

## NAVIGATING CHALLENGES IN THE INSURANCE INDUSTRY: A COMPARATIVE MCDM ANALYSIS OF DEVELOPED AND DEVELOPING COUNTRIES

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**Abstract:** Insurance Policy adoption is the key to a better and safer living whether it comes to the individual or a business setup. Over the years this sector has been exposed to various challenges, especially when it comes to stability and gaining the trust of the people and organizations. The bigger struggle is the business hurdles this sector faces in a developing country and to do so, the current study was conducted to assess the attitude of Pakistani citizens toward insurance programs. Specifically, the study examines the reluctance of Pakistanis to purchase insurance policies as a means of protecting their savings. Due to the lesser available knowledge among the citizens, the reluctance towards the insurance policies is quite at a larger scale. To analyze this fact, MCDM techniques, i.e., TOPSIS and Decision Theory, have been implied to provide a means of assessing the efficiency of insurance companies and the reasons for their lagging in convincing the public to start changing their investment behavior. A comprehensive study of all Pakistani insurance companies has been conducted here. The data was obtained from the published financial statements of insurance companies, and the analysis of primary data was collected from two categories of people; employees and customers. The data enabled the current research to make a comparison between insurance in Pakistan and abroad to see how the two situations vary. According to the results, the companies abroad are more advanced in terms of means and facilities they provide in insurance, while in contrast, the lack of awareness and lesser trust in the companies leads to fewer insurance policies adoption in Pakistan.

**Keywords:** Insurance, policy, MCDM, developing country, TOPSIS, decision theory.

**MSC:** 20F10, 91A35.

### 1. INTRODUCTION

Insurance is a term used for the protection from financial loss. It can be said as a form of risk management whose primary goal is to safeguard against financial loss or any contingencies [1]. Before proceeding concerning the general terms, a person who provides another person with insurance is called an insurer, and similarly, the man or woman that is

furnished with it is referred to as insured or coverage holder [2]. The insurance transaction that is completed involves the insured assuming a fairly small loss in the shape of a charge to the insurer in alternative to the insurer's promise to remunerate the insured in the event of an included loss [3]. The loss can no longer be financial, but rather, it should be abated in economic terms. It usually entails something in which the insured has a coverable institution by using ownership, property possession, or a pre-existing relationship [4]. The logic behind the discussion mentioned above is that first of all, the insured receives a contract called the insurance plan policy, and this covers the essential points, the instances, and stipulations on which the insurer will remunerate the customer [5].

Similarly, the amount of money that the customer has to pay to acquire those services from the insurer is called the premium payable. Furthermore, in case a loss is incurred on the policyholder, which is covered by the insurance policy, then the policyholder will submit a claim to the insurer to process and investigate this loss. This duty is given to the claim's handler, whose task is to investigate the whole situation by interviewing the witnesses [6].

The insurance setup requires a lot of effort and security assurances along with attached benefits to build a long-lasting, trustworthy relationship with customers. In the same way, the quality of the insurance business is affected by several factors, including the human element, since this business is mainly dependent on human interaction, namely the management's role in presenting financial statements fairly to clients [7]. Additionally, companies are expected to maintain an integrated system of internal control and risk management to produce and disseminate quality information to a variety of stakeholders [8]. The importance of risk management in the global insurance market can be observed from the fact that insurance possesses a more substantial role in the recent global financial crises. In this case, the European Insurance and Occupational Pensions Authority (EIOPA) has contributed immensely to the debate, as mentioned earlier, and to ensure a positive contribution to the risks involved in the system and the macroprudential policies [9].

In comparison, the insurance market is still in the developing stages in Pakistan, especially when it comes to generating premium accounts or convincing people to invest in their life or business security [10]. However, it can be seen from the recent efforts between Pakistan and Malaysia that there is an inevitable rise in attractiveness for Takaful (Insurance) among the different communities living in both countries. Although the overall footprint of the Takaful business is smaller as compared to the global insurance businesses, it is expected to gain worldwide recognition [11].

Due to the involvement in pouring significant investments in both tangible materials (such as stocks, bonds, loans, mortgages, equipment, etc.) and intangible assets, the importance of insurance companies is growing in developing countries as their experience in the secure investment field is enhancing with each passing day. The more they experience, the more they will be showing the better paths to ordinary people to seek their help who are looking for alternative ways to gain profits over their savings instead of just hoarding the money in their closets [12]. In this scenario, the aforementioned discussion calls for a proper assessment in the case of developing countries such as Pakistan to ensure that the insurance businesses can gain the trust of the people and to ensure its effective implementation that can lead to the settlement of a much more stable market. The current study tries to fulfill that aim by proposing a model that allows insurance companies to evaluate and present their financial sensitivities in a more refined manner and to enable people to start developing trust in these companies and their systems. Similarly, this

research study attempts to provide an overview of Pakistan's insurance industry while analyzing its financial performance in recent years. For this purpose, the data has been collected from both the perspectives of employees and the customers currently involved in the service, along with the opinions of the general public. To do so, the study applies two techniques in a hybrid combination, i.e., Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) and Decision theory model, to gain the required results. The model helps to provide a comparative analysis to evaluate the awareness of the insurance businesses between people from advanced countries and people from developing countries like Pakistan. The use of the Multi-Criteria Decision Making (MCDM) technique, such as TOPSIS, can be justified by the fact that it compares a set of alternatives with distinct criteria, with the best alternative closer to the positive ideal solution and farthest from the negative ideal solution. The technique was introduced by Hwang and Yoon in 1981, and it holds significant importance in complex decision-making scenarios [13].

Furthermore, the application of the decision tree is to create a hierarchical model to assist with the decisions and their possible and expected outcomes in the form of consequences. It uses the science of the algorithm that comprises conditional statements to formulate a decision [14]. The use of the aforementioned methodologies in the current research involves the comparisons that have been made to bring out the reasons why Pakistanis still don't trust insurance companies, thus forming the aim of the current research.

### **1.1. Research Questions**

The current research aims to find answers to the following research questions:

1. What are the differences between the insurance policies in abroad (developing countries) and developing countries such as Pakistan that seem to be a preferred choice for the people?
2. What could be the solutions to cover these challenges faced by the insurance companies in developing nations that could enable the people to have more trust in them?

The further division of the research study is with a further contribution to understanding the research problem will be explained in the literature review. The process used to collect information and data to make criteria decisions will be applied in the research methodology. The significance of the findings and presentation of our key results would be interpreted in the section on results and discussions, later followed by the conclusion.

