# International Migration:
# An Analysis of Development Policies

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## Abstract

There is a need to probe the different factors that influence and generate the modern displacement of people. Knowing the causes and reasons of migration will facilitate setting the development policies to manage and handle this phenomenon. This paper will argue that poverty, socioeconomic factors and governance are among the main factors that have accelerated migration in recent decades. Deficiency in these factors creates motivation for the outflow of people. Moreover, this research will explore the demographic characteristics of sending and receiving countries that contribute to migration trends.

Besides the fact that economic variables have a great influence on the international movement of people, other factors contribute strongly to this movement. Poverty and liberties are important factors that effect the decision of people to emigrate. Minimizing the burden of poverty and improving political and economic freedom (governance factors) should lower the tendency and intensity of migration. Additionally, demographic characteristics are important in predicting current and future flows of migrants.

The paper does not focus on qualitative analysis but tries to carry out a quantitative analysis to explore the abovementioned objectives. Therefore, factor and cluster analysis were conducted on a sample of countries to study their characteristics in relation with the above-mentioned factors. The results are coherent with the aforesaid analysis and indicate the characteristics of receiving and sending countries that contribute to migration.

# I. INTRODUCTION

Since the beginning of humankind, man has been on the move for reasons that include searching for food and water, discovering new lands, fleeing wars and poverty and seeking better living conditions. However, over the last two centuries, the movement of people has taken on new dimensions and scales and its effects were notable on involved countries.

The presence of new lands in the Americas and better transportation technology encouraged the movement of people between countries, regions and continents. In the second half of the 19$^{th}$ century, about 10% of the world's population left their country of origin and headed towards new destinations. The result positively impacted global welfare. Nevertheless, in the 20$^{th}$ century, the movement of migrants became limited and high restrictions were imposed on it.

While restrictions on people's movement never ceased, immigration stocks worldwide are nevertheless increasing. In 2005, the United Nations Population Division estimates that international migrants numbered 191 million in 2005: 115 million lived in developed countries and 75 million in developing countries (United Nations 2005a).

Migration literature points to various reasons behind the migration movement and its consequences. In sending countries, there are a number of factors that influence the decision of an individual to emigrate which include; high population growth, poverty and lack of economic opportunities, political and ethnic repression or violence, war, environmental degradation, natural disasters, and limited resources. The factors that influence the arrival of immigrants include the demand for skilled and unskilled labor, availability of land, economic opportunity, freedom and democracy among others.

Many people in developing countries live in deprived economic and social conditions that affect all aspects of their life. Other than being exposed to hunger and insecurity, they lack the means to obtain adequate health care and education, and they are vulnerable and incapable of facing natural disasters, and social and economic shocks. Because the cost of escaping poverty is so high, many people prefer to seek opportunities outside their homes.

Countries with poor socioeconomic factors and institutional quality will remain an important source of immigrants. Today, the high percentage of immigrants (to the total population) gives an alarming indication of the condition of these two factors in sending countries. Improving the conditions of these factors are essential, otherwise, the number of immigrants will keep on increasing despite the barriers and fences constructed around rich countries.

Additionally, demography could be a determine factor on migration. In developing countries, high population growth exerts tremendous pressure on income, natural resources and the labor market and has multiple socioeconomic affects. Poverty, unemployment and migration are some of these affects.

In developing countries, economic growth is a challenging problem especially when it is accompanied by fast population growth. Overall income and resources are insufficient for a larger population within a country that lacks economic growth. Furthermore, high population growth means an increase in the percentage of children to the total population and an increase in the child dependency ratio. Taking into consideration that children will enter the labour market at any point of time, without growth, this means there will be more unemployed citizens and more potential for the outflow of people.

Hence, this paper will broach the reasons behind international migration through studying the socio-economic, governance and demographic characteristics of sending and receiving countries. Focusing on these factors will sum up the different causes that encourage migration and will help interested groups to set the needed policies to manage it.

## II. METHODOLOGICAL ASPECTS

Therefore, a Multivariate Analysis will be applied to 25 variables that represent socio-economic, demography and institutional indicators for a set of countries chosen from the United Nations Development Program (UNDP) in 2005. The analysis will identify common characteristic between the UNDP countries that will indicate the different relationship between socioeconomic, demography and governance indicators. Accordingly, clusters of different countries will be formed and development policies will be set for each cluster to reduce the number of outflow migrants.

The current study will include a group of 177 countries selected from among members of the United Nations Development Program (UNDP) in 2005. To conduct the empirical analysis, 25 variables were chosen:

| | |
|---|---|
| 1. | Political stability and the absence of violence |
| 2. | Rule of law |
| 3. | Control of corruption |
| 4. | Government effectiveness |
| 5. | Regular quality |

| | |
|---|---|
| 6. | Voice and accountability[1] |
| 7. | GDP per capita (PPP US $) |
| 8. | Life expectancy at birth |
| 9. | Under 5 mortality rate |
| 10. | Infant mortality rate |
| 11. | Maternal mortality rate |
| 12. | Total fertility rate 1970-05 |
| 13. | Total fertility rate 2000-05 |
| 14. | Population ages 65 and above (% of total) |
| 15. | Population under age 15 (% of total) |
| 16. | Population growth rate 1975-2003 |
| 17. | Adult literacy rate (% ages of 15 and above) |
| 18. | Health expenditure per capita (PPP US $) |
| 19. | Urban population |
| 20. | Human development Index HDI |
| 21. | Migrant stock (1000) |
| 22. | Migrant stock (% of population) |
| 23. | Official development assistance received (US$ millions) |
| 24. | Dependency ratio elderly |
| 25. | Dependency ratio young |

The abovementioned variables were chosen for their close relationship with the migration phenomenon, and for their availability in most of the countries chosen. For the application of a quantitative analysis, the data used represents the average mean over three years from 2003-5. Sources of data include the World Bank and the United Nations[2].

One limitation of this study is the incomplete data on immigration since available data does not include all immigrants. The existence of a large number of undocumented immigrants that are not included in official statistics on immigration and the different definition of the status of immigrants between countries limit the use of variables related to immigration.

## III. MULTIVARIATE ANALYSIS

To achieve the **quantitative** aspect, which includes separating, defining and establishing profiles for different groups of countries or regions, diverse multivariate analysis techniques will be used; factor analysis to reduce the number of variables; cluster analysis to divide countries into determinate groups;

1 The indicators of governance are based on several hundred individual measures of governance perceptions drawn from 25 sources from 18 different organizations, covering the period between 1996-2004 (Kaufmann et.al. 2002): http://www.worldbank.org/wbi/governance/pubs/govmatters4.html (August, 2006).

2 For the definition of indicators (number 7 to 25) see United Nations 2005b

and discriminate analysis to confirm the classification of countries and verify the variables that discriminate and separate each group of countries.

### 3.1. Factor Analysis

Factor analysis is a multivariate statistical method whose primary purpose is to define the underlying structure in a data matrix. It is used to identify a relatively small number of factors that can be used to represent relationships among sets of many interrelated variables.

The factor analysis consists of four main stages- calculation of the correlation matrix of all variables to be used in the analysis; the extraction of factors; the rotation of factors in order to obtain a more understandable factor structure; and finally, the interpretation of the results.

**Results of the Factor Analysis**

KMO measure and Bartlett's test:

The KMO measure and Bartlett's test are two statistical tests for the presence of correlations among variables. The Bartlett's test provides the statistical probability that the correlation matrix has significant correlations among at least some variables. The significance (sig.) of the results (.000) rejects the hypothesis null $H_0$ that the correlation matrix is an identity matrix (that is, all diagonal terms are 1 and all off-diagonal terms are 0, or that the variables are not correlated), against the hypothesis $H_1$ that the correlation matrix is not an identity.

The other test of correlation presented in the table is the Kaiser- Meyer-Olkin (KMO) test (Table 1), which is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. Small values for the KMO measure indicate that a factor analysis of the variables may not be a good idea, since correlation between pairs of variables cannot be explained by the other variables[3]. Therefore, the result of 0.915 indicates that the matrix of correlation is adequate to continue our analysis.

[3] Kaiser (1974) characterizes measures in 0.90's as marvelous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.5 as unacceptable.

**Table 1**

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .915 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 7500.149 |
| | df | 300 |
| | Sig. | .000 |

Source: SPSS results

## A. Extraction of Factors

By using the principle component analysis to extract factors, linear combinations of the observed variables are formed. The first principle component (linear combination) is the combination that accounts for the largest amount of variance in the sample and the second principle component accounts for the next largest amount of variance and is uncorrelated with the first. Successive components explain progressively smaller and smaller portions of the total sample variance and are independent of one another.

In Table (2), the initial statistics for each factor are represented. The first column of the initial eigenvalues (Total) contains the percentage of the total variance attributed to each factor. For example, the linear combination formed by the first factor has a variance of 15.056, which is 60.222% of the total variance 25 (see the second column), and the third column is the accumulative variance, which shows the percentage of variance attributed to that factor and those that precede it. For instance, 85.044% of the total variance is attributable to the first four factors and the remaining factors together account for 14.956% of the variance only.

## Table 2

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 15.056 | 60.222 | 60.222 | 15.056 | 60.222 | 60.222 | 8.513 | 34.053 | 34.053 |
| 2 | 2.595 | 10.381 | 70.603 | 2.595 | 10.381 | 70.603 | 6.989 | 27.958 | 62.011 |
| 3 | 2.027 | 8.107 | 78.711 | 2.027 | 8.107 | 78.711 | 3.181 | 12.723 | 74.734 |
| 4 | 1.583 | 6.334 | 85.044 | 1.583 | 6.334 | 85.044 | 2.578 | 10.311 | 85.044 |
| 5 | .860 | 3.438 | 88.482 | | | | | | |
| 6 | .421 | 1.685 | 90.167 | | | | | | |
| 7 | .373 | 1.494 | 91.661 | | | | | | |
| 8 | .336 | 1.343 | 93.004 | | | | | | |
| 9 | .329 | 1.316 | 94.321 | | | | | | |
| 10 | .265 | 1.059 | 95.380 | | | | | | |
| 11 | .227 | .910 | 96.289 | | | | | | |
| 12 | .182 | .726 | 97.016 | | | | | | |
| 13 | .134 | .537 | 97.553 | | | | | | |
| 14 | .129 | .515 | 98.068 | | | | | | |
| 15 | .103 | .412 | 98.480 | | | | | | |
| 16 | .100 | .401 | 98.881 | | | | | | |
| 17 | .086 | .342 | 99.223 | | | | | | |
| 18 | .054 | .217 | 99.440 | | | | | | |
| 19 | .040 | .159 | 99.599 | | | | | | |
| 20 | .029 | .117 | 99.717 | | | | | | |
| 21 | .028 | .110 | 99.827 | | | | | | |
| 22 | .021 | .084 | 99.911 | | | | | | |
| 23 | .012 | .050 | 99.960 | | | | | | |
| 24 | .008 | .032 | 99.992 | | | | | | |
| 25 | .002 | .008 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

## Rotation of Factors

The extracted four factors are shown in the *component matrix* table (see appendix). As shown in the table, almost all variables are loading high in the first factor leaving the other variables without many loadings. That is to say, while the un-rotated factor solution achieved to reduce the variables into four factors, the interpretation of the information presented in the matrix is not easy since presented information is insufficient.

A way to solve this problem is to rotate the factors. Rotation will help in simplifying the structure of the factors and make their interpretation easier and meaningful. One way to achieve the rotation is by applying the *VARIMAX* rotated factor solution.

The **VARIMAX** rotated factor solution is shown in the last column in Table (2). Note that the total amount of variance extracted is the same in the rotated solution as in the un-rotated one, 85.044%. Nevertheless, there are two major differences. First, the rotated factors can be easily interpreted. Second, the variance has been redistributed so that the factor-loading pattern is different, and the percentage of variance for each of the factors is different as well. In the

rotated matrix, the first factor accounts for 34.053% and the 2nd, 3rd and 4th factors, for 27.958%, 12.723% and 10.311% respectively.

Table (3) shows the new distribution of variables after rotation with loadings above (0.500). Variables are distributed between the factors in a way that makes analysis easier.

**Table 3**
Rotated Component Matrix(a)

| Variable | 1st Factor Socioeconomic | 2nd Factor Governance | 3rd Factor Population | 4th Factor Welfare |
|---|---|---|---|---|
| Under 5 mortality rate (per 1,000 live births) | - 0.904 | | | |
| Maternal mortality rate (per 100,000 live births) | - 0.891 | | | |
| Infant mortality rate (per 1,000 live births) | - 0.879 | | | |
| Total fertility rate (2000-2005) | - 0.858 | | | |
| Human Development Index | 0.847 | | | |
| Life expectancy at birth | 0.842 | | | |
| Dependency ratio young | - 0.804 | | | |
| Adult literacy rate (percentage ages of 15 and above) | 0.798 | | | |
| Population under age 15 (percentage of total) | - 0.750 | | | |
| Urban Population (percentage of total) | 0.628 | | | |
| Rule of Law | | 0.895 | | |
| Control of Corruption | | 0.886 | | |
| Regulatory Quality | | 0.879 | | |
| Government Effectiveness | | 0.853 | | |
| Political Stability | | 0.833 | | |
| Voice and Accountability | | 0.757 | | |
| GDP per capita ( PPP $) | | 0.730 | | |
| Health expenditure per capita PPP US$ | | 0.627 | | 0.599 |
| Population growth rate (1975-2003) | | | 0.837 | |
| Population ages 65 and above (percentage of total) | | | - 0.664 | |
| Dependency ratio elderly | | | - 0.658 | |
| Migrant Stock (percentage of population) | | | 0.607 | |
| Total fertility rate 1970-1975 | - 0.556 | | 0.604 | |
| Migrant stock (1000) | | | | 0.912 |
| Official development assistance received (US$ millions) | | | | - 0.831 |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 5 iterations.

