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# THE DETERMINATION OF THE IDEAL COUNTRY THAT COULD BE PREFERRED IN UNIVERSITY SELECTION WITH COPRAS AND ARAS METHODS

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## ABSTRACT

Many criteria change the order of the preferences of students in their university selections that will significantly affect their future success. The rankings shared with public and conducted by official institutions could be taken into consideration while determining the superiorities of the universities over one another. However; not only the ranking of the universities, but also the socio-economic status of the country of the university may affect the preference of the students. In this study; the countries that include the universities ranking in the first 50 in Times Higher Education World University Ranking report have been compared with the help of different criteria and ranked using COPRAS and ARAS methods which are from the multi-criteria decision making methods. The results attained as a result of the two methods have been compared and the country most ideal to study in a university has been tried to be determined.
***Keywords:*** University Ranks, COPRAS, ARAS, Multi-Criteria Decision Making

## 1.INTRODUCTION

There are many factors affecting the students and determining their selections in their university preferences. These factors could both be related to the status of the universities and could be the economic and social factors. Also; the university rankings calculated by different institutions every year and shared with public both confronts us as a factor in the preference of universities and assist in the revelation of the superiorities of the universities over one another. In this study, Times Higher Education World University Ranking (THEWUR) values have been used. THEWUR published every year as of 2004 and calculated according to various criteria is one of the rankings having high prestige in public (Rankings, 2020).

There could be many criteria in the university preferences of people and the country of the university could also be among the reasons for the preference. The decision making process will be more complex when there are a number of criteria. Decision making has been a very important process from the past to the present and the increase in the number of the faced alternatives and criteria causes to the process to be in a complex situation. The computer technologies and software supports developing today provide opportunities for easier and faster conduction of the process. Besides; there are many different decision making techniques and it is recently seen that different multi-criteria

decision making (MCDM) methods have been developed and used due to both easiness in calculation and understandability in interpretation.

There are many studies in which universities have been compared to one another and multi-criteria decision making methods have been used. Kabak et.al. (2017) have examined and ranked 15 alternative websites making publications in distant education process by taking many criteria as the basis and using various MCDM methods (Kabak, et al., 2017). In the study conducted by Jati (2012), 20 universities accepted as prestigious in the world have been ranked according to the criteria taking place in Webometrics orders by using TOPSIS and VIKOR methods (Jati, 2012). Wu et.al. (2012) have ranked 12 private universities in Taiwan using various criteria according to the performance developments with hybrid MCDM methods (Wu, et al., 2012). In their study, Erdoğan and Kaya (2014) have ranked 29 private universities in Istanbul by using various criteria with Type 2 Fuzzy-based method (Erdoğan & Kaya, 2014). In their study, Salimi and Rezaei (2016) have conducted examinations for PhD. projects providing opportunity for a kind of cooperation between the universities and industry, have examined the projects of 51 alumni and determined the efficiencies of their projects by using Best Worst Method (Salimi & Rezaei, 2016).

In this study; as different from the studies conducted in the literature, instead of the ranking of the universities, it has been aimed to determine which ones of the countries that include the universities already taking place in the upper ranks in the rankings shared with public are the most ideal countries both during the studentship life of the students and during the process in which they start their business life. COPRAS and ARAS being from the MCDM methods have been used and the attained results have been compared to one another in this study conducted for the purpose of determining the most ideal country to study in university with the help of both many social and economic different criteria.

## 2. METHODOLOGY

While it is easy to make a choice and reach a decision among the alternatives in the situations in which there is only one criterion, the process gets harder as the number of the criteria increases and it becomes complex and extends. In such situations, it is convenient to use Multi-Criteria Decision Making (MCDM) methods (Çelikbilek & Özdemir, 2020). Multi-Criteria Decision Making Methods have started to be frequently used in recent years thanks to its applicability in different fields, use of a path away from many assumptions and provision of reaching a solution in a very rapid way especially via the developing software technologies.

Multi-criteria decision making methods are called by different names depending on their ways of application during the process of the preference of the alternatives. While some multi-criteria methods provide opportunity for making a choice and some for classification, some of them are used in ranking problems.

In this study, there is a ranking of the countries taking place in high ranks in world orders according to various criteria. The ranking has been conducted by applying COPRAS and ARAS methods from the MCDM methods. These methods will be explained in this part.