## **2. LITERATURE REVIEW**

Insurance policies are usually drafted for the betterment of the people, to provide security to the industries, and to help various organizations have protective coverage in case of any emergency, disaster, or accident [15]. Although on one end they prove to be very effective and efficient, it is also exposed to various challenges on individual and organizational levels, which makes it difficult for the consumers to adopt these policies thus resulting in the cancelation of the subscriptions or not even listening to the offers put forward by the insurance companies [16]. Some of the challenges that the insurance companies face as a whole include; digital transformation, where the companies are finding it hard to adapt to the rapid and ever-changing technological advancements. The next challenge that follows is to train their employees with new resources and digital skills to keep up with technological advancements. Furthermore, the risks involved in the policies

and premiums are another challenge for them to tackle [17]. Similarly, the challenge of tackling fraudulent activities that involve complex mechanisms is another problem in ensuring the reliability of the organization. Lastly, other challenges that it faces are claims management that is being launched following a natural disaster, shortage of talented workforce, and struggling hard to meet customer expectations to mention a few [18].

The challenges faced by the insurance companies are not only limited to developed countries but also in developing countries where the biggest hurdle is to convince the consumers to subscribe to their packages, have an awareness of how the insurance might benefit them, and above all, to have misconceptions when it comes to religious views about the insurance in general. Developing countries such as Pakistan are no exception where according to the report of SECP, until the end of 2000, the private insurance sector in Pakistan was fragmented by intense irregularities in the form of non-professionalism, unacceptable ethical standards, and inefficiencies in operational activities as compared to the other countries (SECP, 2023; Aziz, et al., 2023). Furthermore, a new law regarding insurance was added in 2000, i.e., Ordinance 2000, that replaced the Insurance Act 1938. The new regulation primarily aimed to ensure the protection of insurance companies and used advertisements for the development of insurance companies [19]. It must be kept in mind that in comparison to other countries like Luxembourg, the insurance business is at a boom with a contribution of 54.42% in GDP as compared to Pakistan's contribution of merely 1.9% [20]. It is to be noted that insurance's contribution to Pakistan's GDP is far less than the neighboring country India's insurance business contribution to its respective GDP [21].

Developing countries like Pakistan are one of the most significant international locations with a populace of approximately 241 million, out of which the majority of the population, i.e., 96.9% is Muslim [22]. About 61.18% of the populace has been living in rural areas, and 37.2% have been living below the poverty line [23]. Due to these factors, as well as a lower income, low literacy rate, and strict non-secular beliefs, the insurance industry in Pakistan has been unable to develop in the same manner as other nations in the subcontinent, such as India and Sri Lanka [24]. In a country such as Pakistan, a lack of supervision, inadequate monetary and regulatory frameworks, and a monopoly of state-owned insurance firms have also contributed to the decline of the insurance industry [25]. Furthermore, the importance of the insurance business in the eyes of buyers is mainly to make some profit in the future with the present saved money. The more investments a company is engaging in, the more it represents its efficiency. But the question in the end remains where and how to get these investments as convincing the customers is a difficult task to achieve, especially when it comes to developing countries or countries with a higher tendency towards religious beliefs [26]. In a similar scenario, a study proposed that the concept of linguistic variables plays a significant role in dealing with the convincing of the potential clients. These variables include the power to present the information with the proper evidence in a confident tone and, secondly, the careful choice of expressions to not reflect any ambiguity in front of the customers coming in over to ask for the information is the actual task to accomplish [27].

Furthermore, when it comes to a complex decision-making scenario, worthy promises are required to allow customers to start at least thinking of this mode of saving as a genuine platform to invest, thus making it one of the competitive strategies. It will allow the customers to build a better understanding of different available options and make considerable comparisons regarding risk or profit expectations attached to each investment

plan [28]. A study can justify the importance of making well-informed decisions carried out on renowned Taiwan companies where the results indicated that it is the significant lack of objective decision-making procedures and assessment criteria of administrators & investors that leads to trust issues among the customers to invest in the long-term projects [29]. Based on the discussion above, the importance of such a research study serves the purpose of evaluating the performance of insurance companies and seeing their service quality by measuring their service deliverance, problems, appraisals, and complaints throughout their tenure of serving even a single customer. To do so, the current research proposes the idea of utilizing the hybrid combination of the MCDM techniques, i.e., TOPSIS and Decision Theory. The significance of the techniques can be depicted in the form of various complex decision-making applications across various research studies. Complex decision-making scenarios such as the evaluation of the smart grid technology [30], overcoming the barriers related to biomass energy [31], evaluation of green low-carbon port [32], assessment of sustainable cities [33] and, the evaluation of the agricultural insurance packages [34] are some of the examples of recent TOPSIS applications. Furthermore, some of the most relevant research also includes the TOPSIS technique in a hybrid combination with other relevant complex decision-making techniques. The recent applications include but are not limited to; developing a new MCDM technique for a car selection scenario [35], the best manufacturing method for urea production [36], selection of a hybrid vehicle in the scenario of a developing country [37], regional development of tourism [38] and comparative analysis of different MCDM methodologies [39] to mention a few. Furthermore, another technique under consideration for the current study is the decision theory, which is utilized to make decisions in complex decision scenarios. It studies the mathematical properties and the logic of decision-making under uncertain scenarios. It involves various applications across the literature such as in the form of data-driven decision theory for the analysis of big data [40], renewable resources allocation in the case of distribution networks [41], hospital informatization assessment [42] and lastly, planning for the insurance market [43] are present in the recent research studies. Similarly, it also includes applications in hybrid decision scenarios such as decision-making under a quantum value operator approach [44]. Another application includes a hybrid combination of regret theory using the triangular fuzzy numbers along with the decision theory to provide three-way problem-solving thinking [45]. Similarly, the formation of complex evidence theory [46] and integrity services for the US Air Force [47] are some of the recent applications of the decision theory

### **2.1. Research Gap**

Based on these discussions, there's a significant research gap in the form of studies that are being carried out for decision-making where the scenario requires effective decision-making in complex scenarios, both in developing and developing countries. The current research introduces a novel combination of the MCDM technique i.e., TOPSIS and Decision Theory in the case of a developing country. Based on these combinations, the study tries to cover the research gap by trying to find solutions to the challenges faced by the insurance companies and to help the policymakers with effective planning, thus making this study a one-of-its-kind with its innovative contribution to the overall research.

### 3. RESEARCH METHODOLOGY

#### 3.1. Data Collection

The data that we collected was in the form of questionnaires collected via Google Docs and Dropbox Application. The link from the Dropbox application was further sent to selected representatives. Thus, the average of the collected data was used for the decision analysis model. A total of 30 responses were collected, including 25 local Pakistani citizens and five from abroad. The respondents' profiles and the number of their responses are depicted in Table 1.

