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An Approach of the Momentum Method for Prospective Scenarios of Brazilian Tourism Post-Covid-19

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Abstract

The study aims to develop prospective scenarios for post-Covid-19 Brazilian tourism, using the Momentum method. Analysis was limited to tourism sector, since no Brazilian studies focused on this theme were identified, bringing a novelty. Momentum presented as a hybrid model, using scenarios prospective vision. Furthermore, Momentum is associated with multi-criteria decision-making, using THOR 2 and AHP-TOPSIS-2N. It was established three prospective scenarios for tourism in Brazil, as well as four alternative tourism forms, directly linked to these scenarios, for the multi-criteria evaluation. It was possible to establish that both methods determined the same alternatives for appropriate tourism in specific scenarios.

Keywords

Momentum method, Brazilian tourism, Covid-19, THOR 2, AHP-TOPSIS-2N.

Introduction

The tourist phenomenon is closely linked with travel, with the visit to a place other than people's residence. In Brazil, the history of tourism begins with the discovery itself (Silva, 2004). The best way to study and plan the tourist market is through its segmentation, which makes it possible to know the main geographic destinations and types of transport, and the demographic composition of tourists (Rodrigues, 2003).

Tourism presents an interdisciplinary, multidisciplinary and transdisciplinary approach (Rejowski, 1996; Moesch, 2002; Schluter, 2003). Innovation is the essence of Tourism, and, as a service sector, it is vital for it to remain competitive (Franchetti & Page, 2011). The tourist activity could only reach the current stage of massification due to the various innovations that have occurred (Vidal, 2010).

Tourism must always be integrated with innovation, as the lack of modernization or updating of tourist facilities makes it difficult to preserve its heritage (Andrade, 2002). Tourism can represent a form of collective behaviour, whether as an entrepreneurial state or an entrepreneurial company (Hall & Williams, 2008).

Tourism manifests environmental, economic, cultural, and social impacts on the community (Oliveira, 2008). According to data from the World Travel and Tourism Council WTTC, the contribution of Tourism to the national GDP in Brazil is expected to grow by 2.5% in 2018 and reach 8.2% in 2028 (*Ministério do Turismo*, 2018).

According to the World Tourism Organization (WTO), the impact of Covid-19 is so great on the sector, that the recovery of the scenario in the segment, which in 2019 had figures like 8% of the country's Gross Domestic Product (GDP), with 7 million Brazilians employed can take between five and seven years (*SEBRAE*, 2020).

The effects of the Covid-19 pandemic on the tourism sector are unquestionable, but will be differentially felt by nations, regions, and places. Although the impacts of the Covid-19 pandemic on the tourism sector are evident, their understanding demands a multi- and trans-scalar analysis, as well as the consideration of aspects of a qualitative

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nature (*Jornal USP*, 2020).

The study of prospective scenarios is significant in times of uncertainty, such as the current pandemic moment, to elucidate and mitigate possible problems caused by the pandemic. The prospective analysis of the Brazilian market in the post-pandemic scenario is of great importance (Vieira et al., 2021).

In this sense, the present study aims to develop prospective scenarios for post-Covid-19 Brazilian tourism, using the Momentum method. The analysis was limited to the tourism sector, since no studies focused on this theme in Brazil were identified, thus bringing a novelty to the literature; to corroborate this statement, a survey was carried out by the authors, using the PRISMA selection method, which aims to assist in reporting systematic reviews of other types of research (Page et al., 2021).

It is worth mentioning that all the papers collected in the Scopus, Web of Science (WoS) and Scielo databases on the subject object of the present study portrayed the construction of scenarios using different approaches. It should be noted, however, that, in addition to the low number of articles specifically focused on tourism, no studies focused on Brazil were identified, specifically for tourism in the post-Covid-19 country. Thus, the novelty of this study comes from this gap in the literature, using the Moment method, associated with the Multi-Criteria Decision Analysis (MCDA) THOR 2 and AHP-TOPSIS-2N, for a better comparison of the generated scenarios.

Theoretical Reference

Brazilian tourism and the consequences of Covid-19

According to Carneiro and Allis (2021), restrictions on access and control within municipal boundaries are direct responses to the insistence on access by people from outside the localities during the pandemic - which would be a nonsense despite the urgency of controlling the virus spread.

For Iaquinto (2020), the tourist is seen as a dispersing element of Covid-19, and various types of travel, such as business, migration, among others, have enabled its greater dissemination (SHI et al., 2020). Some studies, such as the one by Yu et al. (2020) and that of Zheng et al. (2020), argue that there is discrimination and prejudice against tourists coming from places with higher incidences of Covid-19.

Neves et al. (2021), argue that in the periods that followed major epidemics, the experience of global coping with an event of this nature paradoxically seems to awaken in some people the prospect of a more harmonious and supportive future. According to Brouder et al. (2020), this new tourist (post-pandemic Covid-19) will possibly express more solidarity, greater sustainable awareness, greater concern for local development. For Zenker and Kock (2020), there will be less international travel and a greater flow in destinations close to tourists' homes.

Post-pandemic tourism will be marked by the decrease in agglomerations, programs aimed at the family, outdoor programs that offer an exclusive experience, with little or almost no occurrence of Covid-19 (*SEBRAE*, 2020).

Some studies, e.g. (Harsono, 2020; Oliveira et al., 2020; Aronica et al., 2021; Martina et al., 2021; Stackpole et al., 2021; Usui et al., 2021), portray the tourism scenario in the pandemic of Covid-19. However, there is a lack of studies, mainly in Brazil, regarding the post-Covid-19 tourism scenario, so the study of prospective scenarios in this sector is important, so that one can understand the possibilities, as well as prepare for possible scenarios.

Prospective scenarios

In contemporary times, the changes that occur in the business environment force organizations to constantly adapt to new realities and technologies. The identification of future trends and the anticipation of market changes have become crucial for the competitiveness of organizations, which is identified in digital transformation, in higher education (e.g., Barzman et al., 2021).

Although the prediction of future situations does not always guarantee success, especially in unusual situations, such as the Covid-19 pandemic (Milojević & Inayatullah, 2021), it is noteworthy that the ability of organizations to deal with uncertainties and adapt to changes has become a key factor for their success (Varum & Melo, 2010).

Thus, it can be considered that scenario planning is a relevant tool for the strategic analysis of an organization. For Casimiro and Araújo (2020) a source of strategic information for the formulation of strategies and definition of

priorities of organizations is a necessity. In this context, scenario planning stimulates strategic thinking and helps to overcome the limitations of thinking by creating multiple futures (Amer et al., 2013).

