A Mind Genomics-Based Cartography to Assess the Effects of the COVID19 Pandemic in the Tourism Industry

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Abstract: - This study aims to understand what Albanians think about the tourism business and the likely impact of Covid-19 on tourism in Albania. A Mind Genomics-based cartography assessed the different aspects of tourism, with a response from 4800 people out of 7000 invited. Mind Genomics is a new science based on regression models, data mining and clustering techniques. Only 38% of Albanians are optimistic about summer vacations. Two mindsets of Albanian respondents emerged from the study. Around 52.5% of participants belong to the pessimistic mindset about having vacations at all. The remainder, 47.5% of participants belong to the "cautious" group; they would wait for a "reasonable" offer to decide.

Key-Words: - tourism industry, covid19, mind genomics, regression models, clustering techniques

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1 Introduction

There are about 330 million tourism-related jobs worldwide. It has been estimated that tourism contributes between 9% and 10% of the world's gross domestic product, at least during the past decade [1].

COVID 19 pandemic drastically changed the landscape of tourism around the world. Many countries experienced a significantly reduced income from the sector of tourism. The most penalized countries are the ones that depend upon the tourist industry. To give a sense of the dependence on tourism in the region, 25% of the Albanian economy is tourism-related, slightly lower than Croatia (25%) and Montenegro (33%) [2]. Tourism has been identified as one of the main engines of economic development in Albania. Economic activity continued to benefit from rising private consumption and the rapid expansion of tourism.

The National Institute of Statistics estimated that in the period 2013-2017, the average specific contribution of expenditures of foreign tourists (non-residents) in Albania to total GDP was 13.3%, whereas the specific average contribution of expenditures by Albanian citizens abroad to total GDP of Albania is on average 11.2%. According to the data from the Bank of Albania in 2018, foreign

tourists contributed 1.8 billion euros to the economy of Albania. In contrast, and not unexpectedly, 2020 turned out to be the most challenging year for the Albanian economy [3].

Albania is estimated to be one of the most dependent countries as an economy from tourism. Thus, the pronounced contraction in the world economy at this time of the pandemic may affect the contraction of Albania's economy as well. Other measures of tourism are direct flights.

A strong correlation has emerged between international flights and the spread of COVID19 outbreaks [4]. Regression models show a significant linkage between flows of international tourism and COVID-19 outbreaks, with the measure being deaths. Not surprisingly the global traveling industry is in pain, and the consequences in the global economy will be long-lasting. It seems highly likely that the COVID-19 pandemic will severely affect the international tourism industry, with strong negative consequences on the economic growth and prosperity of several nations [5].

Recent data on daily air traffic show a drop of around 80% since January 2020 [6]. The Albanian Institute of Statistics [7] reported that the number of Albanian and foreign citizens entering in the Albanian territory, in July 2020, is 663,980. Compared to July 2019, this indicator results in a decrease of 61.5%. In July 2020, the entries of foreign citizens in the Albanian territory are 387,716. Compared to July 2019, this number has decreased by 67.1%. The number of foreign nationals entering Albania in the seven months of 2020 is 1,169,610, a decrease of 64.7%, compared to the same period of 2019 [7].

The pandemic has also limited the outflow of Albanian citizens. According to the National Institute of Statistics report [7] the departures of Albanian and foreign citizens from the Albanian territory, during July 2020, are 545,962, marking a decrease of 62.7%, compared to the same period a year ago. The number of Albanian citizens leaving the country during July 2020 is 246,334. Compared to July 2019, this number has decreased by 52.3%. The number of foreign citizens leaving Albania during July 2020 is 299,628, a decrease of 68.4% compared to July 2019.

The number of Albanian citizens leaving the country in the seven months of 2020, is 1,626,642, down 48.7%, compared to the same period a year ago, the report states. As the world economy is getting locked down again trying to control Covid19's disastrous consequences, there are voices in the research community arguing the need for a new paradigm that will help to get over these troubled times and address the challenges our society will face after the pandemic [8]. The tourism industry, part of the world economy, has to address the same issues. Studies are trying to identify the fundamental values, institutions, and pre-assumptions that the tourism industry and academia should challenge and breakthrough to advance and reset the research and practice frontiers [9]. As an example, [10] developed a prosperity index model of regional tourism industry to analyze the situation of the industry and determine the trend of industry volatility.