### 2.1. COPRAS Method

COPRAS (COmplex PRoportional ASsesment) is a method developed by Zavadskas et.al. in 1994 (Zavadskas, et al., 1994). This method gives importance to the benefit cost elements of the criteria and it is preferred a lot in recent years due to also presenting relative importance ranks by taking the weights of the criteria into consideration (Harish Garg, 2019).

The application steps of the method are as follows.

*Step 1- Formation of the decision matrix*: Firstly; a decision matrix consisting of m ea. alternatives and n. ea. criteria is formed.

$$\begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ \vdots & & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad (1)$$

Where i = 1, 2, …, m and j = 1, 2, …, n; $x_{ij}$ shows the value of $i^{th}$ alternative taken according to $j^{th}$ criterion.

*Step 2- Normalization of the Decision Matrix:* The decision matrix will be normalized after the application of the formulation given below to each value (Bayrakçı & Aksoy, 2019).

$$x_{ij}^{*} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}} \quad (2)$$

*Step 3- Formation of the Weighted Normalized Decision Matrix:* Where $w_j$ shows weight and $x_{ij}^{*}$ shows the standard values, weighted normalized decision matrix is found with the equation below (Arabameri, et al., 2019).

$$d_{ij} = x_{ij}^{*} * w_j \quad (3)$$

$w_j$, being the weight of the $j^{th}$ criterion, expresses the proportional significance degrees whose sum of weights is equal to 1 (Atan & Altan, 2020). The related weight value could both be found with different statistical techniques and it could also be formed with the compilation of the expert opinions.

*Step 4- Formation of the Weighted Decision Matrix in Which Benefit and Cost Properties Are Included:* Where $S_{+i}$ shows the sum of benefit criteria and $S_{-i}$ shows the sum of cost criteria, the new weighted decision matrix is calculated as follows.

$$S_{+i} = \sum_{j=1}^{k} d_{+ij} \qquad i = 1, 2, \dots, m \qquad j = 1, 2, \dots, k \quad (4)$$

$$S_{-i} = \sum_{j=k+1}^{n} d_{-ij} \qquad i = 1, 2, \dots, m \qquad j = k+1, k+2, \dots, n \quad (5)$$

*Step 5- Calculation of the Relative Significance Values:* Where $Q_i$ value shows the relative significance value of $i^{th}$ alternative, it is calculated as follows. The higher the calculated $Q_i$ value is, the more ideal the related alternative will be (Atan & Altan, 2020).

$$Q_i = S_{+i} + \frac{S_{-min} * \sum_{i=1}^{m} S_{-i}}{S_{-i} * \sum_{i=1}^{m} \left(\frac{S_{-min}}{S_{-i}}\right)} \qquad i = 1, 2, \dots, m \quad (6)$$

*Step 6- Calculation of the Performance Index:* Performance index is calculated as follows with the help of the relative significance levels.

$$P_i = \left(\frac{Q_i}{Q_{max}}\right) * 100\% \qquad i = 1, 2, \dots, m \quad (7)$$

The value of the performance index is attained by comparing the relative significance values of the alternatives to the most efficient alternative and therefore; it will have values between 0% and 100% (Harish Garg, 2019). The alternatives will be ranked by starting from the best after ranking the attained $P_i$ values in a descending sort.

**2.2. ARAS Method**

ARAS (Additive Ratio ASsesment) method was developed by Zavadskas et.al. in 2010 (Zavadskas & Turskis, 2010). ARAS method conducts the performance assessment of the alternatives by revealing the proportional similarities of each alternative when compared to the ideal alternative (Gümüş, et al., 2019).

The application steps of ARAS method are given below.

*Step 1- Formation of the Decision Matrix:* Decision matrix is formed in the same way as COPRAS method. If the optimum value of j criterion is unknown, the optimal value is found with the formula of $x_{oj} = max_i(x_{ij})$ depending on the criteria to show benefit property and it is found with the formula of $x_{0j} = min_i(x_{ij})$ depending on the criteria to show cost property (Koç & Uysal, 2017). In this process, it is firstly necessary to decide whether the criteria are benefit or cost criteria.

*Step 2- Normalization of the Decision Matrix:* The normalization process is conducted as follows depending on the related criterion to be benefit or cost criterion (Karabasevic et al., 2016)

$$\begin{cases} \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} & for\ benefit\ criterion \\ \frac{1/x_{ij}}{\sum_{i=0}^{m} 1/x_{ij}} & for\ cost\ criterion \end{cases} \quad (8)$$

The decision matrix is normalized when the values attained after the application of the processes are placed in the decision matrix.

