CHAPTER IV

RESULTS AND DISCUSSION

The data collected from the Philippine Statistics Authority (PSA) were standardized (see Appendix II). Multidimensional scaling (MDS) analysis and statistical index construction in every region, bootstrap resampling technique, statistical index ranking, and Human Development Index (HDI) ranking presentation were discussed as follows:

4.0. Results of Multidimensional Scaling (MDS) Analysis

4.0.1. National Capital Region (NCR)

Table 4.0.1A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.658	0.000								
INFLA	1.286	1.230	0.000							
LABOR	0.260	0.401	1.197	0.000						
EMPLOY	0.092	0.746	1.292	0.346	0.000					
UN-EMPLOY	1.451	1.240	0.324	1.309	1.474	0.000				
UNDER-EMPLOY	1.378	1.017	0.603	1.186	1.423	0.355	0.000			
POP	0.109	0.550	1.270	0.157	0.201	1.412	1.315	0.000		
BIRTH	1.457	1.307	0.229	1.338	1.473	0.136	0.486	1.428	0.000	
DEATH	1.061	0.570	0.971	0.826	1.126	0.760	0.468	0.975	0.862	0.000

Figure 4.0.1: Conceptual mapping for NCR.

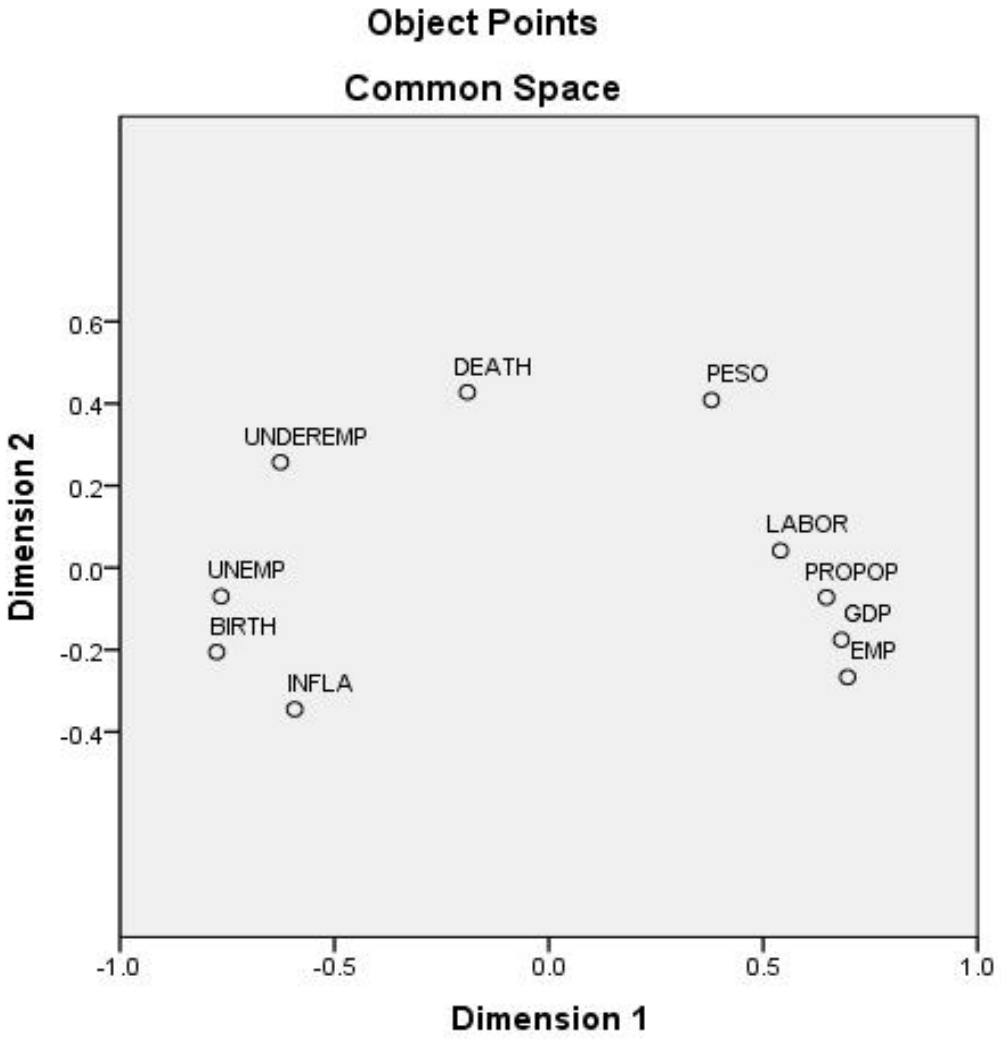


Table 4.0.1A and figure 4.0.1 contain the distance coefficient between variables. There was a high similarity between GROSS DOMESTIC PRODUCT and EMPLOYMENT RATE, UNEMPLOYMENT RATE and BIRTH RATE, LABOR FORCE PARTICIPATION RATE and POPULATION, also DEATH RATE and UNDEREMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.1B: Final coordinates of variables for the 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.682529**	-0.175758
PURCHASING POWER OF THE PESO	0.379477	**0.408572**
INFLATION RATE	-0.592615	**-0.344972**
LABOR FORCE PARTICIPATION RATE	**0.540208**	0.041639
EMPLOYMENT RATE	**0.696989**	-0.266607
UNEMPLOYMENT RATE	-0.764195	**-0.070004**
UNDEREMPLOYMENT RATE	-0.625853	**0.257154**
POPULATION	**0.647635**	-0.072193
BIRTH RATE	-0.774401	**-0.205547**
DEATH RATE	-0.189773	**0.427716**

Table 4.0.1B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinate for the gross domestic product, labor force participation rate, employment rate, and population. On the other hand, the second dimension had a high coordinate for the purchasing power of the peso, inflation rate, unemployment rate, underemployment rate, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the National Capital Region (NCR).

Table 4.0.1C: Stress and Fit Test.

Normalized Raw Stress	0.008730
Dispersion Accounted For (DAF)	0.991270
Tucker's Coefficient of Congruence	0.995625

In Table 4.0.1C, the result of normalized raw stress is 0.008730. With the stress value greater than 0.00 but less than or equal to 0.01, the goodness of fit was very good. The dispersion accounted for (DAF) of 0.991270 and the tucker's coefficient of congruence of 0.995625 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.2. Cordillera Administrative Region (CAR)

Table 4.0.2A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.425	0.000								
INFLA	1.369	1.062	0.000							
LABOR	0.935	0.914	0.836	0.000						
EMPLOY	1.377	0.953	0.924	1.467	0.000					
UN-EMPLOY	0.664	0.716	0.978	0.278	1.432	0.000				
UNDER-EMPLOY	1.047	0.645	1.094	1.387	0.421	1.274	0.000			
POP	0.235	0.309	1.359	1.069	1.217	0.820	0.854	0.000		
BIRTH	1.383	1.120	0.175	0.733	1.092	0.915	1.233	1.402	0.000	
DEATH	0.167	0.432	1.254	0.769	1.368	0.498	1.076	0.360	1.253	0.000

Figure 4.0.2: Conceptual mapping for CAR.

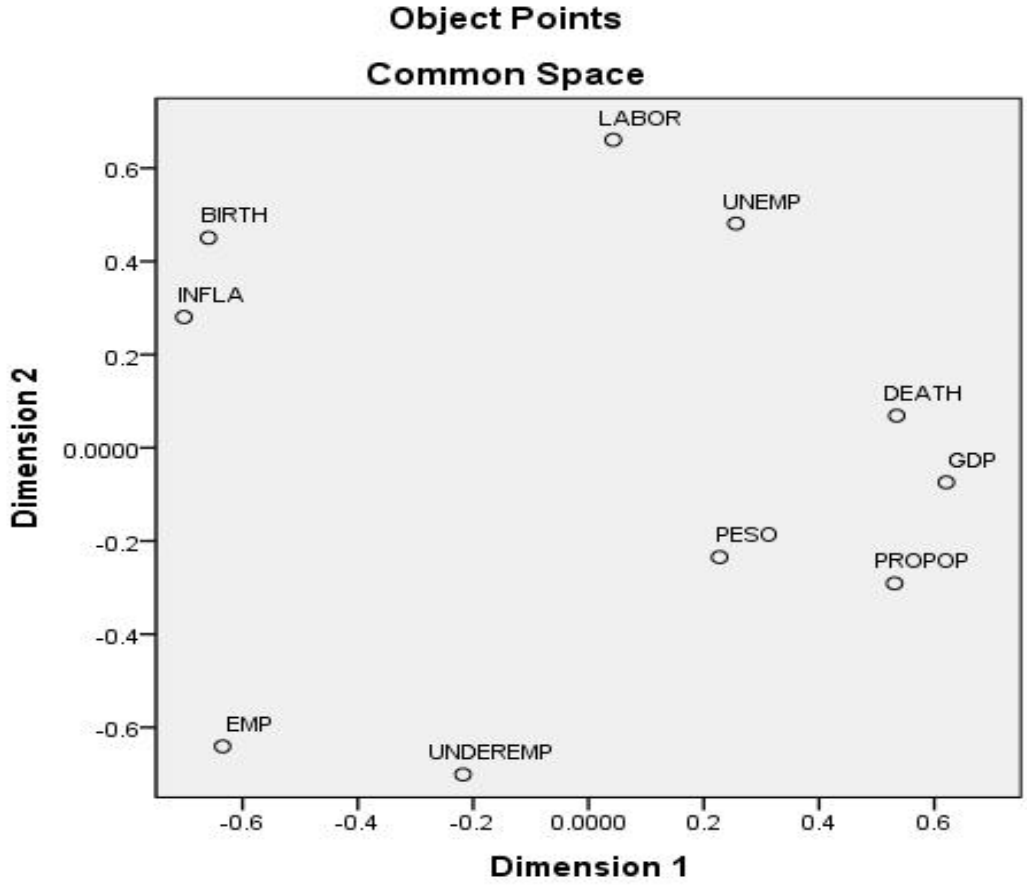


Table 4.0.2A and figure 4.0.2 show the results of distance matrix of the ten variables. There was a high similarity between GROSS DOMESTIC PRODUCT and DEATH RATE, INFLATION RATE and BIRTH RATE, LABOR FORCE PARTICIPATION RATE and UNEMPLOYMENT RATE, PURCHASING POWER OF THE PESO and POPULATION, also EMPLOYMENT RATE and UNDEREMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.2B: Final coordinates of variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.620645**	-0.074161
PURCHASING POWER OF THE PESO	**0.227450**	-0.234654
INFLATION RATE	-0.701632	**0.280471**
LABOR FORCE PARTICIPATION RATE	0.043130	**0.660715**
EMPLOYMENT RATE	**-0.634546**	-0.640729
UNEMPLOYMENT RATE	0.255955	**0.481106**
UNDEREMPLOYMENT RATE	**-0.217636**	-0.701075
POPULATION	**0.530969**	-0.290994
BIRTH RATE	-0.659030	**0.450499**
DEATH RATE	**0.534696**	0.068822

Table 4.0.2B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinate for the gross domestic product, purchasing power of the peso, employment rate, underemployment rate, population, and death rate. On the other hand, the second dimension had a high coordinates for the inflation rate, labor force participation rate, unemployment rate, and birth rate. These coordinates were being utilized for the construction of statistical index for the Cordillera Administrative Region (CAR).

Table 4.0.2C: Stress and Fit Test.

Normalized Raw Stress	0.010986
Dispersion Accounted For (DAF)	0.989014
Tucker's Coefficient of Congruence	0.994492

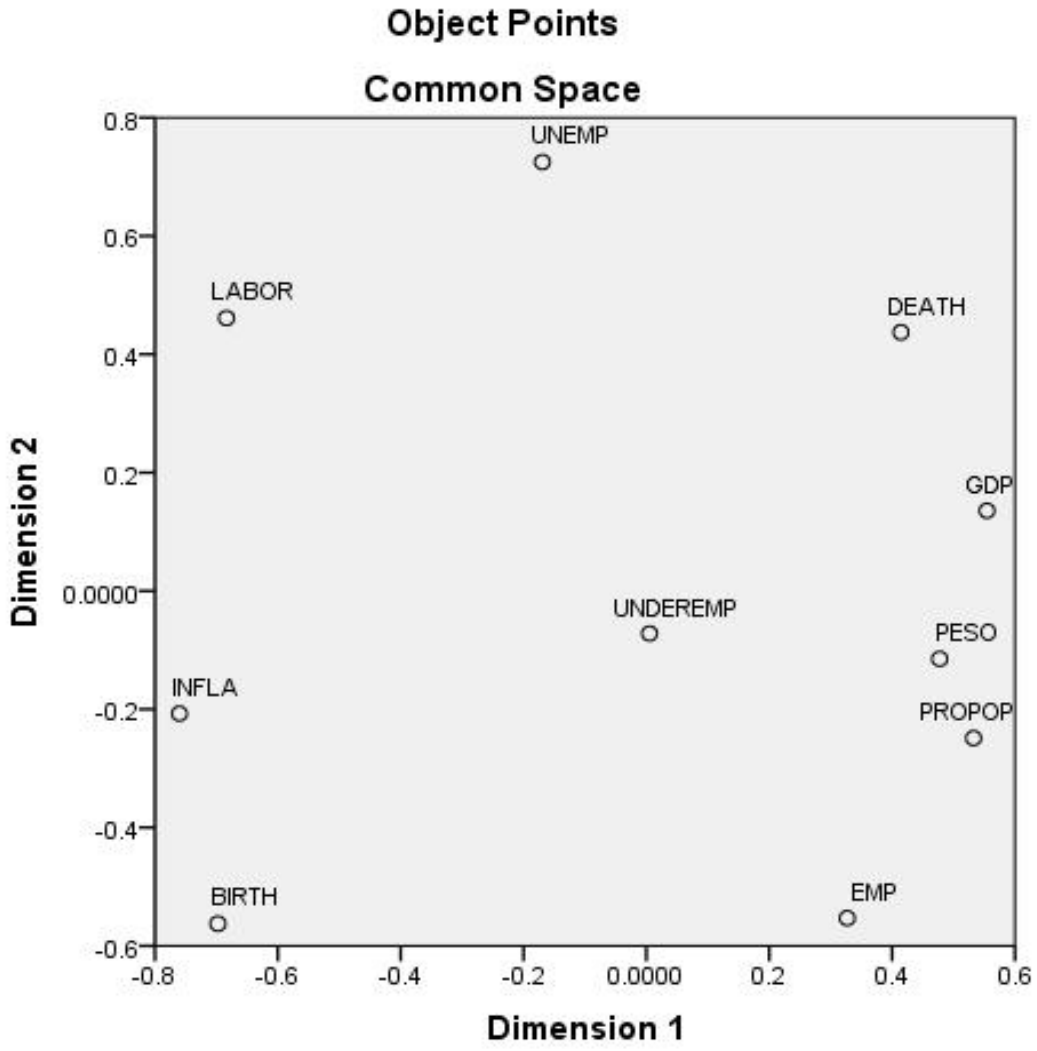
In Table 4.0.2C, the result of normalized raw stress is 0.010986. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.989014 and the tucker's coefficient of congruence of 0.994492 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.3. Ilocos Region (R1)

Table 4.0.3A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.262	0.000								
INFLA	1.359	1.241	0.000							
LABOR	1.280	1.296	0.673	0.000						
EMPLOY	0.725	0.463	1.141	1.432	0.000					
UN-EMPLOY	0.933	1.060	1.104	0.578	1.371	0.000				
UNDER-EMPLOY	0.587	0.474	0.777	0.871	0.579	0.816	0.000			
POP	0.385	0.145	1.293	1.408	0.367	1.200	0.556	0.000		
BIRTH	1.433	1.257	0.361	1.024	1.024	1.392	0.857	1.269	0.000	
DEATH	0.332	0.556	1.340	1.098	0.994	0.651	0.653	0.696	1.495	0.000

Figure 4.0.3: Conceptual mapping for Ilocos Region (R1).