The overarching goal of this paper is to present to governmental institutions some valuable findings and insights that deserve consideration when thinking about how to deal with the social and economic problems caused by the COVID19 pandemic.

This study was designed to answer three different questions, each of a time, practical nature. Question #1 is the perception of Albanian respondents regarding the potential problems affecting the industry of tourism in Albania. To our knowledge, as of this writing (Fall 2020), there is little in the way of understanding in a deep fashion the mind of people regarding the status of the tourism industry. Question #2 is the goal to find the underlying mindsets of respondents so that the results will move beyond descriptive to actionable. Such actionability emerges from the use of meaningful stimuli, meaningful messages of specific content, not just general message [11], [12]. Third, the study presents a way to find these mindsets by selective messaging using the PVI, personal viewpoint identifier using Discriminat Function Analysis [13]. PVI assigns any new person to the appropriate mindset, enabling the individual to receive the appropriate messages.

Other countries could easily use the presented approach to understand the status of the tourism industry and the factors influencing its success regardless of the country's size or the specifics of its tourism industry.

The rest of the paper is presented as follows: Section Method shows the data used for the analyses and the scientific approach, section results and discussions presents a list of the results obtained by this study, and the last section, conclusions, and recommendations, shows findings of this study.

2 Method

This study uses the emerging science of Mind Genomics [12] to design the experiment, collect and analyze the data. Mind Genomics ® is a new

science introduced in 2005 by a group of academics and practitioners, to systematically map consumers' perceptions and preferences of topics of every day [14]. Mind Genomics emerged as a variation on the well-accepted collection of methods known as conjoint measurement, creating a knowledge-development system to understand what people value, and what they do not. Mind Genomics combines permuted experimental design [15], OLS (ordinary least squares) regression [16], statistical models, data mining, and clustering techniques [17] to uncover new-to-the-world mind-sets, the grouping of respondents thinking the same. Mind Genomics can best be conceptualized as a structured research procedure, forcing one to understand a topic by deconstructing that topic into components, evaluating many novel mixtures of the components, and from the responses to the components, understanding the impact or contribution of the different component to one's decision-making. The underlying worldview of Mind Genomics is that people intuitively respond with ease to the every-day situations of their lives but may not be able to articulate WHY they do so, even when asked directly. Only through a structured, easy-to execute, hard-to-'game' experiment can the structure of a person's decision-making be revealed. The keywords are experiment, structure, easy, and iterative. Mind Genomics allows the researcher to understand the response of individuals to the granular aspects, the specifics of everyday life [11], [12]. Mind Genomics emerged from experimental psychology, notably the field of psychophysics, which itself looked for relations between external stimuli of known magnitude (e.g., amount of sweetener in a beverage) and the internal response (e.g., perceived sweetness of that beverage). Rather than dealing with these external-internal relations, Mind Genomics deals entirely with internal ideas, the nature of a message as understood versus the importance of that message, both in the mind. Mind Genomics thus constitutes the 'inner psychophysics' of the mind [18].

Mind Genomics has a long history with applications ranging from finding customer requirements for nature food stores [19], the concerns of people about the prospects of cancer [20], finding what clients think about mobile banking [21], studying corruption in education [22], advertising tourism [23], to understand the specifics of a customer's mind [18] and even evaluating the new distance learning approach used largely as the teaching tool during the COVID19 pandemic [24]. A special volume [25] recently appeared, focusing on the use of Mind Genomics in the field of law.

Mind Genomics follows a set procedure, a series of studies that in an almost algorithmic sense goes from topic to deeper understanding. The following is the sequence as a series of integrated steps.

Step #1 begins the process by defining the topic, that which will be investigated, a seemingly simple question, but one which requires some thinking because in the selection of the topic lies many aspects that will either accelerate knowledge-development or limit it.

Step #2 requires the selection of four questions relevant to the topic, four pillars or silos. These must 'tell a story', making sense as questions, and all must be relevant to the topic, helping to understand the topic deeply rather than just thrown together [24]0).

