Discriminant Analysis to Assess Deprivation Index in Iraq

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Abstract

The aim of this study is to achieve the best distinguishing function of the variables which have common characteristics to distinguish between the groups in order to identify the situation of the governorates that suffer from the problem of deprivation. This allows the parties concerned and the regulatory authorities to intervene to take corrective measures. The main indicators of the deprivation index included (education, health, infrastructure, housing, protection) were based on 2010 data available in the Central Bureau of Statistics.

Keywords: Class analysis, function of differentiation, hierarchical analysis

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1. Introduction

New development literature tends to take the concept of human poverty as more reflective as the multiple dimensions of poverty. The Living Conditions Index adopted in this paper falls within the context of Iraq's most appropriate approach, not only in line with the global trend to adopt the concept of human poverty but also for practical considerations. The available data on household budgets, income and expenditure are necessary to measure income poverty. A large proportion of the population depends on food rations. Although commodity prices have been subsidized on a very large scale (especially fuel prices), the market is not functioning regularly and the labor market is under considerable pressure due to insecurity and other reasons Which made dependence on economic logic in the approach of poverty phenomenon, which is built in the adoption of the concept of income poverty and the calculation of poverty lines on this basis is inappropriate. The characteristics of poverty in Iraq are more complex and interrelated and often do not relate to economic resources, but to other factors related to the characteristics of the transitional period and the deterioration in the institutions and services and disorders experienced by the Iraqi society. On this basis, the approach of poverty from the perspective of living standards and human deprivation in a range of fields (health, education, housing, services, security, economic resources ...) is more objective and more appropriate than other approaches. Therefore, it was necessary to adopt a classification that could lead to indicators that determine the categories of Iraqi society and determine the standards of living and poverty and degrees of deprivation, as adopted by some economists, the families and individuals were classified into five categories of living as follows:

1. Very low standard of living (very high deprivation) where the standard of living index is between zero and less than 0.75
2. Low standard of living (high deprivation) in which the value of the standard of living is between 0.75 and less than 1
3. The average standard of living (low deprivation) in which the value of the standard of living index is between 0.75 and less than 1
4. High standard of living (low deprivation) The standard of living is between 1.25 and less than 1.5
5. Very high standard of living (very little deprivation) The standard of living is between 1.5 and less than 2

On the other hand, the reality of the standard of living in Iraq reflects very low levels in rural areas compared to cities because of the lack of services and infrastructure, which led to increased rates of deprivation of basic needs such as education, health, etc., which led to the migration of many villagers to city centers. In order to achieve an acceptable growth rate in the governorates of the state, the allocation of the development of regions and governorates was increased by 60% according to the criterion of relative importance of the population and 40% according to deprivation criteria.

1.1 Study Problem

The Iraqi economy has suffered from a serious deterioration due to the wars and local unrest for more than four decades, which negatively affected the overall economic and social activity and infrastructure, which reflected negatively on most segments of Iraqi society, especially the poor and vulnerable groups and below the poverty level. There has been a significant difference in the standard of living of the population between the provinces, which led to the need for a mechanism to identify the provinces that suffer from high rates of deprivation and put them in groups that are characterized by being homogeneous, hence the problem of research in how to identify these groups and therefore take the necessary action from Before the state to address those problems for the purpose of reducing them and reduce the disparity between the groups of governorates.

1.2 Aim of the Study

The aim of the studyis to classify the Iraqi governorates with groups that are homogenous within each group and are heterogeneous according to the variables of the deprivation index in Iraq using the method of class analysis

1.3 Study Methodology

For the purpose of achieving the objectives of the research, quantitative and multivariate analysis was used using the method of class analysis.