The table and figure above show how each variable associated with each other. There was a high similarity between PURCHASING POWER OF THE PESO and POPULATION, DEATH RATE and GROSS DOMESTIC PRODUCT, INFLATION RATE and BIRTH RATE, also LABOR FORCE PARTICIPATION RATE And UNEMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.3B: Final coordinates of variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.554385**	0.135629
PURCHASING POWER OF THE PESO	**0.477409**	-0.114924
INFLATION RATE	-0.760249	**-0.207526**
LABOR FORCE PARTICIPATION RATE	-0.683588	**0.461175**
EMPLOYMENT RATE	**0.326879**	-0.553154
UNEMPLOYMENT RATE	-0.169255	**0.724947**
UNDEREMPLOYMENT RATE	**0.005138**	-0.071874
POPULATION	**0.532470**	-0.248869
BIRTH RATE	-0.697542	**-0.562570**
DEATH RATE	0.414352	**0.437167**

Table 4.0.3B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the gross domestic product, purchasing power of the peso, employment rate, underemployment rate, and population. On the other hand, the second dimension had a high coordinates for the inflation rate, labor force participation rate, unemployment rate, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the Ilocos Region (R1).

Table 4.0.3C: Stress and Fit Test.

Normalized Raw Stress	0.032995
Dispersion Accounted For (DAF)	0.967005
Tucker's Coefficient of Congruence	0.983360

In Table 4.0.3C, the result of normalized raw stress is 0.032995. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.967005 and the tucker's coefficient of congruence of 0.983360 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.4. Cagayan Valley (R2)

Table 4.0.4A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.575	0.000								
INFLA	1.308	1.413	0.000							
LABOR	1.336	0.976	1.062	0.000						
EMPLOY	1.018	0.591	1.166	0.392	0.000					
UN-EMPLOY	0.900	1.302	0.756	1.496	1.391	0.000				
UNDER-EMPLOY	1.394	1.351	0.352	0.774	0.971	1.047	0.000			
POP	0.010	0.566	1.303	1.326	1.007	0.902	1.388	0.000		
BIRTH	1.012	1.077	0.336	0.848	0.868	0.694	0.406	1.006	0.000	
DEATH	0.429	0.790	0.899	1.195	0.983	0.516	1.040	0.428	0.637	0.000

Figure 4.0.4: Conceptual mapping for Cagayan Valley.

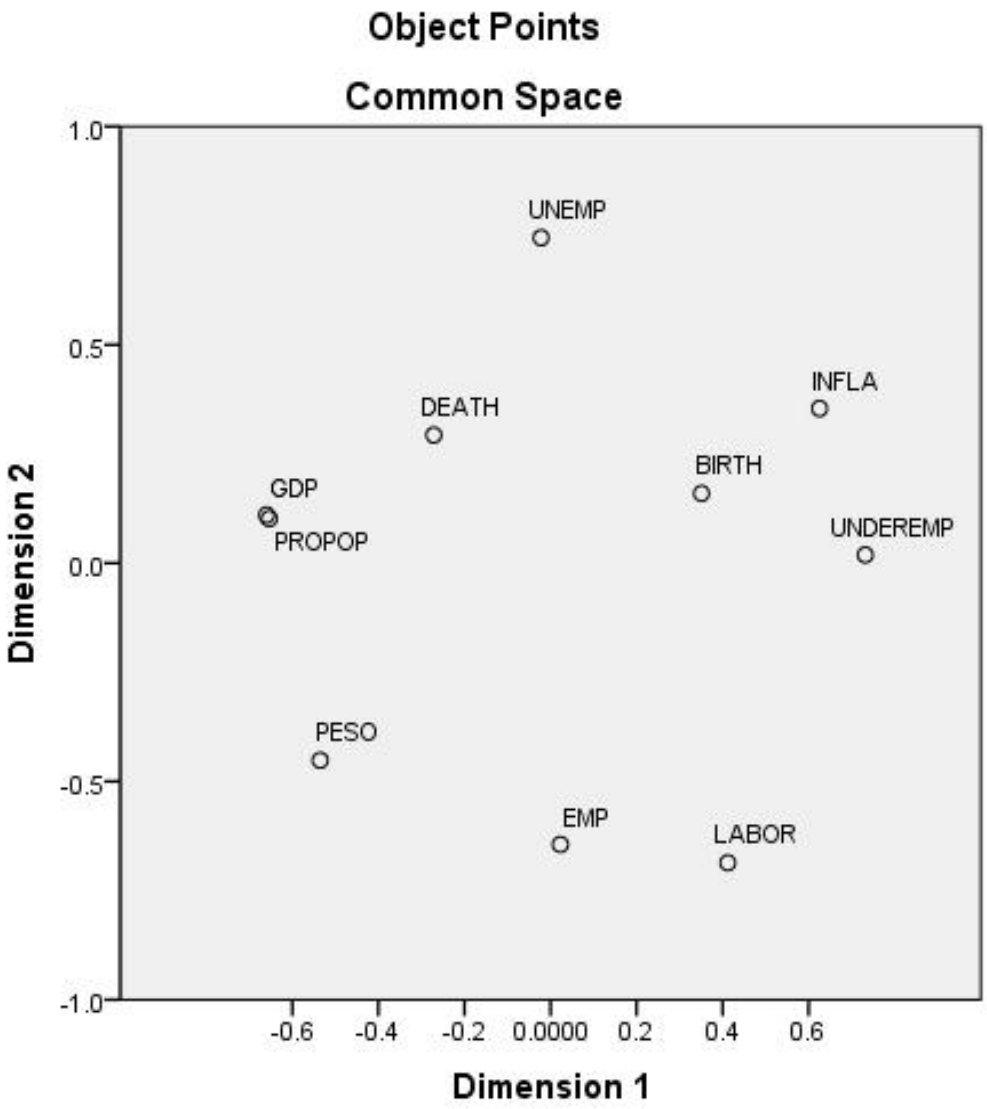


Table 4.0.4A and figure 4.1.4 display the distance matrix of the considered variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, INFLATION RATE and BIRTH RATE, LABOR FORCE PARTICIPATION RATE and EMPLOYMENT RATE, also UNEMPLOYMENT RATE

and DEATH RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.4B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.659823	**0.110210**
PURCHASING POWER OF THE PESO	-0.535478	**-0.451663**
INFLATION RATE	**0.625051**	0.353993
LABOR FORCE PARTICIPATION RATE	**0.412100**	-0.686530
EMPLOYMENT RATE	**0.022803**	-0.644529
UNEMPLOYMENT RATE	-0.021954	**0.745284**
UNDEREMPLOYMENT RATE	**0.731486**	0.018709
POPULATION	-0.653723	**0.101698**
BIRTH RATE	**0.350971**	0.159522
DEATH RATE	-0.271434	**0.293306**

Table 4.0.4B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinate for the inflation rate, labor force participation rate, employment rate, underemployment rate, and birth rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, purchasing power of the peso, unemployment rate, population, and death rate. These

coordinates were being utilized for the construction of statistical index for the Cagayan Valley (R2).

Table 4.0.4C: Stress and Fit Test.

Normalized Raw Stress	0.033590
Dispersion Accounted For (DAF)	0.966410
Tucker's Coefficient of Congruence	0.983060

In Table 4.0.4C, the result of normalized raw stress is 0.033590. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.966410 and the tucker's coefficient of congruence of 0.983060 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.5. Central Luzon (R3)

Table 4.0.5A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.925	0.000								
INFLA	1.320	1.386	0.000							
LABOR	0.201	0.724	1.267	0.000						
EMPLOY	0.279	1.155	1.237	0.449	0.000					
UN-EMPLOY	1.515	1.010	0.837	1.36	1.590	0.000				
UNDER-EMPLOY	0.303	0.692	1.439	0.186	0.582	1.460	0.000			
POP	0.030	0.897	1.322	0.174	0.307	1.500	0.274	0.000		
BIRTH	1.442	1.036	0.682	1.300	1.492	0.155	1.415	1.429	0.000	
DEATH	0.599	0.634	0.864	0.462	0.695	0.917	0.603	0.585	0.844	0.000

Figure 4.0.5: Conceptual mapping for Central Luzon (R3).

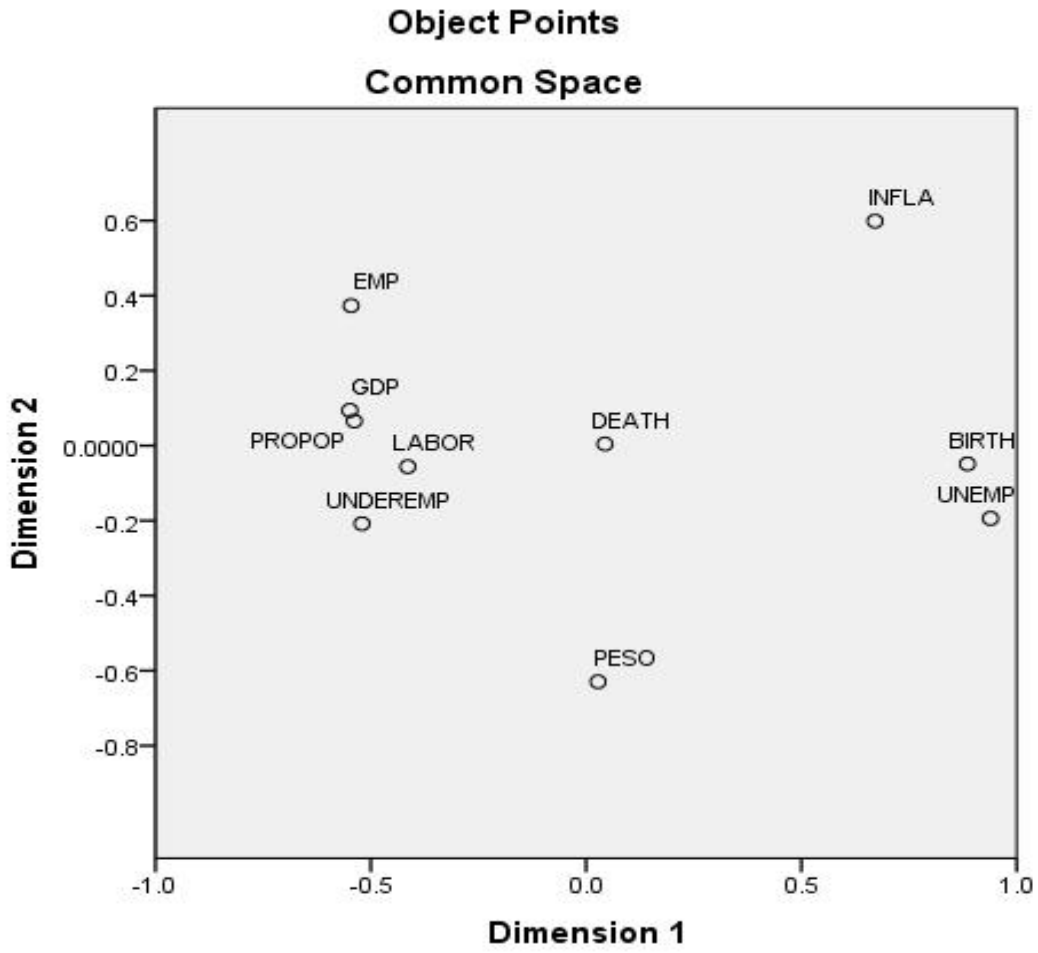


Table 4.0.5A and figure 4.0.5 contain the distance coefficient between variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, UNEMPLOYMENT RATE and BIRTH RATE, UNDEREMPLOYMENT RATE and LABOR FORCE PARTICIPATION RATE, also PURCHASING POWER OF THE PESO and DEATH RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity is not a problem for those data.

Table 4.0.5B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.548751	**0.093801**
PURCHASING POWER OF THE PESO	**0.027813**	-0.629502
INFLATION RATE	**0.670988**	0.598772
LABOR FORCE PARTICIPATION RATE	-0.414110	**-0.055933**
EMPLOYMENT RATE	-0.545734	**0.373245**
UNEMPLOYMENT RATE	**0.939179**	-0.193928
UNDEREMPLOYMENT RATE	-0.520448	**-0.207988**
POPULATION	-0.538419	**0.065856**
BIRTH RATE	**0.885697**	-0.048665
DEATH RATE	**0.043785**	0.004341

Table 4.0.5B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the purchasing power of the peso, inflation rate, unemployment rate, birth rate, and death rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, labor force participation rate, employment rate, underemployment rate, and population. These coordinates were being utilized for the construction of statistical index for the Central Luzon (R3).

Table 4.0.5C: Stress and Fit Test.