Step #3 requires four answers (elements) to each question, with the answer written out as a declarative sentence. The sentence should be simple, easy to read, relevant to understand, and solve the problem. The content of the element is not fixed; it may be a statement of fact, a statement of emotion, and so forth. Ideally, the questions and answers should probe different dimensions of the problem and solution. It is not necessary to be correct, however. The simplicity, speed, and cost allow the researcher to iterate, repeating the study with those elements or answers shown to be relevant, discarding the irrelevant ones, and moving to the next iteration. We provide Iteration #1 in this paper to highlight the method and what can be learned.

Table 1. The four questions, and the four answers for each question

Question A: What will happen in Summer, 2020:
A1 No Summer holidays in 2020, a lot of Albanians lost their jobs because of the quarantine
A2 No vacations as the majority of institutions forced people to use their holidays during the quarantine time
A3 Holidays will be longer as people spent a lot of time inside, they need more time to recover
A4 Less people will take holidays to avoid over-populated areas
Question B: What will people do in Summer 2020, relevant to Albania?
B1 Albanians are indifferent
B2 People are inclined to spend less because of the economic hardship
B3 People have a need of long vacations
B4 People will stay in Albania if the prices are attractive
Question C: What will be the vacation

destination for Albanians in 2020?
C1 Vacation destination: Tourism in the mountains
C2 Vacation destination: Beaches tourism
C3 Vacation destination: Curative tourism (thermal spa, Thermal waters)
C4 Vacation destination: Cultural tourism
Question D: What will be the economics of vacations in Summer, 2020?
D1 Price-quality ratio is good due to reasonable prices for offered services
D2 Price-quality ratio is unpredictable because of large asymmetry of prices
D3 Price-quality ratio depends on the offered touristic packages
D4 Unreasonably high prices for mediocre offered services

Step #4 combines these elements or answers into a unique set of combinations, called vignettes, using the underlying structure provided by an experimental design. The experimental design is a structure comprising 24 combinations, with each combination of vignette comprising either 2, 3, or 4 answers, elements, at most one element from a question, but often no elements from a question. Each element appears five times across these 24 combinations.

The experimental design ensures that the 16 elements are statistically independent of each other, allowing the data to be analyzed by OLS (ordinary least squares) regression. Of key importance is each respondent evaluated a different set of 24 combinations, each set a so-called 'isomorphic permutation' of the core experimental design [15]. The structure has the benefits of covering a great deal of the 'design space,' giving a better idea of the patterns driving decisions and can be analyzed down to the level of a single individual, important for subsequent mind-segmentation.

For this study, 4800 different vignettes are evaluated.

Step #5 creates the respondent classification question. The first part, at the start of the study, obtains the respondent's gender, age, and one of the three reasons for the respondent would go on vacation: 1=Reason: patriotic tourism - staying in Albania 2=Reason: Conventional offers in Albania 3=Reason: Nowhere to go, borders are closed.

Step #6 introduces the study to the respondents in a short fashion. The introduction is deliberately kept short in order to let the elements themselves, the answers to the questions, 'do the work'. The orientation paragraph, presented at the top of each 'screenshot' with its accompanying vignette, reads as follows: This study is about understanding how people feel about going on vacations after COVID19 in Albania. Tourism is a very important part of the Albanian economy. After the long quarantine, it is important to know what Albanians think about vacations, where to spend them and how much to spend on them. This study will help understand what makes people take their decisions on vacations after COVID19.

How do you rate this combination?
1=Unlikely …9=Likely

Step #7 converts the ratings to a binary scale. Ratings of 1-6 are converted to 0, ratings 7-9 are converted to 100. A small random number is then added to the ratings. The conversion of the ratings to a binary scale is done because most managers find it difficult to interpret the meaning of the 9-point scale, or indeed of any Likert scale. The use of the scale prefers to have the data in a simpler form, no or yes. The division of the scale is a matter of convention. The outcome, however, is a binary scale that is subjected to OLS regression.

Step #8 fits a regression model to the data, at the level of the individual, and the level of the group. Either analysis is possible because the experimental design is used at the individual level.

The equation emerging is: Binary Rating = k0 + k1(A1) + k2(A2) + …+ k16(D4).