In Table (3), variables loading high in the first factor are related to poverty/wealth of a nation. The factor has the following variables: "*Under 5 years mortality rate"* (-0.904), "*Maternal mortality rate"* (-0.891*), "Infant mortality rate"* (-.0879), "*Total fertility rate" (2000-05)"* (-.858)*, "Human Development Index"* (0.847)*, "Life expectancy at birth"* (0.842)*, "Dependency ratio young"* (-0.804) *, "Adult literacy rate (percentage ages of 15 and above)"* (0.798)*, "Population under age 15 (percentage of total)"* (-0.750)*, "Urban Population (percentage of total)"* (0.628).

The variables that load high in this factor are directly related to the measure of the socioeconomic level across countries, so will hence be named the **Socioeconomic Factor.** As most variables load negatively in this factor, the interpretation could follow in two ways, leading to the same conclusion. Countries with a low level of child mortality (represented by both variables; "*Under 5 years mortality rate"* and "*Infant mortality rate"*), and a low level of *maternal mortality rate,* have a low level of "*total fertility rate"* and high level of "*human development index"* and *"life expectancy*". Moreover, the "*dependency ratio for young"* is low as a result of the low fertility rate and low percentage of "*population under age 15"* whereas the "*adult literacy rate"* is high with more people concentrated in urban areas rather than rural ones

Studying the variables in the 2nd factor indicates that high governance quality is related to high indices of "*Rule of Law"* (0.895), "*Control of Corruption"* (0.886), "*Regulatory Quality"* (0.879), "*Government Effectiveness"* (.853), "*Political Stability"* (0.833),and "*Voice and accountability*"(0.757), and at the same time is related to a high level of "GDP per capita PPP" (0.730), and "*Health expenditure per capita PPP*" (0.627). Hence, this factor indicates that a high level of governance indicators is related to a high level of economic welfare (represented by the GDP and public expenditures on health). Since the variables loading high in this factor are the governance ones, this factor will be called the **Governance Factor**.

The positive and high loading of the governance variables indicates that in the countries where the indices of governance are loading high, they are simultaneously enjoying a high level of economic welfare. It should be emphasized that the aim of factor analysis is to examine the linear composite of variables and not to predict a dependent variable; in other words, it is not testing a cause-effect relationship between the variables. Hence, the results show that countries with a high quality of governance are associated with a high level of welfare.

The third factor contains the following variables; "*Population growth rate (1975-2003)"* (0.837)*, "Population ages 65 and above (percentage of total)"* (-0.664)*, "Dependency ratio elderly"* (-0.658)*, "Migrant Stock (percentage of population)"* (0.607)*, "Total fertility rate 1970-1975"* (0.604). This factor contains population characteristics and will therefore, be called the **Population Factor**.

The results of this factor indicate that countries with a high population growth have low population ages 65 and above and a low elderly dependency ratio. Moreover, migrant stock (as percentage of total population) is high and the total fertility rate is high too. The inclusion of most of the UNDP countries in the analysis revealed new results[4]. Migrant stocks measured as a percentage of the

[4] Previous analysis conducted on WTO (142 countries) revealed that migrant stock is higher in developed countries (Rabadi 2005). Current results indicate that countries with a high population

total population is high in developing countries. Not only are migrants traveling from the south to the north but also from south to south. Data reveals that migrants in developing countries are high too (see Table 4). Developing and emerging countries are hosting a high percentage of migrants in comparison with their total population.

**Table 4**
Migrant stock as percentage of total population

| Country | Migrant Stock | Country | Migrant Stock | Country | Migrant Stock | Country | Migrant Stock | Country | Migrant Stock |
|---|---|---|---|---|---|---|---|---|---|
| QATAR | 78.3 | Côte d'Ivoire | 13.1 | MALAYSIA | 6.5 | SENEGAL | 2.8 | CHILE | 1.4 |
| UNITED ARAB EMI | 71.4 | UNITED STATES | 12.9 | MACEDONIA | 6.0 | MALTA | 2.7 | BOLIVIA | 1.3 |
| KUWAIT | 62.1 | SWEDEN | 12.4 | BURKINA FASO | 5.8 | PARAGUAY | 2.7 | BULGARIA | 1.3 |
| PALESTINE | 45.4 | GERMANY | 12.3 | DOMINICA | 5.7 | ALBANIA | 2.6 | BURUNDI | 1.3 |
| HONG KONG | 42.6 | BELARUS | 12.2 | KYRGYZ REPUBLIC | 5.5 | DJIBOUTI | 2.6 | RWANDA | 1.3 |
| SINGAPORE | 42.6 | SPAIN | 11.1 | ST. LUCIA | 5.4 | URUGUAY | 2.4 | YEMEN | 1.3 |
| BAHRAIN | 40.7 | FRANCE | 10.7 | SYRIA | 5.2 | ZAMBIA | 2.4 | EQUATORIAL GUIN | 1.2 |
| ISRAEL | 39.6 | GRENADA | 10.5 | SAMOA | 5.0 | SLOVAK REPUBLIC | 2.3 | GUINEA-BISSAU | 1.2 |
| JORDAN | 39.0 | LIBYA | 10.5 | LITHUANIA | 4.8 | SOUTH AFRICA | 2.3 | KOREA, SOUTH | 1.2 |
| LUXEMBOURG | 37.4 | MOLDOVA | 10.5 | SAO TOME AND PR | 4.8 | AZERBAIJAN | 2.2 | SURINAME | 1.2 |
| BRUNEI DARUSSAL | 33.2 | ST. KITTS AND N | 10.4 | UZBEKISTAN | 4.8 | CAMBODIA | 2.2 | TONGA | 1.1 |
| SAUDI ARABIA | 25.9 | COSTA RICA | 10.2 | TAJIKISTAN | 4.7 | CAPE VERDE | 2.2 | BOSNIA-HERZEGOV | 1.0 |
| OMAN | 24.4 | NETHERLANDS | 10.1 | TURKMENISTAN | 4.6 | MALAWI | 2.2 | KENYA | 1.0 |
| SWITZERLAND | 22.9 | BAHAMAS | 9.8 | BOTSWANA | 4.5 | SIERRA LEONE | 2.2 | MALDIVES | 1.0 |
| ANTIGUA AND BAR | 22.4 | BARBADOS | 9.7 | CHAD | 4.5 | BENIN | 2.1 | Congo, Dem. Rep | 0.9 |
| AUSTRALIA | 20.3 | UNITED KINGDOM | 9.1 | CZECH REPUBLIC | 4.4 | MAURITANIA | 2.1 | ECUADOR | 0.9 |
| LATVIA | 19.5 | GREECE | 8.8 | SWAZILAND | 4.4 | MOZAMBIQUE | 2.1 | NIGER | 0.9 |
| CANADA | 18.9 | ST. VINCENT AND | 8.7 | GEORGIA | 4.3 | PAKISTAN | 2.1 | CAMEROON | 0.8 |
| LEBANON | 18.4 | SLOVENIA | 8.5 | GUINEA | 4.3 | TANZANIA | 2.1 | ALGERIA | 0.7 |
| GABON | 17.7 | COMOROS | 8.4 | ITALY | 4.3 | FIJI | 2.0 | BANGLADESH | 0.7 |
| KAZAKHSTAN | 16.9 | RUSSIA | 8.4 | ARGENTINA | 3.9 | CENTRAL AFRICAN | 1.9 | CUBA | 0.7 |
| NEW ZEALAND | 15.9 | ARMENIA | 7.8 | ZIMBABWE | 3.9 | DOMINICAN REPUB | 1.8 | ETHIOPIA | 0.7 |
| GAMBIA | 15.3 | ICELAND | 7.8 | VENEZUELA | 3.8 | POLAND | 1.8 | JAMAICA | 0.7 |
| ESTONIA | 15.2 | GHANA | 7.5 | PANAMA | 3.2 | SRI LANKA | 1.8 | NIGERIA | 0.7 |
| AUSTRIA | 15.1 | NORWAY | 7.4 | HUNGARY | 3.1 | SUDAN | 1.8 | SOLOMON ISLANDS | 0.7 |
| BELIZE | 15.0 | PORTUGAL | 7.3 | FINLAND | 3.0 | TURKEY | 1.8 | MEXICO | 0.6 |
| UKRAINE | 14.7 | CONGO | 7.2 | NEPAL | 3.0 | UGANDA | 1.8 | ROMANIA | 0.6 |
| CROATIA | 14.5 | DENMARK | 7.2 | TOGO | 3.0 | MAURITIUS | 1.7 | TIMOR, EAST | 0.6 |
| IRELAND | 14.1 | NAMIBIA | 7.1 | TRINIDAD AND TO | 2.9 | JAPAN | 1.6 | BHUTAN | 0.5 |
| CYPRUS | 13.9 | BELGIUM | 6.9 | IRAN | 2.8 | THAILAND | 1.6 | INDIA | 0.5 |

Source of data: United Nations[5]

The fourth factor contains three other variables. "*Migrants stock*" (0.912), "*Official development assistance ODA*" (-0.831) and "*Health expenditure*" (0.599). Since negative official assistance belongs to donor countries (countries that receive ODA have positive results), we can say that migrant stocks are attracted to developed countries where public expenditure is high in the health sector. This indicates that people will choose to immigrate to countries that enjoy high levels of welfare expressed in the abovementioned variables. Therefore, this factor will be called the **Welfare Factor,** which point to the variables that encourage the arrival of immigrants.

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growth rate and where the total fertility rate is high also have high migrant stocks, which shows that developing countries are also recipients of migrants.

[5] http://www.un.org/esa/population/publications/2006Migration_Chart/2006IttMig_wallchart.xls

By conducting Factor Analysis, 25 variables were categorized into four factors that represent socioeconomic, population, governance and welfare factors. The analysis reproduced the correlations among variables and the four factors make their interpretation easier. Hence, it is much easier to explain the characteristics of the countries participating in the migration process.

### 3.2. Cluster Analysis

The next step of the empirical analysis is to conduct a cluster analysis. The latter is a multivariate procedure for detecting groupings in data, based on the characteristics they possess. Cluster analysis helps in classifying countries into different groups so that each country is very similar to others in the cluster with respect to some predetermined selection criterion. The resulting clusters of objects should then exhibit high internal (within cluster) homogeneity and high external (between cluster) heterogeneity (Hair 1999).

In this paper, cluster analysis will be used to group the 177 countries of the UNDP in different clusters based on certain characteristics regarding their institutions, poverty and migration. By applying a factor analysis, it was possible to categorize 25 variables in four factors: The Socio-economic, Governance Factor, Population Factor and Welfare Factor. The following step entails grouping together countries that possess the same characteristics in regards to the abovementioned factors, in order to facilitate the formulation of development policies that will reduce the level of international migration.

## A. RESULTS OF CLUSTER ANALYSIS

After applying hierarchical analysis on the factor scores, and using the Square Euclidean Distance as the similarity distance measure, the following tables and results were achieved:

**Table 5**

**Case Processing Summary(a,b)**

| Cases | | | | | |
|---|---|---|---|---|---|
| Valid | | Missing | | Total | |
| N | Percent | N | Percent | N | Percent |
| 177 | 100.0 | 0 | .0 | 177 | 100.0 |

a Squared Euclidean Distance used
b Complete Linkage

The first table is the Case Processing Summary, The table indicates that all of the 177 countries were included in the cluster analysis. Moreover, the note at the bottom of the table indicates the agglomerative procedures used, in this case the complete linkage procedure (the furthest neighbor approach). The results of cluster analysis application indicate that countries could be distributed in 8 clusters (see Table 6).

The distribution of countries in the different clusters reflects the current situation of countries concerning the variables utilized in the analysis. Nevertheless, to examine the validity of country classification according to the four factors, another test is conducted on the factors known as ANOVA.

The results of applying the ANOVA analysis on the four factors are presented in Table (7). This analysis indicates the significance of each factor in the classification of countries. The results of the analysis indicate that the factors are suitable to separate countries with a significance level less than 0.05 (last column Sig.=.000), with the 95% confidence intervals.