The construction of future scenarios can help organizations' strategies and investments by increasing the strength of the strategy by identifying and challenging underlying assumptions about the future; in addition to allowing better strategic decisions by identifying uncertainties; increase knowledge and understanding of the external environment and increase the speed of response to unexpected events by anticipating possible futures (Da Silva et al., 2013).

Regarding technological approaches to scenario construction, there are several ways to create a scenario such as: methodological approaches to scenario construction, these are SRI International (Stanford Research Institute), Global Business Network, Future Mapping, Battelle Memorial Institute, Prospective Analysis, Interax Method, Unified Method of Prospective Strategy Planning (SWOT), Unified Method of Prospective Strategic Planning (Momento), among others.

There is an interesting study of prospective scenarios using the Causal Layered Analysis (CLA) method, carried out for the first time in Brazil at the Futures Thinking Lab, focused on the country's food issue (Inayatullah & Weigel, 2020).

Therefore, four scenarios were established, the preferred one - conceiving food in 2030 as organic, abundant and accessible to all, the renegade - focused on today's large corporations, interested in maintaining their markets, the integrated - imagining a world with healthy food for all by 2030, resulting from the combination of science and technology and the outlier - which brought values that were atypical, but common to human beings (Inayatullah & Weigel, 2020).

The Momentum method, in turn, Gomes and Gomes (2019) state that this method seeks to outline the problem by the systemic concept, identify strengths and weaknesses, threats and opportunities, as well as use indicators to monitor the rise of a given scenario.

The authors also state that the method uses a retrospective analysis to establish probabilities and goals and a cross-impact matrix. The combination of all these techniques used in the method allows the creation of alternative scenarios. It is worth mentioning that a differential of the Moment in relation to other methodologies of construction of existing scenarios is the application of a multicriteria method as one of the steps of the method.

THOR 2

A priori, it is necessary to highlight that THOR 2 (Tenório et al., 2021; Gomes et al., 2021) comes from the Hybrid multicriteria support algorithm, or THOR - currently characterized as THOR 1 (Gomes et al., 2008), based on three algorithms for simultaneous use: Preference Modelling, Utility Theory and Multi-attribute Theory (Gomes, 1999). Its use makes it possible to "analyse more quickly and efficiently" the alternatives, considering the non-determinism of the weighting process and to quantify the non-determinism by reapplying it in the process of ordering the alternatives (Gomes, 1999).

In view of the lack of security and imprecision in the judgment of value used in the multicriteria decision support methods, decision makers must express levels of uncertainty using relevance indices, referring to the weights of the criteria and, also, in the classification of the alternatives for each criterion (Gomes, 1999).

The following elements may be necessary for the application of THOR: (i) a weight for each criterion, representing the relative importance between them; (ii) a threshold for preference (p) and another for indifference (q) for each criterion; (iii) a definition of the discordance domain; (iv) characterization of the relevance of the values of the weights assigned to the criterion; (v) the relevance of the classification of the alternative in the criterion (Gomes, 1999).

In using the S context, the alternatives have their attractiveness punctuated in situations where a strong preference ($aPjb$) occurs. Thus, comparing alternative with the other alternatives, we can identify the criteria in which $aPjb$, considering the preference threshold, indifference, and discordance, checking whether the imposed condition is satisfied. If satisfied, we know that dominates.

If the intra-criterion difference is greater than the preference threshold (p), the comparison is configured as a strong preference ($aPjb$). When the intra-criterion difference module is between the values of the indifference threshold (q) and the preference threshold (p), the comparison is configured as a weak preference ($aQjb$). If the intra-criterion difference module is between the negative value of the indifference limit ($-q$) and the positive value

of the indifference limit (q), the comparison is configured as an indifference (aI_jb). The alternatives are constructed by considering the improvement expressed by equations (1)-(3):

$$S1: \sum_{j=1}^n \alpha_j (w_j | aP_j b) > \sum_{j=1}^n \alpha_j (w_j | aQ_j b + aI_j b + aR_j b + bQ_j a + bP_j a) \quad (1)$$

$$S2: \sum_{j=1}^n \alpha_j (w_j | aP_j b + aQ_j b) > \sum_{j=1}^n \alpha_j (w_j | aI_j b + aR_j b + bQ_j a + bP_j a) \quad (2)$$

$$S3: \sum_{j=1}^n \alpha_j (w_j | aP_j b + aQ_j b + aI_j b) > \sum_{j=1}^n \alpha_j (w_j | aR_j b + bQ_j a + bP_j a) \quad (3)$$

In S2 context, the attractiveness of the alternatives is scored in situations of strong (aP_jb) and weak (aQ_jb) preference. Regarding the S3, the attractiveness in situations of strong preference (aP_jb), weak preference (aQ_jb) and indifference (aI_jb) are pointed out. S1 is considered the strictest scenario, while S3 is the most flexible (Gomes, 1999). Equations (4)-(6) consider the preference relations P (strict preference), I (indifference) and Q (weak preference) considering the limits of preference and indifference:

$$aPb \leftrightarrow g(a) - g(b) > p \quad (4)$$

$$aIb \leftrightarrow -q \leq |g(a) - g(b)| \leq +q \quad (5)$$

$$aQb \leftrightarrow q < |g(a) - g(b)| \leq p \quad (6)$$

THOR 2 inherited the characteristics that stand out from its predecessor, including, also, a distinction in the attribution of weights in situations of indifference and weak preference in situations S1, S2 and S3. The situations that occur indifference bring with them half the value of the weight of the respective criterion and the comparisons in which there is weak preference, carry a proportion between half the value of the weight of the criterion and the total value of the weight (Tenório, 2021).

AHP-TOPSIS-2N

The AHP-TOPSIS-2N classification method is a hybrid method composed of two multi-criteria decision-making techniques, generally used in complex scenarios, and characterized by the existence of multiple and conflicting objectives. To understand this method, it is necessary to understand the two technologies that constitute it (De Souza et al., 2018).

AHP is a systematic decision-making method, including qualitative and quantitative techniques. It is useful to get a single assessment value based on different indicators or standards. It simplifies the decision-making process by subdividing complex issues into a series of structured steps, where each element in the standard hierarchy must be independent of all other elements (Benmoussa, 2019).

On the other hand, Tzeng and Huang (2011) proposed a technique (TOPSIS) that ranks preferences based on similarity to the ideal solution and has a simple principle: the chosen alternative solution must be closer to the ideal solution and dissociate from the ideal solution. ideal. Further. Non-ideal solution. The ideal solution is formed by combining the best performance values shown (in the decision matrix) of any alternative for each attribute. The non-ideal solution is the combination of the worst performance values (Kahraman, 2008).