The important thing to know about the coefficients is that they have absolute meaning and have ratio scale values. An additive constant of 30 means that in the absence of elements (a theoretical situation only because of the experimental design) we expect 30% of the responses to be in the interval 7-9, and 70% of the responses to be in 1-6. A coefficient of + 9 means that when the element is introduced into the vignette, we expect an increase of 9%, so that the 30 becomes 39. Thus, 39% of the responses are expected to be 7-9. One can add, at most one element from each silo and compute the sum of the five numbers (additive constant plus four separate coefficients). Furthermore, the ratio scale property means that a sum of 30 is half as much as a sum of 60 thus, a vignette with a sum of 30 (additive constant + elements) should generate half the number of ratings 7-9 as a vignette with sum 60 (additive constant + elements). The key is to find strong positive coefficients.

Step #9 searches for mindsets, groups of patterns which represent different ways of thinking about the same problem. A hallmark of Mind Genomics is the discovery of different patterns of reactions to the elements, patterns that are intuitively obvious and suggest different ways of perceiving the facts of a particular study case. These differences are referred

to as mindsets, groups of ideas that are consistent with each other and represent a framework that can be named in a straightforward way. The differences are groups of ideas that co-vary so that an individual can be said to think in the way portrayed by the mindset. It is important to state that the mindset does not define *WHO* a person is, but the nature of how the person thinks about a particular topic, at a particular time, in a particular situation. It is this lability of mindsets that make them properties of the mind of the person, not the property of the protoplasm, the physical person. Once the mindsets are developed using K-means clustering [26] on the 16 coefficients, each of the respondents is assigned to one of the two mindsets based strictly on numerical criteria.

It will be the task of the researcher to assign a number to the mindset, a straightforward task once the clustering is carried out properly, and an interpretable but limited number of clusters emerge.

Table 2 shows the preliminary results, the additive constant, and the 16 coefficients for the total panel and the two mindsets. To obtain this number requires simply a single pass through the 4800 observations.

To make the table easier to read, the table shows only the positive coefficients, those coefficients driving the response of interest. Table 2 suggests two distinct mindsets based upon the patterns of the strong performing coefficients, coefficients with value + 8 higher, corresponding to a coefficient lying at least 1.5 standard errors of estimate above the value 0.

The additive constant for 'agreement' is the same for the total panel and the two emergent mindsets. Approximately 40% or 2 in 5 responses should be 'agree', operationally defined as 7-9.

The remaining 3 in 5 responses will be either neither agree/disagree (ratings of 4-6) or disagree (ratings 1-3). It is clear from Table 2 that there is no pattern for the total panel, but two clear patterns for mindsets. It is relevant to note the mindsets are created using
mathematical methods, with naming the mindsets occurring afterward.

Table 2. Coefficients for the total panel and the two mindsets. Only positive coefficients are shown to make the patterns easier to emerge

Additive Constant	Total	MindSet 1	MindSet 2
	38	**37**	**39**
Mind-Set 1 – Focus on the general situation (external view)			
A2;No vacations as the majority of institutions forced people to use their holidays during the quarantine time	6	12	
A1;No Summer holidays in 2020, a lot of Albanians lost their jobs because of the quarantine	4 3	11	
A3;Holidays will be longer as people spent a lot of time inside, they need more time to recover	1	10	
A4;Less people will take holidays to avoid over-populated areas		8	
Mind-Set 2 – Focus on prices and service (internal view)			
D1;Price-quality ratio is good due to reasonable prices for offered services			
D2;Price-quality ratio is unpredictable because of large asymmetry of prices	3 1		12 12
D4;Unreasonable high prices for mediocre offered services			12
D3;Price-quality ratio depends on the offered touristic packages			8
Elements not performing strongly with either mind-set			
B1;Albanians are indifferent			2
B2;People are inclined to spend less because of the economic hardship			2
C2;Vacation destination: Beaches tourism		6	
C1;Vacation destination: Tourism in the mountains		5	
C4;Vacation destination: Cultural tourism		4	
C3;Vacation destination: Curative tourism (thermal spa, Thermal waters)		3	
B4;People will stay in Albania if the prices are attractive	1	2	
B3;People have a need of long vacations			

