths, weaknesses, opportunities and threats that any incubated company may have. From the analysis made it can be said that a company when it becomes incubated starts to have opportunities.

Table 4. SWOT matrix.

	Strengths (S)	**Weaknesses (W)**
Internal Factors	– Entrepreneurial, financial, marketing, technological and management assistance from the incubator. – Infrastructure and quality services offered by the incubator. – Professional networking at local, national and global level.	– Little expertise of the members. – Low initial financial investment.
	Opportunities (0)	**Threats (T)**
External factors	– Strategic relations with universities and research sources. – Patent development. – Incentives from agencies like SEBRAE and ANPROTEC. – Access to specific promotion bids. – Access to specific credit sources.	– Economic / political crisis. – Cutting of specific notices for development. – Exchange variation. – Regulatory changes. – Inexistence or low number of clients.

4.5. Step 5 – elucidation of uncertainties

The uncertainties and their variables are divided into economic, partnerships and structural, as distributed in Table 5.

Table 5. Uncertainties and variables.

Uncertainties	**#**	**Variables**
Economic	V_1	Economic / political crisis
	V_2	Access to specific edicts for development
	V_3	Exchange variation
	V_4	Access to specific credit sources / partnerships
	V_5	Initial financial investment
Partnership	V_6	Strategic relations with universities and research sources
	V_7	Patent development
	V_8	Incentives from agencies like SEBRAE and ANPROTEC
Structural	V_9	Number of clients
	V_{10}	Infrastructure and quality services offered by the incubator

4.6. Step 6 – selection of relevant variables

After identifying the main uncertainties that may influence the future of the sector, the next step is to analyze the relationship between the variables, in order to identify the impact and dependency of each one, through a cross-impact matrix (Table 6 and Table 7).

Table 6. Cross-impact matrix.

#	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	Σ
V_1		-2	-3	-3	-2	-1	-2	-3	-2	-1	-19
V_2	0		0	1	3	3	3	2	0	2	14
V_3	0	0		-1	-2	-1	-1	-1	-1	-1	-8
V_4	0	0	0		3	3	3	1	2	3	15
V_5	0	0	0	0		2	1	0	1	0	4
V_6	0	-1	0	0	0		3	2	1	1	6
V_7	0	0	0	1	0	2		1	1	1	6
V_8	1	2	0	3	1	2	3		2	3	17
V_9	0	0	0	2	1	1	0	0		0	4
V_{10}	0	1	0	3	0	3	1	2	1		11
Σ	1	0	-3	6	4	14	11	4	5	8	50

Table 7. Assessment scale.

Degree	Description
-3	Large negative impact
-2	Average negative impact
-1	Small negative impact
0	No impact
1	Small positive impact
2	Average positive impact
3	Large positive impact

We obtain the impact value and the dependency for each variable, from the algebraic sum of the rows and columns of the matrix, and then we calculate the average impact and dependency, considering absolute values (Table 8).

Table 8. Impact and dependency values for each variable.

Variable	Impact	Dependency
V_1	-19	1
V_2	14	0
V_3	-8	-3
V_4	15	6
V_5	4	4
V_6	6	14

V_7	6	11
V_8	17	4
V_9	4	5
V_{10}	11	8
Average	10.4	5.6

We draw a graph, using the averages of impact and dependency to define the quadrants and then we distribute the values for each variable (Figure 1).