**Table 1:** Respondents' profile

Respondent's Profile	No. of Respondents
Insurance Policy Managers	11
Insurance Consumers	9
Academic Professionals	10

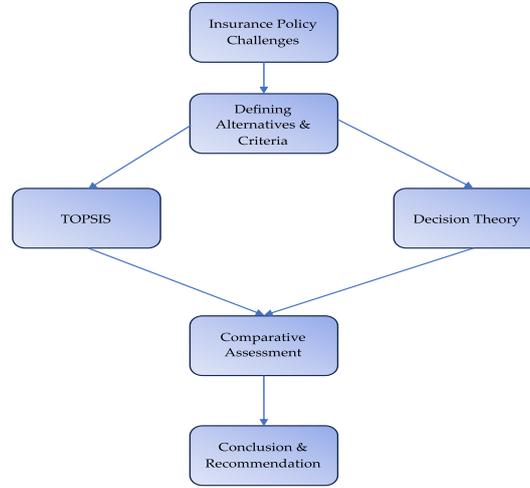
The following variable factors are considered for the decision-making purposes in the scenario of the current research:

- **Service/assurance**                      The service assurance factor contributes towards customer satisfaction across various insurance companies and based on this fact, it's being considered as one of the criteria factors for the research. The purpose is to determine its influence in terms of sorting the challenges faced by insurance companies.
- **Premium payable**                      The second factor under consideration is the premium payable that is being paid by the consumers especially those belonging to the business class for the coverage of their cars, businesses, homes life, etc. It's a very important criteria factor because it is being considered as an income for the insurance companies and they might face issues if the policy is canceled by the concerned party for various reasons.
- **End benefits**                              The third factor to be considered as a criterion is the end benefits of any insurance policy. It's beneficial when a customer is expecting to have long-lasting benefits in case the person gets an early retirement or gets any benefit even after he/she loses any jobs etc. It's an insurance security that can build long-lasting trust in the company.
- **Tenure**                                      Tenure is one of the most crucial factors when acquiring insurance. In technical terms, it is defined as policy tenure that specifies the time limit during which the insurance policy should operate and provide coverage to the consumers. A lower fee subscription and longer tenure are believed to be a key factor in luring in more customers along with easier terms and conditions.
- **Company stability**                      The company's stability is another factor that can drive a customer to acquire insurance. If the company's image is tarnished or is famous for any fraudulent activities, the customers might find it difficult to purchase any insurance policy. Similarly, the stable financial condition and the ability to compensate for any claims are the key factors that are deemed important by individual and business customers alike.

- **Company experience** The last factor under consideration is the company's experience in the insurance sector. The company can adjust the annual premium based on any previous loss experience and its immediate plan on how it can compensate you without hurting the trust of the clients. Any poor experience in handling the premiums might end up in the cancellation of the policy by the clients as well as a financial business loss for the company as a whole.

The methodological combination for the current research represents the conceptual framework, which is constructive through data and information collected for the study purposes. A significant component of formulating and successfully concluding social research is the use of different methodological techniques and means of analyzing observations [48]. In this modern era, many advanced techniques are available that are easy to apply and give sophisticated results. So, for the present research theory, the qualitative research technique is utilized in the form of a questionnaire from both personnel staff and customers to gain their insights and opinions on the insurance business. The survey questionnaire is comprised of two types. The first type of questionnaire was made for research purposes. It was distributed among the senior members/employees of some insurance companies situated in Pakistan and abroad to get the inside opinion of the companies' operations. The second type of questionnaire is made for the public, which forms the clientele of insurance companies situated in Pakistan and abroad, rating us about the criteria that the company is providing them and their expectations of what they are looking for in a perfect insurance company. This category also includes general ideas collected from the people who were a victim of any losses and were not insured. In the third stage, the data is also gathered from the previous research material similar to the current study, i.e., secondary data, to produce authentic outcomes. All of this will help us to do the comparison of insurance in both Pakistan and abroad, enabling us to conclude something better for the insurance companies and the public for the future development of Pakistan.

It should also be noted that standards are often subjective and qualitative, which has a positive impact on decision-makers when it comes to expressing their individual preferences in numerical values and evaluating the results of their evaluations. A hybrid approach was employed in this article, which combines a classic multi-criteria decision-making method that relies on numerical data with the ability to work with linguistic variables. A multi-criteria decision-making approach is used in this article to determine the priority weights of the decision-making criteria, thereby enabling the handling of uncertain and imprecise data. Furthermore, insurance plan companies are rated using the classical multi-criteria decision-making approach. The steps involved in the application of TOPSIS and Decision theory are mentioned in the following sections, followed by the model diagram, depicting the structure of the research in Figure 1.



**Figure 1:** Model flowchart for the research. (Source: Author's Creation)

### 3.2. TOPSIS Method (Technique for Order of Preference by Similarity to Ideal Situation)

TOPSIS is a technique dependent on multi-criteria choice investigation, i.e., choosing various decided options/criteria through weighted measures. The primary aim of TOPSIS begins from the idea of a dislodged perfect point from which the sensitive arrangement has the most limited separation from the positive perfect solution and the most distant from the negative perfect solution [49]. Similarly, an inclination arrangement for every option is positioned by their relative closeness. The positive ideal solution is an answer that amplifies the advantage criteria and limits the cost criteria, though the negative ideal solution boosts the cost criteria and limits the advantage criteria. TOPSIS comprises the fact that every standard needs to be either amplified or limited. Hence, the positive ideal solution for a paradigm is the "maximum value" of all the undertaking options considered, and the negative ideal solution is the "minimum value" of the model for all task choices. The steps of the TOPSIS technique are as follows:

**Step 1.** An evaluation matrix is being constructed that consists of  $m$  alternatives and  $n$  criteria. We, therefore, have a matrix  $(x_{ij})_{m \times n}$ .

**Step 2.** The matrix  $(x_{ij})_{m \times n}$  is normalized to form the matrix.

$R = (r_{ij})_{m \times n}$ , using the normalized method, as depicted in equation 1.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{k=1}^m x_{kj}^2}}, \quad i = 1, 2, 3, \dots, m, \quad j = 1, 2, 3, \dots, n \quad (1)$$

**Step 3.** The weighted normalized decision matrix is calculated by the equation 2.

$$t_{ij} = r_{ij} \cdot w_j, i = 1,2,3, \dots, m, j = 1,2,3, \dots, n \quad (2)$$

Where  $w_j = \frac{W_j}{\sum_{k=1}^n W_k}$ ,  $j = 1, 2, 3, \dots, n$  so that  $\sum_{i=1}^n w_i = 1$  and  $W_j$  is the original weight given to the indicator  $v_j$ ,  $j = 1, 2, 3, \dots, n$ .