De Souza, Gomes & De Barros (2018) point out that it is possible for the AHP-TOPSIS method to perform two normalizations consistent with the application of the method, allowing the sensitivity analysis of the results. To apply the AHP-TOPSIS-2N classification method according to (Souza et al., 2018), the following steps must be followed: (i) definition of the Decision Matrix; (ii) definition of the Weighting Matrix through the fundamental Saaty scale; (iii) determination of the weight of each criterion using the AHP method; (iv) normalization of the Decision Matrix, using two different normalizations; (v) construction of the Weighted Normalized Decision Matrix; (vi) determination of the Positive Ideal Solution (SIP) and the Negative Ideal Solution (SIN); (vii) calculation of

distance measurements; (viii) calculation of the relative proximity to the ideal alternative; (ix) ordering of preferences.

Methodology

For the development of the present study, the Unified Method of Prospective Strategic Planning (Momentum) was used as a basis, which presents itself as a hybrid model, using the prospective vision of scenarios together with the multi-criteria decision-making process (Gomes & Costa, 2013), illustrated by Figure 1, which shows how each step of this method is characterized.

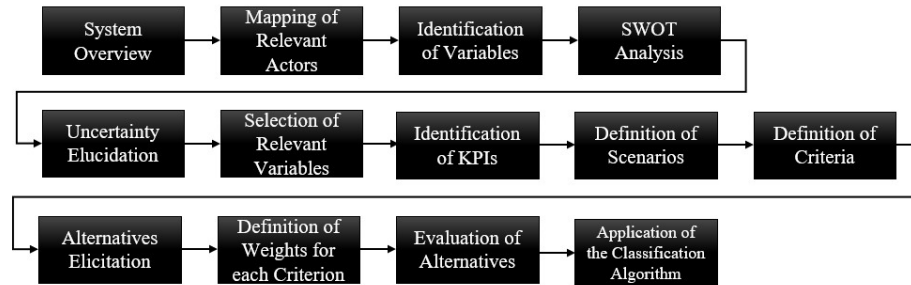


Fig. 1: Momentum method. Source: Adapted from Gomes and Costa (2013).

Based on each step that the Momentum method is constructed, adaptations were made to address each of the points necessary to build and define prospective scenarios for tourism in Brazil, as follows (Oliveira et al., 2018; Oliveira et al., 2021; Nassim et al., 2022):

1. **System Overview:** The system is analysed in general, identifying its inputs and outputs. For this study, tourism and its definitions were characterized, as well as the scenario in Brazil in the present year of 2021, considering the environment of uncertainty generated by Covid-19.
2. **Mapping of Relevant Actors:** The relevant actors for the system are identified. For the identification of these actors, the literature that addresses tourism in the years 2020 and 2021 was considered, translating these actors into the Brazilian context by the authors, given that no works of this nature were identified in the country.
3. **Identification of Variables:** The variables that affect future scenarios are defined. As in point two, the notes present in the literature were also considered – with adaptations to the Brazilian context by the authors, in addition to the consideration of specialists in the area. The specialists determined in this study are characterized by being tourismologists, both active in the practical area of tourism and present in the academic theoretical area of tourism. Thus, their positions regarding Covid-19 in Brazil, as well as their decision-making, are extremely important and valuable for the study, given the direct impact it has on their professional lives. Furthermore, they are direct stakeholders of both professional and personal impacts.
4. **SWOT Analysis:** The strengths, weaknesses, opportunities, and threats of possible scenarios are understood. At this point, a consultation was carried out with specialists in the area, to elucidate which are each of these characteristics in Brazilian tourism.
5. **Elucidation of Uncertainties:** Strategic actions are raised for the present, to anticipate large variations in the environment and reduce future uncertainty. Thus, the uncertainties, as in step two, were also considered from the literature – adapted to the Brazilian context by the authors.
6. **Selection of Relevant Variables:** The variables used are reduced, to prioritize the most important ones. For this point, as recommended in the method, a Cross-Impact Matrix was used (Godet et al., 2000), with the experts' weighting.

7. **Identification of KPIs:** The Key Performance Indicators (KPIs) of the relevant variables established are defined. At this point, the measures of the relevant variables as regulatory were used.
8. **Definition of Scenarios:** Scenarios are built. Based on the previous steps, prospective scenarios were constructed related to tourism in Brazil.
9. **Criteria Definition:** The criteria to be adopted for the evaluation of the alternatives of each scenario are selected. At this point, the integrated part of MCDA begins, in which, for this study, criteria based on specialists in the area were proposed.
10. **Elicitation of Alternatives:** The alternatives are defined, based on the constructed scenarios. With the tourism scenarios in Brazil established, alternatives were made, based on the different forms of tourism pointed out by the specialists, in order to apply them to the multi-criteria methods.
11. **Definition of the Weights of each Criterion:** The weights of the criteria for the scenarios are defined. To implement this point, experts in the area were also consulted, where each of them assumed the role of decision maker.
12. **Assessment of Alternatives:** Must be performed for all criteria and all scenarios. In the study, the average performance of each alternative was calculated, considering the criteria and weights established by the specialists, in view of the proposed scenarios.
13. **Application of the Classification Algorithm:** The multicriteria method is applied to the collected data. For this study, the use of the THOR 2 method and the AHP-TOPSIS-2N method were proposed to compare the results between a non-compensatory and a compensatory method, respectively, since in the group of compensatory methods, there is an idea of compensating a lower performance of an alternative in a given criterion through a better performance in another criterion (Almeida, 2011). While in the group of non-compensatory methods, there is a request for inter-criteria information corresponding to the relative importance between the criteria, avoiding favoring stocks that have an excellent performance in one criterion but are weak in the others (Almeida & Costa, 2003).

Development

Characterization of Brazilian tourism

Tourism is a process and unfolding that is characterized by a stable and permanent element: the experience caused by the act of moving, more specifically by the displacement of the trip. Travel is the basic element that makes up tourism, since its experience, associated with displacement, time and space, is present in a series of studies (Maccannell, 2003; Urbain, 1993; Urbain, 2011; Boorstin, 1971; Figueiredo, 2010).

The consumer society drives tourism, and it, in turn, plays the role of driving this same society. The number of elements that are part of this practice refers to the elaboration of a constant organism, which relates the phenomenon/activity to the possibilities of social change in a field (Nóbrega et al., 2015).

Regarding Brazil, due to the redefinition of public policies aimed at this area, it is associated, therefore, with the process of resumption of federalism, allied to the re-democratization of the country, which took place in the early 1980s (Guimarães, 2007). In this way, tourism has reached the level of priority action, focused on the country's economy, and therefore, on government agendas, generating a distribution of responsibility for tourist duty, from the federal government to local governments (Brandão, 2010).