Normalized Raw Stress	0.012344
Dispersion Accounted For (DAF)	0.987656
Tucker's Coefficient of Congruence	0.993809

In Table 4.0.5C, the result of normalized raw stress is 0.012344. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.987656 and the tucker's coefficient of congruence of 0.993809 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.6. CALABARZON (R4A)

Table 4.0.6A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.810	0.000								
INFLA	1.462	1.220	0.000							
LABOR	0.246	0.862	1.275	0.000						
EMPLOY	0.435	0.725	1.718	0.667	0.000					
UN-EMPLOY	1.511	1.063	0.373	1.372	1.679	0.000				
UNDER-EMPLOY	0.615	1.011	1.000	0.371	1.020	1.180	0.000			
POP	0.021	0.794	1.464	0.260	0.415	1.508	0.629	0.000		
BIRTH	0.828	0.321	1.538	0.963	0.572	1.380	1.201	0.808	0.000	
DEATH	0.063	0.830	1.422	0.185	0.497	1.484	0.556	0.081	0.869	0.000

Figure 4.0.6: Conceptual mapping for CALABARZON (R4A).

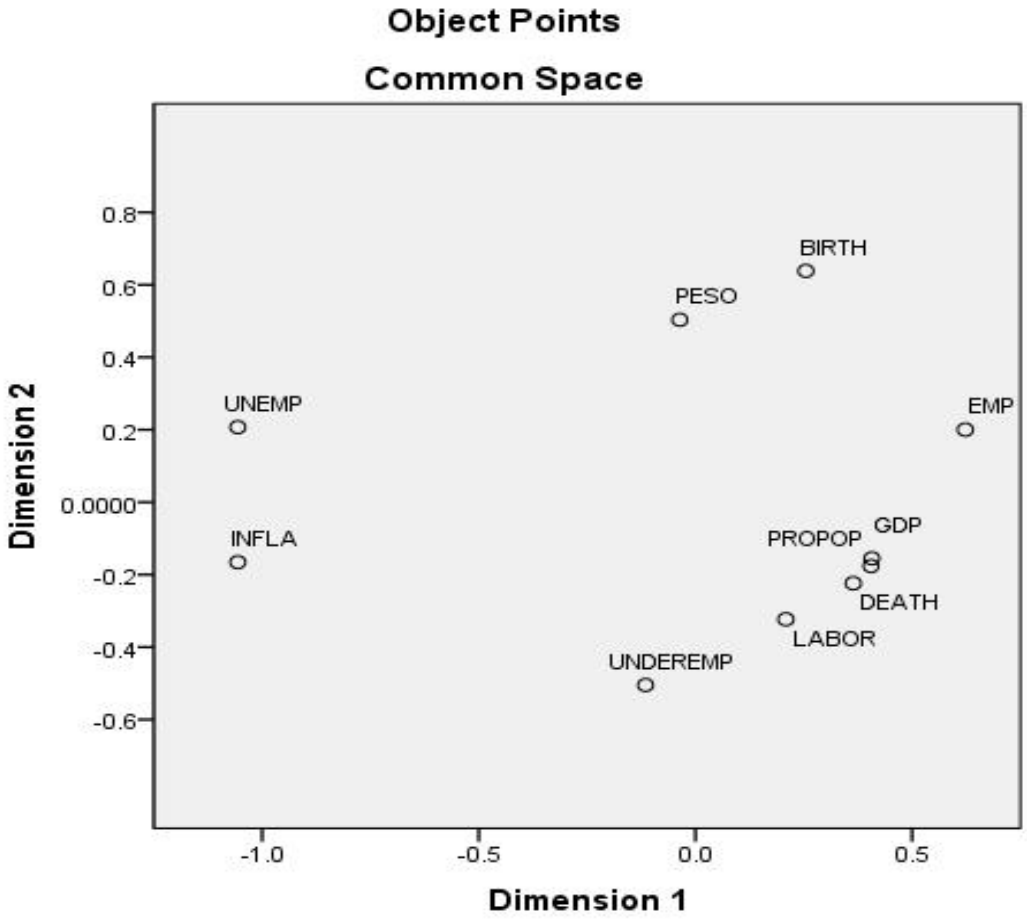


Table 4.0.6A and figure 4.0.6 show the results of distance matrix of the ten variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, LABOR FORCE PARTICIPATION RATE and DEATH RATE, PURCHASING POWER OF THE PESO and BIRTH RATE, also INFLATION RATE and UNEMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.6B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.405390**	-0.176244
PURCHASING POWER OF THE PESO	-0.035896	**0.503423**
INFLATION RATE	-1.056239	**-0.165566**
LABOR FORCE PARTICIPATION RATE	**0.208773**	-0.323365
EMPLOYMENT RATE	**0.622819**	0.200151
UNEMPLOYMENT RATE	-1.056282	**0.207000**
UNDEREMPLOYMENT RATE	**-0.115075**	-0.504767
POPULATION	**0.407238**	-0.155042
BIRTH RATE	0.254984	**0.638292**
DEATH RATE	**0.364287**	-0.223883

Table 4.0.6B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinate for the gross domestic product, labor force participation rate, employment rate, underemployment rate, population, and death rate. On the other hand, the second dimension had a high coordinates for the purchasing power of the peso, inflation rate, unemployment rate, and birth rate. These coordinates were being utilized for the construction of statistical index for the CALABARZON (R4A).

Table 4.0.6C: Stress and Fit Test.

normalized raw stress	0.013060
dispersion accounted for (DAF)	0.986940
Tucker's Coefficient of Congruence	0.993449

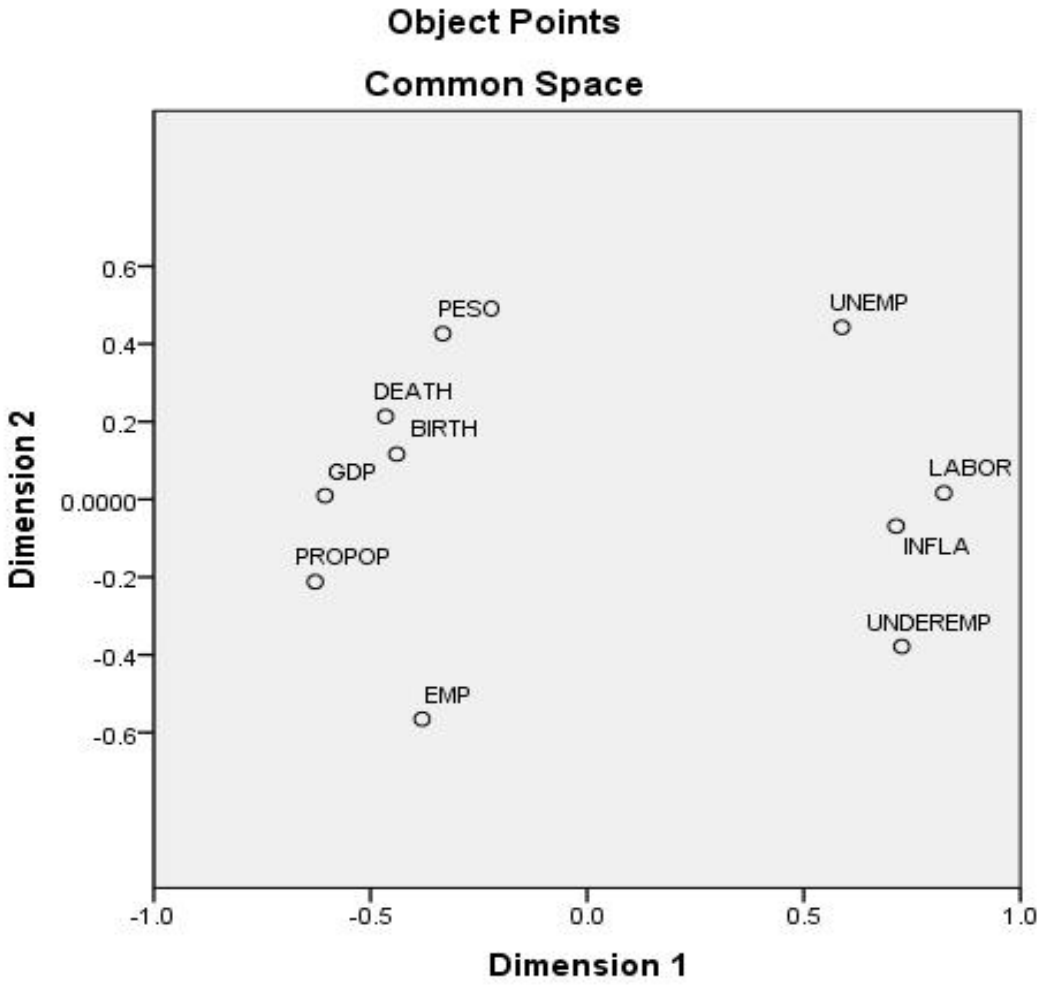
In Table 4.0.6C, the result of normalized raw stress is 0.013060. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.986940 and the tucker's coefficient of congruence of 0.993449 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.7. MIMAROPA (R4B)

Table 4.0.7A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.498	0.000								
INFLA	1.321	1.158	0.000							
LABOR	1.428	1.227	0.139	0.000						
EMPLOY	0.617	0.993	1.202	1.337	0.000					
UN-EMPLOY	1.269	0.921	0.527	0.487	1.398	0.000				
UNDER-EMPLOY	1.387	1.331	0.310	0.407	1.123	0.833	0.000			
POP	0.223	0.703	1.349	1.469	0.431	1.381	1.364	0.000		
BIRTH	0.197	0.328	1.167	1.267	0.684	1.078	1.266	0.379	0.000	
DEATH	0.247	0.251	1.212	1.304	0.784	1.078	1.331	0.455	0.100	0.000

Figure 4.0.7: Conceptual mapping for MIMAROPA (R4B).



The table and figure above show how each variable associated with each other. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, BIRTH RATE and DEATH RATE, also INFLATION RATE and LABOR FORCE PARTICIPATION RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.7B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.605039	**0.009635**
PURCHASING POWER OF THE PESO	-0.333145	**0.426535**
INFLATION RATE	**0.713377**	-0.068777
LABOR FORCE PARTICIPATION RATE	**0.823408**	0.016411
EMPLOYMENT RATE	**-0.380762**	-0.565578
UNEMPLOYMENT RATE	**0.588092**	0.442847
UNDEREMPLOYMENT RATE	**0.726346**	-0.378636
POPULATION	-0.627518	**-0.212201**
BIRTH RATE	-0.439299	**0.116393**
DEATH RATE	-0.465460	**0.213371**

Table 4.0.7B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the inflation rate, labor force participation rate, employment rate, unemployment rate, and underemployment rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, purchasing power of the peso, population, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the MIMAROPA (R4B).

Table 4.0.7C: Stress and Fit Test.

Normalized Raw Stress	0.014127
Dispersion Accounted For (DAF)	0.985873
Tucker's Coefficient of Congruence	0.992911

In Table 4.0.7C, the result of normalized raw stress is 0.014127. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.985873 and the tucker's coefficient of congruence of 0.992911 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.8. Bicol Region (R5)

Table 4.0.8A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.810	0.000								
INFLA	1.379	0.602	0.000							
LABOR	1.392	0.725	0.307	0.000						
EMPLOY	0.759	0.557	1.093	1.273	0.000					
UN-EMPLOY	1.150	0.903	0.903	0.655	1.408	0.000				
UNDER-EMPLOY	1.375	0.826	0.534	0.233	1.383	0.457	0.000			
POP	0.050	0.794	1.371	1.396	0.716	1.176	1.387	0.000		
BIRTH	0.994	0.953	1.096	0.886	1.391	0.264	0.709	1.028	0.000	
DEATH	0.378	0.925	1.394	1.323	1.066	0.916	1.244	0.426	0.704	0.000

Figure 4.0.8: Conceptual mapping for Bicol Region (R5).

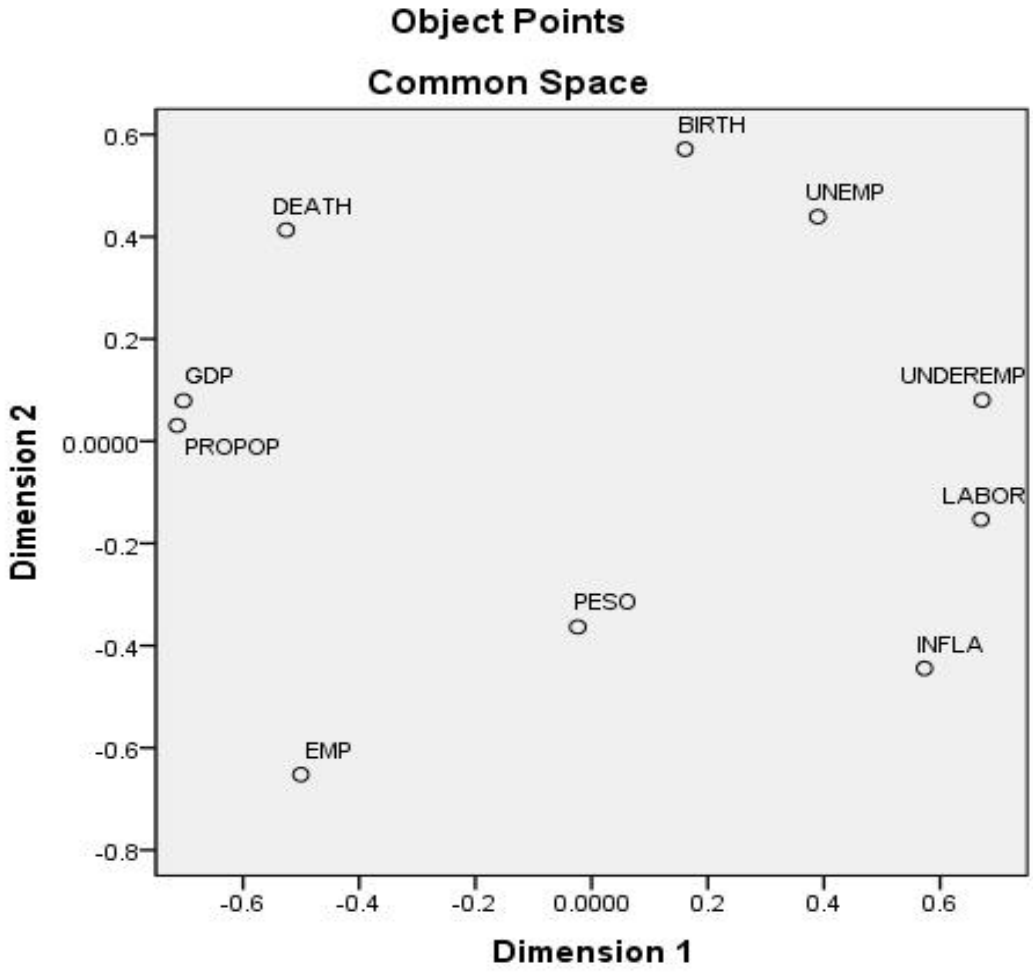


Table 4.0.8A and figure 4.0.8 display the distance matrix of the considered variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, LABOR FORCE PARTICIPATION RATE and UNDEREMPLOYMENT RATE, UNEMPLOYMENT RATE and BIRTH RATE, also PURCHASING POWER OF THE PESO and EMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.8B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.702511	**0.078982**
PURCHASING POWER OF THE PESO	**-0.023761**	-0.363599
INFLATION RATE	**0.573004**	-0.444560
LABOR FORCE PARTICIPATION RATE	**0.670150**	-0.153110
EMPLOYMENT RATE	**-0.500371**	-0.652409
UNEMPLOYMENT RATE	0.389406	**0.439224**
UNDEREMPLOYMENT RATE	**0.672400**	0.080294
POPULATION	-0.713391	**0.030679**
BIRTH RATE	0.160801	**0.571250**
DEATH RATE	-0.525727	**0.413248**

Table 4.0.8B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the purchasing power of the peso, inflation rate, labor force participation rate, employment rate, and underemployment rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, unemployment rate, population, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the Bicol Region (R5).