1.4 Hypotheses

The research includes testing the following null hypothesis:

H01: There are no significant differences in the classification of governorates between groups, according to the variables of deprivation index in Iraq

H02: There are no significant differences between the variables of the deprivation index according to governorates

1.5 Study Variables

As an extension of the ongoing cooperation between the Ministry of Planning and Development Cooperation and the United Nations Development Program (UNDP), which led to the implementation of broader results on the survey of living conditions in Iraq, a joint working team was able to conduct an in-depth analysis of the survey results by measuring living standards Basic needs in a manner consistent with the situation of Iraq, the study was classified into seven main fields are:

1.Education
2.Health
3.Infrastructure
4.Housing
5.Protection and social security
6. Economic family status
7.The standard of living

Table (1) shows the percentages of these levels and by the Iraqi governorates for the year 2010

Table 1

Governorate	Economic status	Protection and social security	Education	health	Infrastructure	Housing
Duhuk	44.0	28.8	33.6	41.5	29.4	31.0
Nainawa	50.0	28.6	34.1	32.1	59.1	25.3
Sulaimani	17.0	26.6	26.3	30.9	35.9	38.2
Kirkuk	23.5	33.5	21.7	31.8	61.9	14.0
Arbil	20.9	29.0	30.1	40.3	33.4	34.1
Diyala	46.3	49.5	17.9	34.0	83.5	23.0
Anbar	28.2	29.8	15.1	17.6	49.5	3.9
Baghdad	20.4	36.1	16.2	24.4	34.6	29.9
Babel	39.4	27.7	46.5	27.5	77.7	38.9
Karbala	41.5	25.3	54.1	15.3	61.9	40.0
Wasit	41.9	25.0	35.4	40.4	62.7	36.0
Saladin	36.5	39.3	35.0	23.5	72.5	24.2
Najaf	41.8	26.1	41.0	22.8	45.2	38.5
Qadisiya	48.0	33.5	42.3	44.0	65.3	50.3
MUthana	57.9	34.8	50.5	29.6	70.4	44.0
Thi Qar	52.6	31.9	36.6	29.1	76.8	46.7
Maysan	40.7	29.1	51.1	54.4	86.7	47.3
Basra	40.3	16.6	20.1	28.2	66.6	24.9

2. Theoretical Framework

2.1 Discriminant Analysis

Discriminant analysis is used for classification or predicting the problems in which the dependent variable is qualitative by identifying and classifying the study groups and then collecting the data of the elements of each group, which represent the set of discriminatory variables that measure the characteristics of each group. In addition, the discriminant analysis works to find the best linear range of these characteristics or variables and called the discriminant function. These variables have discriminatory factors that reflect the importance of each of the variables in the distinction between groups and thus there is a basis for the classification of any of the views within One of the totals.[3,7]

On this basis, this analysis enables us to build a base for the redistribution and characterization of the Iraqi governorates within the special structure of some of the problems of livestock through data provided by livestock surveys and distribution at different levels.

2.2 Investigating Community Overlap

The method of the discriminant analysis is used for the separation of communities on the fact that there is information about two or more similar communities, but they are quantitatively separate. Supposing that there is a (K) of totals and each group contains (ni) observations. [6]

i=1……,k

Using a discriminant analysis, the vector of observations (y) for each group is converted to the formula:

$$zij = a * yij - (2-1)$$

For the purpose of finding the vector (a), which maximizes the differences between vector averages (2-1) by solving the following equation:

$$(E^{-1}\mathrm{H}-\lambda\mathrm{I})\mathrm{a}=0 \quad ----------(2-2)$$

Provided that

$$\mathrm{H}=\sum_{i=1}^{k} n_i\ (\bar{y}_{i.}-\bar{y}_{..})(\bar{y}_{i.}-\bar{y}_{..})^{-}=\sum_{i=1}^{k}\frac{1}{n_i}y_{i.}y_{i.}^{-}-\frac{1}{N}y_{..}y_{..}^{-} \quad ---(2-3)$$

$$\mathrm{E}=\sum_{i=1}^{k}\sum_{j=}^{n_i}(y_{ij}-\bar{y}_{i.})(y_{ij}-\bar{y}_{i.})^{-}$$

$$=\sum_{i=1}^{k}\sum_{j=}^{n_i}y_{ij}y_{ij}^{-}-\sum_{i=1}^{k}\frac{1}{n_i}y_{i.}y_{i.}^{-} \quad ---(2-4)$$