The growth of tourism in the country was primarily influenced by its natural potential, availability of foreign capital to finance projects and the public and private positioning favourable to the development of the activity (Bolson et al., 2004). Cruz (2002) points out that, in the 1990s, three major national programs to encourage tourism were: i) the National Tourism Municipalization Program (PNMT), which assigned municipalities the role of carrying out inventories of tourism potential and organizing the municipal tourist offer, ii) the Action Programs for the Development of Tourism (PRODETUR), which would cover the regions of the Legal Amazon-Midwest; South;

Southeast; and Northeast, but which only directed investments to the Northeast and South regions and iii) the Ecotourism programs, with emphasis on the Program of *Parques do Brasil* and *PROECOTUR Amazônia*, from 1990.

In the first decade of the 2000s, the first exclusive ministry for tourism issues was created, that is, the Ministry of Tourism (MTur), composed of bodies providing direct and immediate assistance to the minister and by finalistic bodies, with the purpose of guiding the necessary actions to consolidate the development of the tourism sector (*Brasil*, 2001), evidencing the importance of the Brazilian State towards this sector.

At the end of the second decade of the 2000s, the world was faced with a pandemic caused by the SARS-CoV-2 virus, popularly known as Covid-19, initiating major changes in behaviour in the lives of the population, including Brazil. Social isolation, for example, has a huge impact on economic activity. Services linked to the travel market are among those most affected (Barbosa et al., 2020).

More specifically, at the end of 2021 and the beginning of 2022, it is possible to perceive a slight improvement in the general environment in Brazil, given the progression of vaccination campaigns, access to Covid-19 self-tests in pharmacies, among others. However, the recovery of tourism in the country is not yet evident, given the new waves of the virus and security protocols that are often not fully efficient.

Therefore, with the slow recovery of this sector, given the current vaccination program in the country, it is necessary to reflect on the future scenarios of Brazilian tourism, in view of the possibilities that it can assume, arising, at the same time, from a relatively strong structure. – associated with the attractive points of the country – with the consequences caused by the pandemic.

Brazilian tourism actors

From the presented context, and from the previously exposed literature survey, it was possible to select a group of different actors in the Brazilian tourism industry, knowing the country's tourism and understanding the main affected by the Covid-19 pandemic, involved in this sector. Thus, Table 1 shows the main established actors and their approximate role in this system.

Table 1. Main actors of Brazilian tourism

N	Main sphere	Main actors	Function
1	Public Initiative	Federal Government and Ministry of Tourism	Regulation
		National Secretariat for Structuring Tourism, National Secretariat for Development and Competitiveness and National Secretariat for Interinstitutional Integration	Planning and management
		Embratur (Brazilian Tourism Institute)	Fomentation
		State Secretaries	Regulation and Control
2	Private initiative	Means of accommodation, tourist guides, shops, bars, among others.	Acting on destiny
		Tour operators, travel agencies, reservation centers, among others.	Destination representatives
3	Local community	Native people of tourist places	Destination integrators
4	Tourists	People with interest in the tourist site	Destination Participants

The variables of Brazilian tourism

Having determined the actors involved, it is necessary, in an analogous way, to establish the main variables linked to the environment of uncertainty generated in the future scenarios of post-pandemic Brazilian tourism. Thus, Table 2 shows the groups of variables surveyed, as well as their descriptions.

Table 2. Main variables of Brazilian tourism

N	Variable	Definition
1	Federal Development	Revenue for the Ministry of Tourism
2	Public Incentive Policies	Public policies created to encourage Brazilian destinations
3	State Promotion	Revenue destined for each Brazilian State
4	Private investment in tourist destinations	Private development focused on tourism and Brazilian destinations
5	Covid-19 Control Policies	Covid-19 vaccine application rate in the Brazilian population
6	Interest in destinations	Number of travels made to Brazilian destinations

SWOT analysis of the situation presented

SWOT analysis is a frequently used tool, as it allows the evaluator to identify the factors internal to the problem – given by strengths and weaknesses – while also considering external factors – such as opportunities and threats. To this end, a SWOT matrix was constructed for this situation, as shown in Table 3.

Table 3. SWOT analysis of Brazilian tourism

Strengths	Weaknesses
<ul style="list-style-type: none"> ● Government economic prioritization, to reheat tourist destination markets; ● Improvements in the provision of services, to attract new customers and markets; ● Encouragement of the country's natural tourist attractions. 	<ul style="list-style-type: none"> ● Decrease in the amount allocated to Brazilian tourism; ● Deceleration of the vaccination rate against Covid-19; ● Lack of interest on the part of people in Brazilian destinations, due to Covid-19.
Opportunities	Threats
<ul style="list-style-type: none"> ● Partnerships between different branches of tourist destinations; ● Flexibility of travel packages by agencies; ● Greater interest in different trips, on the part of tourists. 	<ul style="list-style-type: none"> ● New rise in Covid-19 pandemic; ● New health crisis; ● Difficulty of economic recovery, on the part of tourists.

Elucidating the uncertainties about the present situation

With regard to the health situation in Brazil, there are still many uncertainties regarding Covid-19, given that, as much as vaccination against the virus continues constantly during 2021, so far, it has only approximately 46% of the population is fully immunized in the country (*Secretarias Estaduais de Saúde, 2021*).

This situation, in addition to causing possible "new waves" or even variants of Covid-19, also generates uncertainty regarding the economic power of the population, as well as the way in which it is possible to use the money, directly shaking the country's economy. With this panorama in view, the following uncertainties were identified:

- U1: Brazilian economic growth.
- U2: Stabilization of the Brazilian economy.
- U3: Brazilian economic recession.

- U4: Prioritization in the allocation of government funds.
- U5: Progression of vaccination against Covid-19 in the Brazilian population.
- U6: Stabilization of vaccination against Covid-19 in the Brazilian population.
- U7: Stagnation of vaccination against Covid-19 in the Brazilian population.
- U8: Concentration of tourist capital in Brazilian destinations.
- U9: Dispersion of tourist capital in international destinations.

Selection of relevant variables from the outlined panorama

In view of Brazilian tourism, associated with the Covid-19 pandemic and, considering the characteristics that shape the current situation, it was possible to establish eight variables, based on the group of main variables and the uncertainties established through the method. Are they:

- Balance of tourism in the country (V1);
- Number of public policies developed for tourism in the country (V2);
- Rate of change in Gross Domestic Product (GDP) (V3);
- Dollar exchange rate (V4);
- Unemployment rate (V5);
- Total number of passengers on flights in the country (V6);
- Deaths of the Brazilian population by Covid-19 (V7);
- Number of Brazilians vaccinated (V8).

After the identification of each of the variables of the worked context, the matrix of crossed impacts was structured, to make the selection of the relevant variables within the established set, through the impact and the relationship of dependence that one variable has on another. Table 4 shows the relationship between the variables, considering the values 0 – No Impact, 1 – Low Impact, 2 – Medium Impact, 3 – Great Impact, and 4 – Very Expressive Impact.

