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**THE LINK BETWEEN ECONOMIC GROWTH
AND HUMAN DEVELOPMENT**

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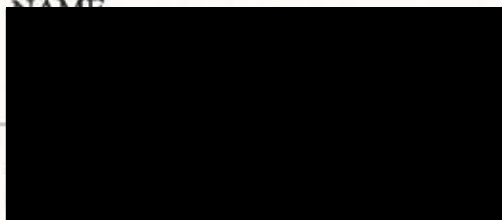
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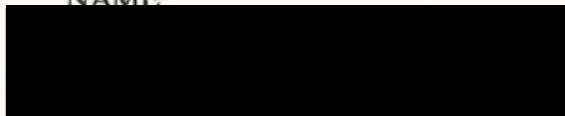
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To those who gave a lot, who cared so much, and who enlightened my life by their tenderness, father and mother,

To those with whom I grew up, who shared me my happiness as well as my sadness, and who encouraged me to seek and find my way, brothers and sisters,

To those with whom I passed the best moments of my life throughout my years in the university, my friends,

To all those whom I love, in a hope to return a part of what they did,

I dedicate this piece of research.



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CHAPTER I

INTRODUCTION

General Background

Human development has become one of the critical issues that are incorporated in the development strategies of countries all over the world . Human development stresses the need to develop human capabilities and is concerned with the way to use these capabilities , through participation of people in social , political , and economic practices .

Previous concepts of development have emphasized the importance of economic growth, assuming that everyone will benefit from this growth. "For years, economists, politicians and development planners have measured average per capita income to chart year-to-year progress , or decline within a country . As a result , a great deal of national development activities was focussed on economic growth , often neglecting the human dimension of development"¹

However , it has been proved that economic growth by itself is not sufficient . It has to be related to people `s life and their welfare` . Human development offers a broader perspective and it has to be linked to economic growth . People are the ultimate end of development . "Development itself has frequently been discussed in terms of strictly

¹ Peter Gall, "What Really Matters: Human Development", World Development, Vol. 3, (May 1990), p. 5.

economic indicators : GDP growth rates , levels of production , per Capita incomes , foreign trade earnings . But the economic crisis of the 1980 s , with its attendant human misery , has made it impossible to overlook the interrelationship between economic development and social development'² .

Several fallacies about human development are popular. One of them claims that human development is limited to specific sectors , such as social sector like health or education . In fact, human development does not focuss on social issues ignoring economic or other issues . It is equally concerned with how people can participate freely in social, political, or economic decision making.

Another fallacy is that human development applies only to basic needs and just to poor countries. This is not true since people anywhere have their needs. These needs may differ from a country to another, but the basic principle is the same. Poor Countries always care for life expectancy, whereas the developed industrialized countries care about the acquirement of advanced technical skills. Human development applies to all countries at all levels of development.

² The World Economy, (The United Nations Department of Public Information, 1990), p. 73.

As a way to measure human development, The Human Development Report 1990 introduced the Human Development Index (HDI). The aim of this index is to show that development planning is directed to people's needs. This index ranks countries by their ability to meet human needs and presents an image about whether people's lives are enriched or not in different countries. "Even countries of low per Capita gross national product (GNP) may rank high on the Human Development Index - that is, their people live relatively long lives, are mostly literate and generate enough purchasing power to rise above poverty"³.

The HDI Combines indicators of national income, life expectancy and educational attainment to give a composite measure of human progress. This triple component was based on certain concepts. The life expectancy was selected because it is concerned about health care, delivery and the ability of people to live a long life. Literacy was selected because it is an indicator of the awareness of people to their surroundings and culture. As for per capita income, it demonstrates the ability to buy commodities and meet the basic needs. "Economists argued then and now that GNP conceals a great many things. you can produce a lot of guns and luxury goods, and you can destroy your environment and still have a high GNP"⁴.

³ Peter Gall, "What Really Matters: Human Development", World Development, Vol. 3, (May 1990), p. 5.

⁴ Cherie Hart, "The Making of the Human Development Report", World Development, Vol. 3, (May 1990), p. 14.

The concept of human development offers ideas that could promote realistic and sustainable development. These ideas have to be translated into practical action. Certain steps should be done to reach this aspect.

First of all , human development strategies are needed. This is the real challenge of each country , whether developing or industrial . Each one must set goals and design strategies . This task may be more difficult for developing rather than industrial countries . Developing ones must formulate their long - term human development goals and integrate them into growth strategies . Radical changes need to be made in policies and in the way to achieve the stated goals . “International organizations can offer some help . UNDP, along with UNICEF and other UN system agencies, is already working with 20 countries that have requested assistance in formulating comprehensive human development strategies”⁵ . As for industrial countries, they need to better clarify their objectives and set new strategies. Serious problems such as increasing unemployment, pollution, drug addiction and others have to be given a certain level of awareness .

Another step that has to be taken is to develop new techniques for project appraisal . Human development requires that projects should be appraised for their impact on people . A development project may concentrate on technical or economic feasibility, yet ignoring certain important aspects such as social and environmental damages. There is a need to

⁵ Human Development Report 1992, (New York: Oxford University Press, 1992), p. 25.

issue new appraisal techniques since most of today`s strategies would not reflect such problems .

Furthermore, there should be new strategies to develop and organize the help that certain countries may receive from other countries or from international organizations. A human development strategy may affect the scale and the distribution of the official development assistance. Policies concerning the way of dealing between the donors and the recipients of the donation have to be formulated, since they have a very critical impact on the future of the development assistance. "Today, only a very small part of ODA (23 %) is earmarked for the poorest nations, and an even smaller part (6.5 %) is for human priority concerns. A major restructuring of ODA will be needed if it is to address concerns of both poverty and human development"⁶ . Donors usually give attention to the policies of recipient countries. One area of their concern is how this aid will be used . They want to see this assistance directed towards satisfying human needs and not other needs as military expenditures for instance .

⁶ Ibid, p. 25.

Purpose of the Study

The purpose of the study is three folds . First , the aim of the study is to evaluate the relative importance of the three components which make the HDI . Relatively speaking, the researcher wants to determine which of the three variables , GNP , adult literacy , and life expectancy is more significant in predicting the Human Development Index. Second, This study aims at testing whether theory is consistent with reality by testing the theoretical recursive system linking the four variables in each of the developing and industrial countries in an attempt to determine the most promising model to fit the data . The third purpose is to decompose the relation between each of the three variables and HDI into direct and indirect links .

Need for the Study

A study such as the one suggested here is recommended by experts in this field. In their technical notes about HDI, the world bank experts noted that “the work in this area is still at its beginning. Much more research is needed - as is more experience with using the HDI for various practical purposes of assessing, planning or programming development”⁷

⁷ Ibid, p. 91.

General Statement of the Problem

Drawing on the relevant literature, it is found that the experts at the world Bank are trying to use HDI index as a substitute for per capita GNP in evaluating the performance of countries . "Last year`s Report introduced the Human Development Index (HDI) - a more realistic statistical measure of human development than mere gross national product (GNP) per head"⁸ .

The researcher, however, wonders if the claim mentionned above is true, given the fact that one of the experts who guided the writing of the Human Development Report stated that "critics will claim that our index does not capture all aspects of human development . All we are saying is that this Report incorporates human choices other than income , and Consequently is a step in the right direction"⁹ .

⁸ Human Development Report 1991, (New York: Oxford University Press, 1991), p. 2.

⁹ Cherrie Hart, "The Making of the Human Development Report", World Development, Vol. 3, (May 1990), p. 14.