The solution for formula (2-2) leads to the extraction of characteristic roots (Eigen value) (iλ) and corresponding to the characteristic vector (ai) for the matrix (E-1H). [6]

Provided that

$\lambda_1 > \lambda_2 > \lambda_3 > \ldots\ldots\ldots\ldots \lambda_s$

Therefore, the largest discriminant root (λ1) represents the maximum value to:

$$\lambda=\frac{a^{-}Ha}{a^{-}Ea} \quad ----------(2-5)$$

Thus, the first discriminatory function that maximizes the difference between the averages of totals is:

$$z_1=a_1^{-}y \quad ----------(2-6)$$

At the level (s) of the characteristic vectors, the discriminatory functions that maximize the difference between the averages of totals are as follows:[4]

$$z_1=a_1^{-}y\ , z_2=a_2^{-}y\ ,,,,,,,,,z_s=a_s^{-}y$$

The characteristic roots are used in the matrix $\mathbf{E^{-1}H}$ In finding the relative importance of the discriminatory function as follows:

$$\frac{\lambda_i}{\sum_{j=1}^{s}\lambda_j} \quad ----------(2-7)$$

2.3 Conducting a Discriminative Analysis

This should go through the following steps

2.3.1 Finding the Dependent Variable

The researcher identifies the groups he wishes to classify [5] either by using advance information about the boundary between the groups or by the hierarchical analysis method, one of the methods of cluster analysis [5]

2.3.2 Selection of the variables that constitute the discriminatory equation

The independent variables that make up the form are chosen by selecting the variables that have the highest value (F) and the lowest value (Wilks Lambda) [5,8]. The rate of (F) represents the contribution of independent variables in the distinction between totals, taking into account the changes caused by the other discriminatory variables. The rate or standard (Wilks Lambda) measures the degree of divergence between the two groups.

2.3.3 Standardization Discriminant coefficients

Standard discriminatory coefficients are represented by the values (b) shown in the following equation: -[2,4]

$$y^{*}=b_1*x_1+ b_2*x_2+ b_3*x_3+\ldots\ldots\ldots\ldots+ b_n*x_n \quad \text{----------(2-8)}$$

whereas :-

y *: - The standard differential value

xn: - the standard differential variable n

bn: - the standard differential coefficient

n: - The number of standard differential variables that make up the discriminatory equation. Equivalent (number of groups - 1)

The standard discriminant equation is used to determine the significance of the variables in the composition, since the variables whose absolute value is large. Contribute significantly to the formation of the discriminatory equation, which means the reference to the normative discrimination coefficient that the contribution of the ratio to discrimination is a positive or negative contribution.

The standard discriminant is also used to determine the boundary between the discriminant coefficients between totals, where the dividing line represents the arithmetic mean of the standard discriminations of aggregates.

2.3.4 Non-Standardization Discriminant coefficients

Non-standard discriminatory coefficients are used in the composition of the discriminatory function rather than standard discriminatory coefficients. [5] This is because the discriminatory variables of the masses appear in real values and percentages, not in normative values. It should be noted that non-normative discriminatory coefficients do not give the relative importance of discriminatory variables because they are derived from raw data, ie, the true values of discriminatory variables. The non-standard discriminatory coefficients of the value (b) shown in the following equation :

$$y=b_1*s_1+ b_2*s_2+ b_3*s_3+\ldots\ldots\ldots\ldots+ b_n*s_n+f \quad \text{----------(2-9)}$$

whereas :-

f: - Fixed

sn: - Non-standard discriminatory variables

bn: - Non-standard discriminatory coefficients

y: - non-standard discriminatory equation sign

2.4 Accuracy of Discriminant Function

The accuracy of the discriminatory function is tested as follows: - [1]

2.4.1 Forecast validity Test

This is done by finding the value of the taxonomic transaction from equation (4) by multiplying the non-standard discriminatory transactions for each ratio or variable with their actual value. Then, the multiplication multipliers are collected for all the percentages within the taxonomic equation, in addition to collecting or subtracting a fixed number. By comparing the group's class value with the actual values of the group, the class is classified within this group or another.