**Step 4.** The worst ( $A_w$ ) and the best ( $A_b$ ) alternatives are determined via equations 3 and 4, respectively.

$$A_w = \{(\max(t_{ij}|i = 1,2,3, \dots, m)|j \in J_-), (\min(t_{ij}|i = 1,2,3, \dots, m)|j \in J_+)\} \equiv \{t_{wj}|j = 1,2,3, \dots, n\} \quad (3)$$

$$A_b = \{(\min(t_{ij}|i = 1,2,3, \dots, m)|j \in J_-), (\max(t_{ij}|i = 1,2,3, \dots, m)|j \in J_+)\} \equiv \{t_{bj}|j = 1,2,3, \dots, n\} \quad (4)$$

where,

$J_+ = \{j = 1,2,3, \dots, n|j\}$  associated with the criteria having a positive impact

$J_- = \{j = 1,2,3, \dots, n|j\}$  associated with the criteria having a negative impact

**Step 5.** The separation between the target alternative  $i$  and the worst condition  $A_w$  is given by equation 5.

$$d_{iw} = \sqrt{\sum_{j=1}^n (t_{ij} - t_{wj})^2}, i = 1,2,3, \dots, m \quad (5)$$

Similarly, the separation between the target alternative  $i$  and the best condition  $A_b$  is depicted by equation 6.

$$d_{ib} = \sqrt{\sum_{j=1}^n (t_{ij} - t_{bj})^2}, i = 1,2,3, \dots, m \quad (6)$$

Where,  $d_{iw}$  and  $d_{ib}$  are the separations between target alternative  $i$  to the worst and the best conditions, respectively.

**Step 6.** Similarity to the worst condition is calculated in equation 7.

$$s_{iw} = \frac{d_{ib}}{(d_{iw} + d_{ib})}, 0 \leq s_{iw} \leq 1, i = 1,2,3, \dots, m \quad (7)$$

$s_{iw} = 1$  if and only if the alternative has the best condition; and

$s_{iw} = 0$  if and only if the alternative has the worst condition.

**Step 7.** The last step involves ranking the alternatives accordingly by using the equation 8.

$$s_{iw}(i = 1,2,3, \dots, m) \quad (8)$$

### 3.3. Decision Theory

Decision theory is a term used for reasoning underlying an insurer's choice. It can be divided into two types: normative decision theory, which recommends how to make first-rate decisions, given a set of uncertain beliefs and a set of values, and descriptive selection theory, which analyzes how existing or perhaps irrational dealers truly make decisions

[50]. In the decision theory, we are going to employ Bayes' theorem and tree hypothesis for our study, with the steps involved discussed below.

Bayes theorem determines the probability of an event is determined by prior knowledge of conditions that could be associated with the event. As an example, if cancer is associated with age, then Bayes's theorem can also be used to more precisely assess the probability that a person will develop cancer, as opposed to the assessment of the probability of cancer made without knowing the individual's age. It can be expressed in equation 9, followed by the hierarchical structure depicted in the form of the decision tree in Figure 2.

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)} \quad (9)$$

## 4. RESULTS AND DISCUSSION

### 4.1. Calculation of the TOPSIS Method

The current section involves the evaluation using equations 1 to 8, i.e., the steps involved in the TOPSIS technique. Averages of the reviews are summarized in Tables A1 and A2 in the appendix section. The second questionnaire was given to employees of the insurance companies to determine the expected attribute weights of criteria that suited the insured. The statistics are shown in Table A3 in the appendix. The steps involved in the analysis are as follows:

**Step1.** The formation of the evaluation matrix is shown in Table 2., given below.

**Table 2:** Evaluation matrix

Criteria	Pakistan	Foreign
Service/assurance	3	5
Premium payable	1	4
End benefits	3	5
Tenure	3	3
Company stability	4	5
Company experience	4	4

**Step 2.** Standardization and then normalization of the evaluation matrix are depicted in Table 3.

**Table 3:** Standardized decision matrix

Criteria	Pakistan	Foreign
Service/assurance	0.5145	0.8575
Premium payable	0.2425	0.9701
End benefits	0.5145	0.8575
Tenure	0.7071	0.7809
Company stability	0.6247	0.7809
Company experience	0.7071	0.7071

**Step 3.** The weighted normalized decision matrix is calculated by multiplying normalized values with expected attribute weights. The results are depicted in Table 4. below

**Table 4:** Weighted normalized decision matrix

Criteria	Pakistan	Foreign
Service/assurance	2.57	.28
Premium payable	0.72	2.91
End benefits	2.57	4.28
Tenure	3.53	3.53
Company stability	2.49	3.12
Company experience	2.82	2.82

**Step 4.** Determination of ideal and negative ideal solution, with the outcome depicted in Table 5.

**Table 5:** Ideal and negative ideal solutions

Criteria	Pakistan	Foreign	Max Value (ideal solution)*	Min Value (negative ideal solution)
Service/assurance	2.57	4.28*	4.28	2.57
Premium payable	0.72*	2.91	0.72	2.91
End benefits	2.57	4.28*	4.28	2.57
Tenure	3.53	3.53*	3.53	3.53
Company stability	2.49	3.12*	3.12	2.49
Company experience	2.82	2.82*	2.82	2.82

**Step 5.** The fifth step involves separating the positive and negative ideal solutions. Separation from ideal solution ( $S_i^*$ ) Separation from negative ideal solution ( $S_i'$ )

$$S_i^* = \{2.49, 2.18\}$$

$$S_i' = \{2.18, 2.49\}$$

The results are shown in Table A4. and Table A5. in the appendix section respectively. The results are then utilized to evaluate the relative closeness in the next step.

**Step 6.** Determining the relative closeness to the ideal solution, followed by ranking of the factors as shown in Table 6.