Research Questions

This research attempts to answer the following questions :

- 1 - What are the major characteristics of the selected group of countries ?
- 2 - What is the relative importance of the independent variables to the proportion of variance accounted for in the HDI for these Countries ?
- 3 - What are the direct and indirect effects between the variables ?

Definition of Terms

The researcher in this study basically used four variables to test the claim of the world Bank. These variables are defined according to the UNDP as follows :

- HDI stands for Human Development Index. It is a new statistical measure of human development .
- Life expectancy stands for the number of years a new born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life .
- Adult literacy rate stands for the percentage of persons aged 15 and over who can , with understanding , both read and write a short simple statement on every day life.

- Gross national product (GNP) stands for the total domestic and foreign value added claimed by residents, calculated without making deductions for depreciation . Gross National Product per capita is the Gross National Product divided by the population .
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CHAPTER II

REVIEW OF LITERATURE

The perception of development has shifted from economic development to socioeconomic development, with emphasis on poverty. Later on, the shift became to human development. It stressed on the development of human choices and returned to the nature and needs of people themselves. This shift was reflected in measuring development as the widening of human choices and not the increase in income or the expansion of commodities. The outcome of these efforts is the Human Development Index (HDI).

The consequences of the economic crisis of the 1980s have pushed several countries to direct their efforts towards human development. Countries are searching nowadays for realistic and practical human development strategies. The Human Development Report was published for the first time in 1990 and its first annual report responded to the concern of human development.

The Human Development Report has been prepared by a team of economists and professionals under the guidance of Dr Mahbub Ul Haq, a former Finance and Planning Minister of Pakistan. "High income is not a passport to human development, says Dr Mahbub Ul Haq, former Finance and Planning Minister of Pakistan, who guided the writing of the Report. Income is not the sum total of human life. GNP does not convey the state of human well-being. It is but one reflection in a complex prism"¹⁰.

¹⁰ Cherrie Hart, "The Making of the Human Development Report", World Development, Vol. 3, (May 1990), p. 13.

The world's approximately 160 countries are divided among two groups, the developing and the developed countries. A country is known as developing or developed according to the degree of industrialization and other indicators such as the per capita gross national product and the diversification of the economy. The world's poor countries are classified as the developing ones. Most of these countries depend on the agriculture and their economies lack diversification. The technologies used are of the low level and thus, their productive capacity is limited. The developed countries are rich. Their technologies are of the advanced levels and their economies are very well diversified.

The evolution of the Report stemmed from the economic crises of the 1980s. Most of the developing countries were suffering from serious debt problems. "Developing nations owed foreign creditors some \$ 1.3 trillion at the end of 1989. This amount is equivalent to about half of their combined gross national products and nearly twice their annual export earnings. The annual interest obligations on this debt are now running at about \$ 100 Billion"¹¹ .

¹¹ Debt, (United Nations Department of Public Information, 1990), p. 21.

These debt problems pushed the indebted countries to have economic adjustments but at the expense of human costs such as a general decline in social services and cuts in health and education budgets. "As the crisis drags on, the evidence accumulates that the economic stagnation of many indebted countries is exacting a severe toll on people's lives. The cutbacks in public expenditure necessitated by the debt crisis often fall most sharply on those areas that benefit the broadest layers of society: health and education"¹².

The Human Development Report explored the link between economic growth and human development and assessed how countries can translate income into human trends. "Dr. Haq became interested in finding ways to ensure that economic growth also translates into better human progress. There was clearly an imbalance between economic growth and social sector advancement, Says Dr. Haq. I wanted to help shape policies that would close that gap"¹³. "Better health and nutrition bring substantial economic benefits, releasing resources that can be used for other development goals. Health and nutrition also have long-run effects on productivity and output, because they influence a child's ability and motivation to learn. Although progress in education is important as an end in itself, it too fuels faster economic growth"¹⁴.

¹² Ibid., p. 27.

¹³ Cherrie Hart, "The Making of the Human Development Report", World Development, Vol. 3, (May 1990), p. 13.

¹⁴ "Improved Social Indicators in the Developing World, 1965-88", Finance and Development, Vol. 28, (December 1991), p. 21.

In the 1980S, the developing world has always suffered of Serious problems which threaten adjustment efforts and constrain economic growth. The main sector in which developing countries were behind was the education sector. "Since 1980, education budgets as a percentage of GNP has declined and enrollment growth has slowed Considerably. Many schools in developing countries do not teach students effectively. They produce students who not only are far behind their industrial country peers on standardized achievement tests in reading math, and science, but who, more importantly, often do not master the knowledge and skills specified in their national curriculum"¹⁵. The second social sector facing provoking problems was health and nutrition. "The poor suffer from high child mortality and poor health. Life expectancy in sub-saharan Africa- the poorest region of the World- is 50 years; it is almost 80 in Japan. Mortality among children under five in south Asia exceeds 170 deaths per thousand; in Sweden it is less than ten"¹⁶. Developing countries also face an increase in population growth. "Nearly 95 percent of the growth in the world's population in the next 25 years will be in developing countries. High fertility rates and poverty together form a vicious circle that threatens the welfare, or even the survival, of their populations"¹⁷.

¹⁵ Adriaan Verspoor, "Educational Development: Priorities for the Nineties", Finance and Development, Vol. 27 (March 1990), p. 21.

¹⁶ Michael Walton, "Combating Poverty: Experience and Prospects", Finance and Development, Vol. 27 (September 1990), p. 2.

¹⁷ Elizabeth M. King, "Challenges in Human Development", Finance and Development, Vol. 28, (September 1991), p. 9.

The Human Development Report which was produced annually since 1990 proposed strategies for human development and emphasized the importance of restructuring budgetary expenditures. An international economic and financial environment oriented towards human development was created. The Report stressed on the role of political commitment towards human progress. It pointed to an enormous potential for restructuring of national budgets and international aid allocations in favour of human development. "Effective government action is the key to improvement in social conditions. This requires making adequate budgetary provision for the social sectors, ensuring access of the poor to resources and facilities"¹⁸ .

In recent years, Some Countries became aware of the need for human development and have begun to improve human opportunities for the poor and provide them with essential social services. "Recognizing the immense waste of human resources within their economies, due to poverty, some developing country governments have begun to change their approaches towards development to include the poor as clearly identified targets of official programs, financed by domestic resources or external aid"¹⁹ . Governments of developing nations were aware that such programs should be designed in a way to tackle several sides of human needs. They recognized that there should be investments in human capital through nutrition, health, and education affairs, as a basis for greater growth.

¹⁸ Michael Walton, "Combating Poverty: Experience and Prospects", Finance and Development, Vol. 27 (September 1990), p. 3-4.

¹⁹ Dominique Van de Walle, "Policies for Reducing Poverty", Finance and Development, Vol. 27 (September 1990), p. 6.

A sort of social progress in the mentioned areas in the developing world has taken place in the latest period. "Data obtained from a World Bank publication, the social indicator of development, 1990, indicate significant improvements in all regions with regard to health and education"²⁰. The care in health and nutrition was reflected in a decline in infant mortality. As for education, there were an improvement in the quality of primary education, an increase of girls' access to schools, and a development of effective training systems. "The number of students in Kenya's primary schools increased nearly fivefold, from less than 900,000 to almost 4,500,000"²¹.

The Report also identified that an efficient and effective public sector will help strengthen the private role in human development. "Success in development requires a careful balancing of the roles of the government and the private sector across a broad range of policies. Many well designed and well targeted programs have worked - and not necessarily with a heavy drain on public resources. Several countries have encouraged Community participation and support for social services"²².

²⁰ "Improved Social Indicators in the Developing World, 1965-88", Finance and Development, Vol. 28, (December 1991), p. 21.