3 Results and Discussions

The obtained results show that the additive constant (or referred to as intercept as well) is 38 (k0 = 38), meaning that 38% of participants are optimist about going on vacation this year of 2020. Overall, the most statistically relevant answer is A2: No vacations as the majority of institutions forced people to use their holidays during the quarantine time evaluated with 6, showing the gloomy picture

created by the pandemic. Answer A1: No Summer holidays in 2020, a lot of Albanians lost their jobs because of the quarantine is evaluated with 4, demonstrates the peculiar economic situation of the country, people are not even considering going on vacation. Question C: What will be the vacation destination for Albanians in 2020 has negative values, meaning that people are not even thinking to choose the kind of tourism they would like to have. Analyses based on the qualifications criterion show that the Reason: patriotic tourism - staying in Albania is the one with the highest statistical relevance and the corresponding answer A3: Holidays will be longer as people spent a lot of time inside, they need more time to recover is the one evaluated with the value of 10. It shows the need for people to have a dreamed long vacation because of the long and painful lockdown period. Participants that have selected this qualifications criterion are the most optimistic as the value of the additive constant is 43. Most of the participants (1920) have selected the Reason: Nowhere to go, borders are closed. They are the least optimistic about going on vacation as the value of the additive constant is 35. Also, the same group of participants has rated answer A2: No vacations as the majority of institutions forced people to use their holidays during the quarantine time with the highest value of 8, another argument that no holidays are on their horizon. Participants that have selected the selection criterion Reason: Conventional offers in Albania, evaluate the most Question B: If Albanians spend holidays in Albania, will this be enough for the tourism industry to recover? The answer with the highest value (8) is B1: Albanians are indifferent. This conclusion is not a very encouraging outcome as it shows that Albanians do not care very much whether the tourism industry will be able to recover or not. In the same group, the next highest rated answer (7) is B2: People are inclined to spend less because of the economic hardship. This result reinforces the widely accepted idea that because of the COVID19 pandemic, people are reluctant to spend money on vacations. The same participants find that services offered in Albania are not reasonable as they rate the answer D4: Unreasonably high prices for mediocre offered services with a value of 4 that is the highest in this group. Also, in the same qualifications criterion (criterion Reason: Conventional offers in Albania), participants have rated with the least value -10 the answer C3: Vacation destination: Curative tourism (thermal spa, Thermal waters). One possible interpretation of this result may be found in the cultural traditions of the country as this kind of tourism is not very common in Albania. Another potential interpretation of this negative result might be the dire economic conditions of the country; people have not even bothered to think about this kind of tourism. Analyses of gender-based results show that women are more optimistic than men about the situation as the value of the additive constant for women is 40 versus 36 for men. They both value (4) the same answer A1: No Summer holidays in 2020 as a lot of Albanians lost their jobs because of the quarantine. In general, women are slightly more optimistic regarding Question A: Will Albanians have summer holidays in 2020? Women in total value this item with 16 while men value this with 12.

Even when evaluating Question B: If Albanians spend holidays in Albania, will this be enough for the tourism industry to recover? Women are more optimistic. They rate this question with a total of 12 while men rate the same question with -6. In general, in Albania women are the ones that control the family budget. Thus, there is hope that women will spend the money, and consequently, the economy may recover faster. Regarding Question D: What do you think will be the cost-quality ratio during Albanian vacations in 2020? Both men and women are neutral to this issue: men evaluate it with 1 while women with 0.

Analyses of groupage-based results show the study included groupages from 13 to 65+. This study excluded groupages 13-17 and 65 + as the number of participants in both groups is irrelevant. Groupage 35-44 is the most optimistic about planning vacations as the value of the additive constant is 50. The most pessimistic groupage is 25-34, and the value of the additive constant is 23. As to confirm their pessimism about planning for vacations this groupage rates the answer A2: No vacations as the majority of institutions forced people to use their holidays during the quarantine time with 17, one of the highest in this study. Groupage 55-64 has the additive constant equal to 36, not a very enthusiastic value, and the rate answer B2: People are inclined to spend less because of the economic hardship with 18, the highest in the study. The same groupage evaluates in total the Question D: What do you think will be the cost-quality ratio during Albanian vacations in 2020? With a value of 44. Thus, groupage 55-64 is the most pessimistic. The final step of Mind Genomics analyses is presenting two or three mindsets, representing a grouping of respondents that think alike. Table 2 presents the mindsets; the highlighted areas show the two mindsets. Mindset 1 represents the people that could be referred to as