**Table 6**

Country clusters

| Country | Cluster |
|---|---|
| ALBANIA | 1 |
| ANTIGUA AND BAR | 1 |
| BAHAMAS | 1 |
| BARBADOS | 1 |
| BELIZE | 1 |
| BOLIVIA | 1 |
| BRAZIL | 1 |
| BULGARIA | 1 |
| CAPE VERDE | 1 |
| CHILE | 1 |
| CHINA | 1 |
| COSTA RICA | 1 |
| CROATIA | 1 |
| CYPRUS | 1 |
| CZECH REPUBLIC | 1 |
| DOMINICA | 1 |
| DOMINICAN REPUB | 1 |
| EGYPT | 1 |
| EL SALVADOR | 1 |
| ESTONIA | 1 |
| FIJI | 1 |
| GREECE | 1 |
| GRENADA | 1 |
| GUATEMALA | 1 |
| GUYANA | 1 |
| HONDURAS | 1 |
| HUNGARY | 1 |
| INDONESIA | 1 |
| ITALY | 1 |
| JAMAICA | 1 |
| KOREA, SOUTH | 1 |
| KYRGYZ REPUBLIC | 1 |
| LATVIA | 1 |
| LITHUANIA | 1 |
| MALAYSIA | 1 |
| MALDIVES | 1 |
| MALTA | 1 |
| MAURITIUS | 1 |
| MEXICO | 1 |
| MONGOLIA | 1 |
| MOROCCO | 1 |
| NICARAGUA | 1 |
| PANAMA | 1 |
| PERU | 1 |
| PHILIPPINES | 1 |
| POLAND | 1 |
| PORTUGAL | 1 |
| ROMANIA | 1 |
| SAMOA | 1 |
| SAO TOME AND PR | 1 |
| SLOVAK REPUBLIC | 1 |
| SLOVENIA | 1 |
| SPAIN | 1 |
| SRI LANKA | 1 |
| ST. KITTS AND N | 1 |
| ST. LUCIA | 1 |
| ST. VINCENT AND | 1 |
| SURINAME | 1 |
| THAILAND | 1 |
| TONGA | 1 |
| TRINIDAD AND TO | 1 |
| TUNISIA | 1 |
| TURKEY | 1 |
| URUGUAY | 1 |
| VANUATU | 1 |
| VIETNAM | 1 |

| Country | Cluster |
|---|---|
| ALGERIA | 2 |
| ARGENTINA | 2 |
| ARMENIA | 2 |
| AZERBAIJAN | 2 |
| BELARUS | 2 |
| BOSNIA-HERZEGOV | 2 |
| COLOMBIA | 2 |
| CUBA | 2 |
| ECUADOR | 2 |
| GEORGIA | 2 |
| IRAN | 2 |
| IRAQ | 2 |
| KAZAKHSTAN | 2 |
| LEBANON | 2 |
| LIBYA | 2 |
| MACEDONIA | 2 |
| MOLDOVA | 2 |
| MYANMAR | 2 |
| PARAGUAY | 2 |
| RUSSIA | 2 |
| SOLOMON ISLANDS | 2 |
| SYRIA | 2 |
| TAJIKISTAN | 2 |
| TURKMENISTAN | 2 |
| UKRAINE | 2 |
| UZBEKISTAN | 2 |
| VENEZUELA | 2 |

| Country | Cluster |
|---|---|
| ANGOLA | 3 |
| BENIN | 3 |
| BHUTAN | 3 |
| BOTSWANA | 3 |
| BURKINA FASO | 3 |
| BURUNDI | 3 |
| CENTRAL AFRICAN | 3 |
| CHAD | 3 |
| GAMBIA | 3 |
| GHANA | 3 |
| GUINEA-BISSAU | 3 |
| LESOTHO | 3 |
| MADAGASCAR | 3 |
| MALAWI | 3 |
| MALI | 3 |
| MAURITANIA | 3 |
| MOZAMBIQUE | 3 |
| NAMIBIA | 3 |
| NIGER | 3 |
| RWANDA | 3 |
| SENEGAL | 3 |
| SIERRA LEONE | 3 |
| SOUTH AFRICA | 3 |
| TANZANIA | 3 |
| TIMOR, EAST | 3 |
| UGANDA | 3 |
| ZAMBIA | 3 |

| Country | Cluster |
|---|---|
| AUSTRALIA | 4 |
| AUSTRIA | 4 |
| BELGIUM | 4 |
| CANADA | 4 |
| DENMARK | 4 |
| FINLAND | 4 |
| HONG KONG | 4 |
| ICELAND | 4 |
| IRELAND | 4 |
| ISRAEL | 4 |
| LUXEMBOURG | 4 |
| NETHERLANDS | 4 |
| NEW ZEALAND | 4 |
| NORWAY | 4 |
| SINGAPORE | 4 |
| SWEDEN | 4 |
| SWITZERLAND | 4 |

| Country | Cluster |
|---|---|
| BAHRAIN | 5 |
| BRUNEI DARUSSAL | 5 |
| JORDAN | 5 |
| KUWAIT | 5 |
| OMAN | 5 |
| PALESTINE | 5 |
| QATAR | 5 |
| SAUDI ARABIA | 5 |
| UNITED ARAB EMI | 5 |

| Country | Cluster |
|---|---|
| BANGLADESH | 6 |
| CAMBODIA | 6 |
| CAMEROON | 6 |
| COMOROS | 6 |
| CONGO | 6 |
| Congo, Dem. Rep | 6 |
| Côte d'Ivoire | 6 |
| DJIBOUTI | 6 |
| EQUATORIAL GUIN | 6 |
| ERITREA | 6 |
| ETHIOPIA | 6 |
| GABON | 6 |
| GUINEA | 6 |
| HAITI | 6 |
| INDIA | 6 |
| KENYA | 6 |
| Lao People's De | 6 |
| NEPAL | 6 |
| NIGERIA | 6 |
| PAKISTAN | 6 |
| PAPUA NEW GUINE | 6 |
| SUDAN | 6 |
| SWAZILAND | 6 |
| TOGO | 6 |
| YEMEN | 6 |
| ZIMBABWE | 6 |

| Country | Cluster |
|---|---|
| FRANCE | 7 |
| GERMANY | 7 |
| JAPAN | 7 |
| UNITED KINGDOM | 7 |

| Country | Cluster |
|---|---|
| UNITED STATES | 8 |

Source: Own table elaborated from the SPSS results of Cluster Analysis

**Table 7**
ANOVA for factors

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Socio_economic | Between Groups | 148.196 | 7 | 21.171 | 128.684 | .000 |
| | Within Groups | 27.804 | 169 | .165 | | |
| | Total | 176.000 | 176 | | | |
| Governance | Between Groups | 129.910 | 7 | 18.559 | 68.050 | .000 |
| | Within Groups | 46.090 | 169 | .273 | | |
| | Total | 176.000 | 176 | | | |
| Population | Between Groups | 98.095 | 7 | 14.014 | 30.399 | .000 |
| | Within Groups | 77.905 | 169 | .461 | | |
| | Total | 176.000 | 176 | | | |
| Welfare | Between Groups | 153.038 | 7 | 21.863 | 160.908 | .000 |
| | Within Groups | 22.962 | 169 | .136 | | |
| | Total | 176.000 | 176 | | | |

## Classification of Countries

To test the validity of the countries' classification, which we concluded after applying the cluster analysis, another statistical test is applied to justify this result known as the Discriminant analysis. Linear discriminant analysis is a statistical technique used to examine whether two or more mutually exclusive groups can be distinguished from each other and how correctly the cases of these groups are classified.

The results in Table 8 show that 93.2% (Note b down the table) of the country classification in the cluster analysis is correctly classified. The results are obtained from the summing of the principle diagonal (60+27+23+16+9+25+4+1)=165/177= .932.

As illustrated in table 8, cluster numbers 2, 5, 7 and 8 have the best classification of countries- 100% in each case. In the other groups, 1, 3, 4, 5 and 6 the percentage of correct classification ranges between 85.2% and 96.2%.

The application of discriminant analysis is aimed at justifying the classification of countries in the different clusters. By applying a cross-validated classification, the results show that distribution of countries in the 8 clusters is 91.5% correct (note c down the table). This is to say that 9.15 out of 10 countries are well classified, a result similar to that which we obtained in the original classification through clustering. The results show that the use of the cluster analysis to classify countries will lead to 93.2% of well classified cases, which means that out of 10 countries 9.32 are well classified. The two results of the two analyses indicate

that the classification of countries was nearly similar with minimal differences, which validates the sound results obtained by the cluster analysis.

**Table 8**
Discriminant analysis

**Classification Results[b,c]**

| | | Complete Linkage | Predicted Group Membership | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Original | Count | 1 | 60 | 4 | 0 | 2 | 0 | 0 | 0 | 0 | 66 |
| | | 2 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| | | 3 | 2 | 0 | 23 | 0 | 0 | 2 | 0 | 0 | 27 |
| | | 4 | 0 | 0 | 0 | 16 | 1 | 0 | 0 | 0 | 17 |
| | | 5 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 9 |
| | | 6 | 0 | 0 | 1 | 0 | 0 | 25 | 0 | 0 | 26 |
| | | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| | | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | % | 1 | 90.9 | 6.1 | .0 | 3.0 | .0 | .0 | .0 | .0 | 100.0 |
| | | 2 | .0 | 100.0 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 |
| | | 3 | 7.4 | .0 | 85.2 | .0 | .0 | 7.4 | .0 | .0 | 100.0 |
| | | 4 | .0 | .0 | .0 | 94.1 | 5.9 | .0 | .0 | .0 | 100.0 |
| | | 5 | .0 | .0 | .0 | .0 | 100.0 | .0 | .0 | .0 | 100.0 |
| | | 6 | .0 | .0 | 3.8 | .0 | .0 | 96.2 | .0 | .0 | 100.0 |
| | | 7 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 | .0 | 100.0 |
| | | 8 | .0 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 | 100.0 |
| Cross-validated[a] | Count | 1 | 59 | 4 | 0 | 2 | 0 | 1 | 0 | 0 | 66 |
| | | 2 | 1 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| | | 3 | 2 | 0 | 23 | 0 | 0 | 2 | 0 | 0 | 27 |
| | | 4 | 0 | 0 | 0 | 16 | 1 | 0 | 0 | 0 | 17 |
| | | 5 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 9 |
| | | 6 | 0 | 0 | 1 | 0 | 0 | 25 | 0 | 0 | 26 |
| | | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 |
| | | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| | % | 1 | 89.4 | 6.1 | .0 | 3.0 | .0 | 1.5 | .0 | .0 | 100.0 |
| | | 2 | 3.7 | 96.3 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 |
| | | 3 | 7.4 | .0 | 85.2 | .0 | .0 | 7.4 | .0 | .0 | 100.0 |
| | | 4 | .0 | .0 | .0 | 94.1 | 5.9 | .0 | .0 | .0 | 100.0 |
| | | 5 | .0 | .0 | .0 | .0 | 100.0 | .0 | .0 | .0 | 100.0 |
| | | 6 | .0 | .0 | 3.8 | .0 | .0 | 96.2 | .0 | .0 | 100.0 |
| | | 7 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 | .0 | 100.0 |
| | | 8 | .0 | .0 | .0 | .0 | .0 | .0 | 100.0 | .0 | 100.0 |

a. 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.

b. 93.2% of original grouped cases correctly classified.

c. 91.5% of cross-validated grouped cases correctly classified.

## IV. CHARACTERISTICS OF COUNTRY CLUSTERS

After classifying countries into different clusters, the characteristic of each cluster is studied in relation to the different variables being used in the empirical analysis. This study intends to reveal the different aspects of each cluster in regards to the four factors being used at the beginning of the analysis.

To interpret values of variables in each cluster, variables were standardized with the mean (0) and standard deviation (1). The interpretation of variables will be determined according to its deviation from the mean. Each factor is comprised of

a number of variables that contribute to its characteristic. For example, the institutional factor consists of variables with high loading in that factor; mainly institution variables (see Table 3). Nevertheless, deviation of each variable from the sample mean is different in each cluster. That is to say, each cluster of countries is different than the other due to different deviations of its variables from the mean.

The different deviations of variables will determine the fragility or soundness of variables in each cluster and these observations will help in designing public policies to achieve development goals.

This research aims to determine institutional quality, the poverty level and migration in different countries. This goal could be achieved by studying each cluster and defining the characteristics that distinguish it from others. Possible conclusions should help policy makers to design necessary public policies to improve the level of indicators in each cluster of countries. To do so, standardized variables for each cluster are arranged according to their previous loadings in the matrix of rotated factors (Table 3).

## FIRST CLUSTER

The first cluster consists of countries that have similar characteristics in relation to the different variables used to obtain this grouping (see Table 6). In order to interpret the characteristic of this cluster, a table of variables in the four factors is created (Table 9)

Table 9 shows the mean of variables in each factor. As shown, cluster 1 has no latent problems in the first factor, **Socio-economic Factor**, since variables that constitute this factor have low values below the mean 0; “Under 5 mortality rate” (-0.534), “Maternal mortality rate” in 2000 (-0.495), “Infant mortality rate” in 2003 (-0.527), “Total fertility rate 2000-2005” (-0.493), and high values of: “Human Development Index 2003” (0.452), “Life expectancy at birth 2003” (0.487), “Adult literacy rate” (0.433) and more people are living in urban areas “Urban population” (0.071). Yet , they have negative dependency ratio (-0.402), negative fertility rate (-0.493) and population under age 15 (-0.364). The later indicate that population is not young and they will have in the mid and long-run a problem in active population in labor market and problems in the pension system.