Table 4.0.8C: Stress and Fit Test.

Normalized Raw Stress	0.017877
Dispersion Accounted For (DAF)	0.982123
Tucker's Coefficient of Congruence	0.991021

In Table 4.0.8C, the result of normalized raw stress is 0.017877. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.982123 and the tucker's coefficient of congruence of 0.991021 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.9. Western Visayas (R6)

Table 4.0.9A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.620	0.000								
INFLA	1.006	0.874	0.000							
LABOR	1.326	1.382	0.549	0.000						
EMPLOY	0.170	0.785	1.062	1.315	0.000					
UN-EMPLOY	1.380	1.068	0.444	0.791	1.464	0.000				
UNDER-EMPLOY	1.463	1.226	0.464	0.644	1.525	0.211	0.000			
POP	0.074	0.689	1.018	1.309	0.097	1.406	1.479	0.000		
BIRTH	1.244	0.831	0.507	0.994	1.355	0.294	0.502	1.283	0.000	
DEATH	0.570	0.965	0.760	0.853	0.496	1.203	1.203	0.525	1.194	0.000

Figure 4.0.9: Conceptual mapping for Western Visayas (R6).

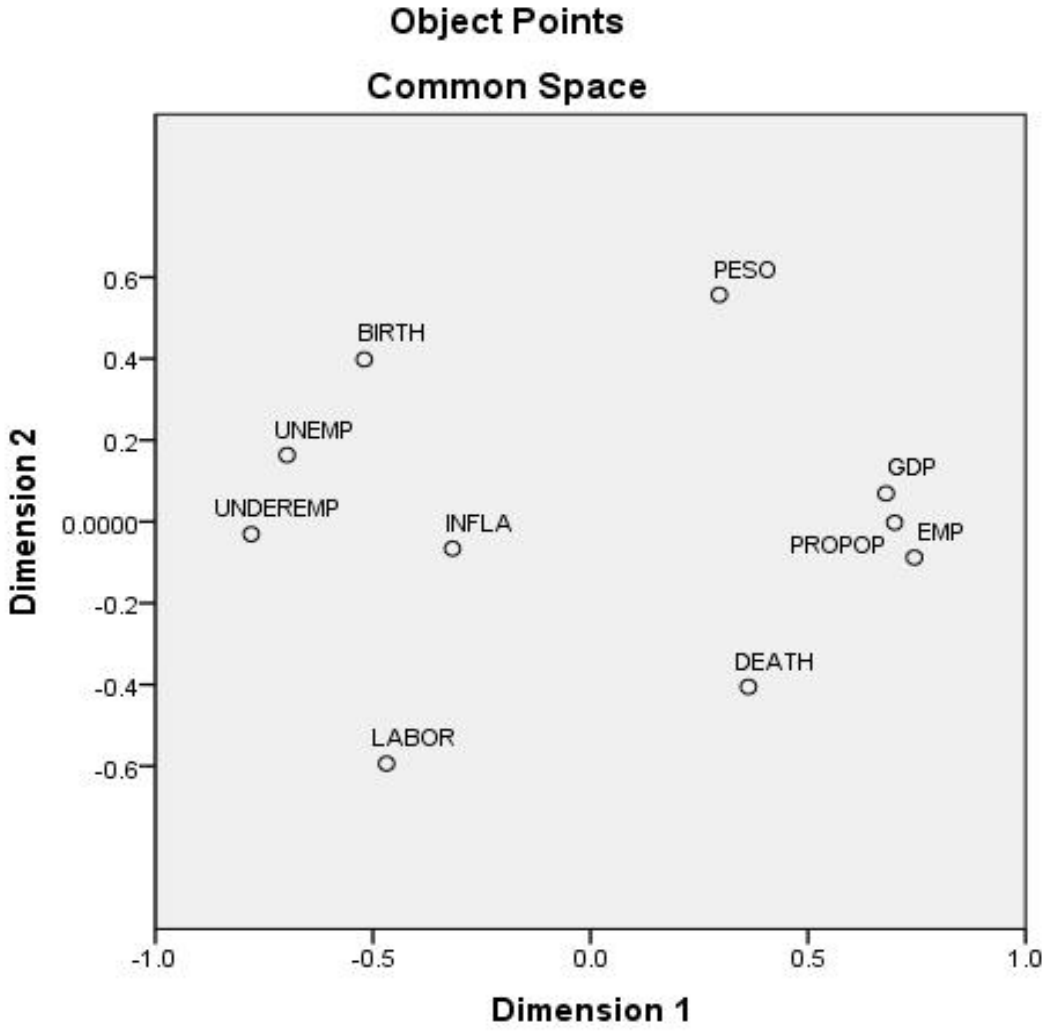


Table 4.0.9A and figure 4.0.9 contain the distance coefficient between variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, UNEMPLOYMENT RATE and UNDEREMPLOYMENT RATE, DEATH RATE and EMPLOYMENT RATE, also LABOR FORCE PARTICIPATION RATE and INFLATION RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.9B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.679491**	0.069131
PURCHASING POWER OF THE PESO	0.296107	**0.556730**
INFLATION RATE	-0.317060	**-0.066429**
LABOR FORCE PARTICIPATION RATE	**-0.468615**	-0.594136
EMPLOYMENT RATE	**0.744588**	-0.088009
UNEMPLOYMENT RATE	-0.697202	**0.163352**
UNDEREMPLOYMENT RATE	-0.779738	**-0.030824**
POPULATION	**0.699167**	-0.002391
BIRTH RATE	-0.519875	**0.398132**
DEATH RATE	**0.363137**	-0.405555

Table 4.0.9B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the gross domestic product, labor force participation rate, employment rate, population, and death rate. On the other hand, the second dimension had a high coordinates for the purchasing power of the peso, inflation rate, unemployment rate, underemployment rate, and birth rate. These coordinates were being utilized for the construction of statistical index for the Western Visayas (R6).

Table 4.0.9C: Stress and Fit Test.

Normalized Raw Stress	0.013409
Dispersion Accounted For (DAF)	0.986591
Tucker's Coefficient of Congruence	0.993273

In Table 4.0.9C, the result of normalized raw stress is 0.013409. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.986591 and the tucker's coefficient of congruence of 0.993273 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.10. Central Visayas (R7)

Table 4.0.10A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.696	0.000								
INFLA	1.109	0.618	0.000							
LABOR	0.481	1.018	1.196	0.000						
EMPLOY	0.304	0.572	1.120	0.783	0.000					
UN-EMPLOY	1.521	1.351	0.833	1.313	1.679	0.000				
UNDER-EMPLOY	0.922	1.059	0.877	0.620	1.155	0.701	0.000			
POP	0.019	0.699	1.103	0.463	0.321	1.506	0.905	0.000		
BIRTH	1.312	0.792	0.203	1.385	1.316	0.818	1.012	1.306	0.000	
DEATH	0.178	0.870	1.243	0.384	0.455	1.572	0.927	0.171	1.446	0.000

Figure 4.0.10: Conceptual mapping for Central Visayas (R7).

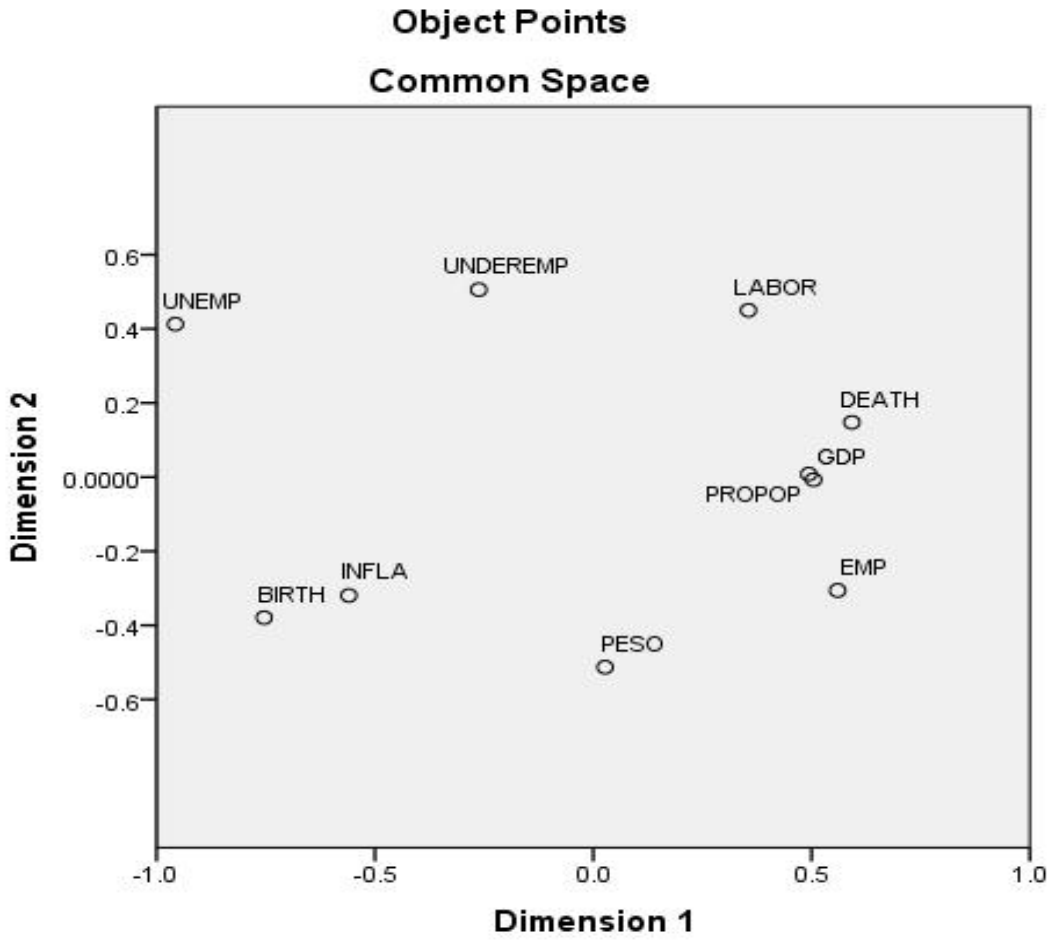


Table 4.0.10A and figure 4.0.10 show the results of distance matrix of the ten variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, INFLATION RATE and BIRTH RATE, LABOR FORCE PARTICIPATION RATE and DEATH RATE, PURCHASING POWER OF THE PESO and EMPLOYMENT RATE, also UNEMPLOYMENT RATE and UNDEREMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.10B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.504597**	-0.006933
PURCHASING POWER OF THE PESO	**0.026969**	-0.512975
INFLATION RATE	-0.559849	**-0.319400**
LABOR FORCE PARTICIPATION RATE	0.355547	**0.450095**
EMPLOYMENT RATE	**0.559914**	-0.305851
UNEMPLOYMENT RATE	-0.957182	**0.412744**
UNDEREMPLOYMENT RATE	-0.262250	**0.505737**
POPUALTION	**0.493609**	0.007973
BIRTH RATE	-0.753756	**-0.379286**
DEATH RATE	**0.592400**	-0.379286

Table 4.0.10B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the gross domestic product, purchasing power of the peso, employment rate, population, and death rate. On the other hand, the second dimension had a high coordinates for the inflation rate, labor force participation rate, unemployment rate, underemployment rate, and birth rate. These coordinates were being utilized for the construction of statistical index for the Central Visayas (R7).

Table 4.0.10C: Stress and Fit Test.