*Step 3- Formation of the Weighted Normalized Decision Matrix:* The values attained in Step 2 ($r_{ij}$) are obtained as a result of the multiplication of the weight values $w_j$ attained with various methods or expert opinions.

$$x_{ij}^* = w_j * r_{ij} \quad (9)$$

*Step 4- Calculation of the Optimal Function Values:* It is calculated with the addition of $x_{ij}^*$ values for each alternative. The higher this value is, the more efficient the related alternative will be.

$$S_i = \sum_{j=1}^{n} x_{ij}^* \qquad i = 0, 1, 2, \dots, m \quad (10)$$

*Step 5- Relative Efficiency of the Alternative:* The relative efficiency of the related alternative is calculated with the following formula.

$$K_i = \frac{S_i}{S_0} \quad (11)$$

$S_0$ value here is the optimal value. The calculated $K_i$ value will have values within the range of [0,1] (Ghram & Frikha, 2019). The assessment of the alternatives is conducted by ranking the attained values in descending sort.

## 3. APPLICATION

The aim of this study is to determine at which country a person planning to have a university education could study best and also at which university s/he could live the standards in a good way. Different data resources have been used while collecting the data. Times Higher Education World University Ranking for 2020 has been taken into consideration while determining the countries with the best universities. The countries of the universities ranking the first 50 in this ranking have been determined and these countries have been determined as the alternatives. However; United States of America and United Kingdom among these countries have been extracted from the study for not affecting the result due to the fact that they so many universities in the ranking. Moreover; the countries have also been examined depending on their income status and it has been determined that while all the countries examined according to the data of Worldbank take place in the "high income" group, only China takes place in "upper middle income" group. Because it is thought that all the countries to be compared should have economic

similarities towards one another and a more homogeneous comparison should be made, China has also been extracted from the scope of the study. At this situation, the alternatives used in this study and their codes are shown in Table 1.

Table 1. Alternatives Used in the Study

| Alternative | Country | Alternative | Country |
|---|---|---|---|
| A1 | Australia | A6 | Hong Kong |
| A2 | Belgium | A7 | Japan |
| A3 | Canada | A8 | Singapore |
| A4 | France | A9 | Sweden |
| A5 | Germany | A10 | Switzerland |

The data used in the study have been compiled from the official websites of THE World University Ranking (Ranking, 2020), Worldbank (Worldbank, 2020), Human Development Index Report (Reports, 2019). While the year 2020 has been taken into consideration for the university rankings, arrangements have been made by taking the data of 2018-2019 into consideration for the remaining variables upon the idea that the rankings of 2020 have been arranged by taking the data of the previous year into consideration. These variables will be called as the criteria used in the ranking of the alternatives. The criteria, used abbreviation codes and their explanations are given in Table 2.

Table 2. Used Criteria and Their Explanations

| Codes | Explanations of Criters |
|---|---|
| C1 | Number of universities in the top 50 in the ranking |
| C2 | Crude death rate indicates the number of deaths occurring during the year, per 1,000 population estimated at midyear. |
| C3 | GDP growth (annual %) |
| C4 | Individuals using the Internet (% of population) |
| C5 | Inflation, consumer prices (annual %) |
| C6 | New business density (new registrations per 1,000 people ages 15-64) |
| C7 | Tax revenue (% of GDP) |
| C8 | Trade (% of GDP) |
| C9 | Women Business and the Law Index Score (scale 1-100) |
| C10 | Human development index (HDI) |
| C11 | Life expectancy at birth |
| C12 | Expected years of schooling |
| C13 | Employment to population ratio |

Based on what is given; it will be tried to be determined which country a person wanting to study in the best universities should prefer when both economic and academic factors are taken into consideration. Rankings have been made according to COPRAS and ARAS methods being from the multi-criteria decision making methods to determine this.

It is necessary to firstly form decision matrix in both methods. Because this step is common in both methods, decision matrix is shown only once in Table 3.