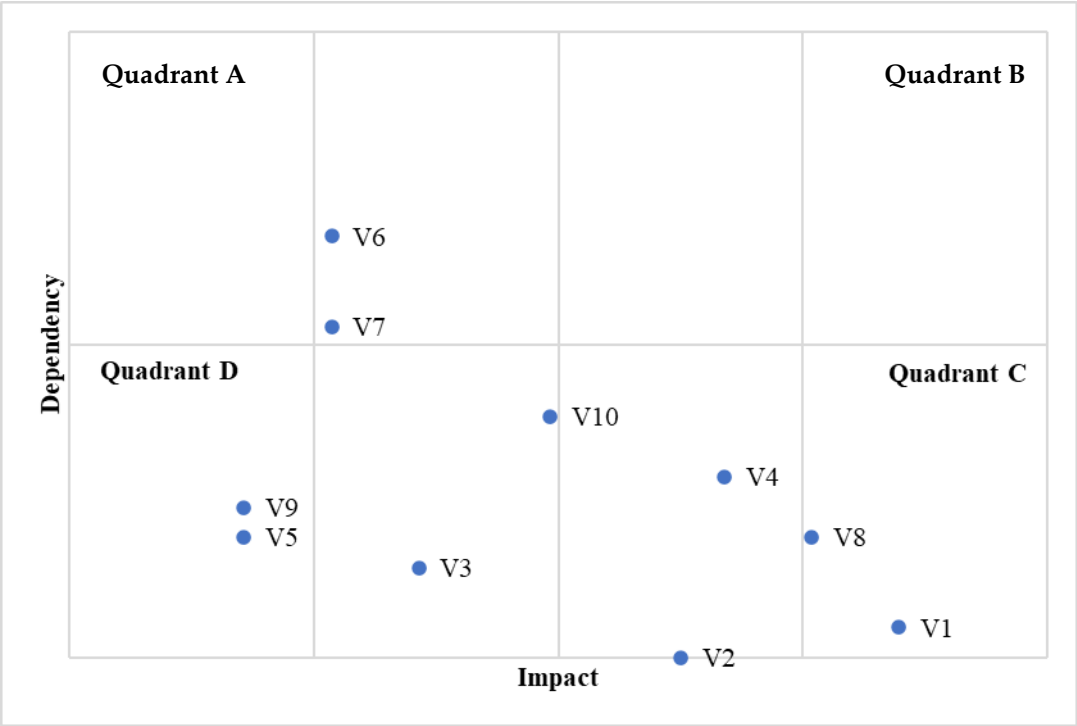

Figure 1. Selection of relevant variables.

According to [10], the large groups of variables are described as follows:

- Quadrant A - Influential variables: very influential and little dependent;
- Quadrant B - Support variables: very influential and highly dependent;
- Quadrant C - Dependent variables: very dependent and not influential;
- Quadrant D - Independent variables: poorly influential and poorly dependent.

The variables in quadrant D (V_3, V_5 and V_9) when compared to the others are considered less relevant. These variables must be excluded. However, the variable V_{10} was included in this study because, among the four variables in quadrant D, V_{10} is the one closest to quadrant C. In addition, the theme "Infrastructure and quality services offered by the incubator" was considered very relevant due to the analysis of the variables that could be excluded. Therefore, the relevant variables for this study are:

- V_1 - Economic / political crisis
- V_2 - Access to specific edicts for development
- V_4 - Access to specific credit sources / partnerships

- V_6 - Strategic relations with universities and research sources
- V_7 - Patent development
- V_8 - Incentives from agencies like SEBRAE and ANPROTEC
- V_{10} - Infrastructure and quality services offered by the incubator

4.7. Steps 7 and 8 – definition of key indicators and definition of scenarios

The variables V_4, V_7 and V_8 will also be used as indicators. As it was not possible to obtain the historical series of each variable, the scenarios were defined through a morphological analysis of variables it is worth mentioning the application of such technique to explore all possible solutions to a multidimensional and non-quantifiable problem that has been used by several researchers in the area of future scenarios [29]–[31]. As a result, three scenarios were built (Table 9), using morphological analysis and considering a five-year horizon.

Table 9. Morphological analysis and scenario building.

#	Variables	Trend	Optimist	Pessimist
V_1	Economic / political crisis	Economic / political crisis remains	Improvement in economics and politics	Increased economic / political crisis
V_2	Access to specific bids for development	Maintenance of specific bids for development	Increase in the number of specific bids for development	Cut in specific notices of development
V_4	Access to specific credit sources / partnerships	Maintenance of credit sources and partnerships	New sources / partnerships for specific credits	Extinction of specific credit sources / partnerships
V_6	Strategic relations with universities and research sources.	Staying in strategic relations with universities and research sources	Increased access to universities and laboratories	Restrictions on access to universities and research sources
V_7	Development of patents	Access to patent development belongs	Increased access to patent development	Increased bureaucracy and delays in patent development
V_8	Incentives from organs such as SEBRAE and ANPROTEC	Maintenance of SEBRAE and ANPROTEC support	Increased incentives for SEBRAE and ANPROTEC	Reduction of the incentives of SEBRAE and ANPROTEC
V_{10}	Infrastructure and quality services offered by the incubator	Services and infrastructure remain	Increase in the number of services and advisory services offered by the incubator	Decreased services offered by the incubator

4.8. Steps 9, 10 and 11 – definition of criteria, elicitation of alternatives and definition of weights for each criterion of all the scenarios

The criteria for evaluating the alternatives were defined based on the study by [32] and the doctoral research by [33], which analyzed the public notices for the selection of companies to be incubated by mixed incubators (Table 10).

Table 10. Criteria for evaluation [34].

Criteria
1. Technical and Economic Feasibility of the Project
2. Potential of interaction of research activities
3. Technological content
4. Innovative Content
5. Sustainability
6. Ability to generate and attract resources
7. Relevance of the problem to be solved
8. Marketing Feasibility
9. Management Feasibility
10. Current stage of product or process development.
11. Creativity and originality
12. Correct filling and clarity of the proposal
13. Public policy
14. Relationship with local government
15. Formed relationship network (Networking)

The alternatives are the six companies to be incubated, named A_1, A_2, A_3, A_4, A_5 and A_6. All criteria were given the same weight.