Table 4. Relationships between the identified variables

	V1	V2	V3	V4	V5	V6	V7	V8	Total
V1		4	2	2	3	2	2	1	16
V2	3		1	2	2	1	1	2	12
V3	2	1		2	3	3	2	2	15
V4	2	2	3		2	3	3	3	18
V5	1	1	3	3		3	2	2	15
V6	3	1	3	2	2		2	2	15
V7	2	2	2	2	1	2		4	15
V8	2	1	1	2	2	2	3		13
Total	15	12	15	15	15	16	15	16	

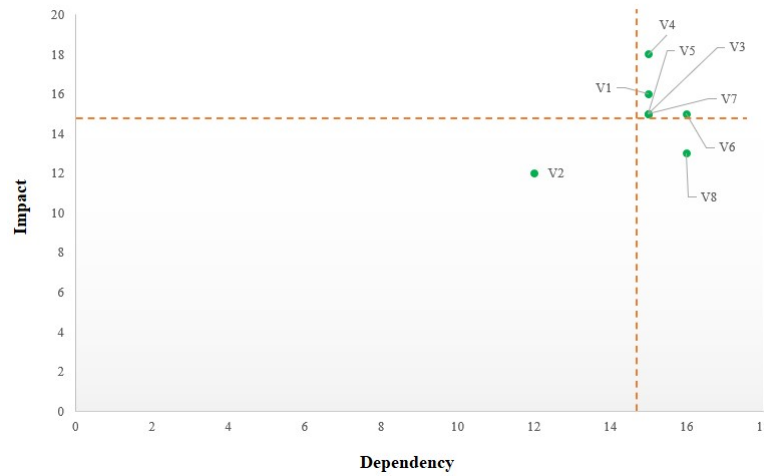
Dependency

Impact

Based on these values, we used a plot of the variables on a Cartesian plane, considering the impact values by the dependence values. In addition, the mean values of each of the measures were used to establish quadrants, as shown in Graph 1.

In the lower right quadrant, we have the variables with high dependence, but with low impact, which is the case of V8, in the lower left, we have the variables with low impact and low dependence, which is the case of variable V2. In the upper quadrants, there is the left, which indicates high impact and low dependence, where no variable appeared, and, finally, in the right is the quadrant that expresses the variables with high impact and high dependence, that is, the variables V1, V3, V4, V5, V6 and V7.

Thus, relevant variables were considered as those present in the upper right quadrant, disregarding the variable V8 (Number of Brazilians vaccinated), as it has a low impact, and the variable V2 (Number of public policies developed for tourism in the country), as it has low impact and dependence.



Graph 1: Relationship of impact and dependence between variables.

Identification of the KPIs of the relevant variables

As can be seen, the variables that were considered relevant present their own indicators, based on the historical values presented over the years, established for the creation of prospective scenarios.

Prospective scenarios proposed for Brazilian tourism

Given the points raised, a morphological analysis was used to characterize three possible prospective scenarios of post-Covid-19 Brazilian tourism, being optimistic, realistic, and pessimistic. Thus, to construct them, the values of the last five years of each of the variables were used, except for the variable V7, which represents the deaths of the Brazilian population by Covid-19, since it only started in 2020. The Table 5 presents the minimum, average and maximum values of each of the variables.

Table 5. Values of the relevant variables

	Tourism balance in the country (millions of US\$)	GDP (%)	Dollar exchange rate (BRL)	Unemployment rate (%)	Total number of passengers on flights in the country (millions)	Brazilian population deaths by Covid-19 (moving average)
Minimum	-13.192	-3.53	3.09	11	14.1	1
Medium	-11.424	9.2	4.47	12.8	94.6	1177
Maximum	-8.473	14.25	5.85	14.7	119.4	3124
Source	Ministério do Turismo (2021)	Instituto Brasileiro de Geografia e Estatística (2021)	Instituto de Pesquisa Econômica Aplicada (2021)	Instituto Brasileiro de Geografia e Estatística (2021)	Ministério do Turismo (2021)	Johns Hopkins University (2021)

Therefore, the possible prospective scenarios of this study are given as follows:

1. Pessimistic Scenario: “More Isolation Time – MIT”, represents the scenario that aggregates the worst possible performance of the relevant variables.
2. Realistic Scenario: “Thinking About the Itinerary – TAI”, represents the trend of the relevant variables, considering their historical values.

3. Optimistic Scenario: "Travels for Everyone – TE", represents the optimistic scenario, in which the variables exceed expectations.
4. Outlier Scenario: "Touristic Progression - TP", represents an atypical scenario, in which tourism is in average progression, without reaching the best of situations.

Thus, Table 6 shows the data for each relevant variable delimited in intervals and arranged for each prospective scenario. For each of the four proposed scenarios, due considerations were made, according to the characteristics that compose them. Thus, for the TAI, the intervals that involved the mean were considered, shifting to the trend values, according to the most recent historical data.

In turn, the MIT represented, in all variables, its worst situation, and for the Tourism Balance, GDP and Number of Passengers, an even greater drop in their values was considered, while for the Exchange Rate variables of the Dollar, Unemployment Rate and Deaths by Covid-19, their increases were considered. It is important to highlight that the dollar exchange rate could be considered in an inverse way, in a scenario in which, the higher the value, the greater the entry of international tourists into the country, however, it was taken into account that the increase in this rate increases the costs of maintenance of travel modes, such as planes, for example, in order to increase the value of their tickets, thus weakening local tourism.

The TE scenario represented the variables in their best situation, with considerable increases in Balance, GDP and number of passengers, linked to an Exchange Rate, Unemployment and Deaths by Covid-19, each time smaller, caused jointly by an efficient population vaccination and a possible takeover of the country's economy.

Finally, the TP scenario presents a slightly slower progression of the best-established scenario, in which Covid-19 cases do not decrease with the expected speed, characterizing it as an outlier.

Table 6. Variable range for each prospective scenario.

Variables	S1	S2	S3	S4
Tourism balance in the country (millions of US\$)	< -13.192	-13.192 - (-11.424)	-11.424 - (-8.473)	-8.473 <
GDP (%)	< -3.53	-3.53 - (9.2)	9.2 - (14.25)	14.25 <
Dollar exchange rate (BRL)	< 3.09	3.09 - 4.47	4.47 - (5.85)	5.85 <
Unemployment rate (%)	< 11	11 - (12.8)	12.8 - (14.7)	14.7 <
Total number of passengers on flights in the country (millions)	< 14.1	14.1 - (94.6)	94.6 - (119.4)	119.4 <
Brazilian population deaths by Covid-19 (moving average)	< 1	1 - (1177)	1177 - (3124)	3124 <
Capiton	Optimistic	Realistic	Pessimistic	Outlier

After creating the scenarios, it was possible to proceed with the Moment method. It is important to note that Momento often makes a clear separation of the alternatives, so that there is no intersection in the values of each one of them in its development, although, in certain cases, some values can be interpreted as mixed, because they are too close to more than one scenario.