Table 3. Decision Matrix

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | 2,00 | 6,30 | 2,94 | 87,00 | 1,91 | 14,47 | 22,99 | 43,19 | 96,90 | 0,94 | 83,28 | 22,10 | 61,50 |
| A2 | 1,00 | 10,70 | 1,49 | 88,66 | 2,05 | 3,37 | 23,99 | 165,42 | 100,00 | 0,92 | 81,47 | 19,70 | 49,90 |
| A3 | 3,00 | 7,70 | 2,01 | 91,00 | 2,27 | 0,16 | 12,91 | 66,11 | 97,50 | 0,92 | 82,32 | 16,09 | 61,40 |
| A4 | 1,00 | 9,20 | 1,79 | 82,04 | 1,85 | 4,84 | 24,23 | 64,48 | 100,00 | 0,89 | 82,54 | 15,49 | 50,00 |
| A5 | 3,00 | 11,50 | 1,53 | 89,74 | 1,73 | 1,35 | 11,51 | 88,67 | 97,50 | 0,94 | 81,18 | 17,10 | 58,50 |
| A6 | 2,00 | 6,40 | 2,86 | 90,51 | 2,41 | 28,59 | 13,00 | 376,93 | 89,40 | 0,94 | 84,69 | 16,51 | 58,60 |
| A7 | 1,00 | 11,00 | 0,32 | 91,28 | 0,98 | 0,39 | 11,91 | 36,82 | 81,90 | 0,91 | 84,47 | 15,23 | 59,30 |
| A8 | 2,00 | 5,00 | 3,44 | 88,17 | 0,44 | 10,01 | 13,14 | 326,94 | 82,50 | 0,93 | 83,46 | 16,33 | 65,70 |
| A9 | 1,00 | 9,10 | 1,95 | 92,14 | 1,95 | 7,18 | 27,91 | 89,13 | 100,00 | 0,94 | 82,65 | 18,83 | 60,20 |
| A10 | 2,00 | 7,80 | 2,75 | 89,00 | 0,94 | 4,53 | 10,08 | 120,03 | 85,60 | 0,95 | 83,63 | 16,21 | 64,90 |

The value of each criterion regarding the alternatives is shown in this matrix. Results regarding COPRAS and ARAS methods have been attained in the continuation of the study.

### 3.1. The Ranking Attained with COPRAS Method

After the formation of the decision matrix, whether the criteria provide benefit or cost element should firstly be determined for COPRAS method to be able to be applied. Furthermore; it is also necessary to determine the weight values belonging to each criterion. The weights determined in this study have been formed with the help of the significance degrees obtained as a result of the interviews made with the sociologists and pedagogues expert in their fields. The benefit/cost situations and weight values regarding each criterion are shown in Table 4. Also; the results regarding the weighted normalized decision matrix attained again as a result the application of the steps of COPRAS method are given in Table 4.

Table 4. Benefit/Cost Definitions, Weight Values and Weighted Normalized Decision Matrix Regarding the Criteria

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benefit/ Cost | Benefit | Cost | Benefit | Benefit | Cost | Benefit | Cost | Benefit | Benefit | Benefit | Benefit | Benefit | Benefit |
| Wi | 0,100 | 0,060 | 0,060 | 0,060 | 0,060 | 0,080 | 0,060 | 0,060 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| A1 | 0,011 | 0,004 | 0,008 | 0,006 | 0,007 | 0,015 | 0,008 | 0,002 | 0,006 | 0,010 | 0,010 | 0,013 | 0,010 |
| A2 | 0,006 | 0,008 | 0,004 | 0,006 | 0,007 | 0,004 | 0,008 | 0,007 | 0,006 | 0,010 | 0,010 | 0,011 | 0,008 |
| A3 | 0,017 | 0,005 | 0,006 | 0,006 | 0,008 | 0,000 | 0,005 | 0,003 | 0,006 | 0,010 | 0,010 | 0,009 | 0,010 |
| A4 | 0,006 | 0,007 | 0,005 | 0,006 | 0,007 | 0,005 | 0,008 | 0,003 | 0,006 | 0,010 | 0,010 | 0,009 | 0,008 |
| A5 | 0,017 | 0,008 | 0,004 | 0,006 | 0,006 | 0,001 | 0,004 | 0,004 | 0,006 | 0,010 | 0,010 | 0,010 | 0,010 |
| A6 | 0,011 | 0,005 | 0,008 | 0,006 | 0,009 | 0,031 | 0,005 | 0,016 | 0,006 | 0,010 | 0,010 | 0,010 | 0,010 |
| A7 | 0,006 | 0,008 | 0,001 | 0,006 | 0,004 | 0,000 | 0,004 | 0,002 | 0,005 | 0,010 | 0,010 | 0,009 | 0,010 |
| A8 | 0,011 | 0,004 | 0,010 | 0,006 | 0,002 | 0,011 | 0,005 | 0,014 | 0,005 | 0,010 | 0,010 | 0,009 | 0,011 |
| A9 | 0,006 | 0,006 | 0,006 | 0,006 | 0,007 | 0,008 | 0,010 | 0,004 | 0,006 | 0,010 | 0,010 | 0,011 | 0,010 |
| A10 | 0,011 | 0,006 | 0,008 | 0,006 | 0,003 | 0,005 | 0,004 | 0,005 | 0,006 | 0,010 | 0,010 | 0,009 | 0,011 |