**Table 9**
Cluster 1

| Variables standarized | Socio-economic | Governance | Population | Welfare |
|---|---|---|---|---|
| Under 5 mortality rate (per 1,000 live births) | -0.534 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.495 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.527 | | | |
| Total fertility rate 2000-2005 | -0.493 | | | |
| Human Development Index 2003 | 0.452 | | | |
| life expectancy at birth 2003 undp | 0.487 | | | |
| Dependency ratio young 2004 | -0.402 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.433 | | | |
| Population under age 15 (%of total) 2003 | -0.364 | | | |
| Urban Pop. as % ot total 2003 | 0.071 | | | |
| Rule of Law | | 0.260 | | |
| Control of Corruption | | 0.131 | | |
| Regulatory Quality | | 0.384 | | |
| Government Effectiveness | | 0.206 | | |
| Political Stability | | 0.399 | | |
| Voice and Accountability | | 0.502 | | |
| GDP per capita ( PPP $) 2003 undp | | -0.048 | | |
| Health expenditure per capita PPP US$ 2002 | | -0.100 | | -0.100 |
| Population growth rate 1975-2003 | | | -0.463 | |
| Dependency ratio old 2004 | | | 0.179 | |
| Migrant Stock (percentage of population) | | | -0.278 | |
| Population ages 65 and above (% of total) 2015 | | | 0.255 | |
| Total fertility rate 1970-1975 | | | -0.280 | |
| Migrant stock (1000) | | | | -0.220 |
| Official development assistance received TOTAL $ mil | | | | 0.140 |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

In the second factor, the **Governance Factor**, institutional variables are above the mean; "Rule of Law" (0.260), "Control of Corruption" (0.131), "Regular Quality" (0.384), "Government Effectiveness" (0.206), "Political stability" (0.399) and "Voice and Accountability" (0.502). This is to say, the quality of institutions does not present any problems and could indicate that countries of this group are moving in the right direction towards quality institution-building. Yet, two variable has a value below the mean of the sample; "GDP/ capita" (-0.048) and health expenditure (-0.100), indicating a low level of economic growth and welfare.

Moreover, variables in the third factor, the **Population Factor**, have good values except for the "Population growth rate (1970-2003)" (-0.463),"Migrant stock" (-0.278) and "Total fertility rate" (-0.280). Other variables' values are; "Dependency ratio old" (0.179) and "Population ages 65 and above" (0.255). The whole factor indicates that this cluster has low fertility rate and population growth.

Moreover, soon they have to deal with an outflow of migrants and an ageing society.

Nevertheless, the Fourth factor has some problems. As seen in Table 5.9, the fourth column, the **Welfare Factor**, has values with negative signs which indicate that the welfare level is lower than the mean of the sample[6]. Countries with low *GDP/capita (PPP)* (-.048) are expected to have lower public expenditure on education and health; *Health expenditure/ capita* (PPP) (-.100), and would be less attractive in terms of immigration flows. The negative values of *Migrant stock* (-.220) indicate that the immigration level is low and could indirectly indicate that there is a migration outflow.

### Policy Options for Cluster 1

Among the four factors presented in Table 9, which require additional attention, are those related to the level of public welfare. As countries in this cluster have a low level of GDP/capita, public policies should be directed towards inducing more economic growth and development from one side, and providing more funds for public expenditure on health and education sectors from another.

Variables of the first factor, the **Socio-economic Factor**, have good values except for "Total fertility", "Dependency ratio" and "Population under age 15" with negative values below the mean of the sample. The low rate of natural increase is a symptom of transit and developed countries where more demographic policies are needed to maintain adequate population growth; encouraging immigration, late retirement, among others.

More funds from the public budget should be directed towards increasing the level of welfare in these countries. Negative values for these variables place these countries below the mean of the whole sample. Policies directed on both development and increasing public expenditure should be suitable for this cluster.

## SECOND CLUSTER

The second cluster of countries is shown in Table 10. It presents the mean of variables (standardized) in the four factors. A look at countries that constitute this cluster (Table 6) shows that they are developing ones.

[6] It must be taken into consideration that naming the factor depends on the variable with the highest loading.

**Table10**
Cluster 2

| Rotated Component Matrix(a) | Component | | | |
|---|---|---|---|---|
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | -0.314 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.498 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.224 | | | |
| Total fertility rate 2000-2005 | -0.527 | | | |
| Human Development Index 2003 | 0.211 | | | |
| life expectancy at birth 2003 undp | 0.297 | | | |
| Dependency ratio young 2004 | -0.397 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.538 | | | |
| Population under age 15 (%of total) 2003 | -0.335 | | | |
| Urban Pop. as % ot total 2003 | 0.201 | | | |
| Rule of Law | | -0.861 | | |
| Control of Corruption | | -0.809 | | |
| Regulatory Quality | | -1.040 | | |
| Government Effectiveness | | -0.752 | | |
| Political Stability | | -0.822 | | |
| Voice and Accountability | | -0.835 | | |
| GDP per capita ( PPP $) 2003 undp | | -0.472 | | |
| Health expenditure per capita PPP US$ 2002 | | -0.385 | | -0.385 |
| Population growth rate 1975-2003 | | | -0.263 | |
| Dependency ratio old 2004 | | | -0.008 | |
| Migrant Stock (percentage of population) | | | -0.188 | |
| Population ages 65 and above (% of total) 2015 | | | 0.096 | |
| Total fertility rate 1970-1975 | | | -0.176 | |
| Migrant stock (1000) | | | | 0.051 |
| Official development assistance received TOTAL $ mil | | | | 0.180 |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

Own table. Elaborated from results of different SPSS analysis.

The first factor, the **Socio-economic Factor**, has low values below the mean 0; “Under 5 mortality rate” (-0.314), “Maternal mortality rate” in 2000 (-0.498), “Infant mortality rate” in 2003 (-0.224), “Total fertility rate 2000-2005” (-0.527), and good values of: “Human Development Index 2003” (0.211), “Life expectancy at birth 2003” (0.297), “Adult literacy rate” (0.538) and more people are living in urban areas “Urban population” (0.201). Yet, they have negative dependency ratio young (-0.397), negative fertility rate (-0.527) and population under age 15 (-0.335). The later variables indicate that population is not young and problems in labor market and the pension system will arise soon.

As shown in the above table, variables of the **Governance Factor** are preceded by a negative sign, indicating their poor values in comparison with the mean of the group; ”Rule of Law” (-0.861), “Control of Corruption” (-0.809), “Regular Quality” (-1.040), “Government Effectiveness” (-0.752), “Political stability” (-0.822) and “Voice and Accountability” (-0.835). Notice that the low level of *GDP/ capita (PPP)* (-0.472) is associated with a low level of institutional quality. Negative governance indicators are firmly associated with socio-economic problems such as poverty, diseases, conflicts, immigration etc.

Furthermore, variables in the third factor, the **Population Factor**, have negative values except for “Population ages 65 and above (% of total)” (0.096). Other variables’ values are; “Dependency ratio old” (0.179) and “Population ages 65 and above” (0.255). The whole factor indicates that this cluster has low fertility rate and population growth and an increasing in the outflow of migrants.

The fourth factor, the **Welfare Factor**, has a negative value in “Health expenditure” (-0.385) indicating the existence of a problem in the welfare. these countries receive ODA and has a stock of migrants above the mean of the sample.

### Policy Options for Cluster 2

The first factor indicates that low fertility rate would effect demographic structure and consequently labor market. The second factor is essential to long-term economic growth. Ending corruption, establishing “political stability”, the “rule of law”, “government efficacy” and “voice and accountability” are variables that indicate the civil, economic and political stability of a country. Improving these indicators is a national priority, while international institutions could encourage their improvement.

Secondly, immediate action should be directed towards improving the level of welfare. While Socioeconomic variables are positive, the level of health expenditure are lower than the mean. Low GDP per capita and negative governance indicators are signs for lack of welfare system.

In the current socioeconomic situation and according to the data on migrants, these countries are considered as sending country. The negative values of migrant stock (percentage of population) (-.188) indicates our previous perception that lack of economic growth, low values for governance indicators and lack of welfare are reasons behind the outflow of migrants.

Poor institutional quality, inferior welfare circumstances and poverty conditions express the absolute precarious socio-economic conditions of these countries. To stimulate changes in these indicators, more public policies should be directed towards economic growth and development, but first toward the improvement of institutional quality.

### Third Cluster

Countries in the third cluster are mainly African (see Table 6). Notice that variables in this cluster have negative means in most of the factors. Moreover, it is characterized by conditions worse than the second cluster and is in an inferior position compared to the remaining clusters.

**Table 11**
Cluster 3

| Rotated Component Matrix(a) | Component | | | |
|---|---|---|---|---|
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | 1.551 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | 1.590 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | 1.491 | | | |
| Total fertility rate 2000-2005 | 1.421 | | | |
| Human Development Index 2003 | -1.482 | | | |
| life expectancy at birth 2003 undp | -1.533 | | | |
| Dependency ratio young 2004 | 1.259 | | | |
| Adult literacy rate (% ages of 15 and above) undp | -1.415 | | | |
| Population under age 15 (%of total) 2003 | 1.170 | | | |
| Urban Pop. as % ot total 2003 | -0.992 | | | |
| Rule of Law | | -0.466 | | |
| Control of Corruption | | -0.400 | | |
| Regulatory Quality | | -0.358 | | |
| Government Effectiveness | | -0.501 | | |
| Political Stability | | -0.274 | | |
| Voice and Accountability | | -0.223 | | |
| GDP per capita ( PPP $) 2003 undp | | -0.692 | | |
| Health expenditure per capita PPP US$ 2002 | | -0.597 | | -0.597 |
| Population growth rate 1975-2003 | | | 0.650 | |
| Dependency ratio old 2004 | | | -0.456 | |
| Migrant Stock (percentage of population) | | | -0.407 | |
| Population ages 65 and above (% of total) 2015 | | | -0.787 | |
| Total fertility rate 1970-1975 | | | 0.898 | |
| Migrant stock (1000) | | | | -0.232 |
| Official development assistance received TOTAL $ mil | | | | 0.284 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.<br>a Rotation converged in 5 iterations. | | | | |

The first factor, the **Socio-economic Factor**, which groups variables that measure poverty has the following values; high incidence of “Under 5 mortality rate” 1.551) and “Maternal mortality rate” in 2000 (1.590), high “Infant mortality rate” in 2003 (1.491), “Total fertility rate 2000-2005” is also high (1.421), and poor values of “Human Development Index 2003” (-1.482). Furthermore, “Life expectancy at birth 2003” is low (-1.533), low “Adult literacy rate” (-1.415), they have high young dependency ratio (1.259), and “population under age 15” is high too (1.170). The later variables indicate that population is young and problems in labor market may lead to outflow of migrants. Finally, high percentage of the population is living in rural areas, “urban Population as % of total” is (-.992). That indicates that population is concentrated in rural areas and are dependent on agriculture in their livings.

As shown in the above table, variables of the **Governance Factor** are preceded by a negative sign, indicating their poor values in comparison with the mean of

the group; ”Rule of Law” (-0.466), “Control of Corruption” (-0.400), “Regular Quality” (-0.358), “Government Effectiveness” (-0.501), “Political stability” (-0.274) and “Voice and Accountability” (-0.223). Moreover, these countries have low level of “GDP / capita (PPP)” (-0.692) and low level of “health expenditure per capita” (-0.597), both variables are associated with a low level of institutional quality. These results confirm once again that negative governance indicators are firmly associated with socio-economic problems such as poverty, diseases, conflicts, immigration etc.

Furthermore, variables in the third factor, the **Population Factor,** are remarkable. Countries in this cluster have high total fertility rate 1970-75 (0.898) as in 2000-05 (1.491) and high Population growth rate too (0.650). On the other side, they have a low “population age 65 and above” (-0.787) and “dependency ratio for the old” is (-0.456). Yet, outflow of migrants is high, and it is reflected by the negative sign of the variable “migrant stock (percentage of population)” (-0.407) and “Migrant stock (1000)” (-0.232). The whole factor indicates that this cluster has high fertility rate, young population, and high population growth. Coupled with negative economic growth and poor quality of governance, countries in this cluster have high outflow of migrants.

The fourth factor, the **Welfare Factor**, has a negative value in “Health expenditure” (-0.385) indicating the existence of a problem in the welfare. these countries receive ODA and has a stock of migrants above the mean of the sample.

**Policy Options for Cluster 3**

In this cluster, countries need to concentrate on solving poverty problems. As shown in the first factor, infant mortality rate represented by *Infant mortality rate* and *Under 5 years mortality rate* are higher than the mean of the sample. Hence, health policies and good nutrition could serve to reduce infant mortality. The other variables: *Life expectancy, Percentage of illiteracy* and *Rate of natural increase* could be solved by adequate policies to induce medium-term economic growth

The second factor is essential to long-term economic growth. Ending corruption, establishing “political stability”, the “rule of law”, “government efficacy” and “voice and accountability” are variables that indicate the civil, economic and political stability of a country. Improving these indicators is a national priority, while international institutions could encourage their improvement.

The Population factor indicates, the population of people in rural areas reflects a structural inequality between rural and urban growth. Moreover, high fertility rate and population growth have many indications. Poor countries have these characteristics that reflects people behavior to face poverty, high mortality rate,

needs for more labor in land, and possible guarantee for future uncertainty due to lack of state welfare and reliable institution other than the family. Yet, in the above circumstances, outflow of migrants reflects ill function of the labor market, high unemployment, needs for extra income among others. Inducing growth and development policies should solve some of the above mentioned dilemmas.

Finally, the welfare level of a country is strongly related to institutional improvement, economic growth and development. As countries move ahead in these variables, the level of welfare will be improve. Contrarily, low levels of public expenditure on health and education will have negative effects on future economic growth. Disease and low school enrollment rates will threaten future prospects for healthy and educated human capital. If young people are ill and uneducated, this will affect the country's productivity level and its income.

More investment in rural development could reduce the inclination of people to move to big cities or to immigrate to new destinations in search of better living conditions. Investment in rural areas should be directed to improve agricultural productivity that includes soil nutrients, water for irrigation, and agriculture extension etc,. Moreover, investment in rural-urban infrastructure as roads, electricity and communications and more investment in the abovementioned social services of health and education and family planning would help in improving conditions of the poor.