²¹ Nat J. Coletta, "Toward Universal Primary Education: Kenya and Indonesia", Finance and Development, Vol. 27 (March 1990), p. 27.

²² Elizabeth M. King, "Challenges in Human Development", Finance and Development, Vol. 28, (September 1991), p. 9.

Developing countries rely heavily on external aid to finance the improvements programs. National budgets are put in favour of human development. However, these budgets aren't enough and official development assistance may have a critical role in enhancing the human development. "Where aid has been well employed, it has benefited the poor through a number of channels; agricultural research and extension; the construction of rural infrastructure, such as farm-to-market road; the provision of primary education, basic health care, and nutrition programs; and relief from natural and man-made disasters"²³.

This external aid is always controlled by the donor countries. They put restrictions on the recipient countries and go into asking them about the way in which the aid will be spent. They insist that human development should be oriented in spending more than any other trend. To reach that end, other expenditures should be squeezed and especially the military expenditures. A government which chooses to spend more on its army than on its people, cannot be seen as committed to human development. This concept is always taken into consideration and high military expenditures are always an area of dialogue in aid negotiations.

However, a major reduction in arms expenditures isn't reached yet. So, a peace machinery has to be established and peace negotiations should be emphasized. "Peace and human development go together. Restructuring budgets to advance human development as

²³ Robert L. Ayres, "Foreign Aid and Poverty Reduction", Finance and Development, Vol. 27 (September 1990), p. 9.

recommended in this Report would call for the attainment and use of the peace dividend"²⁴. This peace dividend may be encouraged if the industrial countries stop shipping arms to developing countries. "Much of the impulse for Third world militarization comes from industrial Countries. Concrete proposals should now be made to phase out military bases in the Third world, to convert military aid into economic aid and to place collective constraints on shipment of sophisticated arms to developing countries"²⁵.

Many countries in the world are making efforts to help the poor nations. Since provision of social services is lacking in the poor countries, the aid from the donating countries may be tailored to provide these social services. This aid is expected to increase and the donors are expected to do more in the purpose of helping the developing nations. "Aid would increase to \$ 64 billion in the year 2000 if it continues to grow at 2 percent a year in real terms, and as high as \$ 144 billion if the widely accepted international target of aid as 0.7 percent of GNP were met by donors currently below it"²⁶.

²⁴ Human Development Report 1991, (New York: Oxford University Press, 1991), p. 83.

²⁵ *Ibid*, p. 82.

²⁶ Robert L. Ayres, "Foreign Aid and Poverty Reduction", Finance and Development, Vol. 27 (September 1990), p. 9.

The Human Development Report discussed the meaning and measurement of human development, proposing a new index, the Human Development Index (HDI). HDI was measured by a statistical method, combining three important variables, the life expectancy, the adult literacy rate and the per capita GNP.

The Report for the year 1990 and the following Reports Contain annexes which present comprehensive, up to date set of human development indicators for more than 130 Countries, developing and developed. These statistical indicators include HDI, the three variables used in the measurement of the Human Development Index and other variables such as: daily calory supply, access to health services, access to safe water, access to sanitation, under-five mortality rate, maternal mortality rate, primary and secondary enrollment ratio, scientists and technicians, percentage of labour force in industry, percentage of labour force in agriculture, labour force as a percentage of total population, females as a percentage of males in labour force, females as a percentage of males in the parliament, population with access to health services, health expenditures, radios, televisions, daily circulation newspaper, education expenditures, military expenditures, arms imports, official development assistance, ratio of exports to imports, gross international reserves, the balance of payments, annual population growth rate, annual rate of inflation, fertility rate, overall budget surplus or deficit, gross domestic saving.

Some deficiencies in these social statistics exist. The most important one is the inadequacy of the data. Other fields could be stressed and could be of great importance in the aim of assessing the need for human development. Some of the variables that were omitted are: the wages, unemployment rates, public expenditures on various sectors by local authorities, the conditions of people living in urban areas and many other variables. Another deficiency that was observed is the incomplete data. There were a lot of missing data. In about the third of the countries, data is not available. Values for important variables such as access to health services or to safe water, adult literacy, primary enrollment ratios, scientists and technicians, GNP per capita and others are missing in several countries. A third deficiency is the lack of reliability and timeliness. Some indicators are very reliable. These indicators are of a limited coverage. Also, variables with comprehensive coverage such as the balance of payments, debt and trade could be counted as reliable. However, some variables have broad approximations and thus, they lack representative data. An example of these variables is access to health services. As for timeliness, some variables were up to date collected because they were processed quickly. Other ones were less timely because they come from infrequent survey. Such indicators are literacy, income, and poverty variables.

The cause lying behind the deficiencies faced in the collection of measurable data may be the lack of information on the total picture of spending on human development. "To overcome this problem, special country case studies were launched in over 30 countries to collect data that would provide the necessary information"²⁷.

²⁷ Human Development Report 1991, (New York: Oxford University Press, 1991), p. 100.

The collection of social statistics is in the process of improvement. The main focus suggested by UNDP was that HDI calculations should be improved and made comparable among Countries. To reach this end, "the following steps deserve priority:

- Better data collection and analysis should be organized for the three essential components of HDI: Life expectancy, adult literacy and real income.
- Distribution of these three components by income groups should be investigated so that the HDI can be made distributionally sensitive.
- Distribution of these components between males and females, between rural and urban and among regional areas should also be investigated, so that separate HDIs can be constructed that are sensitive to gender differences and geographical differences"²⁸.

The world Bank adopted and followed this new index (HDI) to evaluate nations, combining the three indicators: life expectancy, educational attainment, and GNP per capita. The rationale behind this combination stems from the fact that the World Bank's experts believe that high income alone is no guarantee of success and that when social needs are met, we may be contributing indirectly to high income. "The satisfaction of basic needs directly alleviates some of the most severe consequences of poverty. Healthy, well nourished, and educated individuals obviously have a higher standard of living than sick, hungry, and ignorant ones. They are also more productive and better able to respond to

²⁸ Human Development Report 1990, (New York: Oxford University Press, 1990), p. 112-113.

new opportunities. Improved nutrition and health, for instance, increase the time the poor are able to work"²⁹. Education is always necessary for mothers. It is linked to declines in infant and child mortality and improved child nutrition, which will have an effect on the child's ability to learn and perform better. "Country experience indicates that poverty is most effectively reduced when domestic development policies stress two key components in a pattern of growth that encourages the efficient use of labor and the provision of social services to the poor"³⁰.

The HDI is an average for each country. It does not reveal disparities among different social, economic, or regional groups. The HDI extends beyond the GNP measure, by showing how economic growth can be translated into human progress. Several countries may rank lower in HDI more than in per capita income, showing that they have potential to improve human development levels through spending incomes in a wise manner. This divergence between the rankings in GNP and human development show the large path they have to walk in translating economic growth into human well being.

²⁹ Dominique Van de Walle, "Policies for Reducing Poverty", Finance and Development, Vol. 27 (September 1990), p. 7.

³⁰ *Ibid.*, p. 6.

A wide range of examples of countries about the divergence between income and human development does exist. "Adult literacy in Saudi Arabia, for example, is lower than in Srilanka, despite the fact that its per capita income is 15 times higher. Child mortality in Brazil is four times higher than that in Jamaica, eventhough its per capita income is twice that of Jamaica"³¹ .

These divergences between income and human development may be tied to the distribution of income, of social services and market opportunities. Policies to regulate the distribution of these assets equitably will lead to a better link between income and human development.