After the obtainment of the weighted normalized decision matrix, it is necessary to calculate the weighted decision matrix in which the benefit and cost properties are

included. For this, the matrix shown in Table 5 has been formed by using the formulas specified in the 4th step of COPRAS method. The values specified again as Qi in Table 5 and showing the relative significance of each criterion have been calculated by using the calculated benefit/cost measures.

Table 5. Benefit/Cost Measures and Relative Significance Values of the Alternatives

| | Benefit | Cost | Qi |
|---|---|---|---|
| A1 | 0,092 | 0,019 | 0,108 |
| A2 | 0,073 | 0,023 | 0,085 |
| A3 | 0,077 | 0,018 | 0,094 |
| A4 | 0,068 | 0,022 | 0,081 |
| A5 | 0,078 | 0,018 | 0,095 |
| A6 | 0,118 | 0,018 | 0,135 |
| A7 | 0,059 | 0,016 | 0,078 |
| A8 | 0,098 | 0,010 | 0,129 |
| A9 | 0,076 | 0,023 | 0,089 |
| A10 | 0,081 | 0,012 | 0,105 |

With the help of the calculated relative significance values, the formation of performance indexes and ranking of the alternatives could be done. The attained performance index values and rankings are as shown in Table 6.

Table 6. Performance Index Values and the Ranking of Alternatives

| Country | | Pi | Rank |
|---|---|---|---|
| Australia | A1 | 79,956 | 3 |
| Belgium | A2 | 63,382 | 8 |
| Canada | A3 | 69,735 | 6 |
| France | A4 | 60,443 | 9 |
| Germany | A5 | 70,244 | 5 |
| Hong Kong | A6 | 100,000 | 1 |
| Japan | A7 | 58,059 | 10 |
| Singapore | A8 | 95,560 | 2 |
| Sweden | A9 | 66,316 | 7 |
| Switzerland | A10 | 78,190 | 4 |

When the ranking conducted with COPRAS method is examined, Hong Kong has been determined as the best preferable country among 10 countries in which there are universities ranked within first 50 by THE World University Ranking. Hong Kong is followed respectively by Singapore, Australia and Switzerland. The country in the last rank among these 10 countries has been determined as Japan.

### 3.2. The Ranking Attained with ARAS Method

The first step for the applicability of ARAS method is the formation of decision matrix. The related decision matrix is common with the other method and shown in Table 3. As different from COPRAS method; in this method, the normalization process has been calculated with different formulas as specified in Step 3 expressed in the explanation of the method depending on the maximization or minimization of the criteria and after that,

weighted normalized decision matrix has been attained as a result of multiplication with weights. The weights used here have been used in the same way as the ones determined in COPRAS method in terms of ensuring the comparison of the two methods under more homogeneous conditions. The attained weighted normalized decision matrix is shown in Table 7.

Table 7. Max/Min Properties, Weights and Weighted Normalized Decision Matrix of the Criteria

