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Determinants of Human Development Level

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***Abstract*-**Level of living of country is determined by the level of education, level of health and medical facilities. In this paper analysis has been done to study the contribution of different factors affecting different levels of human development. Human Development Index (HDI) has been used as a proxy for human development. In this paper analysis has been done to study the contribution of different factors affecting different levels of human development. Human Development Index (HDI) has been used as a proxy for human development. The analysis has been carried out at three points of time viz for the years 1985, 1995 and 2005. The purpose behind this was to study the changes over a long period of time.

***Keywords*-**Human development, human capital, economic growth health, Education
JEL Classifications O15,J24,O40,I10,I20

I. INTRODUCTION

The progress in human development can be observed from the levels of living. The availability of goods and services in a given time for the needs and satisfaction of the people denotes the standard of living. Level of living of country is determined by the level of education, level of health and medical facilities and services like level of banking system, level of transport, communication, road length and level of leisure and environment (Ganguly and Gupta, 1976).

According to Sen (1988) the standard of living of a society should not be judged by GNP per capita and the supply of particular goods but by people capabilities in what a person can or cannot do. It is entitlements - the set of alternative commodity bundles that a person can command in society. The relevant capabilities are being free from starvation, hunger, under-nourishment. The expansions of these capabilities imply freedom of choice.

In this paper analysis has been done to study the contribution of different factors affecting different levels of human development. Human Development Index (HDI) has been used as a proxy for human development. The analysis has been undertaken to find the relationship of HDI with per capita income (PPP), gross domestic saving, health expenditure in terms of GDP percentage, and education expenditure in terms of GDP percentage, labour force as a percent of total population, urban population as a percent of total population, share of non agriculture sector as a percent of GDP and percentage of labour force in non agriculture sector.

The analysis has been carried out at three points of time viz for the years 1985, 1995 and 2005. The purpose behind this was to study the changes over a long period of time. In order to find the human development level in the developed and developing countries the econometric approach based on regression is used in the form of following equation.

$HDI_{it} = \square_{1it} + \beta_{11}\ln PCI_{it} + \beta_{12}\ln GDS_{it} + \beta_{13}\ln HE_{it} + \beta_{14}\ln EE_{it} + \beta_{15}\ln LFP_{it} + \beta_{16}\ln UP_{it} + \beta_{17}\ln SNA_{it} + \beta_{18}\ln LFNA_{it} + U_{it}$

All Countries Analysis: 1985

The results of the cross country regression analysis for all countries taken together for the year 1985 are presented in table 1. The table shows that 82 percent variations in the dependent variable are explained by the eight factors under study. The coefficient of per capita income and percentage of labour force in non agriculture sector are positive and significant at 1 percent level of significance. The effect of gross domestic saving and health expenditure are positive and significant at 10 percent level of significance. The effect of coefficient of urban population is negative and significant at ten percent level of significance.

Table: 1 Cross Country Regression Results for the year 1985: All Country Analysis

HDI Dependent Variable	Regression Coefficients	t-ratios
Per Capita Income PPP	.118	3.655*
Gross Domestic Saving	.011	1.712***
Health Expenditure as a percent of GDP	.050	1.507***
Education Expenditure as a percent of GDP	.006	.175
Labour force as a percent of total population	.005	.085
Urban population as a percent of	-.159	-1.573***

total population		
Share of Non Agriculture sector as a percent of GDP	.421	1.164
Percentage of Labour Force in Non Agriculture sector	.515	4.161*
Constant	-2.921	-5.336
R^2	.838	
$\bar{R}^2$	.820	

Note: * Significant at 1% ** Significant at 5%
***** Significant at 10%**

This can be attributed to the facts that increase in urbanization increases the cost of sustenance thereby reducing the capability to deploy suitable funds for education and health. Migration of people from rural to urban areas results in slums which further reduces the human development level. Gross domestic saving has direct effect on human development and its value of coefficient is .011 indicating that if there is one percent increase in gross domestic saving the human development will increase by .011 percent. This is due to the fact that increase in saving will increase the income of the inhabitants through increased investments which may help the population to have the capacity to acquire the facilities which are adding to the development of human resource and thus increase in human development level. The coefficient of share of non agriculture sector as a percent of GDP turns out to be positive but insignificant.