Normalized Raw Stress	0.020035
Dispersion Accounted For (DAF)	0.979965
Tucker's Coefficient of Congruence	0.989932

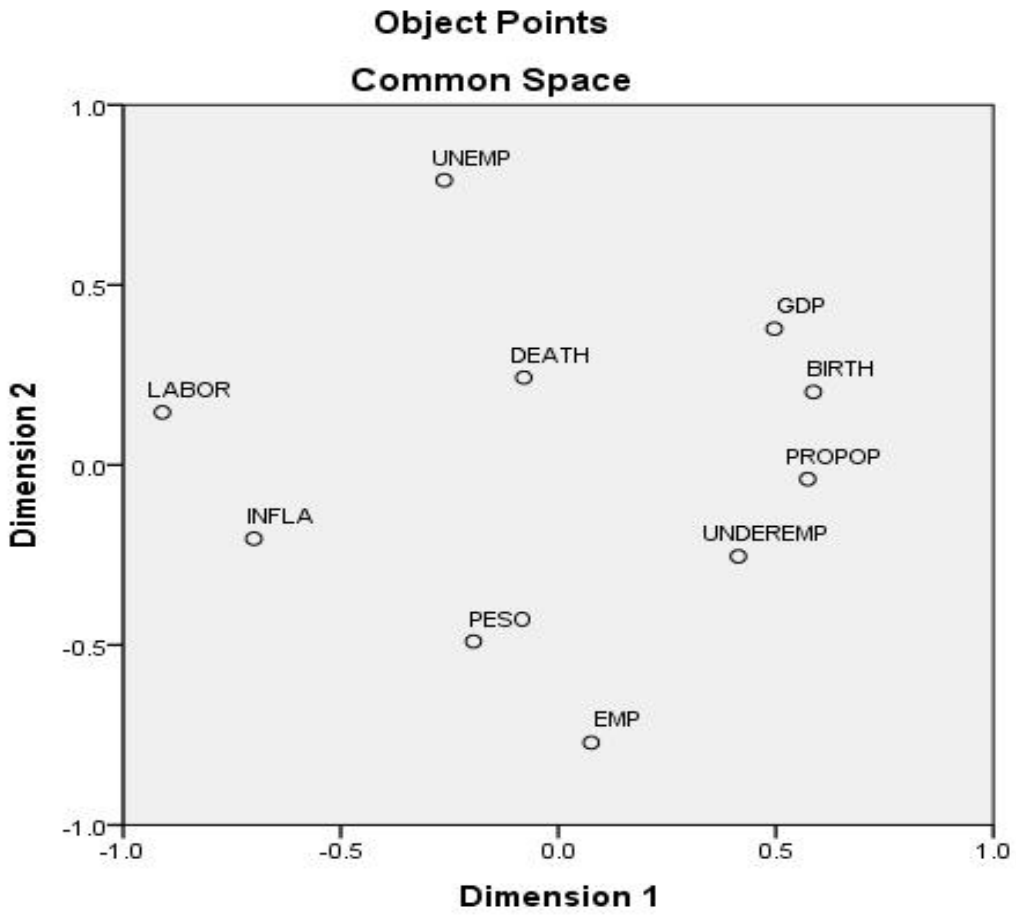
In Table 4.0.10C, the result of normalized raw stress is 0.020035. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.979965 and the tucker's coefficient of congruence of 0.989932 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted

4.0.11. Eastern Visayas (R8)

Table 4.0.11A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	1.110	0.000								
INFLA	1.331	0.580	0.000							
LABOR	1.426	0.957	0.409	0.000						
EMPLOY	1.224	0.390	0.960	1.346	0.000					
UN-EMPLOY	0.864	1.283	1.087	0.914	1.598	0.000				
UNDER-EMPLOY	0.638	0.653	1.114	1.383	0.618	1.244	0.000			
POP	0.425	0.891	1.284	1.495	0.885	1.178	0.268	0.000		
BIRTH	0.197	1.044	1.349	1.498	1.100	1.033	0.488	0.242	0.000	
DEATH	0.591	0.742	0.765	0.837	1.026	0.578	0.7	0.711	0.667	0.000

Figure 4.0.11: Conceptual mapping for Eastern Visayas (R8).



The table and figure above show how each variable associated with each other. There was a high similarity between GROSS DOMESTIC PRODUCT and BIRTH RATE, UNDEREMPLOYMENT RATE and POPULATION, PURCHASING POWER OF THE PESO and EMPLOYMENT RATE, INFLATION RATE and LABOR FORCE PARTICIPATION RATE, also UNEMPLOYMENT RATE and DEATH RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity is not a problem for those data.

Table 4.0.11B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.496630**	0.378288
PURCHASING POWER OF THE PESO	**-0.194819**	-0.490261
INFLATION RATE	-0.699473	**-0.204834**
LABOR FORCE PARTICIPATION RATE	-0.910023	**0.146049**
EMPLOYMENT RATE	**0.075453**	-0.771406
UNEMPLOYMENT RATE	-0.262277	**0.790555**
UNDEREMPLOYMENT RATE	**0.413728**	-0.254133
POPULATION	**0.573402**	-0.039430
BIRTH RATE	**0.586488**	0.202477
DEATH RATE	-0.079108	**0.242695**

Table 4.0.11B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the gross domestic product, purchasing power of the peso, employment rate, underemployment rate, population, and birth rate. On the other hand, the second dimension had a high coordinates for the inflation rate, labor force participation rate, unemployment rate, and death rate. These coordinates were being utilized for the construction of statistical index for the Eastern Visayas (R8).

Table 4.0.11C: Stress and Fit Test.

Normalized Raw Stress	0.031183
Dispersion Accounted For (DAF)	0.968817
Tucker's Coefficient of Congruence	0.984285

In Table 4.0.11C, the result of normalized raw stress is 0.031183. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.968817 and the tucker's coefficient of congruence of 0.984285 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.12. Zamboanga Peninsula (R9)

Table 4.0.12A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.920	0.000								
INFLA	1.241	1.063	0.000							
LABOR	1.458	0.809	0.652	0.000						
EMPLOY	1.125	1.314	0.479	1.115	0.000					
UN-EMPLOY	0.903	0.304	1.343	1.108	1.543	0.000				
UNDER-EMPLOY	1.278	0.466	0.880	0.388	1.272	0.746	0.000			
POP	0.005	0.925	1.242	1.462	1.125	0.908	1.283	0.000		
BIRTH	0.238	0.682	1.124	1.257	1.102	0.685	1.051	0.242	0.000	
DEATH	0.310	0.929	0.970	1.290	0.816	1.010	1.188	0.309	0.361	0.000

Figure 4.0.12: Conceptual mapping for Zamboanga Peninsula (R9).

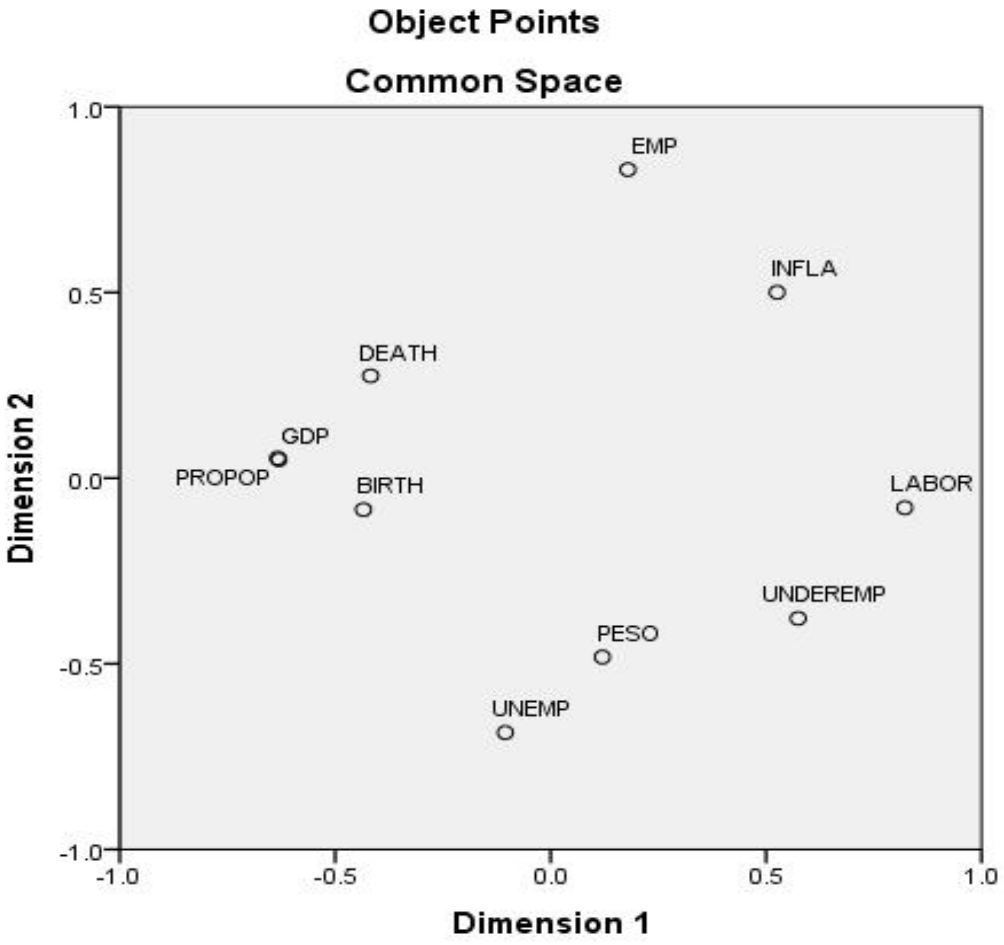


Table 4.0.12A and figure 4.0.12 display the distance matrix of the considered variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, PURCHASING POWER OF THE PESO and UNEMPLOYMENT RATE, LABOR FORCE PARTICIPATION RATE and UNDEREMPLOYMENT RATE, also INFLATION RATE and EMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.12B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.630576	**0.049421**
PURCHASING POWER OF THE PESO	**0.120203**	-0.481947
INFLATION RATE	**0.525730**	0.500307
LABOR FORCE PARTICIPATION RATE	**0.822116**	-0.079907
EMPLOYMENT RATE	0.179193	**0.831070**
UNEMPLOYMENT RATE	**-0.105287**	-0.685294
UNDEREMPLOYMENT RATE	**0.574344**	-0.377956
POPULATION	-0.633418	**0.053593**
BIRTH RATE	-0.434435	**-0.084741**
DEATH RATE	-0.417870	**0.275453**

Table 4.0.12B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the purchasing power of the peso, inflation rate, labor force participation rate, unemployment rate, and underemployment rate, On the other hand, the second dimension had a high coordinates for the gross domestic product, employment rate, population, birth rate, and death rate.. These coordinates were being utilized for the construction of statistical index for the Zamboanga Peninsula (R9).

Table 4.0.12C: Stress and Fit Test.

Normalized Raw Stress	0.026071
Dispersion Accounted For (DAF)	0.973929
Tucker's Coefficient of Congruence	0.986878

In Table 4.0.12C, the result of Normalized Raw Stress is 0.026071. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.973929 and the tucker's coefficient of congruence of 0.986878 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.13. Northern Mindanao (R10)

Table 4.0.13A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.675	0.000								
INFLA	1.341	1.100	0.000							
LABOR	1.442	1.013	0.390	0.000						
EMPLOY	1.162	1.184	0.473	0.844	0.000					
UN-EMPLOY	0.821	0.287	1.365	1.229	1.471	0.000				
UNDER-EMPLOY	1.272	0.666	0.819	0.518	1.159	0.797	0.000			
POP	0.052	0.713	1.334	1.449	1.139	0.868	1.297	0.000		
BIRTH	0.080	0.664	1.268	1.380	1.082	0.835	1.234	0.069	0.000	
DEATH	0.530	0.885	0.987	1.214	0.682	1.138	1.248	0.494	0.453	0.000

Figure 4.0.13: Conceptual mapping for Northern Mindanao (R10).

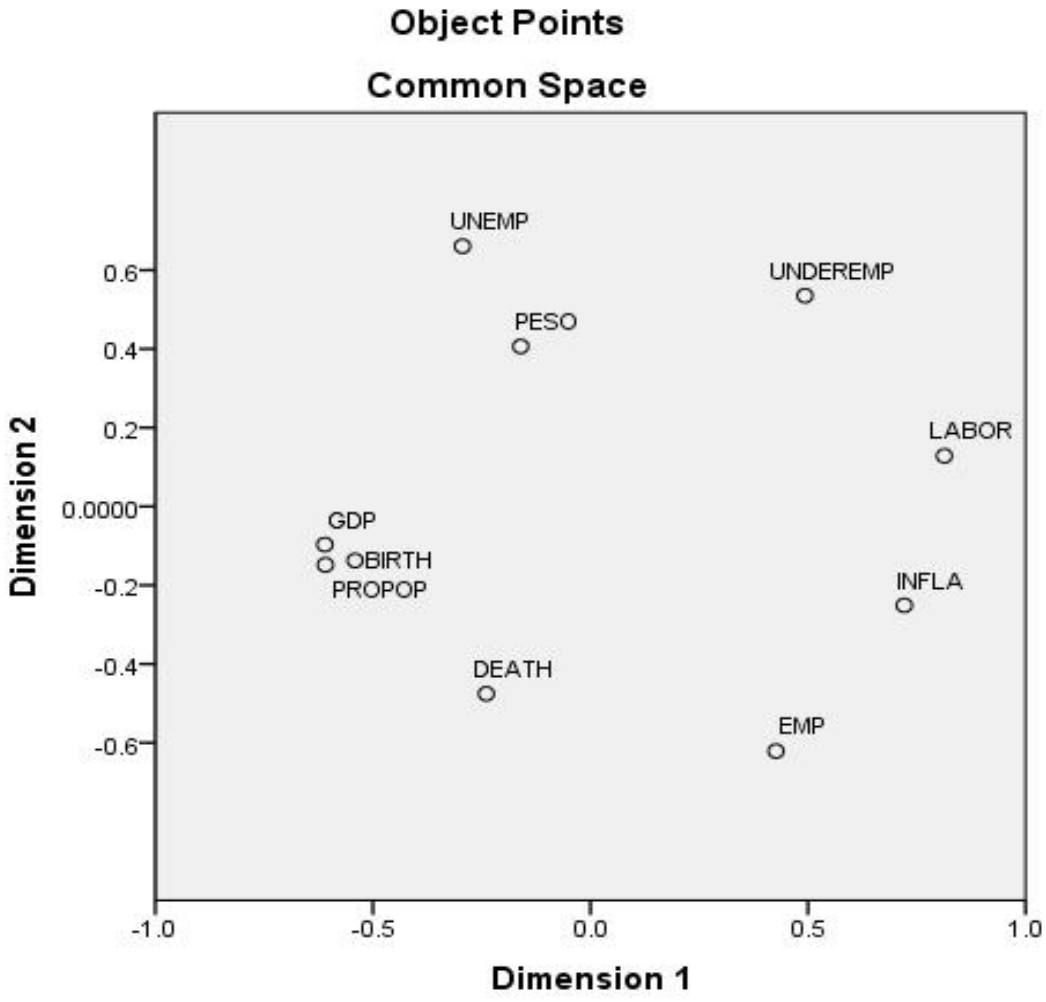


Table 4.0.13A and figure 4.0.13 contain the distance coefficient between variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, PURCHASING POWER OF THE PESO and UNEMPLOYMENT RATE, INFLATION RATE and LABOR FORCE PARTICIPATION RATE, also DEATH RATE and BIRTH RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.13B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.610430	**-0.096760**
PURCHASING POWER OF THE PESO	-0.160448	**0.406271**
INFLATION RATE	**0.721373**	-0.251161
LABOR FORCE PARTICIPATION RATE	**0.813500**	0.128229
EMPLOYMENT RATE	**0.426553**	-0.621404
UNEMPLOYMENT RATE	-0.294218	**0.660750**
UNDEREMPLOYMENT RATE	0.493217	**0.535207**
POPULATION	-0.609074	**-0.148422**
BIRTH RATE	-0.541078	**-0.137229**
DEATH RATE	**-0.239394**	-0.475482

Table 4.0.13B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the inflation rate, labor force participation rate, employment rate, and death rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, purchasing power of the peso, unemployment rate, underemployment rate, population, and birth rate. These coordinates were being utilized for the construction of statistical index for the Northern Mindanao (R10).