To include an intermediate situation, which can be interpreted as mixed between the scenarios, the Outlier Scenario was developed, which shows the development of the increasing state of the variables, specifically between the optimistic and realistic scenarios. However, for the development of the next steps, only three scenarios were considered – pessimistic, realistic and optimistic – given that the outlier values were close to their intermediaries. Furthermore, it is worth mentioning that most scenario studies work with only three scenarios (Oliveira et al., 2018).

Criteria definition

Once the possible scenarios were defined, the evaluation criteria for each possible alternative to be followed were identified, with the help of specialists. Thus, one has:

1. Investment in tourism (C1): Indicates the amount of investment contributed to the tourist trip in the country, established through a five-point scale, being zero investment (1), low investment (2), medium investment (3), moderate investment (4) and high investment (5) – cost monotonic.
2. Covid-19 Vaccination (C2): Relative to the vaccination rate against Covid-19 of people included in tourism, established through a weighting on a five-point scale, with no vaccination (1), few vaccinated (2), average vaccinated (3), above average vaccination (4) and complete vaccination (5);
3. Travel flexibility (C3): Indicates the actions taken by those involved to adapt to tourist trips in the country, established through a five-point scale, namely zero flexibility (1), low flexibility (2), medium easing (3), moderate easing (4) and high easing (5);
4. Availability for tourism (C4): This criterion is associated with availability for a particular tourism. This availability relationship is directly linked to social factors, such as accessibility, transport costs, structure – as can be seen similarly in other papers (Lima et al., 2019; Sant’anna et al., 2020; Maracajá et al., 2021) – in addition to factors characteristic of the country, such as tourist interest and limitations. Finally, the criterion is also parameterized by the variables established in the study and evaluated by the specialists. It is established through a five-point scale, namely zero availability (1), low availability (2), medium availability (3), availability moderate (4) and high availability (5).

Definition of alternatives

The alternatives proposed for this study were built with the help of specialists, based on the characteristics that differentiate the type of tourism that takes place, not only in the country, but throughout the world. Therefore:

1. Individual Tourism (A1): Tourism characteristic of only one person, aimed at some will or desire of a single traveler, which does not conflict with any other objective. It has the characteristic of being more flexible and available, while it needs to contribute less money for the trip.
2. Group Tourism (A2): Characteristic tourism for a composition of any group, focused on the desire of the collective, often above the individual. It has the characteristic of being less flexible and needs more financial support for it.
3. Cultural Tourism (A3): Tourism with the characteristic of a central object focused on the destination, regardless of individual or collective desire. This type of tourism proves to be very inflexible, but with greater financial flexibility, due to packages and promotions created by travel agencies.
4. Seasonal Tourism (A4): Tourism centered on a specific time or attraction of the destination. Generally, it is also not very flexible and requires a greater monetary contribution, as it is attractive to various types of consumer profiles.

It is important to highlight that, although the established alternatives have a predominant characteristic, they can also be considered as mixed. That is, in tourism in practice, it is possible to establish cultural tourism in a group, or individual seasonal tourism, for instance. For this reason, the alternatives were established in this way by the specialists, in order to be able to assess tourism both individually and in combination.

Given the proposed criteria and alternatives, it was possible to establish, through consultation with specialists, the data for each of the alternative tourisms in relation to the scales of the proposed criteria, as shown in Table 7.

Table 7. Values of alternatives for each criterion

	Investment in tourism	Covid-19 Vaccination	Travel flexibility	Availability for tourism
Individual tourism	2	5	5	3
Group tourism	4	3	3	4
Cultural tourism	3	2	1	5
Seasonal tourism	5	2	2	2

First, individual tourism has a high value for Covid-19 vaccination and flexibility, since it is possibly a single adult. In addition to presenting relatively low investment, for the reason. In addition, his availability is average, due to personal responsibilities.

Group tourism, in turn, has a moderate investment value and availability, since there are more people traveling, which can form different combinations. Likewise, Covid-19 vaccination and flexibility are average, for the same reason.

In addition, cultural tourism has high availability, as they are often places with continuous operation, however, they have a low complete vaccination of Covid-19, because the destinations are more rigorous and medium investment, as they are more expensive places, however provided. of packages by agencies. Finally, there is a tendency towards null flexibility, as they are associated with a specific destination and with the packages themselves.

Finally, seasonal tourism has the highest investment, since they are places rated by people, especially considering post-pandemic scenarios, however, it has low vaccination, flexibility, and availability, as it is linked to specific dates.

Calculation of criteria weights for each scenario

After defining all the points proposed by the Moment method, it was possible to define the actors that work in the tourism landscape in Brazil, as well as the establishment of criteria and alternatives for their analysis. Thus, to establish the weights of each of these criteria, the knowledge of the specialists was used again, to analyze them from the perspective of the optimistic, realistic, and pessimistic scenario.

Thus, in view of these constructed scenarios, and given the established criteria, the experts – characterized here as Decision Maker 1 (DM1) and Decision Maker 2 (DM2) – presented the weights, as shown in Table 8.

Table 8. Weight of criteria for each scenario according to the DMs.

PESSIMISTIC SCENARIO			
Criteria	DM1	DM2	Final average
Investment in Tourism	0.1	0.1	0.1
Covid-19 Vaccination	0.6	0.7	0.65
Travel Flexibility	0.1	0.1	0.1
Availability for Tourism	0.2	0.1	0.15
REALISTIC SCENARIO			
Criteria	DM1	DM2	Final average
Investment in Tourism	0.1	0.1	0.1
Covid-19 Vaccination	0.1	0.2	0.15
Travel Flexibility	0.4	0.3	0.35
Availability for Tourism	0.4	0.4	0.4
OPTIMISTIC SCENARIO			
Criteria	DM1	DM2	Final average
Investment in Tourism	0.5	0.6	0.55
Covid-19 Vaccination	0.1	0.1	0.1
Travel Flexibility	0.2	0.1	0.15
Availability for Tourism	0.2	0.2	0.2

Evaluation of the performance of alternatives

Having established the criteria for evaluating Brazilian tourism, in line with the possible alternatives and determining the weights of the prospective scenarios determined by the specialists, it is therefore necessary to evaluate each of the alternatives established in the scenarios. Therefore, Table 9 shows the average performance of each of the alternatives.