**Fourth Cluster**

In Table 12, standardized variables of cluster 4 are presented. An initial review of the table indicates that the four factors have sound values. As seen in Table 6, these countries are developed one. They enjoy high level of socioeconomic variables, governance, welfare and population. Yet, they lack adequate population growth that we will talk about later.

The first factor, the **Socio-economic Factor**, which groups variables that measure poverty has good values such as; low "Under 5 mortality rate" (-0.856), "Maternal mortality rate" in 2000 (- 0.712), "Infant mortality rate" in 2003 (-952), "Total fertility rate 2000-2005" (-0.869), and good values of: "Human Development Index 2003" (1.319), "Life expectancy at birth 2003" (1.101), "Adult literacy rate" (0.847) and more people are living in urban areas "Urban population" (1.140). Yet , they have negative "young dependency ratio" (-1.055), negative "Total fertility rate" (-0.527) and population under age 15 (-0.335). The later variables indicate that population is not young and problems in labor market and the pension system will arise soon.

**Table 12:**
Cluster 4

| Cluster 4 | | | | |
|---|---|---|---|---|
| Rotated Component Matrix(a) | Component | | | |
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | -0.856 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.712 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.952 | | | |
| Total fertility rate 2000-2005 | -0.869 | | | |
| Human Development Index 2003 | 1.319 | | | |
| life expectancy at birth 2003 undp | 1.101 | | | |
| Dependency ratio young 2004 | -1.055 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.847 | | | |
| Population under age 15 (%of total) 2003 | -1.140 | | | |
| Urban Pop. as % ot total 2003 | 1.196 | | | |
| Rule of Law | | 1.849 | | |
| Control of Corruption | | 2.057 | | |
| Regulatory Quality | | 1.680 | | |
| Government Effectiveness | | 1.946 | | |
| Political Stability | | 1.335 | | |
| Voice and Accountability | | 1.294 | | |
| GDP per capita ( PPP $) 2003 undp | | 2.154 | | |
| Health expenditure per capita PPP US$ 2002 | | 2.150 | | 2.150 |
| Population growth rate 1975-2003 | | | -0.751 | |
| Dependency ratio old 2004 | | | 1.112 | |
| Migrant Stock (percentage of population) | | | 0.905 | |
| Population ages 65 and above (% of total) 2015 | | | 1.311 | |
| Total fertility rate 1970-1975 | | | -1.336 | |
| Migrant stock (1000) | | | | 0.149 |
| Official development assistance received TOTAL $ mil | | | | -0.553 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.<br>a Rotation converged in 5 iterations. | | | | |

The second factor, the **Governance Factor**, has values above the mean (0) and with a high deviation, which indicates that these countries enjoy high institutional quality. The argument previously maintained in the analysis, which stipulates that high institutional quality is associated with high income and welfare conditions and a low- poverty level still stands.

While the most part of the second factor shows good values, the *Rate of natural increase* indicates that these countries have demographic problems just like other developed countries. Their high life expectancy and low level of natural increase indicates that these countries will fall short in terms of their labor force in the medium run; that is to say, they will have a low percentage of labor population in 15-65 years. A slow or declining labor force growth means less people to pay taxes and social security fees and more budget pressure on social services for the elderly - a demographic problem that rich countries should address.

## Policy Options for Cluster 4

In the short and medium run, the low rate of natural increase will shrink the workforce in these countries. The currently proposed solutions to this problem are the following;1/ workers could work more hours, 2/ more women could join the work force, 3/ retirement could be delayed and 4/ more immigrants could be accepted. All these solutions have or will receive varying arguments. However, this research is in favor of the second and fourth solutions. Migrants will keep on reaching rich countries. Instead of ignoring their existence, they could be integrated and offered regular jobs. They will contribute to the social system as original citizens, and locals will keep on enjoying high level of welfare. Many studies indicate that migrants are mainly occupying jobs that local regard as unsuitable. Therefore, part of labor market deficiency will be solved, population will not decrease and the social system will receive adequate and needed contributions for local pension systems.

## Fifth Cluster

In the following table (Table 13), the variables that form Cluster 5 are presented. In the first factor, the **Socio-economic Factor** has good values. Most of these countries registered good results in challenging illiteracy, child mortality and life expectancy. The prospect for the future and for new generations could be positive, especially if female participation increases. In the first factor, it is important to indicate that these countries are mainly desert, which means high concentration of people in urban area (1.264).

The second factor, the **Governance Factor**, are above the mean except in the "*Voice and Accountability"* (-.875): "*Political Stability"* (0.310)*, "Rule of Law*" (0.532)*, "Control of Corruption"* (0.498)*, "Government Effectiveness" (0.495), "Regulatory Quality"* (0.243) and *GDP/ capita (PPP)* (0.491)*.* Notice that while the values of these variables are above the mean (0), they are still lower than the values of the same variables in the $4^{th}$, $7^{th}$ and $8^{th}$ clusters.

The third factor, the **Population Factor**, a high percentage of "Population Growth" (1.926), high "Migrant Stock" (percentage of population) (3.134),and high "fertility rate" (0.889). Positive value of "*Percentage of migration"* indicates that these countries depend on immigration for the labor market. Moreover, other variables indicate that population are mainly youth; "Population ages 65 and above" (-0.962), and "Elderly Dependency ratio" is low (-0.990).

**Table 13**
Cluster 5

| Rotated Component Matrix(a) | Component | | | |
|---|---|---|---|---|
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | -0.688 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.633 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.722 | | | |
| Total fertility rate 2000-2005 | 0.068 | | | |
| Human Development Index 2003 | 0.584 | | | |
| life expectancy at birth 2003 undp | 0.688 | | | |
| Dependency ratio young 2004 | -0.113 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.218 | | | |
| Population under age 15 (%of total) 2003 | 0.029 | | | |
| Urban Pop. as % ot total 2003 | 1.264 | | | |
| Rule of Law | | 0.532 | | |
| Control of Corruption | | 0.498 | | |
| Regulatory Quality | | 0.243 | | |
| Government Effectiveness | | 0.495 | | |
| Political Stability | | 0.310 | | |
| Voice and Accountability | | -0.875 | | |
| GDP per capita ( PPP $) 2003 undp | | 0.491 | | |
| Health expenditure per capita PPP US$ 2002 | | -0.002 | | -0.002 |
| Population growth rate 1975-2003 | | | 1.926 | |
| Dependency ratio old 2004 | | | -0.990 | |
| Migrant Stock (percentage of population) | | | 3.134 | |
| Population ages 65 and above (% of total) 2015 | | | -0.962 | |
| Total fertility rate 1970-1975 | | | 0.889 | |
| Migrant stock (1000) | | | | 0.245 |
| Official development assistance received TOTAL $ mil | | | | 0.192 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.<br>a Rotation converged in 5 iterations. | | | | |

In the fourth factor, the **Welfare Factor**, the variables of this factor have values above the mean (0) in the sample: *"Health expenditure/capita (PPP)" slightly negative* (-0.002). Accordingly, the level of *Migration Stock (0.245)* is high and indicates that this country has an attractive welfare system for immigrants. Finally, some of the countries receive high Official Development Assistance ODA (0.192).

## Policy Options for Cluster 5

In the Institutional Factor more attention should be given to the variables of "*Voice and Accountability".* This indicator includes a number of indicators measuring various aspects of the political process, civil liberties and political rights. These indicators measure the extent to which citizens of a country are able to participate in the selection of governments. Also it includes indicators measuring the independence of the media, which plays an important role in monitoring those in authority and holding them accountable for their actions.

More work should be done to increase political and civil participation and rights. Most of the countries in this cluster lack the political and civil experience given the short time span from their independence until today. Notice that the rate of natural increase in these countries is high and GDP/ capita is high due to abundant natural wealth - petrol.

Note that the Welfare Factor indicates that health expenditure is slightly below the mean of the sample and that obviously more resources should be channeled to the health sector. Finally, high population in urban areas is due to the fact that the larger part of these countries is desert.

**Sixth Cluster**

Countries that group in this cluster (Table 14) are developing one and have a number of underlying problems that could encourage the outflow of people. In the first factor, all variables indicate that these countries are suffering from poverty and low level of welfare.

The first factor, the **Socio-economic Factor**, which groups variables that measure poverty has the following values; high incidence of “Under 5 mortality rate” 0.986) and “Maternal mortality rate” in 2000 (0.860), high “Infant mortality rate” in 2003 (1.031), “Total fertility rate 2000-2005” is also high (0.946), and poor values of “Human Development Index 2003” (-1.117). Furthermore, “Life expectancy at birth 2003” is low (-1.109), low “Adult literacy rate” (-0.970), they have high young dependency ratio (0.988), and “population under age 15” is (0.978). The later variables indicate that population is young and problems in labor market may lead to outflow of migrants. Finally, high percentage of the population is living in rural areas, “urban Population as % of total” is (-.781). That indicates that population is concentrated in rural areas and are dependent on agriculture in their livings.

As shown in the above table, variables of the **Governance Factor** are preceded by a negative sign, indicating their poor values in comparison with the mean of the group; ”Rule of Law” (-0.988), “Control of Corruption” (-0.400), “Regular Quality” (-0.952), “Government Effectiveness” (-0.968), “Political stability” (-1.017) and “Voice and Accountability” (-0.972). Moreover, these countries have low level of “GDP / capita (PPP)” (-0.631) and low level of “health expenditure per capita” (-0.608), both variables are associated with a low level of institutional quality. These results confirm once again that negative governance indicators are firmly associated with socio-economic problems such as poverty, diseases, conflicts, immigration etc.

**Table 14**
Cluster 6

| Cluster 6 | | | | |
|---|---|---|---|---|
| Rotated Component Matrix(a) | Component | | | |
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | 0.986 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | 0.860 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | 1.033 | | | |
| Total fertility rate 2000-2005 | 0.946 | | | |
| Human Development Index 2003 | -1.117 | | | |
| life expectancy at birth 2003 undp | -1.109 | | | |
| Dependency ratio young 2004 | 0.988 | | | |
| Adult literacy rate (% ages of 15 and above) undp | -0.970 | | | |
| Population under age 15 (%of total) 2003 | 0.978 | | | |
| Urban Pop. as % ot total 2003 | -0.781 | | | |
| Rule of Law | | -0.988 | | |
| Control of Corruption | | -0.924 | | |
| Regulatory Quality | | -0.952 | | |
| Government Effectiveness | | -0.968 | | |
| Political Stability | | -1.017 | | |
| Voice and Accountability | | -0.972 | | |
| GDP per capita ( PPP $) 2003 undp | | -0.631 | | |
| Health expenditure per capita PPP US$ 2002 | | -0.608 | | -0.608 |
| Population growth rate 1975-2003 | | | 0.795 | |
| Dependency ratio old 2004 | | | -0.638 | |
| Migrant Stock (percentage of population) | | | -0.376 | |
| Population ages 65 and above (% of total) 2015 | | | -0.768 | |
| Total fertility rate 1970-1975 | | | 0.773 | |
| Migrant stock (1000) | | | | -0.103 |
| Official development assistance received TOTAL $ mil | | | | 0.380 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.<br>a Rotation converged in 5 iterations. | | | | |

Furthermore, variables in the third factor, the **Population Factor,** are remarkable. Countries in this cluster have high total fertility rate 1970-75 (0.773) as in 2000-05 (0.946) and high Population growth rate too (0.795). On the other side, they have a low “population age 65 and above” (-0.768) and “dependency ratio for the old” is (-0.638). Yet, outflow of migrants is high, and it is reflected by the negative sign of the variable “migrant stock (percentage of population)” (-0.376) and “Migrant stock (1000)” (-0.103). The whole factor indicates that this cluster has high fertility rate, young population, and high population growth. Coupled with negative economic growth and poor quality of governance, countries in this cluster have high outflow of migrants.

The fourth factor, the **Welfare Factor**, has a negative value in “Health expenditure” (-0.608) indicating the existence of a problem in the welfare. these countries receive ODA and has a stock of immigrants above the mean of the sample.

**Policy Options for Cluster 6**

The symptoms of this cluster are similar to cluster 3. Developing policies should focus on economic growth, development, and improving the state of welfare.

**Seventh Clusters**

As seen in Table 6, countries in this group include developed countries; France, Germany, Japan and United Kingdom. Values of the different variables are good and the have little problems related to population growth.

The first factor, the **Socio-economic Factor**, which groups variables that measure level of poverty, has good values such as; low "Under 5 mortality rate" (-0.856), "Maternal mortality rate" in 2000 (- 0.708), "Infant mortality rate" in 2003 (-959), "Total fertility rate 2000-2005" (-0.963), and good values of: "Human Development Index 2003" (1.298), "Life expectancy at birth 2003" (1.128), "Adult literacy rate" (0.896) and more people are living in urban areas "Urban population" (1.088). Yet , they have negative "young dependency ratio" (-1.238), negative "Total fertility rate" (-0.963) and population under age 15 (-1.418). The later variables indicate that population is not young and problems in labor market and the pension system will arise soon.

The second factor, the **Governance Factor**, has values above the mean (0) and with a high deviation, which indicates that these countries enjoy high institutional quality. The argument previously maintained in the analysis, which stipulates that high institutional quality is associated with high income and welfare conditions and a low- poverty level still stands.