All Country Analysis: 1995

The cross country regression results for all countries taken together for the year 1995 are presented in the table 2. The table reveals that 86.5 percent variations are explained by the explanatory variables under consideration. The coefficient of per capita income, share of non agriculture sector as a percent of GDP and percentage of labour force in non agriculture sector are positive and significant at 1 percent level of significance. The coefficient of health expenditure in terms of GDP percentage is positive whereas that of urban population as a percent of total population is negative and both are significant at ten percent level of significance. The coefficient of education expenditure as percent of GDP is negative but non-significant. The coefficient of health expenditure is .05 indicating that if there is one percent increase in the health expenditure, the human development will increase by .05 percent. The coefficient of share of non agriculture sector as a percent of GDP and labour force in non agriculture sector is positive and highly significant meaning thereby that increase in these factors will result into increase in income and hence better opportunity for education and better health facilities thus raising the human development level.

Table: 2 Cross Country Regression Results for the year 1995: All Country Analysis

HDI Dependent Variable	Regression Coefficients	t-ratios
Per Capita Income PPP	.113	4.009*
Gross Domestic Saving	.004	.805
Health Expenditure as a percent of GDP	.050	1.397***
Education Expenditure as a percent of GDP	-.003	-.087
Labour force as a percent of total population	-.019	-.224
Urban population as a percent of total population	-.154	-1.427***
Share of Non Agriculture sector as a percent of GDP	1.103	3.206*
Percentage of Labour Force in Non Agriculture sector	.362	3.779*
Constant	-3.840	-6.068
R^2	.879	
$\bar{R}^2$	.865	

Note: * Significant at 1% ** Significant at 5%
***** Significant at 10%**

All Countries Analysis: 2005

The cross country regression results for all countries for the year 2005 are presented in the table 3. It is clear from the table that 91.7 percent variations are explained by eight explanatory variables under study. The coefficients of per capita income (PPP), share of non agriculture sector as a percent of GDP and percentage of labour force in non-agriculture sectors are substantially positive at one percent level of significance. The coefficient of labour force as a percent of total population is positive and that of urban population as a percent of total population is negative and both are significant at 10 percent level of significance. The coefficient of remaining variables like gross domestic saving, health expenditure, education expenditure are positive but non significant. The study found that the value of R^2 and $\bar{R}^2$ which was 83.8% and 82% respectively in the year 1985 has increased to 87.9% and 86.5 percent respectively in 1995. These further increased to 92.6 and 91.7 percent in 2005. This indicates that the effect of the explanatory variables on the dependent variable have increased over the period of time. The per capita income continues to be positive and highly significant throughout the study period. The coefficient of gross domestic saving was significant in the year 1985 but it became insignificant in the year 1995 and 2005 though remained positive.

The coefficient of health expenditure has remained significant upto the year 1995 and in the 2005 it became insignificant though remained positive. The coefficient of urban population as a percent of total population has also remained negative and significant throughout the study period. The coefficient of share of non agriculture sector as a percent of GDP was non significant in the year 1985 but it became significant in the year 1995 as well as 2005.

Table: 3 Cross Country Regression Results for the year 2005: All Country Analysis

HDI Dependent Variable	Regression Coefficients	t-ratios
Per Capita Income PPP	.122	7.411*
Gross Domestic Saving	.004	.207
Health Expenditure as a percent of GDP	.028	1.003

Education Expenditure as a percent of GDP	.016	.689
Labour force as a percent of total population	.066	1.889**
Urban population as a percent of total population	-.229	-2.881**
Share of Non Agriculture sector as a percent of GDP	.668	3.095*
Percentage of Labour Force in Non Agriculture sector	.466	5.445*
Constant	-3.452	-9.574
R^2	.926	
$\bar{R}^2$	.917	