Table 9. Evaluation of the performance of alternatives

	Performance average			
	Investment in tourism	Covid-19 Vaccination	Travel flexibility	Availability for tourism
Individual Tourism	0.5	1.5	1	0.75
Group Tourism	1	0.9	0.6	1
Cultural Tourism	0.75	0.6	0.2	1.25
Seasonal Tourism	1.25	0.6	0.4	0.5

Application of the classification algorithm for Brazilian tourism from the perspective of multicriteria

Thus, considering the individual assessments and the total data of the decision matrix, the THOR 2 and AHP-TOPSIS-2N methods were applied in order to compare the results between a non-compensatory and a compensatory method.

THOR 2 application

From the decision matrix and the established parameters of preference, indifference and dominance, corresponding to THOR 2, the THOR Web tool - available at www.thor-web.com, was used to obtain the result of the alternatives in relation to the proposed scenarios. As shown in Figure 2, we have, first, the result for the pessimistic scenario, which, from a strong preference, that is, in S1, THOR 2 managed to establish a better alternative than the others, showing that, for this scenario, individual tourism is the most appropriate.

In the realistic scenario, in turn, THOR 2 was not able to establish a result in S1, however, in S2, taking into account strong and weak preferences, it establishes the most appropriate tourism, choosing group tourism as the best alternative for this scenery. Finally, in the optimistic scenario, as well as in the pessimistic scenario, it was possible to determine the alternative already in S1, with seasonal tourism being more appropriate for this.

Pessimistic Scenario	Realistic Scenario	Optimistic Scenario
<p>Result S1</p> <p>Individual tourism - 0 0.746 0.746 0.746</p> <p>Group tourism - 0 0 0.5 0.5</p> <p>Cultural tourism - 0 0.5 0 0.5</p> <p>Seasonal tourism - 0 0.5 0.5 0</p> <p>Individual tourism = 2.238</p> <p>Group tourism = 1.0</p> <p>Cultural tourism = 1.0</p> <p>Seasonal tourism = 1.0</p> <p>Individual tourism > Group tourism = Cultural tourism = Seasonal tourism - Original.</p>	<p>Result S1</p> <p>Individual tourism - 0 0.5 0.5 0.5</p> <p>Group tourism - 0.5 0 0.5 0.5</p> <p>Cultural tourism - 0.5 0.5 0 0.5</p> <p>Seasonal tourism - 0.5 0.5 0.5 0</p> <p>Individual tourism = 1.5</p> <p>Group tourism = 1.5</p> <p>Cultural tourism = 1.5</p> <p>Seasonal tourism = 1.5</p> <p>Individual tourism = Group tourism = Cultural tourism = Seasonal tourism - Original.</p>	<p>Result S1</p> <p>Individual tourism - 0 0 0.5 0</p> <p>Group tourism - 0.545 0 0.5 0.5</p> <p>Cultural tourism - 0.5 0.5 0 0</p> <p>Seasonal tourism - 0.545 0.5 0.574 0</p> <p>Individual tourism = 0.5</p> <p>Group tourism = 1.545</p> <p>Cultural tourism = 1.0</p> <p>Seasonal tourism = 1.619</p> <p>Seasonal tourism > Group tourism > Cultural tourism > Individual tourism - Original.</p>
<p>Result S2</p> <p>Individual tourism - 0 0.746 0.746 0.9</p> <p>Group tourism - 0 0 0.846 0.9</p> <p>Cultural tourism - 0 0 0 0.5</p> <p>Seasonal tourism - 0 0 0.5 0</p> <p>Individual tourism = 2.392</p> <p>Group tourism = 1.746</p> <p>Cultural tourism = 0.5</p> <p>Seasonal tourism = 0.5</p> <p>Individual tourism > Group tourism > Cultural tourism = Seasonal tourism - Original.</p>	<p>Result S2</p> <p>Individual tourism - 0 0.5 0.5 0.9</p> <p>Group tourism - 0.5 0 0.6 0.9</p> <p>Cultural tourism - 0.5 0 0 0.5</p> <p>Seasonal tourism - 0 0 0.5 0</p> <p>Individual tourism = 1.9</p> <p>Group tourism = 2.0</p> <p>Cultural tourism = 1.0</p> <p>Seasonal tourism = 0.5</p> <p>Group tourism > Individual tourism > Cultural tourism > Seasonal tourism - Original.</p>	<p>Result S2</p> <p>Individual tourism - 0 0 0.5 0</p> <p>Group tourism - 0.745 0 0.8 0</p> <p>Cultural tourism - 0.5 0 0 0</p> <p>Seasonal tourism - 0.545 0.545 0.737 0</p> <p>Individual tourism = 0.5</p> <p>Group tourism = 1.545</p> <p>Cultural tourism = 0.5</p> <p>Seasonal tourism = 1.827</p> <p>Seasonal tourism > Group tourism > Individual tourism = Cultural tourism - Original.</p>
<p>Result S3</p> <p>Individual tourism - 0 0.746 0.746 0.9</p> <p>Group tourism - 0 0 0.846 0.9</p> <p>Cultural tourism - 0 0 0 0.705</p> <p>Seasonal tourism - 0 0 0 0.773 0</p> <p>Individual tourism = 2.392</p> <p>Group tourism = 1.746</p> <p>Cultural tourism = 0.705</p> <p>Seasonal tourism = 0.773</p> <p>Individual tourism > Group tourism > Seasonal tourism > Cultural tourism - Original.</p>	<p>Result S3</p> <p>Individual tourism - 0 0.5 0.5 0.9</p> <p>Group tourism - 0.5 0 0.6 0.9</p> <p>Cultural tourism - 0.5 0 0 0.514</p> <p>Seasonal tourism - 0 0 0 0.568 0</p> <p>Individual tourism = 1.9</p> <p>Group tourism = 2.0</p> <p>Cultural tourism = 1.014</p> <p>Seasonal tourism = 0.568</p> <p>Group tourism > Individual tourism > Cultural tourism > Seasonal tourism - Original.</p>	<p>Result S3</p> <p>Individual tourism - 0 0 0.5 0</p> <p>Group tourism - 0.745 0 0.8 0</p> <p>Cultural tourism - 0.5 0 0 0</p> <p>Seasonal tourism - 0.545 0.545 0.789 0</p> <p>Individual tourism = 0.5</p> <p>Group tourism = 1.545</p> <p>Cultural tourism = 0.5</p> <p>Seasonal tourism = 1.879</p> <p>Seasonal tourism > Group tourism > Individual tourism = Cultural tourism - Original.</p>

Fig. 2: Result of tourism alternatives for THOR 2 of each proposed scenario.