Table 4.0.13C: Stress and Fit Test.

Normalized Raw Stress	0.012538
Dispersion Accounted For (DAF)	0.987462
Tucker's Coefficient of Congruence	0.993711

In Table 4.0.13C, the result of normalized raw stress is 0.012538. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.987462 and the tucker's coefficient of congruence of 0.993711 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.14. Davao Region (R11)

Table 4.0.14A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	1.002	0.000								
INFLA	1.229	1.266	0.000							
LABOR	1.377	1.112	0.378	0.000						
EMPLOY	0.648	1.359	0.850	1.149	0.000					
UN-EMPLOY	1.261	0.385	1.125	0.873	1.462	0.000				
UNDER-EMPLOY	1.200	0.739	0.638	0.380	1.165	0.501	0.000			
POP	0.067	0.947	1.246	1.376	0.704	1.218	1.182	0.000		
BIRTH	0.215	1.127	1.112	1.312	0.441	1.337	1.193	0.277	0.000	
DEATH	0.320	0.714	1.270	1.329	0.891	1.020	1.074	0.255	0.508	0.000

Figure 4.0.14: Conceptual mapping for Davao region (R11).

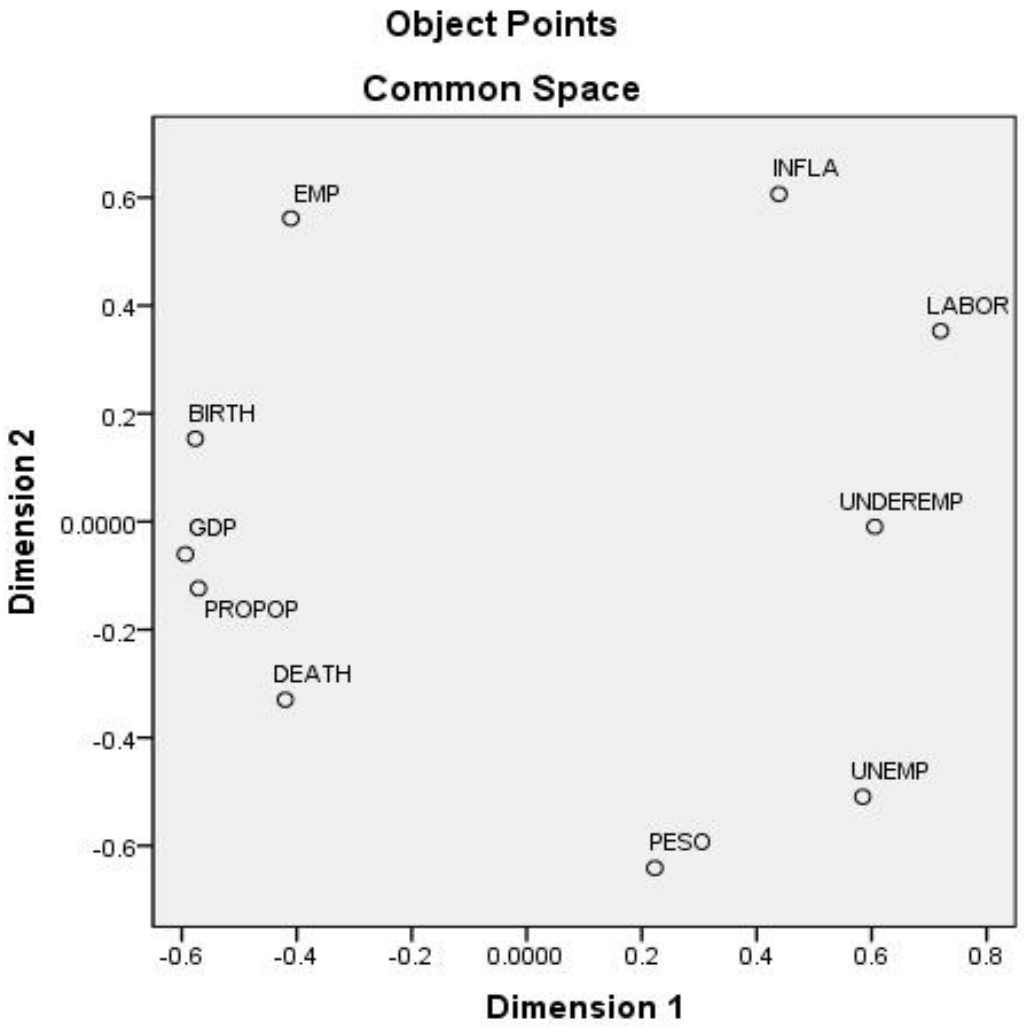


Table 4.0.14A and figure 4.0.14 show the results of distance matrix of the ten variables. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, INFLATION RATE and LABOR FORCE PARTICIPATION RATE, PURCHASING POWER OF THE PESO and UNEMPLOYMENT RATE, also EMPLOYMENT RATE and BIRTH RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.14B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.593683	**-0.060401**
PURCHASING POWER OF THE PESO	**0.222724**	-0.641430
INFLATION RATE	0.438801	**0.606303**
LABOR FORCE PARTICIPATION RATE	**0.719819**	0.353047
EMPLOYMENT RATE	-0.410203	**0.561399**
UNEMPLOYMENT RATE	**0.584404**	-0.509530
UNDEREMPLOYMENT RATE	**0.605337**	-0.009435
POPULATION	-0.570810	**-0.123692**
BIRTH RATE	-0.576473	**0.153445**
DEATH RATE	-0.419917	**-0.329706**

Table 4.0.14B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the purchasing power of the peso, labor force participation rate, unemployment rate, and underemployment rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, inflation rate, employment rate, population, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the Davao Region (R11).

Table 4.0.14C: Stress and Fit Test.

Normalized Raw Stress	0.010366
Dispersion Accounted For (DAF)	0.989634
Tucker's Coefficient of Congruence	0.994803

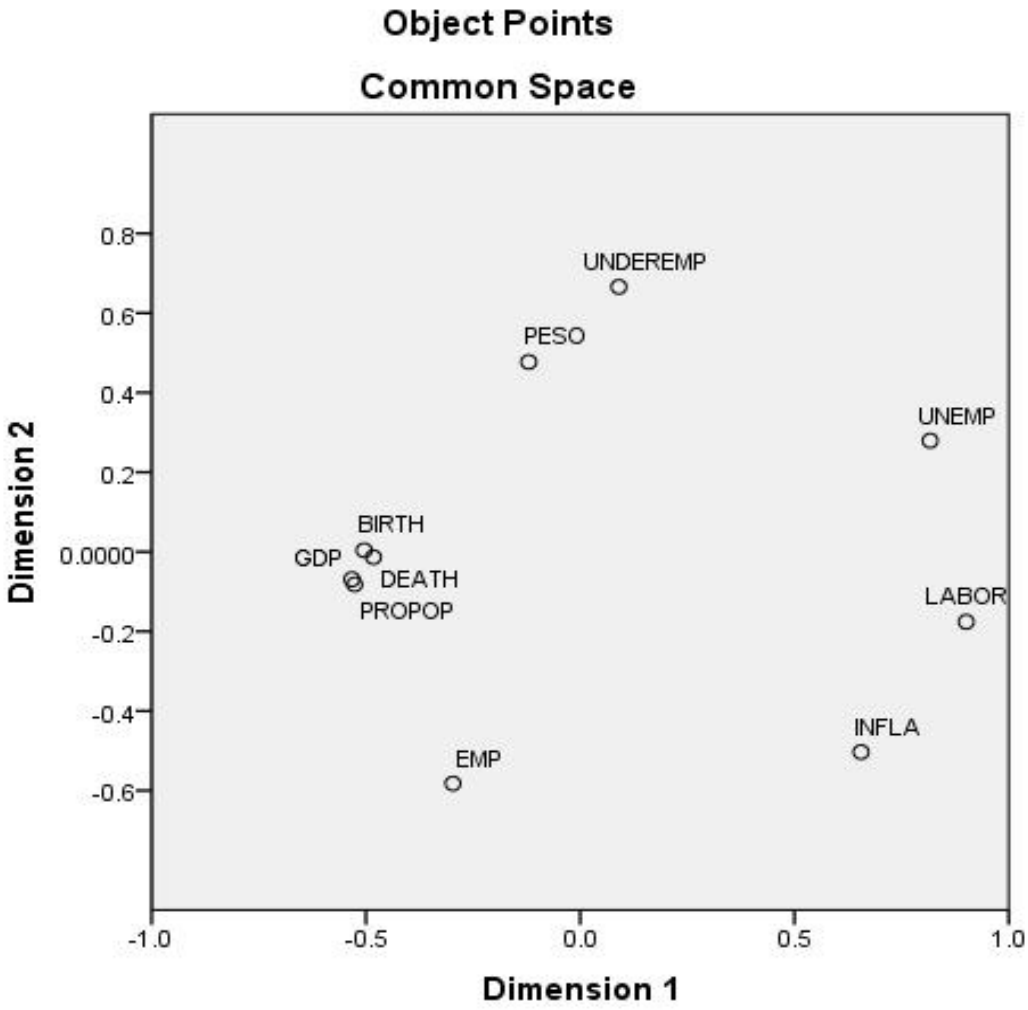
In Table 4.0.14C, the result of normalized raw stress is 0.010366. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.989634 and the tucker's coefficient of congruence of 0.994803 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.15. SOCCSKSARGEN (R12)

Table 4.0.15A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.684	0.000								
INFLA	1.265	1.250	0.000							
LABOR	1.438	1.212	0.409	0.000						
EMPLOY	0.565	1.074	0.956	1.265	0.000					
UN-EMPLOY	1.394	0.957	0.799	0.463	1.408	0.000				
UNDER-EMPLOY	0.963	0.283	1.298	1.169	1.307	0.823	0.000			
POP	0.015	0.691	1.255	1.430	0.550	1.391	0.969	0.000		
BIRTH	0.078	0.609	1.266	1.416	0.622	1.349	0.890	0.089	0.000	
DEATH	0.075	0.610	1.239	1.393	0.598	1.332	0.889	0.081	0.027	0.000

Figure 4.0.15: Conceptual mapping for SOCCSKSARGEN (R12).



The table and figure above show how each variable associated with each other. There was a high similarity between GROSS DOMESTIC PRODUCT and POPULATION, BIRTH RATE and DEATH RATE, PURCHASING POWER OF THE PESO and UNDEREMPLOYMENT RATE, also INFLATION RATE and LABOR FORCE PARTICIPATION RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.15B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.532807	**-0.069016**
PURCHASING POWER OF THE PESO	-0.120057	**0.477009**
INFLATION RATE	**0.655406**	-0.503233
LABOR FORCE PARTICIPATION RATE	**0.900863**	-0.175959
EMPLOYMENT RATE	**-0.297130**	-0.582195
UNEMPLOYMENT RATE	**0.816704**	0.279249
UNDEREMPLOYMENT RATE	0.090213	**0.665764**
POPULATION	-0.526313	**-0.082063**
BIRTH RATE	-0.504111	**0.003855**
DEATH RATE	-0.482767	**-0.013410**

Table 4.0.15B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the inflation rate, labor force participation rate, employment rate, and unemployment rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, purchasing power of the peso, underemployment rate, population, birth rate, and death rate. These coordinates were being utilized for the construction of statistical index for the SOCCSKSARGEN (R12).

Table 4.0.15C: Stress and Fit Test.

Normalized Raw Stress	0.010936
Dispersion Accounted For (DAF)	0.989064
Tucker's Coefficient of Congruence	0.994517

In Table 4.0.15C, the result of normalized raw stress is 0.010936. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.989064 and the tucker's coefficient of congruence of 0.994517 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.16. CARAGA (R13)

Table 4.0.16A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.985	0.000								
INFLA	1.268	1.109	0.000							
LABOR	1.303	0.712	0.551	0.000						
EMPLOY	0.346	1.142	1.084	1.263	0.000					
UN-EMPLOY	1.413	0.509	1.013	0.468	1.484	0.000				
UNDER-EMPLOY	0.684	1.158	0.742	1.047	0.388	1.372	0.000			
POP	0.174	1.003	1.419	1.406	0.514	1.466	0.858	0.000		
BIRTH	0.089	1.028	1.357	1.380	0.414	1.472	0.768	0.101	0.000	
DEATH	0.111	0.907	1.291	1.279	0.446	1.354	0.758	0.130	0.121	0.000

Figure 4.0.16: Conceptual mapping for CARAGA (R13).