2.4.2 The ability of the discriminant function to distinguish between totals

To test the ability of the discriminant function to distinguish between totals, this is based on the following statistical indicators

2.4.3 Intrinsic values (Eigen value)

The intrinsic values (characteristic roots) are used to determine the ability of the discriminant function between totals [4]. The high value of the characteristic roots is an indicator of the ability of the function to distinguish between totals. The characteristic roots can be extracted as follows:

$$\lambda = \frac{a^{-} Ha}{a^{-} Ea} \quad ---------- (2-10)$$

Whereas

$$\mathrm{H} = \sum_{i=1}^{k} n_i \ (\bar{y}_{i.} - \bar{y}_{..})(\bar{y}_{i.} - \bar{y}_{..})^{-} = \sum_{i=1}^{k} \frac{1}{n_i} y_{i.} y_{i.}^{-} - \frac{1}{N} y_{..} y_{..}^{-} \quad --- (2-11)$$

$$\mathrm{E} = \sum_{i=1}^{k} \sum_{j=}^{n_i} (y_{ij} - \bar{y}_{i.})(y_{ij} - \bar{y}_{i.})^{-}$$

$$= \sum_{i=1}^{k} \sum_{j=}^{n_i} y_{ij} y_{ij}^{-} - \sum_{i=1}^{k} \frac{1}{n_i} y_{i.} y_{i.}^{-} \quad --- (2-12)$$

In addition, formula (2-12) can be written as follows:

$$\lambda_1 = \frac{SSH_{(z)}}{SSE_{(z)}} \quad ---------- (2-13)$$

Whereas

$$SSE = \sum_{ij} (z_{ij} - \bar{z}_{ij})^2$$

$$SSE = n \sum_{i=1}^{K} (\bar{z}_{i.} - \bar{z}_{..})^2$$

2.4.4 Canonical correlation Coefficient

The conditional correlation coefficient measures the quality of conciliation to the discrimination function since the high value of the legal correlation coefficient is an indication of the high quality of the discrimination function and is equal to the square of the limiting factor [4,9]

The aggregate correlation coefficient is calculated by dividing the sum of squares of variances between groups on the square root of total squares of total discrepancies.

2.4.5 Wilkes Lambda Test

This test is used to demonstrate the ability of the function to distinguish between totals and to be found as follows:[10]

$$V_m = -\left[N - 1 - \frac{1}{2(P+K)}\right] ln\Delta_m \quad ----------(2-14)$$

Whereas

$$\Lambda_m = \prod_{i=m}^{s} \frac{1}{1+\lambda_i},$$

The λ test statistic has a free square distribution of Kai $p-m+1,k-m,N-k-m+1$ **If the calculated value is less than the tabular value, it is an indication that the discriminant function has the ability to distinguish between totals.**

2.4.6 F Test

The F test is used to test the statistical significance of the ability of the discriminant function to separate the totals since the test statistic is: [1 ,10]

$$F = \frac{1-\Delta_m^{\frac{1}{t}}}{\Delta_m^{1/t}} \frac{df_2}{df_1} \quad ----------(2-15)$$

Whereas

$$\mathrm{df}_1 = (p-m+1)(k-m),$$

$$\mathrm{df}_2 = wt - \tfrac{1}{2}[(p-m+1)(k-m)-2].$$

$$\Lambda_m = \prod_{i=m}^{s} \frac{1}{1+\lambda_i}, \qquad m = 2, 3, \ldots, s,$$

And that: -

K: - represents the number of totals

P: - represents the number of variables

If the calculated F value is greater than the F value of a table below a certain level and the degree of freedom (df1, df2) this means that the discriminant function has the ability to distinguish between totals.