AHP-TOPSIS-2N application

After the evaluation made by THOR 2, the AHP-TOPSIS-2N procedure was used for a comparison between the two methods, compensatory and non-compensatory. The AHP-TOPSIS-2N was developed in collaboration with the Military Institute of Engineering (IME), Centre for Analysis of Naval Systems (CASNAV) and Federal Fluminense University (UFF).

With the AHP-TOPSIS-2N procedure, the defined criteria are inserted in the procedure, together with the alternatives and parameters defined by the opinion of experts, together with an equivalent scale of the weights established for each scenario. Thus, the results were obtained (TABLE 10) observing the result of the first normalization and score obtained from the alternatives related to the pessimistic scenario, in which D+ represents the Distance to the ideal positive solution, D- represents the Distance to the negative ideal solution and RS is the Relative proximity.

Table 10. Normalization 1: Pessimistic Scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.0539	0.3192	0.8555	0.8555
Group Tourism	0.2123	0.1180	0.3572	0.3572
Tourism in Cultural	0.3194	0.0627	0.1641	0.1641
Seasonal Tourism	0.3224	0.0376	0.1044	0.1044

Table 11 presents the data referring to the first normalization and its respective score obtained through it, referring to the pessimistic scenario.

Table 11. Normalization 2: pessimistic scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.1321	0.6851	0.8383	0.8383
Group Tourism	0.4576	0.2574	0.3600	0.3600
Tourism in Cultural	0.6856	0.1535	0.1830	0.1830
Seasonal Tourism	0.6974	0.0883	0.1124	0.1124

In this analysis, it is verified that Individual Tourism should be prioritized in relation to the others, that is, in the pessimistic scenario tourism companies should prioritize individual tourism, followed by Group Tourism with a score in the ranking considerably lower than the first place. Table 12 shows the result of the first normalization and score obtained from the alternatives related to the realistic scenario.

Table 12. Normalization 1: Realistic scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.1374	0.1998	0.5926	0.5926
Group Tourism	0.1182	0.1611	0.5767	0.5767
Tourism in Cultural	0.1924	0.1923	0.4999	0.4999
Seasonal Tourism	0.2415	0.0679	0.2193	0.2193

Table 13 presents the data referring to the first normalization and its respective score obtained through it, regarding the realistic scenario.

Table 13. Normalization 2: Realistic scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.3366	0.3454	0.5065	0.5065
Group Tourism	0.2301	0.3553	0.6070	0.6070
Tourism in Cultural	0.3190	0.4710	0.5962	0.5962
Seasonal Tourism	0.5295	0.1428	0.2124	0.2124

Unlike the calculations of the pessimistic scenario, the analysis of the realistic scenario presents Group Tourism as a priority in the ranking, however individual tourism, which in the previous scenario has surpassed in relation to the others, in this scenario the same appears third in the ranking. The second place in this scenario is related to Cultural Tourism.

Table 14 shows the result of the first normalization and score obtained from the alternatives related to the optimistic scenario.

Table 14. Normalization 1: Optimistic scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.2454	0.0996	0.2887	0.2887
Group Tourism	0.0990	0.1734	0.6366	0.6366
Tourism in Cultural	0.1874	0.1076	0.3649	0.3649
Seasonal Tourism	0.1068	0.2416	0.6935	0.6935

Table 15 presents the data referring to the second normalization and its respective score obtained through it, relative to the optimistic scenario.

Table 15. Normalization 2: Optimistic scenario

Alternative	D+	D-	RS	Score Obtained
Individual Tourism	0.6012	0.1770	0.2275	0.2275
Group Tourism	0.2261	0.4168	0.6483	0.6483
Tourism in Cultural	0.4271	0.2637	0.3817	0.3817
Seasonal Tourism	0.2264	0.5906	0.7229	0.7229

The last scenario to be analysed when applying the AHP-TOPSIS-2N method is the Optimistic Scenario, which presented that Seasonal Tourism should be prioritized over the others. This result is distinguished from all presented in the previous scenarios, it is worth mentioning, that seasonal tourism in the analyses of the Pessimistic Scenario and the Realistic Scenario ranked last.

Discussions and Conclusions

Through the present study, the creation of prospective scenarios is important, so that one can understand the possibilities, as well as prepare for possible scenarios, especially when it is a pandemic, such as the one generated by Covid-19, in a sector so dependent on the restrictions caused, such as tourism.

In this way, the paper achieved its objective of developing prospective scenarios for post-Covid-19 Brazilian tourism, using the Momentum method. Such scenarios were arranged through the available knowledge of the literature, linked to the consideration of experts in the tourism area, so that it was possible to create optimistic, realistic, pessimistic and outlier aspects for this sector, within the Covid-19 panorama.

In the optimistic scenario it is possible to see progress, both in the economy and in the Brazilian vaccination schedule, to allow greater tourist trips, whereas in the realistic scenario, the prominent return of trips and large itineraries, keeping expectations for a moderate scenario, caused by the pandemic. In the pessimistic scenario, possible economic problems arise and with the control of new waves of Covid-19, which can slow down the recovery of the sector, and finally, in the outlier scenario it was possible to see a median recovery.

Through the four scenarios built, it was possible to develop alternatives and criteria within three of them, with the help of experts, for the analysis focused on MCDA. This development brought interesting tourism options, which were individual tourism, group tourism, seasonal tourism and cultural tourism, which encompass the general

interests of tourism in the country, as well as the ways in which they are exercised.

Therefore, with the help of THOR 2 - a non-compensatory method - it was possible to compare these alternatives of types of tourism, given the weights for each scenario generated, and criteria linked to the impact of Covid-19. For the pessimistic scenario, THOR 2 determined individual tourism as the best alternative, given the restrictions of this scenario. In addition, in the realistic scenario, it determined that group tourism would be the best alternative, since there is an improvement in conditions, mainly focused on investment in tourism in the country. Finally, in the optimistic scenario, seasonal tourism gained prominence, since there are improvements, not only in investment, but also in the number of people in public places.

Likewise, the AHP-TOPSIS-2N – a compensatory method – was used as an evaluative comparison. In the pessimistic scenario, it determined that the best alternative would be individual tourism. Furthermore, in its second normalization, it also chose group tourism as the best option for the realistic scenario and, finally, in the optimistic scenario, it determined that the best option would be seasonal tourism, being fully aligned with the choices made by THOR 2.

It is noted that this study has certain limitations, given that the number of criteria and alternatives, based on the stipulated scenarios, is limited to only four of each, which may be the reason for the approximation of the values of the two methods to be close.

Thus, as future studies, it is recommended to expand this study, through the insertion of more alternatives and criteria relevant to Brazilian tourism. Furthermore, the use of other multicriteria methods is also recommended to compare the results with those developed in this study.

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