The need to assess human development is increasing day after day. A look into the nature of human beings proved to be necessary. "Traditional economic progress, which has provided much of the world with an ever - higher material standard of living, is just about exhausted. Instead, we are entering an era in which progress will take the form not of more and better goods and services but of a transformation in the nature of human beings themselves"³² .

³¹ Human Development Report 1990, (New York: Oxford University Press, 1990), p. 43.

³² Paul R. Krugman, "Are you Ready for the 21st Century?", Fortune, Vol. 127, (April 5, 1993), p. 77.

CHAPTER III

PROCEDURES AND METHODOLOGY

Population of the Study

The population of this study consists of all the developing Countries (127 countries) and the industrial countries (33 countries) included in the UNDP publication for 1992 .

Sample Selected

Since a lot of Countries have missing information, the researcher used 77 developing countries (61% of the population) and 28 industrial countries (85% of the population), as shown in Tables I and II.

TABLE I

LIFE EXPECTANCY(X1), ADULT LITERACY RATE(X5)
GROSS NATIONAL PRODUCT(X6), HUMAN DEVELOPMENT INDEX(X40)
FOR THE SAMPLE SELECTED OF 77 DEVELOPING COUNTRIES.

COUNTRY	X1	X5	X6	X40
URUGUAY	72.20	96.00	2620.00	0.83
KOREA REP. OF	70.10	96.00	4400.00	0.87
CHILE	71.80	93.00	1770.00	0.86
COSTA RICA	74.90	93.00	1780.00	0.84
ARGENTINA	71.00	95.00	2160.00	0.83
VENEZUELA	70.00	88.00	2450.00	0.82
KUWAIT	73.40	73.00	16150.00	0.82
MEXICO	69.70	87.00	2010.00	0.80
MALAYSIA	70.10	78.00	2160.00	0.79
COLOMBIA	68.80	87.00	1200.00	0.76
SURINAME	69.50	95.00	3010.00	0.75
BRAZIL	65.60	81.00	2540.00	0.74
PANAMA	72.40	88.00	1760.00	0.73
JAMAICA	73.10	98.00	1260.00	0.72
SAUDI ARABIA	64.50	62.00	6020.00	0.69
THAILAND	66.10	93.00	1220.00	0.69
SYRIA	66.10	65.00	980.00	0.67
LIBYA	61.80	64.00	5310.00	0.66
SRILANKA	70.90	88.00	430.00	0.65
ECUADOR	66.00	86.00	1020.00	0.64
PARAGUAY	67.10	90.00	1030.00	0.64
CHINA	70.10	73.00	350.00	0.61
PHILIPPINES	64.20	90.00	710.00	0.60
PERU	63.00	85.00	1010.00	0.60
DOMINICAN REP.	66.70	83.00	790.00	0.60

COUNTRY	X1	X5	X6	X40
JORDAN	66.90	80.00	1640.00	0.59
TUNISIA	66.70	65.00	1260.00	0.58
IRAN	66.20	54.00	3200.00	0.55
GABON	52.50	61.00	2960.00	0.55
GUYANA	64.20	96.00	340.00	0.54
BOTSWANA	59.80	74.00	1600.00	0.53
ALGERIA	65.10	57.00	2230.00	0.53
SALVADOR	64.40	73.00	1070.00	0.50
INDONESIA	61.50	77.00	500.00	0.49
GUATEMALA	63.40	55.00	910.00	0.49
TURKEY	65.10	81.00	1370.00	0.67
HONDURAS	64.90	73.00	900.00	0.47
MOROCCO	62.00	50.00	880.00	0.43
ZIMBABWE	59.60	67.00	650.00	0.40
BOLIVIA	54.50	78.00	620.00	0.39
EGYPT	60.30	48.00	640.00	0.39
CONGO	53.70	57.00	940.00	0.37
KENYA	59.70	69.00	360.00	0.37
MADAGASCAR	54.50	80.00	230.00	0.33
PAPUA NEW GUINEA	54.90	52.00	890.00	0.32
ZAMBIA	54.40	73.00	390.00	0.32
CAMERON	53.70	54.00	1000.00	0.31
GHANA	55.00	60.00	390.00	0.31
PAKISTAN	57.70	35.00	370.00	0.31
INDIA	59.10	48.00	340.00	0.30
COTE D'IVOIRE	53.40	54.00	790.00	0.29
HAITI	55.70	53.00	360.00	0.28
ZAIRE	53.00	72.00	260.00	0.26
NIGERIA	51.50	51.00	250.00	0.24
YEMEN	51.50	39.00	650.00	0.23

COUNTRY	X1	X5	X6	X40
TOGO	54.00	43.00	390.00	0.22
UGANDA	52.00	48.00	250.00	0.19
RWANDA	49.50	50.00	320.00	0.19
BANGLADESH	51.80	35.00	180.00	0.19
SENEGAL	48.30	38.00	650.00	0.18
ANGOLA	45.50	42.00	610.00	0.17
NEPAL	52.20	26.00	180.00	0.17
BURUNDI	48.50	50.00	220.00	0.17
EQUATORIAL GUINEA	47.00	50.00	330.00	0.16
CENTRAL AFRICAN REP.	49.50	38.00	390.00	0.16
MOZAMBIQUE	47.50	33.00	80.00	0.15
MAURITANIA	47.00	34.00	500.00	0.14
BENIN	47.00	23.00	380.00	0.11
CHAD	46.50	30.00	190.00	0.09
SOMALIA	46.10	24.00	170.00	0.09
GUINEA - BISSAU	42.50	37.00	180.00	0.09
GAMBIA	44.00	27.00	240.00	0.08
MALI	45.00	32.00	270.00	0.08
NIGER	45.50	28.00	290.00	0.08
BURKINA FASO	48.20	18.00	320.00	0.07
SIERRA LEONE	42.00	21.00	220.00	0.06
GUINEA	43.50	24.00	430.00	0.05
MEAN	58.79	61.87	1284.68	0.43
STANDARD DEVIATION	9.32	23.17	2064.12	0.25

TABLE II
 LIFE EXPECTANCY(Y1), MEAN YEARS OF SCHOOLING(Y2),
 GROSS NATIONAL PRODUCT(Y3), HUMAN DEVELOPMENT
 INDEX(Y24), FOR THE SAMPLE SELECTED 28 INDUSTRIAL COUNTRIES

COUNTRY	Y1	Y2	Y3	Y24
CANADA	77.00	12.10	19030.00	0.98
JAPAN	78.60	10.70	23810.00	0.98
NORWAY	77.10	11.60	22290.00	0.98
SWITZERLAND	77.40	11.10	29880.00	0.98
SWEDEN	77.40	11.10	21570.00	0.98
U S A	75.90	12.30	20910.00	0.98
AUSTRALIA	76.50	11.50	14360.00	0.97
FRANCE	76.40	11.60	17820.00	0.97
NETHERLANDS	77.20	10.60	15920.00	0.97
UNITED KINGDOM	75.70	11.50	14610.00	0.96
ICELAND	77.80	8.90	21070.00	0.96
GERMANY	75.20	11.10	20440.00	0.96
DENMARK	75.80	10.40	20450.00	0.95
FINLAND	75.50	10.60	22120.00	0.95
AUSTRIA	74.80	11.10	17300.00	0.95
BELGIUM	75.20	10.70	16220.00	0.95
NEWZEALAND	75.20	10.40	12070.00	0.95
ISRAEL	75.90	10.00	9790.00	0.94
LUXEMBOURG	74.90	8.40	24980.00	0.93
ITALY	76	7.3	15120	0.92
IRELAND	74.6	8.7	8710	0.92

COUNTRY	Y1	Y2	Y3	Y24
SPAIN	77.00	6.80	9330.00	0.92
GREECE	76.10	6.90	5350.00	0.90
HUNGARY	70.90	9.60	2590.00	0.83
POLAND	71.80	8.00	1790.00	0.87
YUGOSLAVIA	72.60	6.20	2920.00	0.86
MALTA	73.40	6.10	5830.00	0.85
PORTUGAL	74.00	6.00	4250.00	0.85
MEAN	75.57	9.69	15018.92	0.90
STANDARD DEVIATION	1.79	1.98	7658.79	0.17

The Selected Variables and Their Measurement

The selected dependent and independent variables were discussed in Chapter 1, and this section is devoted basically to the measurement of these variables.