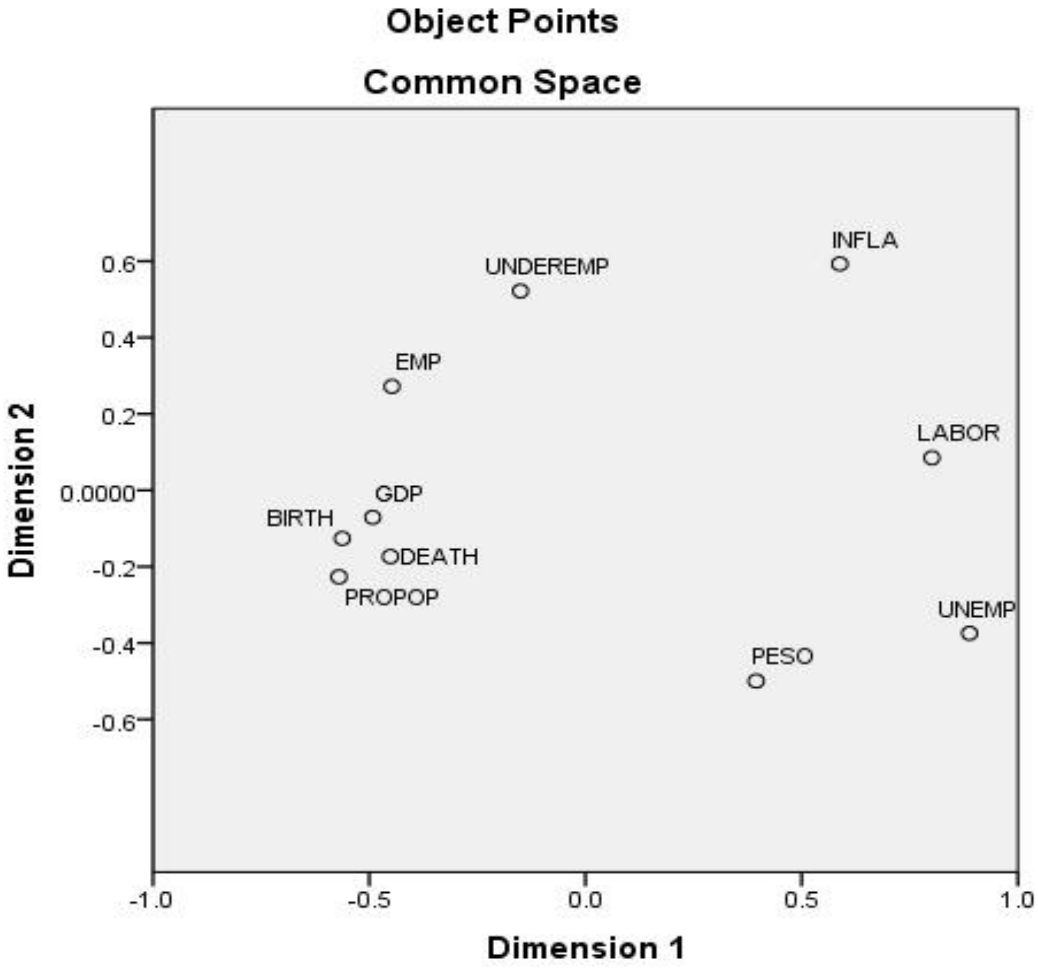


Table 4.0.16A and figure 4.1.16 display the distance matrix of the considered variables. There was a high similarity between GROSS DOMESTIC PRODUCT and BIRTH RATE, UNDEREMPLOYMENT RATE and EMPLOYMENT RATE, also LABOR FORCE PARTICIPATION RATE and UNEMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.16B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	-0.492044	**-0.070986**
PURCHASING POWER OF THE PESO	**0.394975**	-0.499627
INFLATION RATE	0.588294	**0.593000**
LABOR FORCE PARTICIPATION RATE	**0.801404**	0.084941
EMPLOYMENT RATE	-0.447341	**0.271951**
UNEMPLOYMENT RATE	**0.888373**	-0.374565
UNDEREMPLOYMENT RATE	-0.150439	**0.522059**
POPULATION	-0.569861	**-0.226748**
BIRTH RATE	-0.562365	**-0.126244**
DEATH RATE	-0.450997	**-0.173630**

Table 4.0.16B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the purchasing power of the peso, labor force participation rate, and unemployment rate. On the other hand, the second dimension had a high coordinates for the gross domestic product, inflation rate, employment rate, underemployment rate, population, birth rate, and death rate.. These coordinates were being utilized for the construction of statistical index for the CARAGA Region (R13).

Table 4.0.16C: Stress and Fit Test.

Normalized Raw Stress	0.013195
Dispersion Accounted For (DAF)	0.986805
Tucker's Coefficient of Congruence	0.993380

In Table 4.0.16C, the result of normalized raw stress is 0.013195. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.986805 and the tucker's coefficient of congruence of 0.993380 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.0.17. ARMM (R14)

Table 4.0.17A: Distance matrix for the ten variables.

	GDP	PESO	INFLA	LABOR	EMPLOY	UN-EMPLOY	UNDER-EMPLOY	POP	BIRTH	DEATH
GDP	0.000									
PESO	0.971	0.000								
INFLA	1.352	1.350	0.000							
LABOR	1.490	1.215	0.382	0.000						
EMPLOY	1.083	1.282	0.320	0.643	0.000					
UN-EMPLOY	0.455	0.583	1.444	1.463	1.249	0.000				
UNDER-EMPLOY	1.534	0.955	0.814	0.463	0.994	1.367	0.000			
POP	1.359	0.692	0.925	0.640	1.027	1.140	0.266	0.000		
BIRTH	1.121	0.252	1.210	1.021	1.199	0.790	0.715	0.449	0.000	
DEATH	1.353	0.692	0.918	0.635	1.019	1.136	0.265	0.008	0.450	0.000

Figure 4.0.17: Conceptual mapping for ARMM (R14).

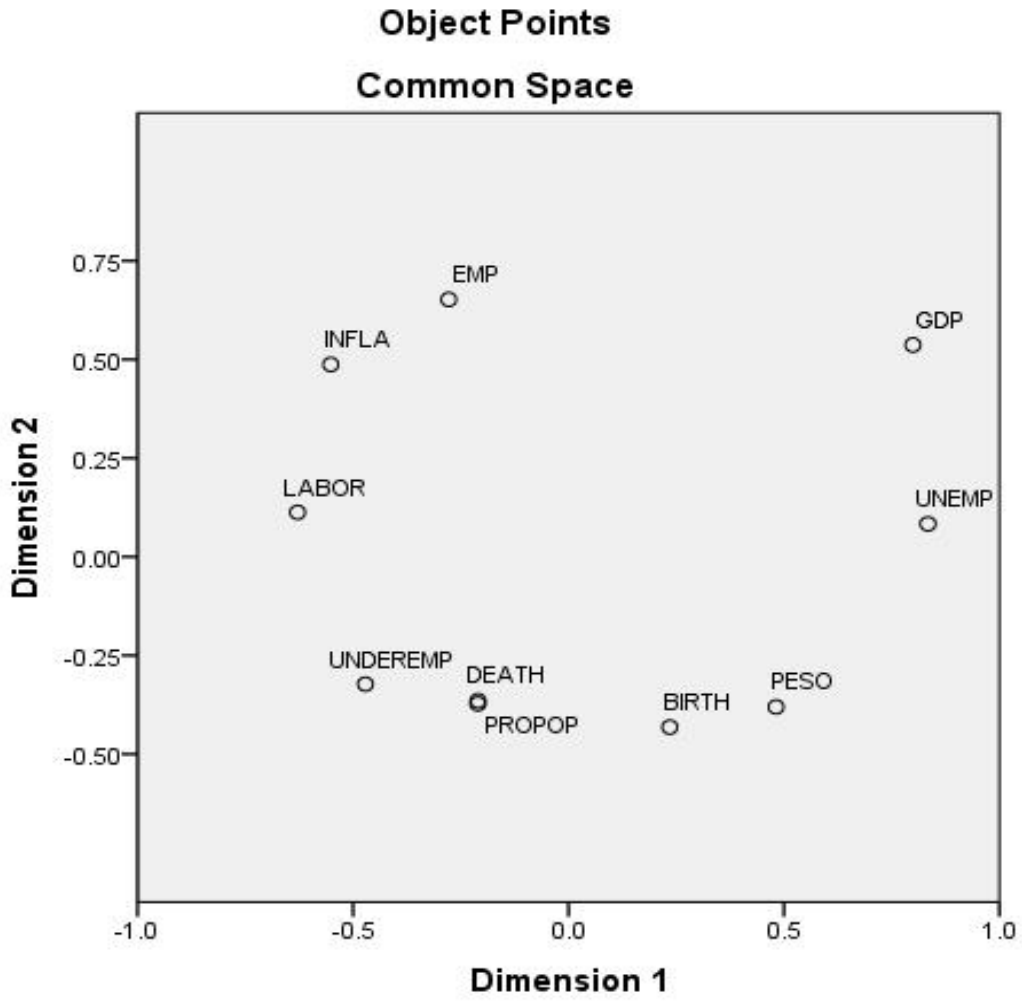


Table 4.0.17A and figure 4.0.17 contain the distance coefficient between variables. There was a high similarity between POPULATION and DEATH RATE, PURCHASING POWER OF THE PESO and BIRTH RATE, INFLATION RATE and EMPLOYMENT RATE, also GROSS DOMESTIC PRODUCT and

UNEMPLOYMENT RATE. There was a fair similarity or correlation between the other variables. Hence, multicollinearity was not a problem for those data.

Table 4.0.17B: Final coordinates of the variables for 2-dimensional conceptual mapping.

Variable Name	Dimension	
	1	2
GROSS DOMESTIC PRODUCT	**0.799339**	0.536779
PURCHASING POWER OF THE PESO	**0.481762**	-0.380696
INFLATION RATE	-0.551880	**0.487150**
LABOR FORCE PARTICIPATION RATE	-0.628663	**0.112687**
EMPLOYMENT RATE	-0.277923	**0.651996**
UNEMPLOYMENT RATE	**0.834181**	0.083453
UNDEREMPLOYMENT RATE	-0.471447	**-0.322564**
POPULATION	**-0.210513**	-0.372417
BIRTH RATE	**0.235064**	-0.431548
DEATH RATE	**-0.209921**	-0.364841

Table 4.0.17B displays the final 2-dimensional coordinates of every variable. It can be noticed that the first dimension had a high coordinates for the gross domestic product, purchasing power of the peso, unemployment rate, population, birth rate and death rate. On the other hand, the second dimension had a high coordinates for the inflation rate, labor force participation rate, employment rate, and underemployment rate. These

coordinates were being utilized for the construction of statistical index for the ARMM (R14).

Table 4.0.17C: Stress and Fit Test.

Normalized Raw Stress	0.025063
Dispersion Accounted For (DAF)	0.974937
Tucker's Coefficient of Congruence	0.987389

In Table 4.0.17C, the result of normalized raw stress is 0.025063. With the stress value greater than 0.01 but less than or equal to 0.05, the goodness of fit was good. The dispersion accounted for (DAF) of 0.974937 and the tucker's coefficient of congruence of 0.987389 were all closer to 1.00 which indicates a high degree of variable similarity. Thus, the distances among variables as representation of the relationship given by the data were not distorted.

4.1. Results of Statistical Index Construction

The identified high dimensional coordinates of every variable were used in the final construction of the statistical index. The **Economic Development Index** (**EDI**) was computed using the aggregation method.

Table 4.1A: The EDI of every region in the Philippines.

ABBRV	REGION	EDI (%)
NCR	NATIONAL CAPITAL REGION	30.40280
CAR	CORDILLERA ADMINISTRATIVE REGION	29.34369
R1	ILOCOS REGION	27.49474
R2	CAGAYAN VALLEY	29.41246
R3	CENTRAL LUZON	28.36443
R4A	SOUTHERN TAGALOG: CALABARZON	30.76581
R4B	SOUTHERN TAGALOG: MIMAROPA	30.24194
R5	BICOL REGION	29.24805
R6	WESTERN VISAYAS	30.38729
R7	CENTRAL VISAYAS	28.47379
R8	EASTERN VISAYAS	29.25347
R9	ZAMBOANGA PENINSULA	30.61900
R10	NORTHERN MINDANAO	29.41849
R11	DAVAO REGION	29.39632
R12	SOCCSKSARGEN	30.57982
R13	CARAGA REGION	28.74154
ARMM	AUTONOMOUS REGION IN MUSLIM MINDANAO	28.59181

The index values in table 4.1A were expressed in percentage (The Economist Newspaper Ltd., 2006). Furthermore, the EDI yielded the highest value of 30.76581% which implies that the environment is more conducive to the making and implementations of economic development policies while the lowest value of 27.49474% tells us that the environment is not so conducive. The index had a standard error of 0.227489325 which indicates that the sample mean is more likely an accurate reflection of the actual population mean. Moreover, the distribution was negatively skewed which implies that fewer extremely low values of indices are present.

4.2. Results of Bootstrap Resampling Technique

Bootstrap resampling technique was used to evaluate the statistical property of the Economic Development Index (EDI). Bootstrap resamples *B* of 200, 400, 600, 800, and 1000 with different percent sample sizes *s* of 25%, 45%, and 75% were considered in the study.

Table 4.2A: Bias values of EDI.

% NUMBER OF SAMPLE (S)	**NUMBER OF BOOTSTRAP RESAMPLE (B)**				
	B=200	**B=400**	**B=600**	**B=800**	**B=1000**
S=25%	-0.0000217422	0.0000706623	0.0000760979	0.0000190245	0.0000239165
S=45%	0.0000350390	0.0000486361	0.0000264097	0.0000321023	-0.0000023372
S=75%	0.0000130490	0.0000060069	0.0000072481	0.0000020506	-0.0000014924

Table 4.2A shows the bias values of EDI for each combination of the percent sample size *s* and the number of bootstrap resample *B.* The highest bias value was observed for *s* = 25% samples at *B* = 600 resamples while the lowest bias value was observed for *s* = 25% samples at *B* = 200 resamples which suggests that the estimate for the EDI values is acceptable.

Figure 4.2A: Bias value of EDI.