pessimistic; they have rated quite high the elements of silo A, rated on average with 11. Silo A contains answers that do describe a rather pessimistic view of the situation. Mindset 2 represents participants that have a rather "wait and see" approach. They have rated high the answers of silo D, evaluated on average with 10.25. Silo D contains answers expressing a pragmatic view of the situation, the future actions depend on the kinds of offers will be available at the time when the decisions should be made. Both mindsets have a rather careful approach to the future of their planning vacation process as the addition constants for both are very similar, 37 and 39.

4 Conclusions and Recommendations

The Covid19 pandemic has created a very difficult time in the world economy and specifically has severely hit the industry of tourism. The countries that will economically suffer the most are the ones that have a high dependence on the tourism industry. Albania, being one of the countries that have high dependency on tourism will suffer grave economic consequences. Official sources state that Albania will lose 1.5 billion Euro from the Covid19 pandemic [27]. The results obtained from the study demonstrate that Mind Genomics is a very sound approach providing a wide range of data. It allows having five classification criteria that will create the heart of the analysis. By default, the system offers gender and groupage as classification criteria leaving the researchers the choice to add three others to make the study more complex. Thus, the researcher can analyze the collected data according to five different criteria. This large choice of classification criteria allows for a deep understanding of the problem in the study, making it possible to see many points of view.

This study shows that the qualifications criterion Reason: patriotic tourism - staying in Albania was rated the highest with a total score of 27 and an additive constant of 43. This item had 1512 observations, demonstrating this is an important issue for the majority of the people. Data from the national institute of statistics show that the concept of "patriotic tourism" is of significant relevance. Tourists from Kosova came to the rescue of the tourism industry of Albania. According to [7] over a million tourists from Kosova visited Albania during the Summer. A considerable number of people from the Albanian diaspora as well, joined the Albanian Kosovars, to give a boost to the local tourism industry during the difficult times of Summer 2020. Meanwhile, statistics state that the number of total entries from Kosova during the same period, January-August, was 52% lower than the same period a year before [7]. Thus, the Albanian government should take all necessary steps to make crossing the border with Kosova as easy as possible.

This study shows that the issue expressed in answer D4: Unreasonably high prices for mediocre offered services is rated with a value of 4 that is the highest in this group. Thus, reasonably well-established prices could help the tourism industry and the "patriotic tourism" flourish and substitute for loses for lack of international tourism. According to the Albanian Tourism Union (ATU), prices went up to 30% this year (2020) compared to the year before. The price increase will directly hit "patriotic tourism" as it will be very difficult for locals to afford this price hike [28]. As the Covid19 pandemic may last for some time, the issue of stimulating local tourism becomes fundamental for the revival of the Albanian tourism industry. Many important business voices are advocating, locally, and internationally for a more active role from the government [29]. ATU has asked for a well-detailed supporting plan from the government. The same voice asks not for credits from banks but help from the government in the form of sovereign credits. The government could play an active role in helping the tourism industry by organizing a national database that would manage the global supply and demand for touristic purposes. A centralized center will help hotels and restaurants save money as they would not pay the third parties for advertisement purposes. Another helpful role government could play is the organization of seminars with the participation of world-known specialists to teach small businesses how to advertise and reach international audiences via the use of modern technologies. Such initiative from the government will help especially, small businesses in the tourism industry that cannot afford this kind of seminars. Thus, the tourism industry should look for new inventive approaches to overcome the hardship caused by the Corona19 pandemic. These efforts need strong support from the government to re-establish normality in this sector. The tourism industry is a vital branch of the Albanian economy.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

Petraq Papajorgji has contributed to the designing of the experiment, data analysis and writing.

Orkida Ilollari has contributed to the designing of the experiment, data analysis and writing.

Adrian Civici has contributed to the designing of the experiment, data analysis and writing.

Howard Moskowitz has contributed to the designing of the experiment, data analysis and writing.