Human development was defined as the process of increasing people's options. It emphasized that the most critical choices people made should stress the options of a long and healthy life, to be knowledgeable and educated, and to have access to the assets and income needed for a minimum decent standard of living. Going from these findings, we are in front of two kinds of variables, the dependent variable and the independent variables.

HDI is used in this research as the dependent variable. HDI was defined by UNDP as a new measure of development. It is composed of three indicators: life expectancy, education and income. These three indicators are used as the three independent variables.

In an attempt to measure the dependent variable (HDI), the Human Development Report constructed it in three steps. "The first step is to define a measure of deprivation that a country suffers in each of the three basic variables - life expectancy, literacy, and (the log of) real GDP per capita. A maximum and a minimum values are determined for each of the three variables given the actual values. The deprivation measure then places a country in the range of zero to one as defined by the difference between the maximum and the minimum.

The second step is to define an average deprivation indicator . This is done by taking a simple average of the three indicators . The third step is to measure the Human Development Index (HDI) as one minus the average deprivation index”³³ .

“Longevity is measured by life expectancy at birth as the sole unadjusted indicator. Knowledge is measured by two educational stock variables: adult literacy and mean years of schooling”³⁴ . Considering the income or the purchasing power , the per capita GNP was based on the utility function . “For income, the HDI is based on the premise of diminishing returns from income for human development using an explicit formulation for the diminishing return”³⁵ .

³³ Human Development Report, 1990, (New York: Oxford University Press, 1990), p. 109.

³⁴ Human Development Report, 1992, (New York: Oxford University Press, 1992), p. 91.

³⁵ *Ibid.*, p. 91.

Conceptual Framework for Analyzing the Data Using Path Analysis

The use of path analysis as an explanatory tool in nonexperimental research has been supported and explained by experts of multivariate analysis. Some of these experts are : Simon, wright, and Blalock. In order to analyze the data, the researcher postulated a four - variables model.

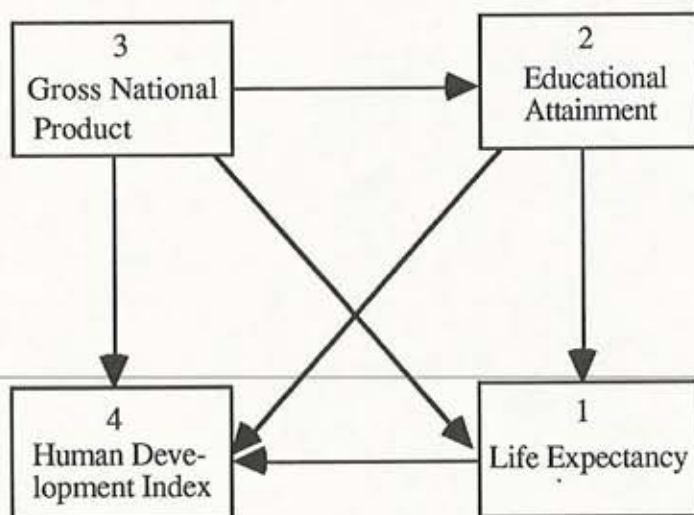


Figure - 1 -

Decomposing the Correlation Coefficients

By using matrix algebra, the following equations for direct and indirect effects in the system were obtained:

$$r_{41} = P_{41} + P_{42} P_{21} + P_{43} P_{31} + P_{43} P_{32} P_{21}$$

$$r_{42} = P_{41} P_{21} + P_{42} + P_{43} P_{31} P_{21} + P_{43} P_{32}$$

$$r_{43} = P_{41} P_{31} + P_{41} P_{32} P_{21} + P_{42} P_{31} P_{21} + P_{42} P_{32} + P_{43}$$

A Criterion of Meaningfulness

A criterion of meaningfulness is used to terminate the direct path that is less than 0.05.

CHAPTER IV

FINDINGS OF THE STUDY

Chapter IV presents the findings to the research questions that were formulated in Chapter I. These questions are :

- 1- What are the major characteristics of the selected group of countries ?
- 2- What is the relative importance of the independent variables to the proportion of variance accounted for in the HDI of these countries.
- 3- What are the direct and indirect effects between the variables ?

Within this chapter , the answers to the research questions are organized in two major sections.

The first section describes the major characteristics and explains the relative importance of variables leading to the variation in the HDI of the developing countries.

The second section describes the major characteristics and explains the relative importance of variables leading to the variation in the HDI of the industrial countries.

Major Characteristics of the Developing Countries

The selected sample of LDCs is described according to the following variables :

- 1- Life expectancy X1
- 2- Adult literacy rate X5
- 3- GNP per capita X6
- 4- Human Development Index X40

In this study, there are 77 less developed countries. Their ages (life expectancy) range from as low as 42 years to as high as 75 years. Their average daily calories is approximately 100 units. The average adult literacy rate is approximately 62%. The percentage of labor force in agriculture ranges from as low as 1.7% to as high as 93% with an average of 58%. The average GNP per capita is 1285, showing the low per capita GNP in these countries. Their ratings on the HDI extend from 0.05 to 0.88.

The Relative Importance of the Independent Variables to the Explained Variation In the Dependent Variable in the Developing Countries

Table III shows the matrix of the correlation between the variables.

TABLE III
MATRIX OF THE CORRELATION BETWEEN VARIABLES

	HDI X ₄₀	LIFE Exp. X ₁	ALR X ₅	GNP PC X ₆	ALR X ₅₀₁	GNP PC X ₆₀₀
HDI X ₄₀	1.000	.955	.888	.508	.023	.815
LIFE Exp. X ₁	.955	1.000	.860	.443	-.008	.725
ALR X ₅	.888	.860	1.000	.286	.038	.598
GNP PC X ₆	.508	.443	.286	1.000	-.045	.753
ALR X ₅₀₁	.023	-.008	.038	-.045	1.00	-.041
GNP PC X ₆₀₀	.815	.725	.598	.753	-.041	1.00

The squared semipartial correlation was used to evaluate the relative importance of the independent variables to the variance explained in the dependent variables.

The correlation between the two variables, life expectancy (X_1) and Adult literacy rate (X_5) is equal to .860. This is a high value which indicates the existence of multicollinearity in the data. In order to get rid of it, the adult literacy rate variable is transformed. The correlation between X_1 (life expectancy) and X_{501} (X_5 after transformation) is equal to -0.008. X_6 (GNP PC) is transformed to X_{600} because of being highly skewed.

Two of the independent variables were significant in predicting HDI with X_1 , life expectancy being the most important one, X_6 , GNP per capita being the second most important one, while X_5 , adult literacy rate is not important at all.

The two explanatory variables (life expectancy and GNP per capita) are highly significant in predicting HDI with having life expectancy more significant than GNP per capita. They explain approximately 95% of the variation in HDI with an F Test equal to 633.25 which is significant at the zero level.

The following tables show the output of the final analysis for the developing countries.