While the most part of the second factor shows good values, variables in the 3rd factor indicate some problems. For example, the *Rate of natural increase* indicates that these countries have demographic problems just like other developed countries. Their high life expectancy and low level of natural increase indicates that these countries will fall short in terms of their labor force in the medium run; that is to say, they will have a low percentage of labor population in 15-65 years. A slow or declining labor force growth means less people to pay taxes and social security fees and more budget pressure on social services for the elderly - a demographic problem that rich countries should address. Moreover, these countries have large stocks of migrants. Being rich in resources and enjoy high level of governance, welfare and economic growth, these countries are always perceived as a good destination for immigrants.

Two thinks that could be learn form this cluster; rich countries enjoy high level of welfare but lack the needed population to maintain these systems viable and being rich will attract immigrants that are seeking better conditions of life.

**Table 16**
Cluster 7

**Cluster 7**

| Rotated Component Matrix(a) | Component | | | |
|---|---|---|---|---|
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | -0.854 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.708 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.959 | | | |
| Total fertility rate 2000-2005 | -0.963 | | | |
| Human Development Index 2003 | 1.298 | | | |
| life expectancy at birth 2003 undp | 1.128 | | | |
| Dependency ratio young 2004 | -1.238 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.896 | | | |
| Population under age 15 (%of total) 2003 | -1.418 | | | |
| Urban Pop. as % ot total 2003 | 1.088 | | | |
| Rule of Law | | 1.617 | | |
| Control of Corruption | | 1.678 | | |
| Regulatory Quality | | 1.283 | | |
| Government Effectiveness | | 1.510 | | |
| Political Stability | | 0.914 | | |
| Voice and Accountability | | 1.324 | | |
| GDP per capita ( PPP $) 2003 undp | | 1.790 | | |
| Health expenditure per capita PPP US$ 2002 | | 2.113 | | 2.113 |
| Population growth rate 1975-2003 | | | -1.191 | |
| Dependency ratio old 2004 | | | 1.806 | |
| Migrant Stock (percentage of population) | | | 0.046 | |
| Population ages 65 and above (% of total) 2015 | | | 2.055 | |
| Total fertility rate 1970-1975 | | | -1.534 | |
| Migrant stock (1000) | | | | 1.506 |
| Official development assistance received TOTAL $ mil | | | | -3.873 |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 5 iterations.

## Policy Options for Cluster 7

In the short and medium run, the low rate of natural increase will shrink the workforce in these countries. The currently proposed solutions to this problem are the following; 1/ workers could work more hours, 2/ more women could join the work force, 3/ retirement could be delayed and 4/ more immigrants could be accepted. On the other side, to reduce level of immigration, development policies in sending countries should be foster to create job opportunities, to reduce poverty, to fight food insecurity among others. Therefore, economic policies in these countries should consider contributing to development in sending and poor countries. Unless these policies are created more immigrants will find ways to reach developed countries.

## Eight Cluster

This cluster represents the situation of the USA. The state of all factors is similar to developed countries and shares the same latent problems of rich world; declining population growth and large stock of immigrants. Values of indicators are similar and would recommend the same policies as developed countries.

**Table 17**
Cluster 8

| **Cluster 8** | | | | |
|---|---|---|---|---|
| Rotated Component Matrix(a) | Component | | | |
| **Variables**<br>Variables standarized | 1st Factor<br>**Socio-economic** | 2nd Factor<br>**Governance** | 3rd Factor<br>**Population** | 4th Factor<br>**Welfare** |
| Under 5 mortality rate (per 1,000 live births) | -0.808 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) | -0.696 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -0.883 | | | |
| Total fertility rate 2000-2005 | -0.701 | | | |
| Human Development Index 2003 | 1.334 | | | |
| life expectancy at birth 2003 undp | 0.945 | | | |
| Dependency ratio young 2004 | -0.930 | | | |
| Adult literacy rate (% ages of 15 and above) undp | 0.896 | | | |
| Population under age 15 (%of total) 2003 | -0.977 | | | |
| Urban Pop. as % ot total 2003 | 1.103 | | | |
| Rule of Law | | 1.675 | | |
| Control of Corruption | | 1.859 | | |
| Regulatory Quality | | 1.288 | | |
| Government Effectiveness | | 1.848 | | |
| Political Stability | | 0.571 | | |
| Voice and Accountability | | 1.291 | | |
| GDP per capita ( PPP $) 2003 undp | | 2.751 | | |
| Health expenditure per capita PPP US$ 2002 | | 5.346 | | 5.346 |
| Population growth rate 1975-2003 | | | -0.654 | |
| Dependency ratio old 2004 | | | 0.979 | |
| Migrant Stock (percentage of population) | | | 0.407 | |
| Population ages 65 and above (% of total) 2015 | | | 1.098 | |
| Total fertility rate 1970-1975 | | | -1.534 | |
| Migrant stock (1000) | | | | 11.331 |
| Official development assistance received TOTAL $ mil | | | | -8.689 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.<br>a Rotation converged in 5 iterations. | | | | |

Cluster analyze is used to examine the different characteristics of different groups of countries. In this analysis, we were able to have a broad idea of the state of welfare in all countries participating in the analysis and to recommend policies to overcome challenges. Moreover, we were able to indicate causes and reasons behind outflow of people. At the same time we were able to point out the different reasons behind the attraction forces in developed countries; mainly the level of welfare.

# V. CONCLUSION

Over the last two centuries, the movement of people has taken on new dimensions and scales. The presence of new lands in the Americas and better transportation technology (e,g. steamships) changed the movement of people between different countries and regions. In the second half of the 19th century, about 10% of the world's population left their country of origin and headed towards new destinations. The result positively impacted global welfare. Nevertheless, in the 20th century, the movement of labor became limited and many restrictions were imposed on it.

This research focuses on the reasons behind the migration of people. It discusses the reasons that determine the movement of people in developing countries and then puts these to an empirical study. The qualitative and quantitative discussion leads to the following results:

- **Poverty** is found to be a determinant factor in international migration. Poor people live in deprived economic and social conditions that affect all aspects of their life. Other than being exposed to hunger and insecurity and lacking the means to obtain adequate health care and education, they are vulnerable and incapable of facing natural disasters and social and economic shocks. A policy to create economic growth would reduce poverty and indirectly reduce the level of international migration. If people are provided with dignified living conditions, emigration will be limited. Moreover, poor countries lack sufficient resources to support a high rate of population growth, which increases poverty and unemployed labors.

- On the other hand, action should be taken to improve the quality of **governance** from outside these countries. International organizations and donors could contribute to the improvement of institutional quality by providing technical assistance and increasing the capacity of locals to solve institutional problems. Moreover, governance quality could be controlled from outside through credits and loans agreements, trade and investment prospects etc., which focus on governance improvement for further developing collaboration. Furthermore, a moral duty continues to lie on developed countries regarding the debts of poor countries. Exempting poor countries from their loans and participating in fighting fatal diseases could bring economic growth to poor countries.

- While poverty has a direct effect on the migration of people, the analysis detected a latent relationship between migration, quality of institutions and **demographic** characteristics. The results of the factor analysis indicate that population, welfare, and institutions are determinant factors in the migration flow. The high outflow of migration is related to countries with deficient socioeconomic variables, bad governance and high population growth.

In the empirical analysis, some demographic variables were introduced to detect if there is a relation to international migration. The results indicate that sending countries have higher fertility rates, high population levels under 15 years, a high young dependency ratio and a low elderly dependency ratio.

High population growth means that the overall income must grow rapidly to maintain per capita income at a reasonable level. A larger population will need larger production. Yet, in countries that lack the facilities to produce more will witness a decrease in the portion of production per individual. This negative population effect may cause serious socioeconomic problems, especially if the economy in question lacks physical and human capital.

Moreover, countries with high population growth will increase the youth percentage in a society. A high birth rate will increase the ratio of children to the total population. Most developing countries have a higher percentage of children in comparison with other population groups, thus increasing the dependency ratio of children and increasing pressure on public services and facilities. In countries that lack development policies and have low income growth, children will receive less health and education services and who will soon be adults with little opportunities to work and develop. This will consequently increase the level of unemployment and potential emigration.

While growth is necessary to overcome poverty, governance is essential to create sustainable growth. The way that a system functions reflects the kind of institutions a country possesses, which can in turn explain part of the discrepancy between poor and rich countries. In the last century, the level of income between rich and poor countries varied from 10:1 in 1900 to 60:1 in 2000. There is a prevalent belief that these differences are due to a number of reasons including sound macroeconomic policies, political stability and sound public management.

As institutions play a major role in both promoting growth and improving welfare, they indirectly create the socio-economic environment that people will either choose to live in or escape from. Poverty, deprived health and education services, lack of liberties and high fertility rates are signs of countries with a potential outflow of people.

The redirection of government activities towards the provision of public goods and services that include public health, education, infrastructure and security among others, will have affects on economic growth. These essential objectives facilitate people's access to their needs and allow them to participate in the different market activities.

An increase in people's income will reduce the tendency to emigrate. People will emigrate to find better opportunities; where these opportunities already exist, the

level of emigration is low. The empirical analysis concluded that high income countries have positive migrant stocks. That is to say, where there is high income per capita, good governance and opportunities there is a high level of immigrants and low level of emigrants.

Large percentages of immigrants are generated in developing countries and are moving in all directions. There are many reasons behind this movement, some of which this paper tries to pinpoint. Facing this phenomenon is the duty of both developed and developing countries. More restriction policies toward immigration is not the right solution for such a wide-scale and important phenomenon. With adequate development policies in sending countries less people will emigrate towards more affluent countries.

❋ ❋ ❋

## Reference


Acemoglu, Daron (2003). “Root Causes: A historical Approach to Assessing the Role of Institutions in Economic Development”. *Finance and Development*. Washington D.C., IMF.

Acemoglu, Daron, Simin Johnson , and James A. Robinson (2002), “Reversal of Fortunes: Geography and Institutions in the Making of the Modern World Income Distribution”, Quarterly Journal of Economics, Vol. 117 (Nov.), p:1231-94

Adams, Richard H. Jr. (1998).“Remittances, Investment, and Rural Asset Accumulation in Pakistan”. *Economic Development and Cultural Change,* Vol. 47, pp. 155-173.

Adams, Richard H. Jr. (2002).“Economic Growth, Inequality and Poverty: Findings from a New Data Set”. The World Bank Policy Research Working Paper 2972, Washington D.C.

Adams, Richard H. Jr. (2003 a).”International Migration, Remittances and Poverty in Developing Countries”. Policy Research WP 3179. Washington D.C. ,World Bank.

Adams, Richard H. Jr. (2003 b).”International Migration, Remittances and the Brain Drain: A Study of 24 Labor-Exporting Countries”. Policy Research WP 3069. Washington D.C. (June), World Bank.

Bagwatti, Jagdish (1976). “The Brain Drain”. *International Social Science Journal* 28: 691-729.

Barro, Robert J. (1991) “ Economic Growth in a Cross Section of Country”. *The Quarterly Journal of Economics*, Vol. 106 (2): 407-443.

Barro, Robert J. (1997). *Determinants of economic growth: A cross-country empirical study.* Cambridge, MA,MIT Press.

Barro, Robert J., Gregory Mankiw and Xavier Sala-I-Martin (1992).” Convergence”. *Journal of Political Economy* 100:223-251.

Barro, Robert J. and Jong-Wha Lee (2000). “International data on educational attainment: Updates and Implications”. Center for International Development at Harvard University. Working Paper No. 42.

Borjas, George J. (1995). “The economic benefits from immigration”. *Journal of Economic Perspectives*, 9(2):3-22.

Borjas, George J. (1998) “Immigration and Welfare Magnets” NBER WP 6813.

Borjas, George J. (2003) “The labor demand curve is downward sloping: reexamining the impact of immigration on the labor market”. NBER WP 9755

Bray, David (1984). ”Economic development: The middle class and international migration in the Dominican Republic”, *International Migration Review* 18: 217-236.

Brucker, Herbert (2000). “Can International Migration Solve The Problems Of European Labour Markets?”. Economic Survey of Europe, 2002 No.2.

Chiswick, Barry R. and Timothy J. Hatton (2002). “International Migration and the Integration of Labor Markets”, IZA Discussion paper No.559.

Harris, John R. & Todaro, Michael P. (1970). “Migration, Unemployment and Development: A Two-Sector Analysis” *The American Economic Review*, Vol. 60, Issue 1, 126-142.

Hatton, Timothy J. and Jeffery G. Williamson (eds.). (1994). Migration and the International Labor Market, 1870-1939. London, Routledge.

Hatton, Timothy J. and Jeffery G. Williamson (1994), “What drove the mass migration from Europe in the late nineteenth century?” Population and Development Review, 90 (3): 533-59.

Hatton, Timothy J. and Jeffery G. Williamson (1998 a). The Age of Mass Migration. New York, Oxford University Press.

Hatton, Timothy J. and Jeffery G. Williamson. (1998 b) “Labor Market Impact Abroad and Convergence” in T.J. Hatton and J.G. Williamson, The Age of Mass Migration: Causes and Economic Impact. New York, Oxford University Press.

Hatton, Timothy J. and Jeffery G. Williamson (1998) The Age of Mass Migration. New York, Oxford University Press.

Hatton, Timothy J. and Jeffery G. Williamson (2001) “Demographic and Economic Pressure on African Emigration”. NBER working paper 8124. National Bureau of Economic Research, Cambridge, Mass. (March).

Hatton, Timothy J. and Jeffery G. Williamson (2002).” What Fundamental Drive World Migration?”. NBER Working Paper 9159, National Bureau of Economic Research, Cambridge, Mass. (Sept.)