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | max | min | max | max | min | max | min | max | max | max | max | max | max |
| wi | 0,100 | 0,060 | 0,060 | 0,060 | 0,060 | 0,080 | 0,060 | 0,060 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| X0 | 0,014 | 0,008 | 0,008 | 0,006 | 0,013 | 0,022 | 0,008 | 0,013 | 0,006 | 0,009 | 0,009 | 0,011 | 0,010 |
| A1 | 0,010 | 0,007 | 0,007 | 0,005 | 0,003 | 0,011 | 0,003 | 0,001 | 0,006 | 0,009 | 0,009 | 0,011 | 0,009 |
| A2 | 0,005 | 0,004 | 0,004 | 0,005 | 0,003 | 0,003 | 0,003 | 0,006 | 0,006 | 0,009 | 0,009 | 0,010 | 0,008 |
| A3 | 0,014 | 0,005 | 0,005 | 0,006 | 0,003 | 0,000 | 0,006 | 0,002 | 0,006 | 0,009 | 0,009 | 0,008 | 0,009 |
| A4 | 0,005 | 0,004 | 0,004 | 0,005 | 0,003 | 0,004 | 0,003 | 0,002 | 0,006 | 0,009 | 0,009 | 0,008 | 0,008 |
| A5 | 0,014 | 0,004 | 0,004 | 0,005 | 0,003 | 0,001 | 0,007 | 0,003 | 0,006 | 0,009 | 0,009 | 0,009 | 0,009 |
| A6 | 0,010 | 0,006 | 0,007 | 0,006 | 0,002 | 0,022 | 0,006 | 0,013 | 0,005 | 0,009 | 0,009 | 0,008 | 0,009 |
| A7 | 0,005 | 0,004 | 0,001 | 0,006 | 0,006 | 0,000 | 0,007 | 0,001 | 0,005 | 0,009 | 0,009 | 0,008 | 0,009 |
| A8 | 0,010 | 0,008 | 0,008 | 0,005 | 0,013 | 0,008 | 0,006 | 0,011 | 0,005 | 0,009 | 0,009 | 0,008 | 0,010 |
| A9 | 0,005 | 0,005 | 0,005 | 0,006 | 0,003 | 0,006 | 0,003 | 0,003 | 0,006 | 0,009 | 0,009 | 0,010 | 0,009 |
| A10 | 0,010 | 0,005 | 0,007 | 0,005 | 0,006 | 0,004 | 0,008 | 0,004 | 0,005 | 0,009 | 0,009 | 0,008 | 0,010 |

X0 value specified in Table 7 shows the optimal value of the related criterion.

Optimal function values (Si) and alternative relative efficiencies have been calculated for each alternative after the application of the other steps of ARAS method and they have been shown in Table 8.

Table 8. Optimal Function Values, Alternative Relative Efficiencies and Rankings of the Alternatives

| Countries | | Si | Ki | Rank |
|---|---|---|---|---|
| | X0 | 0,1385 | 1 | |
| Australia | A1 | 0,092 | 0,667 | 3 |
| Belgium | A2 | 0,073 | 0,531 | 8 |
| Canada | A3 | 0,082 | 0,596 | 6 |
| France | A4 | 0,070 | 0,506 | 9 |
| Germany | A5 | 0,083 | 0,598 | 5 |
| Hong Kong | A6 | 0,113 | 0,816 | 1 |
| Japan | A7 | 0,069 | 0,497 | 10 |
| Singapore | A8 | 0,111 | 0,804 | 2 |
| Sweden | A9 | 0,077 | 0,556 | 7 |
| Switzerland | A10 | 0,090 | 0,652 | 4 |

As seen in Table 8; when the countries are ranked according to their alternative relative efficiencies, Hong Kong has been determined as the most ideal country. Respectively Singapore, Australia and Switzerland have been determined as the countries most ideal after Hong Kong. Japan has been in the last rank among the determined 10

countries. Besides; it is seen that the attained ranking is the same as the one attained with COPRAS method.

## 4. CONCLUSIONS

There are many criteria that could confront the people wanting to have a university education while making their choices. Clearly every individual wants to have an education in a good university, but the living conditions of the country that includes the university also has an importance for the individual to be able to sustain his/her education in a peaceful way and to be able to make plans for his/her future. In this study, country rankings have been made with COPRAS and ARAS methods being from multi-criteria decision making methods for the purpose of determining the most ideal country to study in a university with the help of different criteria.

Various results regarding the rankings of the best universities in the world are shared with the public every year. The superiorities, advantages and disadvantages of the universities in the world over one another are clearly presented with the help of these rankings. THE World University Ranking has been accepted as one of the most prestigious ones among the explained rankings. For this reason; ranking has been made by also examining the impact of different economic and demographic criteria among the countries that include the universities within the first 50 in THEWUR.

Same rankings have been attained in both COPRAS and ARAS methods for the 10 countries examined in this study. In this respect; the most ideal country a student could select in his/her university preference has been determined as Hong Kong. Hong Kong is respectively followed by Singapore, Australia and Switzerland. In addition; Japan has been determined as the country that could be preferred lastly among the examined 10 countries. Japan is followed by France and Belgium.

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