3. Practical Framework

For the purpose of applying the method of analysis (Discriminant analysis) to the data of the deprivation index in Iraq, the following stages were passed:

3.1 Classification of Iraqi provinces according to the groups to which they belong

In order to find the qualitative variable (variable of classification) and used as a dependent variable in the distinguishing function of the deprivation index in Iraq, the method of hierarchical analysis, which is one of the methods of cluster analysis, to classify the provinces to (4, 3, 2) The following table is configured:

Table 2 The membership of the provinces to the groups belonging to them

No.	Province	Two- group classification	Three – group classification	Four-group classification
1	Duhuk	1	1	1
2	Nainawa	1	1	1
3	Sulaimani	2	2	2
4	Kirkuk	2	2	2
5	Arbil	2	2	2
6	Diyala	1	1	3
7	Anbar	2	2	2
8	Baghdad	2	2	2
9	Babel	1	1	1
10	Karbala	1	1	1
11	Wasit	1	1	1
12	Saladin	1	1	3
13	Najaf	1	1	1
14	Qadisiya	1	1	1
15	MUthana	1	1	1
16	Thi Qar	1	1	1
17	Maysan	1	3	4
18	Basra	1	1	1

It is noted from Table (2) that Maysan belongs to the fourth group, while each governorate (Sulaymaniyah, Anbar, Kirkuk, Erbil, Baghdad) belongs to the second group. Third. The rest of the provinces belong to the first group, in the case of classification into four groups. Where the results of accuracy in the case of classification into four groups as follows:

Table 2

Classification Results[a,c]							
			Predicted Group Membership				
		الترميز	1.00	2.00	3.00	4.00	Total
Original	Count	1.00	10	0	0	0	10
		2.00	0	5	0	0	5
		3.00	0	0	2	0	2
		4.00	0	0	0	1	1
	%	1.00	100.0	.0	.0	.0	100.0
		2.00	.0	100.0	.0	.0	100.0
		3.00	.0	.0	100.0	.0	100.0
		4.00	.0	.0	.0	100.0	100.0
Cross-validated[b]	Count	1.00	9	0	0	1	10
		2.00	0	3	2	0	5
		3.00	0	1	1	0	2
		4.00	1	0	0	0	1
	%	1.00	90.0	.0	.0	10.0	100.0
		2.00	.0	60.0	40.0	.0	100.0
		3.00	.0	50.0	50.0	.0	100.0
		4.00	100.0	.0	.0	.0	100.0
a. 100.0% of original grouped cases correctly classified.							
b. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.							
c. 72.2% of cross-validated grouped cases correctly classified.							

It is noted from Table (3) that the governorates of the first, second, third and fourth groups were classified accurately (100%). In accordance with the variables used in the research and the evidence of deprivation in Iraq.

3.2 Average variables in different groups

In order to study the characteristics of each group of groups, classified according to the deprivation index in Iraq. The following conditions have been identified. For the purpose of knowing the characteristics of the totality of the deprivation index in Iraq. The second method of cluster analysis methods, which is the mean of the variables, is used as follows:

Table 3 Variables averages in different groups relative to the deprivation index variable in Iraq

Final Cluster Centers				
	Cluster			
	1	2	3	4
Zscore(financial)	.70957	.25584	-.40082-	-.65444-
Zscore(social)	-.04180-	1.99343	-.28638-	-.57713-
Zscore(education)	.80621	-.59029-	-.01026-	-1.19495-
Zscore(health)	.61116	-.28343-	-.19506-	-.57822-
Zscore(infrastructure)	.76527	1.03064	-.94361-	-.01588-
Zscore(housing)	.91593	-.75975-	.08833	-1.53145-

It is noted from Table (4) that:

1.As for the economic situation, the average economic situation of the governorates of the first group is higher than the average of all governorates, equivalent to (0.70957) of the standard deviation. While the problem of infrastructure and the governorates of the second group is greater than the rest of the provinces and by (1.03064). As for the housing, the governorates of the first group suffered from this problem greater than the rest of the provinces and the equivalent of (0.91593) of the standard deviation.