Hair, Anderson, Tatham, Black (1999) *Analysis Multivariate*. 5th ed., Madrid.

Islam, Roumeen and Claudio E. Montenegro (2002). “What determines the Quality of Institutions”. World Bank

International Organization for Migration-IOM (2003) *Labour Migration: Trends, challenge and policy responses in countries of origin*. Geneva: IOM.

Kaiser, Henry F., (1974) “ Alpha factor analysis”, *Psychometrika*, No. 30 (1-14).

Kaiser, Henry F., (1974) “An index of factorial Analysis” *Psychometrika*, No. 39 (31-36).

Khadria, Binod (2002). “Skilled Labor Migration from Developing Countries: Study on India”. International Migration Programme. Geneva, ILO.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi (2005) “Governance Matters IV: Governance Indicators for 1996-2004”. Washington D.C., World Bank.
http://www.worldbank.org/wbi/governance/pubs/govmatters4.html (August, 2006)

Martin, Philip L (2003). “Sustainable Migration Policies in Globalizing World”. Geneva, International Institute for Labour Studies.

Martin, Phillip (2003) “Bordering on Control: Combating Irregular Migration in North America and Europe”. Geneva: IOM.

Martin, Phillip (2004) “Migration” in *Global Crises, Global Solution.* Edited by Bjørn Lomborg. Cambridge University Press.

Massey, Douglas S. (1990) “Social structure, household strategies, and the cumulative causation of migration”. *Population Index* 56:3-26.

Massey, Douglas S. and Emilio Parrado (1994). “Migradollars: The remittances and saving of Mexican migrants to the United States”, *Population Research and Policy Review* 13: 3-30.

Massey, Douglas S. and Felipe Garcia España (1987) “The social process of international migration”. *Science* 237:733-738.

Massey, Douglas S. Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, J. Edward Taylor (1994). “An Evaluation of International Migration Theory: The North American Case. *Population and Development Review*, Vol. 20, Issue 4 (Dec., 1994), 699-751.

Massey, Douglas S. Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, J. Edward Taylor (1993). “Theories of International Migration: A Review and Appraisal” *Population and Development Review*, Vol. 19, Issue 3, 431- 466.

Maurice Schiff (1998). “Trade, Migration and Welfare; the impact of social capital” The World Bank.

Melvin W. Reder (1963), “The Economic Consequences of Increased Immigration”, *Review of Economics and Statistics,* XLV(3),August, 221-30.

Rotte, Ralph and Michael Volger (1998) “Determinants of international migration: empirical evidence fro migration from developing countries to Germany”. IZA DP No. 12.

Rotte, Ralph and Michael Volger 1999. “The Effects of Development on Migration: Theoretical Issues and New Empirical Evidence”. Institute for the study of labor, IZA DP No. 46.

Solimano, Andreas (2001). “International Migration and the Global Economic Order”, Washington, D.C.: World Bank, Working paper 2720.

Solimano, Andreas (2001a). “The Evolution of World Income Inequality: Assessing the impact of Globalization” Economic Development Division. Economic Commission for Latin America ECLAC.

Stark, Oded (1984) “Migration decision making: A review article” *Journal of Development Economics* 14:251-259

Stark, Oded (1991) *The Migration of Labor*. Cambridge: Basil Blackwell.

Thomas-Hope, Elizabeth (2002). “Skilled Labor Migration from Developing Countries: Study on the Caribbean Region”. International Migration Programme. Geneva, ILO.

Thompson, Gary, Ricardo Amon, and Philip L. Martin (1986). “Agricultural development and emigration: Rhetoric and reality”, *International Migration Review* 20: 575-598.

Todaro, Michael P. (1969). “A Model of Labor Migration and Urban Unemployment in Less Developed Countries” *The American Economic* Review, Vol. 59, Issue 1, 138- 148.

Todaro, Michael P. and Lidia Maruszko (1989). “Illegal Migration and US immigration reform: A conceptual framework”. Population and Development Review 13: 101-114.

United Nation- General Assembly (2005a)“International migration and development: Report of the Secretary-General.”

United Nations (2005 b) *Human Development Report 2005*. Database. United Nations Development Programme. New York.

Visco, Ignazio (2000). "Immigration, Development and the Labor Market ". The International Conference on Migration: Scenarios for the 21st Century. Rome, OECD.

Williamson, Jeffrey G (1996). "Globalization, Convergence, and History" *The Journal of Economic History*, Vol. 56, Issue 2, 227-306.

Zimmermann, Klaus F. (1995). "Tackling the European Migration Problem" *The Journal of Economics Perspectives*, Vol. 9, Issue 2, 45-62.

Zlotnik, Hania (1998). "International Migration: 1965-1990. An Overview". *Population and Development Review*, 24(3), pp. 429-468.

# Appendix

## **Factor Analysis**: SPSS results

**Descriptive Statistics**

| | Mean | Std. Deviation[a] | Analysis N[a] | Missing N |
|---|---|---|---|---|
| Voice and Accountability | -.0798 | .99876 | 177 | 0 |
| Political Stability | -.0836 | .96912 | 177 | 0 |
| Government Effectiveness | -.0297 | .98999 | 177 | 0 |
| Regulatory Quality | -.0266 | .96796 | 177 | 0 |
| Rule of Law | -.0745 | .98777 | 177 | 0 |
| Control of Corruption | -.0386 | 1.00510 | 177 | 0 |
| Under 5 mortality rate (per 1,000 live births) | 60.91 | 65.116 | 177 | 2 |
| Maternal mortality rate 2000 (per 100,000 live births) (adjusted by UN) | 299.97 | 402.143 | 177 | 4 |
| Infant mortality rate (per 1,000 live births) 2003 | 41.86 | 39.277 | 177 | 2 |
| Human Development Index 2003 | .70555 | .177669 | 177 | 2 |
| Total fertility rate 2000-2005 | 3.205 | 1.6942 | 177 | 5 |
| life expectancy at birth 2003 undp | 65.773 | 12.2651 | 177 | 1 |
| Adult literacy rate (% ages of 15 and above) undp | 81.562 | 20.5205 | 177 | 1 |
| Population under age 15 (%of total) 2003 | 31.477 | 10.4658 | 177 | 5 |
| Population ages 65 and above (% of total) 2003 | 5.967 | 4.2486 | 177 | 5 |
| Total fertility rate 1970-1975 | 5.053 | 1.9621 | 177 | 5 |
| GDP per capita ( PPP $) 2003 undp | 9164.11 | 10321.322 | 177 | 0 |
| Health expenditure per capita PPP US$ 2002 | 623.47 | 860.040 | 177 | 4 |
| Migrant stock (1000) | 1062.18 | 3291.194 | 177 | 0 |
| Migrant Stock (percentage of population) | 7.851 | 12.4004 | 177 | 0 |
| Official development assistance received TOTAL (US$ millions) | -99.478 | 1843.1813 | 177 | 3 |
| Urban Pop. as % ot total 2003 | 54.342 | 23.2904 | 177 | 1 |
| Population growth rate 1975-2003 | 1.791 | 1.2064 | 177 | 1 |
| Dependency ratio young 2004 | .5288 | .23116 | 177 | 6 |
| Dependency ratio old 2004 | .0948 | .06543 | 177 | 6 |

a. For each variable, missing values are replaced with the variable mean.

Correlation Matrix(a)