SPSS/PC+

*** MULTIPLE REGRESSION ***

Equation Number 1 Dependent Variable.. X40 HDI

beginning Block Number 1. Method: Stepwise

Variable(s) Entered on Step Number

1.. X1 LIFE EXP.

Multiple R .95550
 R Square .91298
 Adjusted R Square .91182
 Standard Error .07553

analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	4.48885	4.48885
Residual	75	.42785	.00570

F = 786.86423 Signif F = .0000

SPSS/PC+

*** MULTIPLE REGRESSION ***

Equation Number 1 Dependent Variable.. X40 HDI

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
X1	.02608	9.29724E-04	.95550	28.051	.0000
(Constant)	-1.09894	.05534		-19.860	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
X5	.25652	.44409	.26080	4.264	.0001
X6	.10622	.32289	.80415	2.935	.0044

TABLE V- MULTIPLE REGRESSION - DEVELOPING COUNTRIES

SPSS/PC+

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. X40 HDI

Beginning Block Number 1. Method: Stepwise

Variable(s) Entered on Step Number
1.. X1 LIFE EXP.Multiple R .95550
R Square .91298
Adjusted R Square .91182
Standard Error .07553

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	4.48885	4.48885
Residual	75	.42785	.00570

F = 786.86423 Signif F = .0000

SPSS/PC+

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. X40 HDI

----- Variables in the Equation -----

Variable	B	SE B	Beta	t	Sig T
X1	.02608	9.29724E-04	.95550	28.051	.0000
(Constant)	-1.09894	.05534		-19.860	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min toler	t	Sig T
X501	.03159	.10708	.99993	.926	.3572
X600	.25884	.60468	.47492	6.531	.0000

TABLE VI - MULTIPLE REGRESSION - DEVELOPING COUNTRIES

SPSS/PC+

* * * * MULTIPLE REGRESSION * *

Equation Number 1 Dependent Variable.. X40 HD1

Variable(s) Entered on Step Number
2.. X600 GNPMultiple R .97201
R Square .94480
Adjusted R Square .94331
Standard Error .06056

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	4.64529	2.32264
Residual	74	.27142	.00367

F = 633.25512 Signif F = .0000

SPSS/PC+

* * * * MULTIPLE REGRESSION * *

Equation Number 1 Dependent Variable.. X40 HD1

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
X1	.02096	1.08176E-03	.76794	19.376	.0000
X600	.15144	.02319	.25884	6.531	.0000
(Constant)	-1.23151	.04879		-25.240	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
X501	.04066	.17282	.47372	1.499	.1381

End Block Number 1 PIN = .050 Limits reached.

The appropriate recursive system for the developing countries is shown in fig. 2.

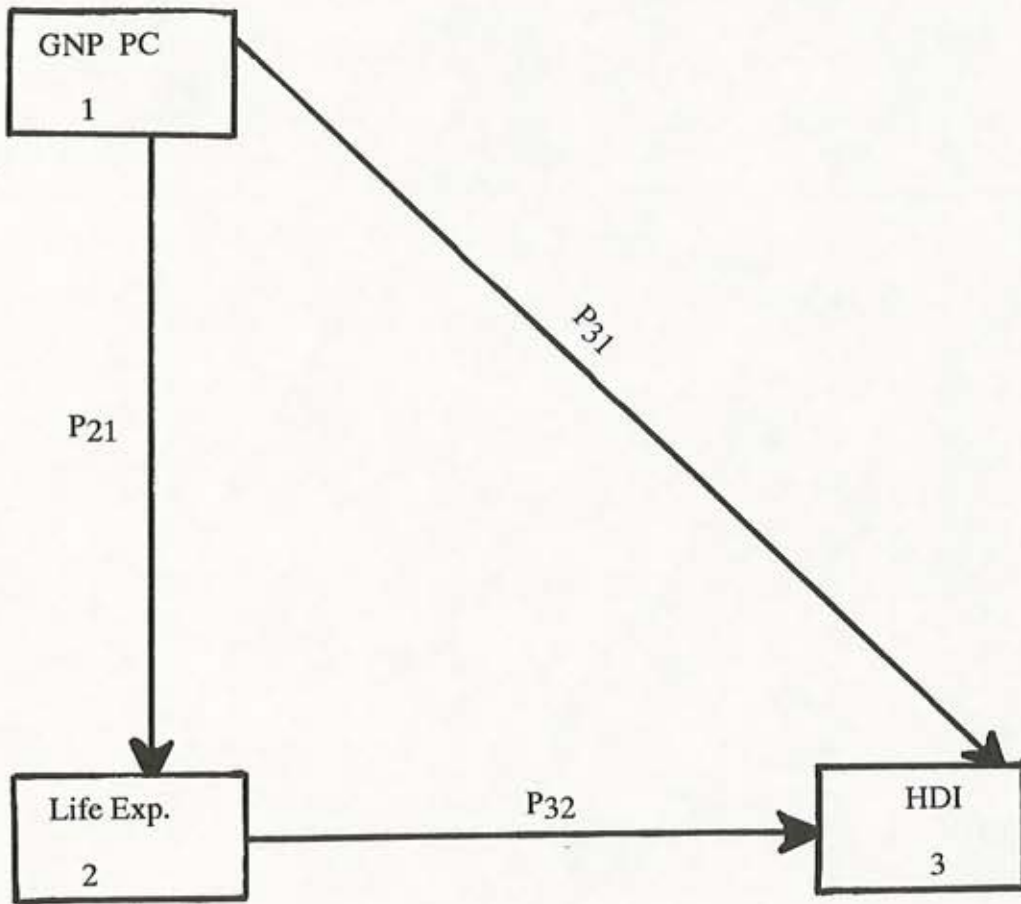


Fig. 2

By using the matrix algebra, the direct and indirect effects between the variables were assessed from the following equations :

$$\Gamma_{31} = P_{31} + P_{32} P_{21}$$

$$\Gamma_{32} = P_{32} + P_{31} P_{21}$$

$$\begin{aligned} \Gamma_{31} &= (0.76794)(0.725) + 0.25884 \\ &= 0.5567565 + 0.25884 \\ &= 0.81559 \end{aligned}$$

$$\begin{aligned} \Gamma_{32} &= 0.76794 + (0.25884)(0.725) \\ &= 0.76794 + 0.187659 \\ &= 0.955599 \end{aligned}$$

As shown above, the relation between GNP and HDI is strong equal to .815, which can be decomposed into direct effect from GNP to HDI equal to .26 and indirect effect through life expectancy equal to .56. This implies that the indirect effect of GNP on HDI through life expectancy is more than twice as much as the direct effect. As for life expectancy, the relation between HDI and life expectancy is very strong and can be decomposed into a very strong direct relation equal to .77 and an indirect effect through GNP equal to .19. This implies that the direct effect of life expectancy on HDI is more than three times as much as the indirect effect of life expectancy on HDI through GNP.

Major Characteristics of the Industrial Countries

The selected sample of industrial countries is described according to the following variables :

- 1- Life expectancy Y₁
- 2- Mean years of schooling Y₂
- 3- GNP per capita Y₃
- 4- Human Development Index Y₂₄

In this study, There are 28 industrial countries. Their ages (life expectancy) range from as low as 71 years to as high as 79 years. The average mean years of schooling is approximately 10 years. The GNP per capita ranges from as low as 1790 to as high as 29880, with an average of 15019. Ratings on the HDI extend from .85 to .98 with an average of .938.

The Relative Importance of the Independent Variables to the Explained Variation in the Dependent Variable in the Industrial Countries.