2.In terms of protection and social security, the governorates of the second group suffer from this problem greater than the rest of the governorates, equivalent to (1.99343) of the standard deviation .. And the health variable, the governorates of the first group is higher than the average of all governorates and equivalent to (0.61116) of the standard deviation.

3.For education, the governorates of the first group suffer from this problem more than the rest of the provinces and the equivalent of (0.80621) of the standard deviation.

3.3 Determining the dependent variable

It is the classification index of the provinces into totals, which will be predicted through independent variables (the deprivation index in Iraq). In order to reach this variable, the hierarchy analysis was used as follows:

Table 4 The taxonomic variable according to the deprivation index in Iraq

No.	Province	Deprivation index
1	Duhuk	1
2	Nainawa	1
3	Sulaimani	2
4	Kirkuk	2
5	Arbil	2
6	Diyala	3
7	Anbar	2
8	Baghdad	2
9	Babel	1

10	Karbala	1
11	Wasit	1
12	Saladin	3
13	Najaf	1
14	Qadisiya	1
15	MUthana	1
16	Thi Qar	1
17	Maysan	4
18	Basra	1

3.4 Independent variables

The variables used to find a discriminatory equation for the classification of cases according to the groups of variables approved and the evidence of deprivation in Iraq. Where these variables are selected, which consists of the proposed model to distinguish between the provinces experiencing problems, according to the standard value of the highest (F) Wilks Lambda). Using the differential analysis, the independent variables were determined as follows:

Table 6 Wilkes Lambda progressive test (F) for the variables involved in the analysis

Wilks Lambda value	F value	Tolerance		
.946	77.614	.544	Protection %	
.147	6.184	.544	Infrastructure %	
b. Minimum partial F to enter is 3.84. c. Maximum partial F to remove is 2.71.				

It is noted in Table (6) that the most important variables in the distinction between totals for the deprivation index were the relative distribution of the lack (protection, infrastructure), because the calculated F values of (77.614.6.184) are greater than the minimum required to introduce the variable in the analysis. In addition, the relatively high Tolerance index shows that these variables do not suffer from the linear correlation problem between them. [1]

3.5 Boundary point determination

In order to determine the boundary point between the groups of governorates, the middle distance between the intermediate centers of each group was adopted as follows:

Table 7 Functions at group centroid

Functions at Group Centroids			
Function			Codin g
3	2	1	
-.176-	-.385-	3.048	1.00
.670	-.633-	-5.073-	2.00
-2.015-	1.760	-3.912-	3.00
2.442	3.496	2.705	4.00
Unstandardized canonical discriminant functions evaluated at group means			

It is noted from Table (7) that the values of averages, which distinguish between totals for the first discriminatory function, reached (3.048, -3.912 ,, 5.073-2705). This means that the value of the distinguishing mark of a governorate for the first function if it is negative, the governorate is classified in the third or second group. However, if the value of the discriminatory mark is positive, it is classified within the first or fourth group and the second discriminatory function is transferred to the classification of that province more accurately within one of these totals.

3.6 Identifying standardized discriminatory coefficients

In order to measure the actual contribution of the independent variables for the dependent variable of the deprivation index in Iraq, the following table was formed:

Table 5

Standardized Canonical Discriminant Function Coefficients			
Function			
3	2	1	
-.492-	-.272-	1.450	Economic status
-.516-	.393	-1.404-	Social security and protection
.339	.488	.342	Education
.655	.686	.203	Health
.083	.789	-.060-	Infrastructure
-.036-	-.412-	.447	Housing

Table (8) shows that the independent variable (economic status), with a normative value of (1.45), was the major contributor to the first discriminatory function. As for the second discriminatory function, the variable (infrastructure) had a significant contribution to the composition of that function and a standard value of (0.789).