4.9. Step 12 – evaluation of the alternatives from the point of view of each criterion

The six alternatives (companies to be incubated) were evaluated by the consultants of the business incubator (Incubator X). For each criterion a score of 1 to 5 was defined, following the scale:

1. Does not meet;
2. Partially meets;
3. Meets;
4. Partially exceeds,
5. Exceeds.

Table 11 presents the scores defined by the consultants for each criterion.

Table 11. Scoring of alternatives for each criterion of Incubator X.

Criteria / Alternatives	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}	C_{14}	C_{15}
A_1	5	5	5	3	3	5	1	3	2	2	3	2	2	2	2
A_2	5	1	1	1	1	4	3	1	1	1	5	5	5	1	5
A_3	5	4	5	4	3	3	5	5	3	2	1	2	1	1	1
A_4	3	4	3	3	2	4	4	4	4	4	1	3	3	3	2
A_5	5	3	5	3	4	5	4	3	5	4	4	5	5	1	3
A_6	2	2	4	2	5	5	3	3	3	5	4	3	1	4	2

4.10. Step 13 –application of the TOPSIS 2N Method

We applied the TOPSIS 2N method, considering the following steps:

1. Preliminaries (objectives, matrix, weights and impacts);
2. First Data Normalization (named N_2);
3. Data weighting;
4. Determination of ideal solution (PIS) and anti-ideal solution (NIS);
5. Calculations of the distances D+ and D- for each alternative;
6. Calculation of the coefficients C for each alternative;
7. Sorting of alternatives by coefficients;
8. Second Normalization of the Data (named N_4);
9. Data weighting;
10. Determination of ideal solution (PIS) and anti-ideal solution (NIS);
11. Calculations of the distances D+ and D- for each alternative;
12. Calculation of the coefficients C for each alternative;
13. Ranking of alternatives by coefficients.

In the optimistic scenario the companies were ordered as demonstrated in the Table 12. Companies A_2 and A_5 had a better evaluation with similar results in the two normalizations; while companies A_4 and A_1 received the worst evaluations.

Table 12. Optimistic scenario ordering.

Scenario 1: Optimist	
Normalization N_2	**Normalization N_4**
A_2	A_2
A_5	A_5
A_1	A_3
A_3	A_6
A_6	A_4
A_4	A_1

In the trend scenario, company A_2 was also ranked first, followed by A_5; while companies A_4 and A_6 were the ones with the worst evaluations (Table 13).

Table 13. Ordering trend scenario.

Scenario 2: Trend	
Normalization N_2	**Normalization N_4**
A_2	A_2
A_5	A_5
A_1	A_3
A_3	A_4
A_6	A_1
A_4	A_6

The result of the pessimistic scenario corroborates those of the optimistic and trend scenario, where company A_2 is the best classified, followed by company A_5. The A_4 and A_1 companies had the worst results (Table 14).

Table 14. Ordering pessimistic scenario.

Scenario 3: Pessimist	
Normalization N_2	**Normalization N_4**
A_2	A_2
A_5	A_5
A_1	A_6
A_6	A_4
A_3	A_3
A_4	A_1

Table 15 consolidates the results for each scenario.

Table 15. Ranking results.

Scenario1: Optimist		Scenario 2: Trend		Scenario 3: Pessimist	
N_2	**N_4**	**N_2**	**N_4**	**N_2**	**N_4**
A_2	A_2	A_2	A_2	A_2	A_2
A_5	A_5	A_5	A_5	A_5	A_5
A_1	A_3	A_1	A_3	A_1	A_6
A_3	A_6	A_3	A_4	A_6	A_4
A_6	A_4	A_6	A_1	A_3	A_3
A_4	A_1	A_4	A_6	A_4	A_1

Based on these results the following groups were created:

- Group: 1 alternative A_2;
- Group 2: alternative A_5;
- Group 3: other alternatives.

It must be highlighted that the final ranking depends on the number of vacancies offered by each business incubator. TOPSIS 2N always allows decision makers to go back to previous steps to review key information, perform sensitivity analyzes, assess the impact of project weights and scores, and adjust scales; until it reaches the proper stability for the application of the method.

6. Conclusions

Increasingly, the role of business incubators has become essential for generating new business. It is important that works related to the theme are developed in order to improve or create methods that help them or improve their performance. We did not find in the literature any study that uses prospective scenarios with a multicriteria method to evaluate companies to be incubated.

In this sense, this research proposes a model to evaluate the business project of a companies that are candidate for incubation, considering prospective scenarios and a multicriteria decision method to rank the alternatives (companies to be incubated). We combined Momentum method with TOPSIS-2N.

The proposed criteria and the ranking method are an attempt to improve the existing models used by the incubators. Therefore, we include scenario analysis to create an initial core of criteria for evaluating incubation projects.

This set of criteria is original. Three distinct scenarios have been elaborated and as a result an evaluation model that contemplates fifteen (Table 10) unpublished criteria and prospective scenarios.

We hope that our model can assist incubator managers in this process. We highlight that our model can be used and / or adapted by any business incubator.

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