**Table 6:** Relative Closeness

Criteria	Pakistan	Foreign
$S_i^*$	2.49	2.18
$S_i'$	2.18	2.49
$S_i^* + S_i'$	4.67	4.67
$S_i' / (S_i' + S_i^*)$	0.466	0.533 (max is best)

It can be seen that foreign setup for the insurance companies is better than Pakistan due to their better privileges to customers in the criteria range. The results obtained after the TOPSIS assessment, based on the data obtained from the experts depict that the challenges faced by the companies in the developing countries are still holding them back in gaining the interest of the larger clientele. It can be seen that the experts preferred the insurance policies that are in the more developed countries in comparison to those available in developing countries such as Pakistan. Table 6. Shows that the relative closeness for the foreign companies holds a much better score in comparison to those in a developing country. The possible reason that depicts this outcome is the lower awareness among the

people along with the lower literacy rate, which makes the people unaware of the importance of getting insurance. Similarly, the companies that are operating within those countries lack proper training and stability and their inability to reach out to the customers are some of the major drawbacks. In comparison, the companies that are operating in developed countries are run by well-trained staff, they have strong support from the government and the entire documentation is tracked, which makes it difficult for the companies to indulge in any fraudulent activities similarly, the customers are also liable for any fake claims that they might have against the company's policies. Based on these facts, show the reason that people would still prefer that the insurance facilities in developed countries are much better than developing countries such as Pakistan.

#### **4.2. Calculation of Decision Tree**

The following part involves the steps involved in Figure 2. The decisions and their expected outcomes are based on the probabilities and calculated in the case of Pakistan and abroad. It can be seen from the assessment that people living abroad with insurance are more satisfied as compared with the people living in Pakistan with insurance, clearly connecting to the misunderstanding, risks involved, and lesser amount of trust of the people in the insurance companies based locally in Pakistan.

##### **4.2.1. Pakistan**

Having insurance and being satisfied:

$$0.32 * 3/5 = 0.192$$

Having insurance and being unsatisfied:

$$0.32 * 2/5 = 0.128$$

##### **4.2.2. Abroad**

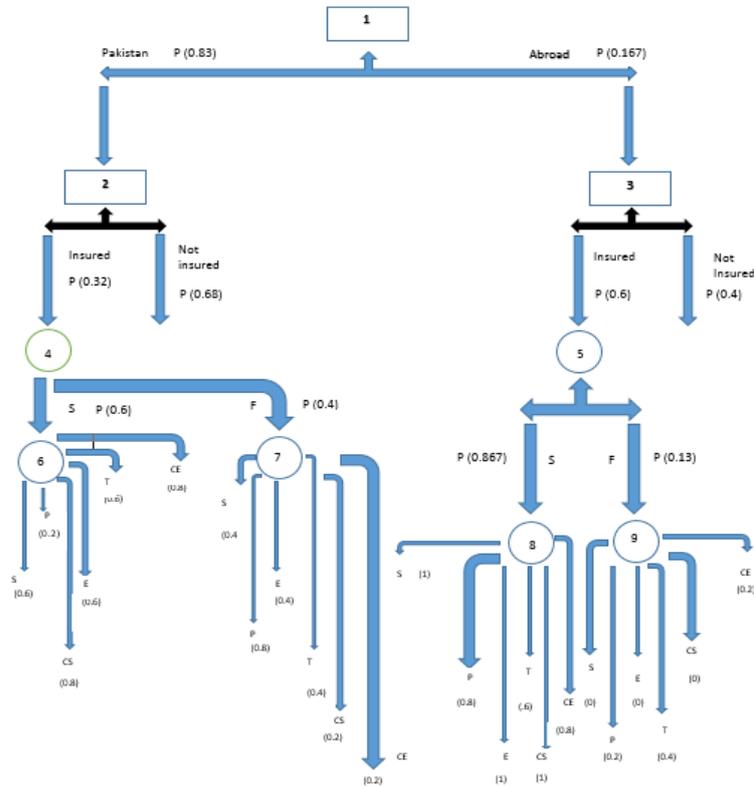
Having insurance and being satisfied:

$$0.6 * 13/15 = 0.52$$

Having insurance and being unsatisfied:

$$0.4 * 2/15 = 0.053$$

The aforementioned results are in the section 4.2.1. and 4.2.2. are derived from the figure 2. That depicts the outcome of the decision theory. The results are based on the expected outcomes from the probabilities of the different scenarios and depict that the people would prefer facilities that are abroad or in developed countries and it would ensure that they will be satisfied with a much higher probability if they have insurance there. Similarly, in comparison, it can be seen that the people who have an option of acquiring insurance and being satisfied, have a very low probability.



**Figure 2:** Tree Diagram. (Source: Author’s Creation)

The purpose of the current research was to analyze the insurance policies in both developing and developed countries. The aim was to obtain insight regarding the preference of the consumers in terms of having the choice of acquiring a local (developing country) based company's insurance or from a company that is established and provides services abroad. The aim was to assess this via two different methods to ensure whether the results obtained depict any difference or not. The current research compares the results obtained from both the techniques i.e., TOPSIS and the decision theory, and evaluates that the best preferred choice is the insurance policies and facilities provided by the companies that are established abroad. Since the results obtained from both techniques second each other, it validates the results obtained for the research and calls for the policymakers based in developing countries to ensure that the insurance companies can reach out to their customers easily and that the people are made aware of the importance of such policies. It will ensure that the challenges being faced by the companies in developing countries are being addressed and new opportunities are being created.

### 4.3. Sensitivity Analysis

The results obtained based on the data collected from the various experts are being evaluated in the previous sections. The current research goes one step ahead to ensure that the results are valid and to do so, the study incorporated sensitivity analysis. The purpose of the sensitivity analysis is to check how many variations in the results or a model can be observed if the input weights are being changed. To do so, the input weights for the criteria were changed for the TOPSIS technique and the final results display slight variations but the main outcome stays the same i.e., the top preferred insurance policies are those that are based on the foreign-developed countries. The outcome of the analysis can be seen in Table 7.

**Table 7:** Sensitivity Analysis

Criteria	Pakistan	Foreign
$S_i^*$	2.45	2.08
$S_i'$	2.08	2.45
$S_i^*+S_i'$	4.53	4.53
$S_i'/(S_i'+S_i^*)$	0.45916115	0.540838852

From Table 7., it can be seen that the final relative closeness values obtained show that even the criteria weights are slightly modified, there is no big difference in the final results and thus shows that even if the responses were modified in the actual sense, still the people would prefer that the companies abroad are providing much better incentives as compared to the local companies i.e., based in developing countries like Pakistan.