3.7 Determination of Canonical Discriminant Function Coefficients

For the purpose of calculating the discriminatory markings of the governorates in relation to the deprivation index in Iraq, the following table is formed:

Table 6

Canonical Discriminant Function Coefficients			
Function			
3	2	1	
-.086-	-.048-	.254	Economic status
-.103-	.078	-.280-	Social security and protection
.037	.053	.037	Education
.075	.079	.023	Health
.006	.058	-.004-	Infrastructure
-.003-	-.040-	.043	Housing
2.580	-7.012-	-4.312-	(Constant)
Unstandardized coefficients			

3.8 The ability of the discriminating function to distinguish between totals

The Eigen value, the explanatory variance ratio, and the legal correlation coefficient were used to distinguish statistically significant functions for the governorates according to the deprivation index in Iraq as follows:

Table 7

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	18.537[a]	87.1	87.1	.974
2	1.564[a]	7.3	94.4	.781
3	1.189[a]	5.6	100.0	.737
a. First 3 canonical discriminant functions were used in the analysis.				

It is noted from Table (10) that the variation ratio of the first discriminant function reached (87.1). In addition, the function has a high correlation quality with a legal correlation coefficient of (0.974). (94.8%) of the change in group membership is due to the change in the predicted variables. The following table shows the statistical significance of the estimated outcome:

Table 8 Test the statistical significance of the model

Wilks' Lambda				
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	.009	56.368	18	.000
2 through 3	.178	20.700	10	.023
3	.457	9.400	4	.052

It is noted from table (11) that the first distinctive function is statistically significant below 0.05, because the significance level is 0.000, less than the moral level (0.05), while the second discriminant function is not statistically significant below (0.05)

1. Conclusions

The present study reached at the following conclusions:

1.Concerning the economic situation, the average economic status of the governorates of the first group is higher than the average of all governorates, equivalent to (0.70957) of the standard deviation. While the problem of infrastructure and the governorates of the second group is greater than the rest of the provinces and by (1.03064). As for the housing, the governorates of the first group suffered from this problem greater than the rest of the provinces and the equivalent of (0.91593) of the standard deviation.

2.In terms of protection and social security, the governorates of the second group suffer from this problem greater than the rest of the governorates, equivalent to (1.99343) of the standard deviation .. And the health variable, the governorates of the first group is higher than the average of all governorates and equivalent to (0.61116) of the standard deviation.

3.For education, the governorates of the first group suffer from this problem more than the rest of the governorates and the equivalent of (0.80621) of the standard deviation.

2. Recommendations

1.Attention to the security situation, especially for the governorates of the first group

2.Attention to the economic situation, especially for the governorates of the second group.

3.Attention to education, especially for the governorates of the first group

4.Attention to infrastructure, especially the governorates of the second group.

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التحليل الطبقي لتقييم دليل الحرمان في العراق

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المستخلص :

يهدف البحث الى التوصل الى افضل دالة تمييز للمتغيرات والتي تمتاز بصفات وخصائص مشتركة للتمييز بين المجاميع، وذلك للتعرف على اوضاع المحافظات التي تعاني من مشكلة الحرمان، مما يسمح للاطراف ذات المصلحة والجهات الرقابية بالتدخل لاتخاذ الاجراءات التصحيحية، وقد تم الاعتماد على المؤشرات الرئيسة لدليل الحرمان والمتضمنه (التعليم ، الصحة، البنى التحتية، المسكن، الحماية) وذلك بالعتماد على بيانات 2010 والمتوفرة في الجهاز المركزي للاحصاء.

المصطلحات الرئيسة للبحث/ التحليل الطبقي، دالة التمميز، التحليل الهرمي