The correlation between the variables are shown in the following matrix of correlation coefficients

TABLE VII
MATRIX OF THE CORRELATION COEFFICIENTS BETWEEN VARIABLES

	HDI Y ₂₄	GNP PC Y ₃	MYOS Y ₂	Life Exp. Y ₁
HDI Y ₂₄	1.00	.831	.894	.77
GNP PC Y ₃	.831	1.00	.662	.713
MYOS Y ₂	.894	.662	1.00	.444
Life Exp. Y ₁	.77	.713	.444	1.0

Considering the significance of the variables in explaining the variation in HDI, it is found that the variable mean years of schooling is more significant than life expectancy. Life expectancy is the second important one, while GNP is the least significant one.

The variables in the modified causal model accounted for 98% of the variation in HDI.

The following table shows the output of the final analysis for the industrial countries.

TABLE VIII - MULTIPLE REGRESSION - INDUSTRIAL COUNTRIES

SPSS/PC+

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. Y24 HDI

Variable(s) Entered on Step Number

3.. Y3 GNP PC

Multiple R .98883

R Square .97779

Adjusted R Square .97501

Standard Error 6.438025E-03

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	.04380	.01460
Residual	24	.00099	.00004

F = 352.20777 Signif F = .0000

SPSS/PC+

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. Y24 HDI

----- Variables in the Equation -----

Variable	B	SE B	Beta	t	Sig T
Y2	.01299	8.36001E-04	.63159	15.538	.0000
r1	9.038263E-03	9.87461E-04	.39756	9.153	.0000
Y3	6.862078E-07	2.76129E-07	.12904	2.485	.0203
(Constant)	.11876	.07275		1.632	.1157

End Block Number 1 POUT = .100 Limits reached.

To test the theoretical model that was formulated in chapter III, the data analysis proceeded in different steps using path analysis. The path analysis is essentially a several step multiple regression procedure in which each variable is regressed against all those assumed to precede it in the model to be tested, though it can provide evidence that can support a hypothesized causal model.

In order to analyze the data using path analysis, the researcher postulated the following four-variables causal model in chapter III.

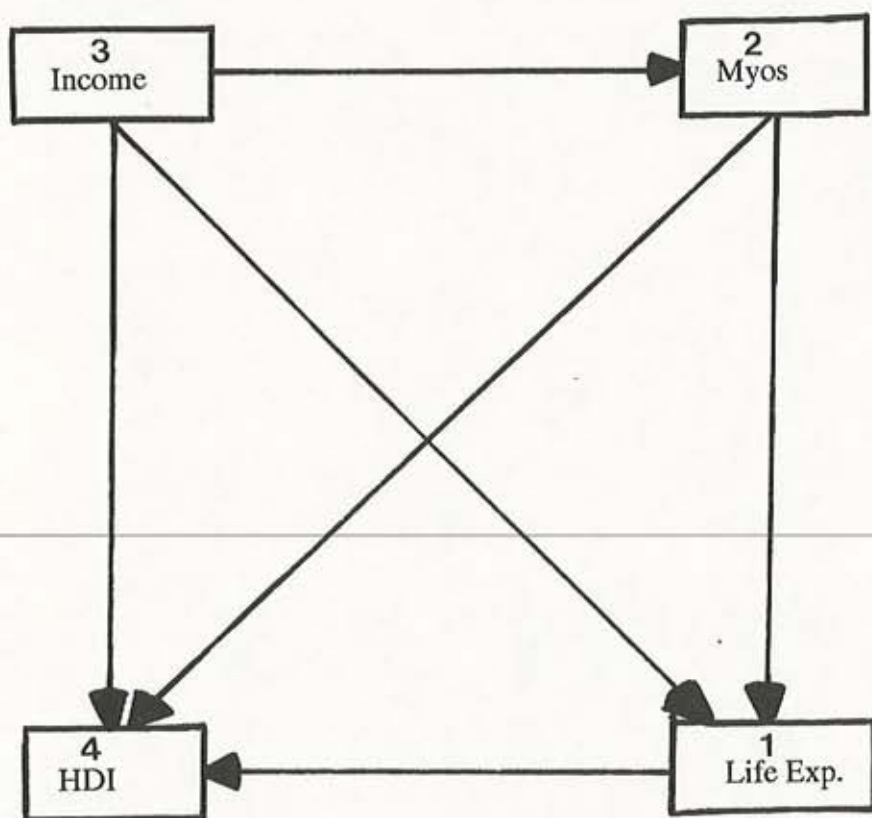


Fig. 3

The order of the variables in the causal model was based on a logical basis. By using the matrix algebra, the following equations for direct and indirect effects in the system were obtained :

$$\Gamma_{41} = P_{41} + P_{42} P_{21} + P_{43} P_{31} + P_{43} P_{32} P_{21}$$

$$\Gamma_{42} = P_{41} P_{21} + P_{42} + P_{43} P_{31} P_{21} + P_{43} P_{32}$$

$$\Gamma_{43} = P_{41} P_{31} + P_{41} P_{32} P_{21} + P_{42} P_{31} P_{21} + P_{42} P_{32} + P_{43}$$

It should be noted here that as long as all variables are connected by paths and all the path coefficients are employed, the correlation matrix can be reproduced regardless of the causal model formulated. Consequently, the reproduction of the correlation matrix when all the path coefficients are used is of no help in testing a specific theoretical model.

By deleting certain paths, the researcher hopes to offer a more parsimonious causal model as shown in the following causal model.