Note: * Significant at 1%
**** Significant at 5% *** Significant at 10%**

II. DEVELOPING COUNTRIES ANALYSIS

In this section analysis has been done to study the human capital status of developing countries. The multiple regression analysis technique was applied to see whether the effect of different factors differs significantly between the countries. The human development index has been used as a proxy for judging the human capital level. Attempt has been made to find the relationship of human development index with per capita income (PPP), gross domestic saving, health expenditure as a percent of GDP, education expenditure as a percent of GDP, labour force as a percent of total population, share of non-agriculture sector as a percent of GDP, percentage of labour force in non-agriculture sector.

Developing Countries Analysis: 1985

The cross country regression result for all the developing countries for the year 1985 are presented in the table 4.The results of the regression analysis as given by equation I shows that 75.3 percent variation in the dependent variable are explained by the set of explanatory variable under study. The coefficient of per capita income (PPP) is positive and significant at one percent level. This means that as the per capita income increases the human capital level increased significantly in the year 1985. The coefficient of percentage of labour force in non-agriculture sector is positive and significant at one percent level of significance. This is due to the fact that as the labour force in non agriculture sector increases their income increases. The increase in income lead to better standard of living of people and hence increase in human development index which signifies the increase of human capital level. The coefficient of urban population as a percent of total population is negative and significant at five percent level of significance. The coefficient of gross domestic saving, health expenditure as a percent of GDP, labour force as a percent of total population and share of non agriculture sector as a percent of GDP are positive but non significant. The coefficient of health expenditure as a percent of GDP is .016. This indicates that if there is 1 percent increase in the health expenditure the human development index will increase by .016 percent.

The analysis has also been done to find the relationship by excluding the variable per capita income. The equation II of the table shows that 68.3 percent variations in the dependent variable are explained by the explanatory variables under consideration. The coefficient of health expenditure as a percent of GDP and share of non-agriculture sector as a percent of GDP are positive and significant at five percent level of significance. The coefficient of percentage of labour force as a percent of total population remained positive and significant at one percent level and that of urban population as a percent of total population is negative and significant at five percent level of significance.

Table: 4 Cross Country Regression Results for the year 1985: Developing Countries Analysis

HDI Dependent Variable	Eq 1	T-Value	Eq II	T-Value
Per Capita Income PPP	.220	3.979*		
Gross Domestic Saving	.007	.960	.013	1.714
Health Expenditure as a percent of GDP	.011	.277	.076	1.895**
Education Expenditure as a percent of GDP	.016	.375	.005	.107
Labour force as a percent of total population	.074	.731	.021	.182
Urban population as a percent of total population	-.299	-2.243**	-.291	-1.925**
Share of Non Agriculture sector as a percent of GDP	.459	1.110	.993	2.238**
Percentage of Labour Force in Non Agriculture sector	.508	3.527*	.740	4.956*
Constant	-3.726	-5.385	-3.349	
R^2	.787		.721	
$\bar{R}^2$	.753		.683	

Note: * Significant at 1% level of significance
**** Significant at 5% level of significance**
***** Significant at 10% level of significance**

Developing Countries Analysis: 1995

The cross country regression results for human capital status for the year 1995 are presented in the table-5. The equation I of the table show that 79.7 percent variations in the dependent variable are given by the set of explanatory variables under study. The coefficient of per capita income (PPP) is found to be positive and significant at one percent level of significance. The coefficient of share of non-agriculture sector as a percent of GDP is positive and significant at five percent level and the coefficient of percentage of labour force in non- agriculture sector is positive and significant at one percent level of significance.