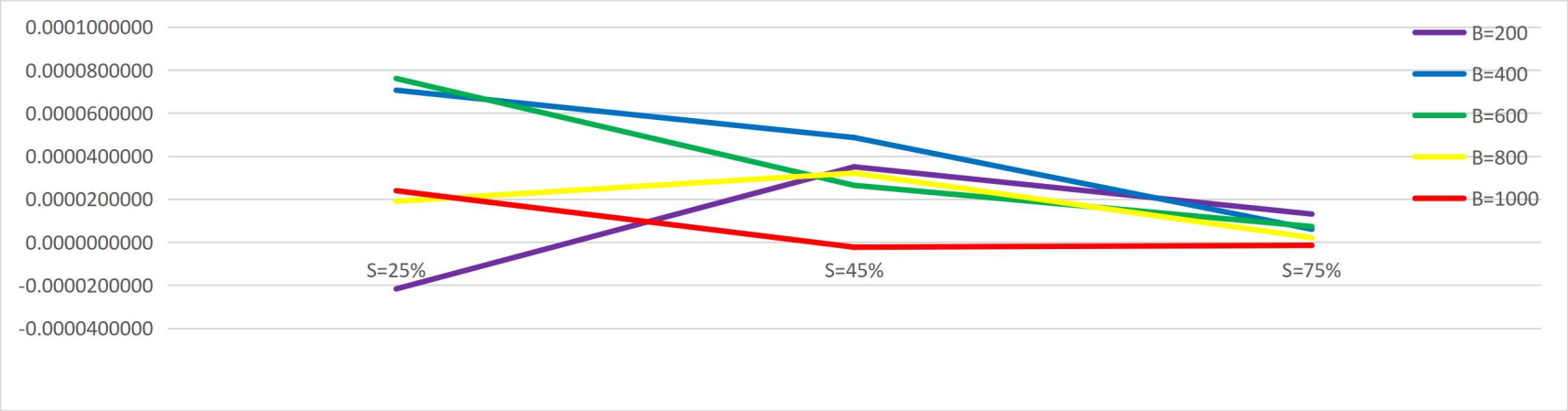


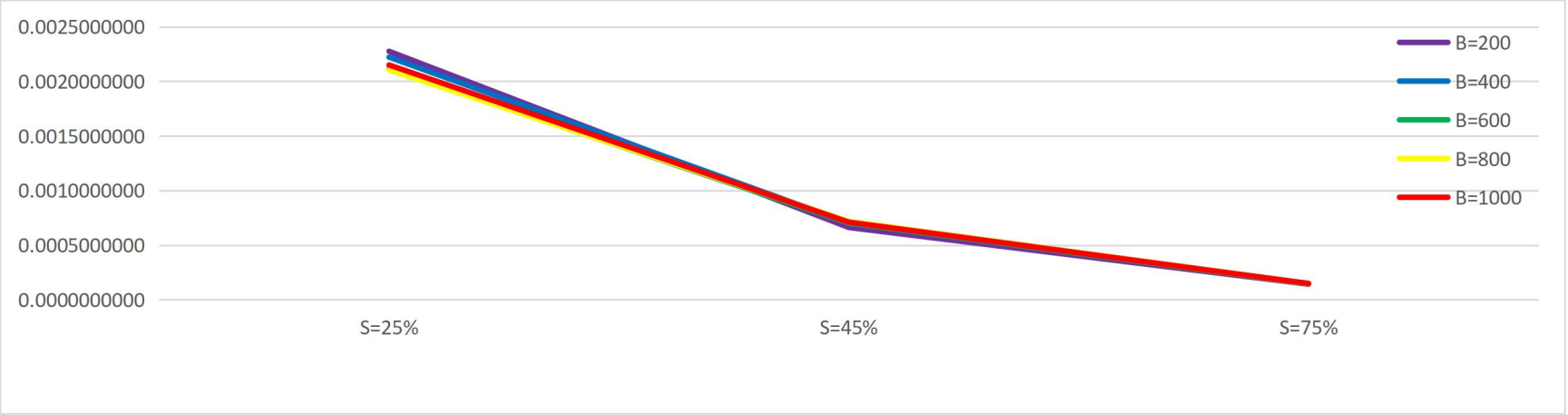
Figure 4.2A showed the behavior of the bias value of the EDI for the different percent sample size *s* and number of bootstrap resample *B*. It could be observed that as the percent sample size increases, the value of the bias from the pseudo bias got smaller. Thus, the bias value approached zero as the sample size increased. Furthermore, Lines were moving up and down to intersect each of the axes at the appropriate point along its scale resulting to a pattern that can be easily be compared to the patterns formed by other lines (S. Few, 2008). Based on this, the EDI is accurate that mirrors correctly the true structure of the estimated values (M.V. Wilson, 1981).

Table 4.2B: Standard Error of Economic Development Index (EDI).

% NUMBER OF SAMPLE (S)	NUMBER OF BOOTSTRAP RESAMPLE (B)				
	B=200	**B=400**	**B=600**	**B=800**	**B=1000**
S=25%	0.0022755494	0.0022216004	0.0021177102	0.0021050104	0.0021500182
S=45%	0.0006616862	0.0007056928	0.0007021012	0.0007181871	0.0007104601
S=75%	0.0001415714	0.0001483946	0.0001448103	0.0001476569	0.0001484791

Table 4.2B shows the standard error of EDI for each combination of percent sample sizes *s* and the numbers of bootstrap resamples *B*. The highest standard error was observed for *s* = 25% samples at *B* = 200 resamples while the lowest standard error was observed for *s* = 75% samples at *B* = 200 resamples which implies that the representation of EDI values as samples is correct.

Figure 4.2B: Standard error of EDI.



As seen in figure 4.2B, the standard error of EDI decreases which tends to approach to 0 as the sample size *s* increases that signifies accuracy of the resulting indices.

4.3. Result of Economic Development Index (EDI) Ranking

TABLE 4.3A: Ranking of Philippine Regions based on the computed EDI.

RANK	REGION	EDI (%)	DESCRIPTIVE EQUIVALENT
1	SOUTHERN TAGALOG: CALABARZON (**R4A**)	30.76581	HIGH DEVELOPMENT
2	ZAMBOANGA PENINSULA (**R9**)	30.61900	HIGH DEVELOPMENT
3	SOCCSKSARGEN (**R12**)	30.57982	HIGH DEVELOPMENT
4	NATIONAL CAPITAL REGION (**NCR**)	30.40280	HIGH DEVELOPMENT
5	WESTERN VISAYAS (**R6**)	30.38729	HIGH DEVELOPMENT
6	SOUTHERN TAGALOG: MIMAROPA (**R4B**)	30.24194	HIGH DEVELOPMENT
AVE.	PHILIPPINES (**PHIL**)	29.45502647	MEDIUM DEVELOPMENT
7	NORTHERN MINDANAO (**R10**)	29.41849	MEDIUM DEVELOPMENT
8	CAGAYAN VALLEY (**R2**)	29.41246	MEDIUM DEVELOPMENT
9	DAVAO REGION (**R11**)	29.39632	MEDIUM DEVELOPMENT
10	CORDILLERA ADMINISTRATIVE REGION (**CAR**)	29.34369	MEDIUM DEVELOPMENT
11	EASTERN VISAYAS (**R8**)	29.25347	MEDIUM DEVELOPMENT
12	BICOL REGION (**R5**)	29.24805	MEDIUM DEVELOPMENT
13	CARAGA REGION (**R13**)	28.74154	MEDIUM DEVELOPMENT
14	AUTONOMOUS REGION IN MUSLIM MINDANAO (**ARMM**)	28.59181	MEDIUM DEVELOPMENT
15	CENTRAL VISAYAS (**R7**)	28.47379	MEDIUM DEVELOPMENT
16	CENTRAL LUZON (**R3**)	28.36443	MEDIUM DEVELOPMENT
17	ILOCOS REGION (**R1**)	27.49474	MEDIUM DEVELOPMENT

Table 4.3B: Percentage scaling with descriptive equivalent.

PERCENTAGE SCALE	DESCRIPTIVE EQUIVALENT
0.00	NO DEVELOPMENT
1.00 - 9.00	LOW DEVELOPMENT
10.00 - 29.00	MEDIUM DEVELOPMENT
30.00 - 49.00	HIGH DEVELOPMENT
50.00 - 89.00	VERY HIGH DEVELOPMENT
90.00 - 100.00	COMPLETE DEVELOPMENT

Table 4.3A presents the ranking of Philippine regions with descriptive equivalent based from highest to lowest computed Economic Development Index (EDI) in percentage, respectively. Table 4.3B presents the percentage scaling with descriptive equivalent for the EDI. Region 4-A: SOUTHERN TAGALOG: CALABARZON tops the list with an EDI value of 30.76581%, followed by region 9: ZAMBOANGA PENINSULA (30.61900%) and region 12: SOCCSKSARGEN (30.57982%) which means that the regions are highly developed regions in the Philippines. On the other hand, region 7: CENTRAL VISAYAS (28.47379%), region 3: CENTRAL LUZON (28.36443%) and region 1: ILOCOS REGION (27.49474%) are the three regions with the lowest EDI value which means that the regions are the bottom regions in the Philippines that are medium in development.

4.4. Presentation of Provincial Ranking for HDI

Table 4.4A: Ranking of the Philippine provinces based on Human Development Index.

RANK	PROVINCE	HDI (%)	DESCRIPTIVE EQUIVALENT
1	METRO MANILA	83.7	VERY HIGH DEVELOPMENT
2	BENGUET	83.3	VERY HIGH DEVELOPMENT
3	BATANES	82.0	VERY HIGH DEVELOPMENT
4	ILOCOS NORTE	81.3	VERY HIGH DEVELOPMENT
5	RIZAL	76.3	HIGH DEVELOPMENT
6	CAVITE	73.7	HIGH DEVELOPMENT
7T	BATAAN	72.6	HIGH DEVELOPMENT
7T	BULACAN	72.6	HIGH DEVELOPMENT
9	LAGUNA	72.3	HIGH DEVELOPMENT
10	NUEVA VIZCAYA	70.5	HIGH DEVELOPMENT
11	PAMPANGA	65.9	MEDIUM DEVELOPMENT
12T	BATANGAS	65.7	MEDIUM DEVELOPMENT
12T	CAGAYAN	65.7	MEDIUM DEVELOPMENT
14T	AURORA	65.5	MEDIUM DEVELOPMENT
14T	BILIRAN	65.5	MEDIUM DEVELOPMENT
16	MISAMIS ORIENTAL	65.0	MEDIUM DEVELOPMENT
17	ILOILO	64.3	MEDIUM DEVELOPMENT
18T	LA UNION	64.0	MEDIUM DEVELOPMENT
18T	QUIRINO	64.0	MEDIUM DEVELOPMENT
20	SOUTH COTABATO	63.6	MEDIUM DEVELOPMENT
AVE.	PHILIPPINES	63.3	MEDIUM DEVELOPMENT
21	CATANDUANES	63.0	MEDIUM DEVELOPMENT
22	ISABELA	62.7	MEDIUM DEVELOPMENT
23	DAVAO DEL SUR	62.6	MEDIUM DEVELOPMENT
24	ZAMBALES	62.4	MEDIUM DEVELOPMENT
25T	CEBU	60.5	MEDIUM DEVELOPMENT
25T	ILOCOS SUR	60.5	MEDIUM DEVELOPMENT
27	TARLAC	59.6	MEDIUM DEVELOPMENT
28	LEYTE	58.8	MEDIUM DEVELOPMENT
29	PANGASINAN	57.8	MEDIUM DEVELOPMENT
30	MARINDUQUE	56.5	MEDIUM DEVELOPMENT

31T	AGUSAN DEL NORTE	56.2	MEDIUM DEVELOPMENT
31T	KALINGA	56.2	MEDIUM DEVELOPMENT
33T	LANAO DEL NORTE	55.8	MEDIUM DEVELOPMENT
33T	NEGROS OCCIDENTAL	55.8	MEDIUM DEVELOPMENT
35	OCCIDENTAL MINDORO	55.0	MEDIUM DEVELOPMENT
36	CAPIZ	54.3	MEDIUM DEVELOPMENT
37	GUIMARAS	53.2	MEDIUM DEVELOPMENT
38T	CAMIGUIN	53.1	MEDIUM DEVELOPMENT
38T	NUEVA ECIJA	53.1	MEDIUM DEVELOPMENT
40	APAYAO	52.9	MEDIUM DEVELOPMENT
41	DAVAO DEL NORTE	52.6	MEDIUM DEVELOPMENT
42T	ALBAY	51.8	MEDIUM DEVELOPMENT
42T	NORTH COTABATO	51.8	MEDIUM DEVELOPMENT
44	PALAWAN	51.7	MEDIUM DEVELOPMENT
45	BUKIDNON	51.4	MEDIUM DEVELOPMENT
46	ANTIQUE	51.3	MEDIUM DEVELOPMENT
47	SORSOGON	51.2	MEDIUM DEVELOPMENT
48	CAMARINES SUR	51.1	MEDIUM DEVELOPMENT
49T	ABRA	50.8	MEDIUM DEVELOPMENT
49T	SOUTHERN LEYTE	50.8	MEDIUM DEVELOPMENT
51T	BOHOL	50.1	MEDIUM DEVELOPMENT
51T	QUEZON	50.1	MEDIUM DEVELOPMENT
53T	MISAMIS OCCIDENTAL	49.6	LOW DEVELOPMENT
53T	ORIENTAL MINDORO	49.6	LOW DEVELOPMENT
55	SIQUIJOR	48.9	LOW DEVELOPMENT
56	CAMARINES NORTE	48.8	LOW DEVELOPMENT
57	IFUGAO	48.3	LOW DEVELOPMENT
58	SAMAR	48.0	LOW DEVELOPMENT
59T	AKLAN	47.8	LOW DEVELOPMENT
59T	BASILAN	47.8	LOW DEVELOPMENT
61	EASTERN SAMAR	46.8	LOW DEVELOPMENT
62	SULTAN KUDARAT	46.6	LOW DEVELOPMENT
63	SURIGAO DEL NORTE	46.0	LOW DEVELOPMENT
64T	MOUNTAIN PROVINCE	44.9	LOW DEVELOPMENT
64T	NORTHERN SAMAR	44.9	LOW DEVELOPMENT
66	ROMBLON	44.5	LOW DEVELOPMENT

67	LANAO DEL SUR	43.2	LOW DEVELOPMENT
68	MASBATE	42.2	LOW DEVELOPMENT
69	ZAMBOANGA DEL NORTE	39.9	LOW DEVELOPMENT
70	SARANGANI	38.6	LOW DEVELOPMENT
71	DAVAO ORIENTAL	37.0	LOW DEVELOPMENT
72	AGUSAN DEL SUR	36.8	LOW DEVELOPMENT
73	TAWI-TAWI	32.2	LOW DEVELOPMENT
74	MAGUINDANAO	31.2	LOW DEVELOPMENT
75	SULU	27.6	LOW DEVELOPMENT

Table 4.4B: Percentage scaling with descriptive equivalent.

PERCENTAGE SCALE	DESCRIPTIVE EQUIVALENT
0.00	NO DEVELOPMENT
1.00 - 49.00	LOW DEVELOPMENT
50.00 - 69.00	MEDIUM DEVELOPMENT
70.00 - 79.00	HIGH DEVELOPMENT
80.00 - 99.00	VERY HIGH DEVELOPMENT
100.00	COMPLETE DEVELOPMENT

Based on table 4.4A, the above average Philippine provinces with highest Human Development Index (HDI) were the provinces surrounding the top most Metro Manila (83.7%) which implies that individual development is very high while below average Philippine provinces with lowest HDI were from outside the Luzon region. Moreover, Sulu (27.6%) got the lowest score in the rankings which implies that individual development is low. Table 4.4B shows the percentage scaling with descriptive equivalent for the HDI.