The aforementioned results call for a better role from both the customers and the companies to ensure that the challenges are met effectively and that the preferences of the people could be changed in acquiring local insurance. Based on the research conducted, it has been concluded that the higher the educational status in Pakistan is, the more likely the people are to be aware of the importance of insurance plans in today's world. In Pakistan, the literacy rate is on the lower side, and it is difficult for them to understand the financial terms and their growing importance in this advanced world. People in Pakistan at the majority level belong to the middle and lower-class groups, with their incomes only sufficient to fulfill the needs of their own and extended families. As there are not many savings, less interest is shown by the public towards investments as they always fear they might require cash more than the one being invested because insurance for them is a regular expense than any profit [51]. People in Pakistan have an aptitude for short-term profits. As most of the insurance business pledges to long-term profits, such programs are easily rejected before they are even taken into slight consideration. People have rigid religious beliefs regarding insurance businesses, which restrict them mainly from investing, so they hesitate to buy any such policies no matter how attractive outcomes they guarantee. Decision analysis results on the customers' end clearly show that foreigners prefer insurance more than Pakistani citizens. Furthermore, the Insurance companies have a complicated set of rules and policies that make it more difficult for the common public to understand them with ease, rendering them to avoid such plans. Similarly, lack of training among the employees keeps them deficient in their communication skills [52]. Even if they remain successful in delivering all the information to the public, they lack the convincing part, which adds to the anxiety of the insurance business holders. Too much reliance on

the companies' qualified workforce hinders the companies in reaching the actual profits. They might remain successful in reaching the mass population but remain unable to convince the ultimate target, which is the upper-middle-class group of people. Since they do not have a systematic process for delivering messages to the communities using seminars, workshops, or other modern state-of-the-art tools, they are unable to attract communities to start taking an interest in insurance policies. Companies situated in Pakistan lack a level of trust, as shown by TOPSIS and the Decision tree model, and this needs to be overcome by the employees of insurance companies. They should advertise and make people aware of the fact that insurance is not a category of interest but rather of building ultimate trust.

#### **4.4. Practical Implications and Future Recommendations**

The study incorporates a novel hybrid combination of the techniques i.e., TOPSIS and Decision Theory to assess the challenges faced by the insurance companies and to analyze the preference of the overall experts in terms of acquiring insurance from a local or a company based in a foreign country. This study lays down the foundation of a first-ever study conducted in such a scenario along with the comparative results obtained from both methods. The study will be helpful for the local insurance companies and the policymakers to focus on their shortcomings and to ensure that they can provide relatively better services to gain the trust of the people. The implication also includes the guidelines for the policymakers that increasing the awareness among the people and literacy of such topics could ensure positive results shortly.

The study can be further extended towards the financial formulations for the insurance companies in a developing country's context and similarly, many other decision-making techniques could be applied to evaluate the different aspects of the insurance sector. It will ensure that the sector can function properly and with much better outcomes for the people and the economy as a whole.

### **5. CONCLUSION**

Insurance companies play a great role in the betterment of the country in terms of providing services to the people and businesses and also contributing towards the economy in general. A better insurance policy can be helpful in terms of any workplace accidents, car damages, and lifesaving situations and it's better to have it to ensure financial security. Although the insurance companies play a great role, it also comes with a bigger challenge in terms of self-stability and gaining the customer's trust. Profiting from the consumers isn't very easy in various scenarios and many companies struggle to get established especially when it comes to developing countries. It can be safely stated that companies find it more challenging to work in developing countries with meager resources and the consumers are less aware of the positive side of the insurance policy. Similarly, a bigger challenge also comes in the scenario where the people are less educated, have lesser access to reliable resources, are bounded strongly by religious beliefs and especially, when an insurance company isn't able to advertise itself properly. For this purpose, the current study was carried out to see the satisfaction level of the people if they had a choice between selecting an insurance company working in a developing country or a foreign well-developed country. Our primary target is to increase the awareness of people regarding these insurance companies to make their decision with having some background

knowledge or idea about what they are getting into is right. This study utilizes two hybrid models i.e., TOPSIS and Decision Theory, that are being used for the evaluation. The results indicate that the People of Pakistan are not adequately aware of the benefits that insurance holds, especially provided by those companies that are based in Pakistan. The current study focuses on the comparison of Pakistan with foreign citizens, and the results indicate that the people of Pakistan are not satisfied with these insurance companies due to trust issues, and they think they might not be able to get an expected return when they apply for the claim. Also, due to a lack of awareness of insurance in general, people do not want to and try to indulge themselves in this type of situation. The other factors that might be affecting their judgment are the misconceptions among the people (Muslims) regarding interest and profit. The easy availability of such information for the understanding of the citizens, along with proper training of the staff, can be a key to evolving the insurance industry within the country. This research will provide significant insights into the challenges that the companies are facing, and the solution to the problem can be extracted. The study provides conclusive evidence about the choice of insurance companies based in developing and developed countries by the people in general. Still, the study is also exposed to limitations such as the unavailability of financial data because of the rules and regulations of the companies and the time limitations involved in the collection of the data.

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## REFERENCES

- [1] D. A. Osei, B. Krasniq, B. Hooley, F. Tediosi and G. Fink, "Equity in health insurance schemes enrollment in low and middle-income countries: A systematic review and meta-analysis," *International Journal for Equity in Health*, vol. 21, no. 1, pp. 1-12, 2022.
- [2] Jinaratana and Y. Permatasari, "Legal Protection of Policyholders for Claim Issues Insurance coverage based on positive Indonesian law," *Asian Journal of Social and Humanities*, vol. 1, no. 7, pp. 389-396, 2023.
- [3] G. Dionne and D. Desjardins, "A re-examination of the US insurance market's capacity to pay catastrophe losses," *Risk Management and Insurance Review*, vol. 25, no. 4, pp. 515-549, 2022.
- [4] R. Rebonato, D. Kainth and L. Melin, "Climate Output at Risk," *The Journal of Portfolio Management*, vol. 48, no. 10, pp. 46-59, 2022.
- [5] E. Chondrogiannis, V. Andronikou, E. Karanastasis, A. Litke and T. Varvarigou, "Using blockchain and semantic web technologies for the implementation of smart contracts between individuals and health insurance organizations," *Blockchain: Research and Applications*, vol. 3, no. 2, pp. 1-14, 2022.
- [6] L. Herlina and L. Benny, "Information System Design of Allianz Insurance," *Jurnal Mandiri IT*, vol. 11, no. 2, pp. 62-72, 2022.
- [7] Lie, "The social capital in business organizations: A case study of PT Asia Motor vehicle insurance claim polysindo crime in Jakarta," *International Journal for Educational and Vocational Studies*, vol. 4, no. 1, pp. 58-63, 2022.
- [8] S. N. Odunko, "Internal Control and Firm Performance: Evidence from Selected Firms in Nigeria (2015-2020)," *International Journal of Innovative Finance and Economics Research*, vol. 10, no. 1, pp. 68-80, 2022.