| Indicators | Voice & Acc. | Political Stability | Government Effectiveness | Regulatory Quality | Rule of Law | Control of Corruption | Dependency ratio young | Dependency ratio old | Pop. growth rate 75-03 | Urban Pop. 2003% | Population under age | Pop. ages above 65 | fertility rate 2000-2005 | fertility rate 1970-1975 | GDP/ ( PPP ) | life expectancy | HDI | Adult literacy rate | Health expenditure | Infant mortality | Under 5 mortality | Maternal mortality | Migrant Stock %Pop | Migrant per (1000) | ODA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Voice and Accountability | 1.000 | 0.703 | 0.730 | 0.818 | 0.791 | 0.744 | -0.508 | 0.551 | -0.559 | 0.375 | -0.540 | 0.624 | -0.465 | -0.619 | 0.616 | 0.492 | 0.574 | 0.415 | 0.623 | -0.525 | -0.483 | -0.397 | 0.039 | 0.124 | -0.375 |
| Political Stability | 0.703 | 1.000 | 0.795 | 0.796 | 0.864 | 0.803 | -0.520 | 0.432 | -0.388 | 0.423 | -0.533 | 0.504 | -0.473 | -0.514 | 0.652 | 0.518 | 0.613 | 0.420 | 0.553 | -0.549 | -0.516 | -0.439 | 0.313 | 0.059 | -0.317 |
| Government Effectiveness | 0.730 | 0.795 | 1.000 | 0.909 | 0.957 | 0.960 | -0.677 | 0.522 | -0.394 | 0.624 | -0.692 | 0.645 | -0.610 | -0.664 | 0.851 | 0.645 | 0.751 | 0.509 | 0.792 | -0.645 | -0.604 | -0.524 | 0.400 | 0.252 | -0.438 |
| Regulatory Quality | 0.818 | 0.796 | 0.909 | 1.000 | 0.921 | 0.895 | -0.589 | 0.517 | -0.425 | 0.521 | -0.614 | 0.614 | -0.532 | -0.633 | 0.774 | 0.579 | 0.677 | 0.457 | 0.686 | -0.586 | -0.547 | -0.464 | 0.321 | 0.164 | -0.376 |
| Rule of Law | 0.791 | 0.864 | 0.957 | 0.921 | 1.000 | 0.963 | -0.636 | 0.516 | -0.404 | 0.565 | -0.651 | 0.620 | -0.569 | -0.629 | 0.839 | 0.641 | 0.732 | 0.479 | 0.770 | -0.653 | -0.612 | -0.516 | 0.397 | 0.222 | -0.450 |
| Control of Corruption | 0.744 | 0.803 | 0.960 | 0.895 | 0.963 | 1.000 | -0.609 | 0.508 | -0.375 | 0.586 | -0.630 | 0.619 | -0.529 | -0.624 | 0.851 | 0.613 | 0.705 | 0.449 | 0.811 | -0.606 | -0.561 | -0.475 | 0.404 | 0.245 | -0.468 |
| Dependency ratio young 2004 | -0.508 | -0.520 | -0.677 | -0.589 | -0.636 | -0.609 | 1.000 | -0.610 | 0.664 | -0.642 | 0.989 | -0.809 | 0.954 | 0.861 | -0.648 | -0.805 | -0.876 | -0.752 | -0.591 | 0.813 | 0.806 | 0.753 | -0.283 | -0.214 | 0.330 |
| Dependency ratio old 2004 | 0.551 | 0.432 | 0.522 | 0.517 | 0.516 | 0.508 | -0.610 | 1.000 | -0.670 | 0.379 | -0.678 | 0.840 | -0.547 | -0.735 | 0.547 | 0.419 | 0.533 | 0.493 | 0.595 | -0.453 | -0.409 | -0.375 | 0.007 | 0.197 | -0.381 |
| Population growth rate 1975-2003 | -0.559 | -0.388 | -0.394 | -0.425 | -0.404 | -0.375 | 0.664 | -0.670 | 1.000 | -0.203 | 0.705 | -0.804 | 0.638 | 0.806 | -0.375 | -0.457 | -0.546 | -0.559 | -0.425 | 0.485 | 0.475 | 0.432 | 0.250 | -0.093 | 0.268 |
| Urban Pop. as % ot total 2003 | 0.375 | 0.423 | 0.624 | 0.521 | 0.565 | 0.586 | -0.642 | 0.379 | -0.203 | 1.000 | -0.627 | 0.491 | -0.603 | -0.526 | 0.616 | 0.646 | 0.718 | 0.547 | 0.549 | -0.626 | -0.598 | -0.541 | 0.495 | 0.232 | -0.291 |
| Pop. under age 15 (%of total) | -0.540 | -0.533 | -0.692 | -0.614 | -0.651 | -0.630 | 0.989 | -0.678 | 0.705 | -0.627 | 1.000 | -0.874 | 0.925 | 0.901 | -0.676 | -0.778 | -0.860 | -0.734 | -0.628 | 0.785 | 0.768 | 0.712 | -0.270 | -0.227 | 0.357 |
| Pop. ages 65 and above (% of total) | 0.624 | 0.504 | 0.645 | 0.614 | 0.620 | 0.619 | -0.809 | 0.840 | -0.804 | 0.491 | -0.874 | 1.000 | -0.728 | -0.922 | 0.672 | 0.612 | 0.714 | 0.608 | 0.704 | -0.612 | -0.578 | -0.515 | 0.063 | 0.237 | -0.439 |
| Total fertility rate 2000-2005 | -0.465 | -0.473 | -0.610 | -0.532 | -0.569 | -0.529 | 0.954 | -0.547 | 0.638 | -0.603 | 0.925 | -0.728 | 1.000 | 0.786 | -0.551 | -0.793 | -0.870 | -0.800 | -0.499 | 0.840 | 0.851 | 0.822 | -0.206 | -0.170 | 0.275 |
| Total fertility rate 1970-1975 | -0.619 | -0.514 | -0.664 | -0.633 | -0.629 | -0.624 | 0.861 | -0.735 | 0.806 | -0.526 | 0.901 | -0.922 | 0.786 | 1.000 | -0.680 | -0.648 | -0.757 | -0.667 | -0.673 | 0.660 | 0.637 | 0.576 | -0.108 | -0.246 | 0.394 |
| GDP per capita ( PPP $) 2003 | 0.616 | 0.652 | 0.851 | 0.774 | 0.839 | 0.851 | -0.648 | 0.547 | -0.375 | 0.616 | -0.676 | 0.672 | -0.551 | -0.680 | 1.000 | 0.591 | 0.731 | 0.507 | 0.900 | -0.576 | -0.535 | -0.458 | 0.442 | 0.331 | -0.535 |
| life expectancy at birth 2003 | 0.492 | 0.518 | 0.645 | 0.579 | 0.641 | 0.613 | -0.805 | 0.419 | -0.457 | 0.646 | -0.778 | 0.612 | -0.793 | -0.648 | 0.591 | 1.000 | 0.915 | 0.682 | 0.558 | -0.905 | -0.901 | -0.834 | 0.333 | 0.172 | -0.317 |
| Human Development Index 2003 | 0.574 | 0.613 | 0.751 | 0.677 | 0.732 | 0.705 | -0.876 | 0.533 | -0.546 | 0.718 | -0.860 | 0.714 | -0.870 | -0.757 | 0.731 | 0.915 | 1.000 | 0.860 | 0.676 | -0.920 | -0.914 | -0.851 | 0.362 | 0.217 | -0.388 |
| Adult literacy rate (% ages of 15 and | 0.415 | 0.420 | 0.509 | 0.457 | 0.479 | 0.449 | -0.752 | 0.493 | -0.559 | 0.547 | -0.734 | 0.608 | -0.800 | -0.667 | 0.507 | 0.682 | 0.860 | 1.000 | 0.477 | -0.762 | -0.779 | -0.757 | 0.213 | 0.142 | -0.263 |
| Health expenditure per capita PPP U | 0.623 | 0.553 | 0.792 | 0.686 | 0.770 | 0.811 | -0.591 | 0.595 | -0.425 | 0.549 | -0.628 | 0.704 | -0.499 | -0.673 | 0.900 | 0.558 | 0.676 | 0.477 | 1.000 | -0.532 | -0.491 | -0.423 | 0.289 | 0.516 | -0.703 |
| Infant mortality rate (per 1,000 live bi | -0.525 | -0.549 | -0.645 | -0.586 | -0.653 | -0.606 | 0.813 | -0.453 | 0.485 | -0.626 | 0.785 | -0.612 | 0.840 | 0.660 | -0.576 | -0.905 | -0.920 | -0.762 | -0.532 | 1.000 | 0.987 | 0.884 | -0.316 | -0.162 | 0.292 |
| Under 5 mortality rate (per 1,000 live | -0.483 | -0.516 | -0.604 | -0.547 | -0.612 | -0.561 | 0.806 | -0.409 | 0.475 | -0.598 | 0.768 | -0.578 | 0.851 | 0.637 | -0.535 | -0.901 | -0.914 | -0.779 | -0.491 | 0.987 | 1.000 | 0.912 | -0.296 | -0.150 | 0.270 |
| Maternal mortality rate(per 100,000 l | -0.397 | -0.439 | -0.524 | -0.464 | -0.516 | -0.475 | 0.753 | -0.375 | 0.432 | -0.541 | 0.712 | -0.515 | 0.822 | 0.576 | -0.458 | -0.834 | -0.851 | -0.757 | -0.423 | 0.884 | 0.912 | 1.000 | -0.273 | -0.136 | 0.242 |
| Migrant Stock (% of population) | 0.039 | 0.313 | 0.400 | 0.321 | 0.397 | 0.404 | -0.283 | 0.007 | 0.250 | 0.495 | -0.270 | 0.063 | -0.206 | -0.108 | 0.442 | 0.333 | 0.362 | 0.213 | 0.289 | -0.316 | -0.296 | -0.273 | 1.000 | 0.165 | -0.087 |
| Migrant stock (1000) | 0.124 | 0.059 | 0.252 | 0.164 | 0.222 | 0.245 | -0.214 | 0.197 | -0.093 | 0.232 | -0.227 | 0.237 | -0.170 | -0.246 | 0.331 | 0.172 | 0.217 | 0.142 | 0.516 | -0.162 | -0.150 | -0.136 | 0.165 | 1.000 | -0.722 |
| ODA received TOTAL (US$ mil) | -0.375 | -0.317 | -0.438 | -0.376 | -0.450 | -0.468 | 0.330 | -0.381 | 0.268 | -0.291 | 0.357 | -0.439 | 0.275 | 0.394 | -0.535 | -0.317 | -0.388 | -0.263 | -0.703 | 0.292 | 0.270 | 0.242 | -0.087 | -0.722 | 1.000 |
| Voice and Accountability | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.305 | 0.050 | 0.000 |
| Political Stability | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.218 | 0.000 |
| Government Effectiveness | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Regulatory Quality | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.015 | 0.000 |
| Rule of Law | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| Control of Corruption | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| Dependency ratio young 2004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 |
| Dependency ratio old 2004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.464 | 0.005 | 0.000 |
| Population growth rate 1975-2003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.109 | 0.000 |
| Urban Pop. as % ot total 2003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| Population under age 15 (%of total) 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 |
| Population ages 65 and above (% of | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.206 | 0.001 | 0.000 |
| Total fertility rate 2000-2005 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.013 | 0.000 |
| Total fertility rate 1970-1975 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.079 | 0.001 | 0.000 |
| GDP per capita ( PPP $) 2003 undp | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| life expectancy at birth 2003 undp | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | 0.000 |
| Human Development Index 2003 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 |
| Adult literacy rate (% ages of 15 and | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.030 | 0.000 |
| Health expenditure per capita PPP U | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Infant mortality rate (per 1,000 live bi | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.000 | 0.016 | 0.000 |
| Under 5 mortality rate (per 1,000 live | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.000 | 0.023 | 0.000 |
| Maternal mortality rate 2000 (per 100 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.000 | 0.037 | 0.001 |
| Migrant Stock (percentage of popula | 0.305 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.464 | 0.000 | 0.000 | 0.000 | 0.206 | 0.003 | 0.079 | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | | 0.014 | 0.124 |
| Migrant stock (1000) | 0.050 | 0.218 | 0.000 | 0.015 | 0.001 | 0.001 | 0.003 | 0.005 | 0.109 | 0.001 | 0.001 | 0.001 | 0.013 | 0.001 | 0.000 | 0.011 | 0.002 | 0.030 | 0.000 | 0.016 | 0.023 | 0.037 | 0.014 | | 0.000 |
| Official development assistance rece | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.124 | 0.000 | |

Determinant = 2.30E-021

**KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .915 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 7500.149 |
| | df | 300 |
| | Sig. | .000 |

**Communalities**

| | Initial | Extraction |
|---|---|---|
| Voice and Accountability | 1.000 | .776 |
| Political Stability | 1.000 | .786 |
| Government Effectiveness | 1.000 | .935 |
| Regulatory Quality | 1.000 | .898 |
| Rule of Law | 1.000 | .965 |
| Control of Corruption | 1.000 | .945 |
| Under 5 mortality rate (per 1,000 live births) | 1.000 | .907 |
| Maternal mortality rate 2000 (per 100,000 live births) (adjusted by UN) | 1.000 | .836 |
| Infant mortality rate (per 1,000 live births) 2003 | 1.000 | .901 |
| Human Development Index 2003 | 1.000 | .960 |
| Total fertility rate 2000-2005 | 1.000 | .909 |
| life expectancy at birth 2003 undp | 1.000 | .845 |
| Adult literacy rate (% ages of 15 and above) undp | 1.000 | .743 |
| Population under age 15 (%of total) 2003 | 1.000 | .907 |
| Population ages 65 and above (% of total) 2003 | 1.000 | .900 |
| Total fertility rate 1970-1975 | 1.000 | .883 |
| GDP per capita ( PPP $) 2003 undp | 1.000 | .843 |
| Health expenditure per capita PPP US$ 2002 | 1.000 | .884 |
| Migrant stock (1000) | 1.000 | .838 |
| Migrant Stock (percentage of population) | 1.000 | .667 |
| Official development assistance received TOTAL (US$ millions) | 1.000 | .804 |
| Urban Pop. as % ot total 2003 | 1.000 | .630 |
| Population growth rate 1975-2003 | 1.000 | .884 |
| Dependency ratio young 2004 | 1.000 | .905 |
| Dependency ratio old 2004 | 1.000 | .709 |

Extraction Method: Principal Component Analysis.

**Total Variance Explained**

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 15.056 | 60.222 | 60.222 | 15.056 | 60.222 | 60.222 | 8.513 | 34.053 | 34.053 |
| 2 | 2.595 | 10.381 | 70.603 | 2.595 | 10.381 | 70.603 | 6.989 | 27.958 | 62.011 |
| 3 | 2.027 | 8.107 | 78.711 | 2.027 | 8.107 | 78.711 | 3.181 | 12.723 | 74.734 |
| 4 | 1.583 | 6.334 | 85.044 | 1.583 | 6.334 | 85.044 | 2.578 | 10.311 | 85.044 |
| 5 | .860 | 3.438 | 88.482 | | | | | | |
| 6 | .421 | 1.685 | 90.167 | | | | | | |
| 7 | .373 | 1.494 | 91.661 | | | | | | |
| 8 | .336 | 1.343 | 93.004 | | | | | | |
| 9 | .329 | 1.316 | 94.321 | | | | | | |
| 10 | .265 | 1.059 | 95.380 | | | | | | |
| 11 | .227 | .910 | 96.289 | | | | | | |
| 12 | .182 | .726 | 97.016 | | | | | | |
| 13 | .134 | .537 | 97.553 | | | | | | |
| 14 | .129 | .515 | 98.068 | | | | | | |
| 15 | .103 | .412 | 98.480 | | | | | | |
| 16 | .100 | .401 | 98.881 | | | | | | |
| 17 | .086 | .342 | 99.223 | | | | | | |
| 18 | .054 | .217 | 99.440 | | | | | | |
| 19 | .040 | .159 | 99.599 | | | | | | |
| 20 | .029 | .117 | 99.717 | | | | | | |
| 21 | .028 | .110 | 99.827 | | | | | | |
| 22 | .021 | .084 | 99.911 | | | | | | |
| 23 | .012 | .050 | 99.960 | | | | | | |
| 24 | .008 | .032 | 99.992 | | | | | | |
| 25 | .002 | .008 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

**Component Matrix[a]**

| | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Human Development Index 2003 | .941 | | | |
| Population under age 15 (%of total) 2003 | -.910 | | | |
| Dependency ratio young 2004 | -.900 | | | |
| Government Effectiveness | .872 | | | |
| Total fertility rate 1970-1975 | -.862 | | | |
| Rule of Law | .861 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -.861 | | | |
| Total fertility rate 2000-2005 | -.856 | | | |
| life expectancy at birth 2003 undp | .843 | | | |
| Control of Corruption | .840 | | | |
| Population ages 65 and above (% of total) 2003 | .838 | | | |
| Under 5 mortality rate (per 1,000 live births) | -.836 | | | |
| GDP per capita ( PPP $) 2003 undp | .831 | | | |
| Regulatory Quality | .812 | | | |
| Health expenditure per capita PPP US$ 2002 | .797 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) (adjusted by UN) | -.763 | | | |
| Adult literacy rate (% ages of 15 and above) undp | .762 | | | |
| Voice and Accountability | .725 | | | |
| Political Stability | .723 | | | |
| Urban Pop. as % ot total 2003 | .701 | | | |
| Dependency ratio old 2004 | .679 | | | |
| Population growth rate 1975-2003 | -.639 | | .620 | |
| Migrant Stock (percentage of population) | | | .696 | |
| Migrant stock (1000) | | | | -.799 |
| Official development assistance received TOTAL (US$ millions) | | | | .591 |

Extraction Method: Principal Component Analysis.

a. 4 components extracted.

**Rotated Component Matrix[a]**

| | Component | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Under 5 mortality rate (per 1,000 live births) | -.904 | | | |
| Maternal mortality rate 2000 (per 100,000 live births) (adjusted by UN) | -.891 | | | |
| Infant mortality rate (per 1,000 live births) 2003 | -.879 | | | |
| Total fertility rate 2000-2005 | -.858 | | | |
| Human Development Index 2003 | .847 | | | |
| life expectancy at birth 2003 undp | .842 | | | |
| Dependency ratio young 2004 | -.804 | | | |
| Adult literacy rate (% ages of 15 and above) undp | .798 | | | |
| Population under age 15 (%of total) 2003 | -.750 | | | |
| Urban Pop. as % ot total 2003 | .628 | | | |
| Rule of Law | | .895 | | |
| Control of Corruption | | .886 | | |
| Regulatory Quality | | .879 | | |
| Government Effectiveness | | .853 | | |
| Political Stability | | .833 | | |
| Voice and Accountability | | .757 | | |
| GDP per capita ( PPP $) 2003 undp | | .730 | | |
| Health expenditure per capita PPP US$ 2002 | | .627 | | .599 |
| Population growth rate 1975-2003 | | | .837 | |
| Population ages 65 and above (% of total) 2003 | | | -.664 | |
| Dependency ratio old 2004 | | | -.658 | |
| Migrant Stock (percentage of population) | | | .607 | |
| Total fertility rate 1970-1975 | -.556 | | .604 | |
| Migrant stock (1000) | | | | .912 |
| Official development assistance received TOTAL (US$ millions) | | | | -.831 |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.