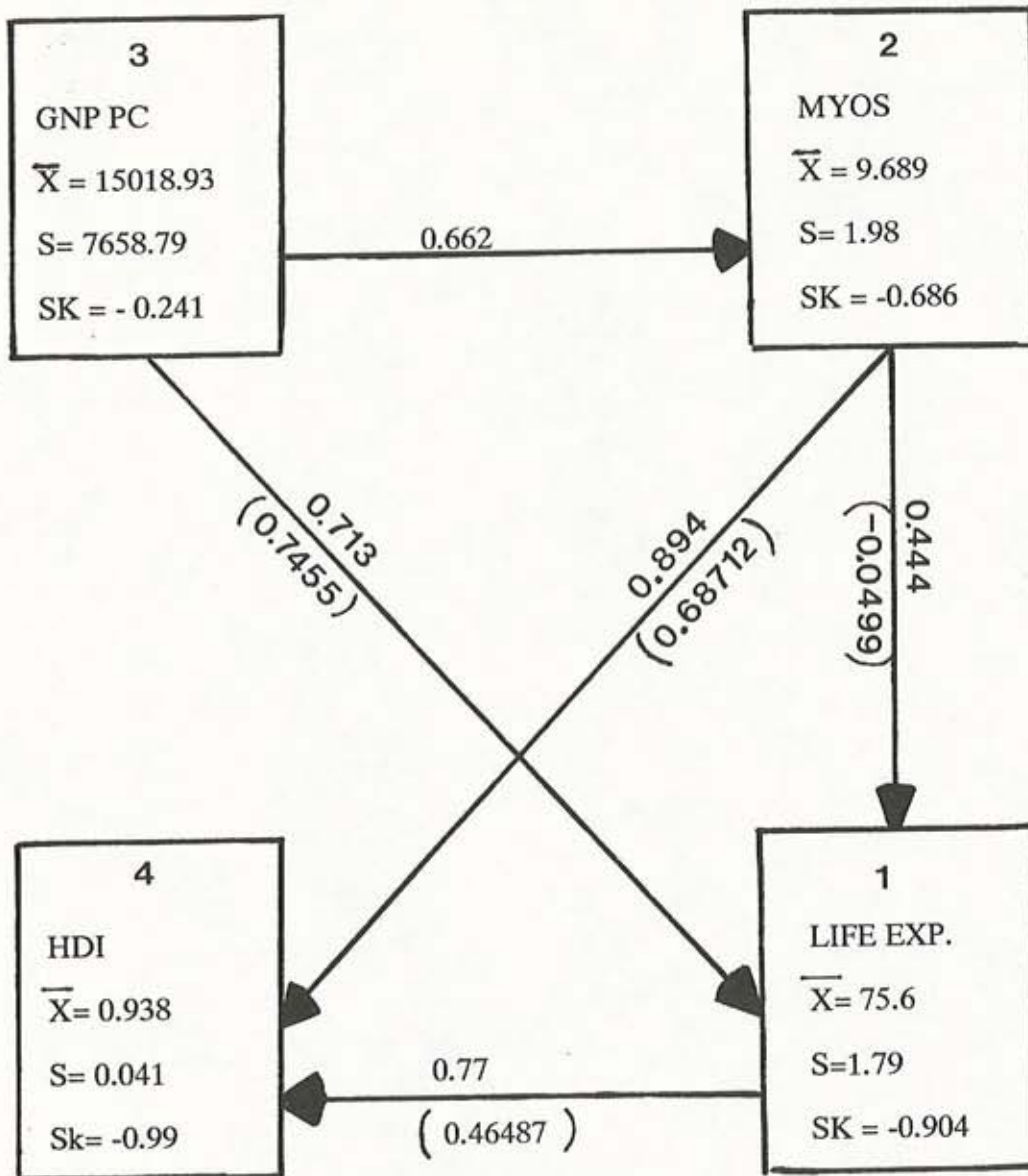


Fig.4

$$r_{41} = P_{41} + P_{42} P_{12} + P_{43} P_{13}$$

$$r_{41} = 0.46487 + (-0.03429) + 0.33911$$

$$r_{41} = 0.7697$$

$$D = 0.0003$$

$$\Gamma_{42} = P_{41} P_{12} + P_{41} P_{13} P_{23} + P_{42}$$

$$\Gamma_{42} = -0.023197 + 0.2294 + 0.68712$$

$$\Gamma_{42} = 0.89335$$

$$D = 0.000654$$

$$\Gamma_{43} = P_{13} P_{41} + P_{23} P_{12} P_{41} + P_{23} P_{42}$$

$$\Gamma_{43} = 0.34656 + (-0.01536) + 0.45487 = 0.787$$

$$D = 0.045$$

The results of the path analysis showed that in the model tested above through which the direct relation between GNP PC and HDI is terminated, the researcher could reproduce the relations between variables. This means that this is the best model to fit the data since the relations were reproduced even after the deletion of a path.

The observed relation between GNP PC and HDI is .831 while the reproduced one is .787. The difference between the two is .045 which is acceptable because it is less than 5%, the criteria of meaningfulness to terminate a direct path.

CHAPTER V

SUMMARY AND CONCLUSION

In 1990, the World Bank followed a new approach in comparing countries by developing a new index called HDI (Human Development Index), which is based on three indicators : Life expectancy, educational attainment, and GNP per capita. Since the phenomenon is new, it is imperative to test their claim.

Summary of the Answers to the Research

Questions

This research attempts to identify the major characteristics of the selected group of countries as well as the relative importance of the independent variables to the proportion of variance accounted for in the HDI for these countries. Relatively speaking, the researcher wants to determine which of the three variables, life expectancy, educational attainment, and GNP per capita is more significant in predicting the Human Development Index. Also, the direct and indirect effects between the dependent and each of the independent variables are to be identified.

The researcher took 40 variables (including the HDI) on 127 developing countries that were reported in the UNDP 1992 edition. Since some of the countries have missing data, they were excluded from the sample and the researcher was kept with 77 countries.

By using stepwise multiple regression, the researcher found that HDI is determined basically by two out of the three variables defined by the World's Bank team of experts. These two variables are life expectancy and GNP per capita. The findings of the research related to the developing countries didn't support the World's Bank claim. Hence, 37 variables were found not significant and deleted from the analysis.

The multiple regression showed that life expectancy is the most significant variable in determining the variation in HDI while GNP per capita is the second most important variable. Adult literacy rate (used to measure educational attainment) is not significant at all.

The relationships between the variables were shown in Table III, the matrix of the correlation coefficients between variables. It was found that the relation between life expectancy and adult literacy is very high indicating the existence of multicollinearity. To get rid of it, the researcher decided to use transformation for the adult literacy variable. Also , X6 (GNP PC) was found to have a high skewness and so, it was transformed also.

As for the major characteristics of the countries, it was found that the average GNP per capita is 1285 which indicates that these countries have low GNP PC. The average adult literacy rate is 62%. The average life expectancy is 59 years while the average HDI is .434.

After testing the recursive system, the relations between HDI and each of the two independent variables were decomposed into direct and indirect effects. Life expectancy has a direct effect on HDI which is stronger than the indirect effect on HDI through GNP PC while GNP PC has an indirect effect on HDI through life expectancy which is stronger than the direct effect on HDI.

Considering the industrial countries, the researcher took 24 variables (including HDI) on 33 countries that were reported in the UNDP 1992 edition. Since some of the countries have missing data, they were excluded from the sample and the researcher was kept with 28 countries.

By using stepwise multiple regression, the findings of the research showed that HDI is determined by the three variables as it was mentioned by the World Bank's experts in their report. Concerning the significance of the variables, the mean years of schooling (used to measure educational attainment) is the most significant variable in explaining the variation in HDI. The life expectancy comes next and lastly comes GNP per capita.

However, after testing the recursive system, it was stated that in the best model to fit the data, GNP affects HDI but indirectly. The direct effect of GNP on HDI is terminated. As for the other two variables, they have indirect effects on HDI but their direct effects are much more stronger. This means that HDI is determined directly by life expectancy and mean years of schooling, while the effect of GNP on HDI can be measured indirectly through mean years of schooling and life expectancy. So, GNP affects HDI but through its effects on schooling and life expectancy. Hence, better GNP means better schooling and better health leading to better HDI.

The relationships between the variables were shown in Table VIII, the matrix of the correlation coefficients between variables.

Concerning the major characteristics, the average life expectancy is 76 years. The average GNP PC is 15019 which indicates that industrial countries have high GNP PC. The average mean years of schooling is 10 years while the average HDI is .938.

Implications

Human Development Index was followed by the World Bank's experts as a new approach for evaluating and comparing countries. They claimed that HDI is determined by three indicators : life expectancy , educational attainment and GNP per capita.

When this claim was tested on the developing countries, the results of the research showed that variation in HDI for this set of countries is explained by the variations in two variables only which are life expectancy and GNP per capita, thus denying the claim of the World Bank. So, in the case of the developing countries, the World Bank's claim is not accepted.

Concerning the industrial countries, the results of the research showed that the claim is valid but with certain modifications. HDI is determined directly by life expectancy and educational attainment, but determined indirectly by GNP per capita, through the other two variables.

The difference between the two kinds of results may be due to the fact that the adult literacy rate used in developing countries to measure educational attainment is more difficult to be measured than the mean years of schooling used in industrial countries to measure educational attainment.

Recommendations

This piece of research discusses the causal variables affecting HDI. It studies the level of significance each of these variables has on the variation in HDI.

It is recommended for further research to study the effect of HDI on important social and economic phenomena. Examples are the effect of the variation in HDI on the ability of countries to meet their external obligations or the effect of the variation in HDI on the foreign assistance that some countries are receiving from other countries or from international organizations. Furthermore, the effect of the variation in HDI on environmental factors is recommended to be assessed in future researches.

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