- [9] G. P. Clemente and A. Cornaro, "A multilayer approach for systemic risk in the insurance sector," *Chaos, Solitons & Fractals*, vol. 162, no. 1, pp. 1-11, 2022.
- [10] T. Fischer, M. Frolich and A. Landmann, "Adverse Selection in Low-Income Health Insurance Markets: Evidence from an RCT in Pakistan," *American Economic Journal: Applied Economics*, vol. 15, no. 3, pp. 313-340, 2023.
- [11] M. Safdar, "Determinants of Takaful Business in Pakistan and Malaysia: An Empirical Analysis," *Bulletin of Business and Economics (BBE)*, vol. 12, no. 1, pp. 36-55, 2023.
- [12] S. Rahimiaghdam, R. Babazadeh and M. Shamsi, "Analysis of the relationship between competency-based factors of competitive advantages: a case of the insurance industry," *International Journal of Technology, Policy and Management*, vol. 22, no. 4, pp. 306-324, 2022.
- [13] C.-L. Hwang and K. Yoon, *Methods for Multiple Attribute Decision Making*, Berlin, Heidelberg: Springer, 1981.
- [14] J. L. Hodges and E. L. Lehmann, "The use of Previous Experience in Reaching Statistical Decisions," *The Annals of Mathematical Statistics*, vol. 23, no. 3, pp. 396-407, 1952.
- [15] J. Rana, *Catastrophe insurance*, Delhi: Blue Rose Publishers, 2023.
- [16] O. D. Kibu, E. Kegang, R. Sinsai, A. Conner, C. Asahngwa, W. Ngwa and N. V. Ngo, "Barriers and Motivations for Health Insurance Subscription Among Health-Care Users in Cameroon," *Journal of Surgical Research*, vol. 293, no. 1, pp. 158-167, 2024.
- [17] D. G. Akkor and S. Ozyukse, "The effects of new technologies on the insurance sector: a proposition for underwriting qualifications for the future," *Eurasian Journal of Business and Management*, vol. 8, no. 1, pp. 36-50, 2020.
- [18] Y. B. Ahn and H. C. Park, "Sustainability Management through Corporate Social Responsibility Activities in the Life Insurance Industry: Lessons from the Success Story of Kyobo Life Insurance in Korea," *Sustainability*, vol. 15, no. 15, pp. 1-16, 2023.
- [19] B. Khan, Z. Zainuddin and D. Md-Jadi, "Overview of Insurance Sector in Pakistan during the economy instability and Global Financial Crisis," *International Journal of Business Management and Commerce*, vol. 3, no. 2, pp. 7-13, 2018.
- [20] PACRA, "General Insurance Sector Study," PACRA, Lahore, 2022.
- [21] E. K. Chowdhury and R. Chowdhury, "Role of financial inclusion in human development: Evidence from Bangladesh, India and Pakistan," *Journal of the Knowledge Economy*, vol. 1, no. 1, pp. 1-26, 2023.
- [22] Worldometer, "Worldometer," 2023. [Online]. Available: <https://www.worldometers.info/world-population/pakistan-population/#:~:text=The%20current%20population%20of%20Pakistan,of%20the%20total%20world%20population..> [Accessed 12 October 2023].
- [23] World Bank, "Poverty & Equity Brief SouthAsia Pakistan," World Bank, Washington D.C., 2023.
- [24] N. Noor, I. Batool and H. U. Rehman, "An empirical assessment of mediating role of financial self efficacy on financial literacy and financial inclusion in Pakistan," *Annals of Social Sciences and Perspective*, vol. 3, no. 1, pp. 77-103, 2022.
- [25] M. Dawood, S. U. Rehman, U. Majeed and S. Idrees, "Contribution the Effect of Corporate Governance on Firm Performance in Pakistan," *Review of Education, Administration & Law*, vol. 6, no. 1, pp. 51-62, 2023.

- [26] H. N. Sameer and A. A. Al-Jumaili, "The Expected Impact of the New Iraqi Health Insurance Program and the Challenges Facing its Implementation: Physicians' Perspective: Impact of the Iraqi Health Insurance Program," *Journal of the Faculty of Medicine Baghdad*, vol. 65, no. 1, pp. 34-44, 2023.
- [27] R. Priyadarshini and D. M., "To study the persuasive factors of customers to choose health insurance policies in private insurance companies during COVID 19," *International Journal of Early Childhood*, vol. 14, no. 3, pp. 7653-7657, 2022.
- [28] C. Eckert, C. Neunsinger and K. Osterrieder, "Managing customer satisfaction: digital applications for insurance companies," *The Geneva Papers on Risk and Insurance-Issues and Practice*, vol. 47, no. 3, pp. 569-602, 2022.
- [29] D. M. Nguyen and Y.-T. H. Chiu, "Corporate social responsibility authenticity as an antecedent to customer citizenship behavior: evidence from hospitality industry in Taiwan," *Journal of Hospitality Marketing & Management*, vol. 32, no. 4, pp. 477-504, 2023.
- [30] D. Abdul and J. Wenqi, "Evaluating appropriate communication technology for smart grid by using a comprehensive decision-making approach fuzzy TOPSIS," *Soft Computing*, vol. 26, no. 17, pp. 8521-8536, 2022.
- [31] M. Irfan, R. M. Elavarasan, M. Ahmad, M. Mohsin, V. Dagar and Y. Hao, "Prioritizing and overcoming biomass energy barriers: Application of AHP and G-TOPSIS approaches," *Technological Forecasting and Social Change*, vol. 177, no. 1, pp. 1-17, 2022.
- [32] S. Yang, Y. Pan and S. Zeng, "Decision making framework based Fermatean fuzzy integrated weighted distance and TOPSIS for green low-carbon port evaluation," *Engineering Applications of Artificial Intelligence*, vol. 114, no. 1, pp. 1-8, 2022.
- [33] J. Wątróbski, A. Bączkiewicz, E. Ziemia and W. Sałabun, "Sustainable cities and communities assessment using the DARIA-TOPSIS method," *Sustainable Cities and Society*, vol. 83, no. 1, pp. 1-24, 2022.
- [34] T.-C. Chu and T. H. P. Le, "Evaluating and selecting agricultural insurance packages through an AHP-based fuzzy TOPSIS Method," *Soft Computing*, vol. 26, no. 15, pp. 7339-7354, 2022.
- [35] Y. Ali, B. Mehmood, M. Huzaifa, U. Yasir and A. U. Khan, "Development of a new hybrid multi criteria decision-making method for a car selection scenario," *Facta Universitatis, Series: Mechanical Engineering*, vol. 18, no. 3, pp. 357-373, 2020.
- [36] Y. Ali, M. Haroon, M. Abdullah and A. U. Khan, "The best manufacturing procedure for the commercial production of urea, using AHP based TOPSIS," *International Journal of the Analytic Hierarchy Process*, vol. 11, no. 3, pp. 313-33-, 2019.
- [37] F. Khan, Y. Ali and A. U. Khan, "Sustainable hybrid electric vehicle selection in the context of a developing country," *Air Quality, Atmosphere & Health*, vol. 13, no. 1, pp. 489-499, 2020.
- [38] H. B. Hameed, Y. Ali and A. U. Khan, "Regional development through tourism in Balochistan under the China-Pakistan economic corridor," *Journal of China Tourism Research*, vol. 18, no. 1, pp. 1-19, 2022.
- [39] U. Khan and Y. Ali, "Analytical hierarchy process (AHP) and analytic network process methods and their applications: a twenty year review from 2000-2019," *International Journal of the Analytic Hierarchy Process*, vol. 12, no. 3, pp. 369-459, 2020.

- [40] N. Elgendy, A. Elragal and T. Päiväranta, "DECAS: a modern data-driven decision theory for big data and analytics," *Journal of Decision Systems*, vol. 31, no. 4, pp. 337-373, 2022.
- [41] R. Fathi, B. Tousi and S. Galvani, "Optimal Allocation of Renewable Resources in Distribution Networks Considering Uncertainty Based on Info-Gap Decision Theory Using Improved Salp Swarn Algorithm," *Journal of Modeling in Engineering*, vol. 20, no. 68, pp. 207-223, 2022.
- [42] F. Wu, X. Liu, Y. Wang, X. Li and M. Zhou, "Research on Evaluation Model of Hospital Informatization Level Based on Decision Tree Algorithm," *Security and Communication Networks*, vol. 1, no. 1, pp. 1-9, 2022.
- [43] J. Long, "Analysis of Insurance Marketing Planning Based on BD-Guided Decision Tree Classification Algorithm," *Security and Communication Networks*, vol. 1, no. 1, pp. 1-9, 2022.
- [44] L. Xin and H. Xin, "Decision-making under uncertainty—a quantum value operator approach," *International Journal of Theoretical Physics*, vol. 62, no. 3, p. 48, 2023.
- [45] J. Zhan, J. Deng, Z. Xu and L. Martinez, "A three-way decision methodology with regret theory via triangular fuzzy numbers in incomplete multi-scale decision information systems," *IEEE Transactions on Fuzzy Systems*, vol. 31, no. 8, pp. 2773-2787, 2023.
- [46] S. Zhang and F. Xiao, "A TFN-based uncertainty modeling method in complex evidence theory for decision making," *Information Sciences*, vol. 619, no. 1, pp. 193-207, 2023.
- [47] M. Ceberio, O. Kosheleva and V. Kreinovich, "Integrity First, Service Before Self, and Excellence: Core Values of US Air Force Naturally Follow from Decision Theory," University of Texas, Texas City, 2023.
- [48] F. Kohlbacher, "The Use of Qualitative Content Analysis in Case Study Research-Vol 7, No 1," 2006.
- [49] Beg and T. Rashid, "Multi-criteria trapezoidal valued intuitionistic fuzzy decision making with Choquet integral based TOPSIS, OPSEARCH, 51(1)," pp. 98-129, 2014.
- [50] Huang and J. Keisler, "Multi-criteria decision analysis in environmental science: ten years of applications and trends". *Science of the Total Environment*, p. 3578–3594. doi:10.1016/j.scitotenv, 2011.
- [51] R. Ahuja, "Why People Aren't Buying Life Insurance.," pp. <http://clubthrifty.com/why-people-arent-buying-life-insurance>, 2012.
- [52] SHRM, "Managing Organizational Communication," 25 July 2018.
- [53] W. R. Paczkowski, *Business Analytics: Data Science for Business Problems*, Springer Nature, 2022.
- [54] "IEEE Reference Guide," *IEEE Periodicals*, 2018. [Online]. Available: <https://www.ieee.org/documents/ieeecitationref.pdf>. [Accessed 16 May 2022].
- [55] Jensen and N. Wirth, *PASCAL user manual and report*, New York: Springer, 1991.
- [56] Mrkela and Z. Stanimirović, "VNS-based solution approaches to the maximal covering location problem with customer preference ordering," in *Proceedings of the XIII Balkan conference on operational research, BALCOR 2018, Belgrade*, 2018.
- [57] P. Hansen, N. Mladenović, J. Brimberg and J. A. M. Pérez, "Variable neighborhood search," in *Handbook of metaheuristics*, Springer, Cham., 2019, pp. 57-97.

- [58] D. Zhang, D. Li, H. Sun and L. Hou, "A vehicle routing problem with distribution uncertainty in deadlines," *European Journal of Operational Research*, vol. 292, no. 1, pp. 311-326, 2021.
- [59] V. E. J, "risk management," 1997. [Online]. Available: <https://en.wikipedia.org/wiki/Insurance>.
- [60] SECP, "Insurance Sector," 2023. [Online]. Available: <https://www.secp.gov.pk/data-and-statistics/insurance-companies/>. [Accessed 10 January 2024].
- [61] Aziz, A. Parveen and A. Ali, "Analysis of Islamic Capital Market-Products and Challenges: A Case Study of Pakistan," *Al-Idah*, vol. 41, no. 1, pp. 1-16, 2023.

## APPENDIX

**Table A1:** Average Criteria Weight of Pakistani Residents.

Criteria	Criteria Weight
Service/assurance	3
Premium payable	1
End benefits	3
Tenure	3
Company stability	4
Company experience	4

**Table A2:** Average Criteria Weight of Foreign Residents.

Criteria	Criteria Weight
Service/assurance	5
Premium payable	4
End benefits	5
Tenure	3
Company stability	5
Company experience	4

**Table A3:** Expected attribute weight.

Criteria	Expected attribute weight
Service/assurance	5
Premium payable	3
End benefits	5
Tenure	5
Company stability	4
Company experience	4

**Table A4:** Separation from Si\*

Criteria	Pakistan	Foreign
Service/assurance	2.92	0
Premium payable	0	4.79
End benefits	2.92	0
Tenure	0	0
Company stability	0.39	0
Company experience	0	0

**Table A5:** Separation from Si'

Criteria	Pakistan	Foreign
Service/assurance	0	2.92
Premium payable	4.79	0
End benefits	0	2.92
Tenure	0	0
Company stability	0	0.39
Company experience	0	0