Table: 5 Cross Country Regression Results for the year 1995: Developing Countries Analysis

HDI Dependent Variable	Eq 1	T-Value	Eq II	T-Value
Per Capita Income PPP	.162	3.619*		
Gross Domestic Saving	.001	.066	.012	2.021**
Health Expenditure as a percent of GDP	.026	.557	.100	2.112**
Education Expenditure as a percent of GDP	.005	.117	.006	.137
Labour force as a percent of total population	.021	.174	.014	.109
Urban population as a percent of total population	-.249	-1.641***	-.251	-1.490***
Share of Non Agriculture sector as a percent of GDP	1.151	2.811**	1.722	4.107*
Percentage of Labour Force in Non Agriculture sector	.364	3.184*	.519	4.413*
Constant	-4.270	-5.306	-4.443	-4.981
R^2	.825		.780	
$\overline{R}^2$	.797		.750	

Note: * Significant at 1% level of significance
**** Significant at 5% level of significance**
***** Significant at 10% level of significance**

The coefficient of gross domestic saving, health expenditure, education expenditure as a percent of GDP, labour force as a percent of total population are positive but non significant. The coefficient of labour force as a percent of total population is .021 indicating that if there is one percent increase in the labour force as a percent of total population the human development index will increase by .021 percent.

The analysis has also been made to find the relationship by excluding the variable per capita income (PPP). The equation II of the table shows that 75 percent variations in the dependent variable are explained by the explanatory variables under study. The coefficient of gross domestic saving and health expenditure as a percent of GDP are positive and significant at five percent level of significance. The coefficients of share of non-agriculture sector as a percent of GDP become positive and significant at one percent level of significance. The coefficient of urban population as a percent of total population remained negative and significant at 10 percent and that of percentage of labour force in non- agriculture sector positively significant at one percent level of significance.

Developing Countries Analysis: 2005

The cross country regression results for human capital status for developing countries for the year 2005 are presented in the table 6. The equation I of the table shows that 88.6 percent variations in the dependent variable are explained by the explanatory variables under study. The coefficients of per capita income (PPP) and percentage of labour force as a percent of total population are positive and significant at one percent level of significance. The coefficient of labour force as a percent of total population and coefficient of share of non-agriculture sector as a percent of GDP are positive and significant at five percent level of significance. The coefficient of urban population as a percent of total population is negative and significant at five percent level of significance. The coefficient of gross domestic saving, health expenditure and education expenditure are positive but non-significant.

Analysis has also been made to find the relationship by excluding the variable per capita income. The equation II of the table shows that 83.4 percent variations in the dependent variable are explained by the explanatory variables. The coefficient of health expenditure as a percent of GDP is positive and significant at five percent level of significance. The coefficient of labour force as a percent of total population and share of non agriculture sector became significant at one percent level of significance.

Table: 6 Cross Country Regression Results for the year 2005: Developing Countries Analysis

HDI Dependent Variable	Eq 1	T-Value	Eq II	T-Value
Per Capita Income PPP	.139	4.998*		
Gross Domestic Saving	.011	.542	.003	.138
Health Expenditure as a percent of GDP	.034	.920	.090	2.132**
Education Expenditure as a percent of GDP	.019	.679	.037	1.116
Labour force as a percent of total population	.247	2.706**	.379	3.600*
Urban population as a percent of total population	-.235	-2.639**	-.265	-2.472**
Share of Non Agriculture sector as a percent of GDP	.616	2.635**	.880	3.196*
Percentage of Labour Force in Non Agriculture sector	.458	4.307*	.777	7.580*
Constant	-4.177	-8.645	-4.641	-8.098
R^2	.902		.853	
$\overline{R}^2$	.886		.834	

Note: * Significant at 1% level of significance ** Significant at 5% level of significance
***** Significant at 10% level of significance**

III. CONCLUSIONS

The present paper envisages detremiknants of human development level across world along with developing countries based on the secondary data sources pertaining to the three point of times viz. 1985, 1995 and 2005. The results of the study found that the value of R^2 and $\overline{R}^2$

which was 83.8 percent and 82 percent respectively in the year 1985 has increased to 87.9 percent and 86.5 percent in 1995. It further increased to 92.6 and 91.7 percent in 2005. This indicates that the effect of the explanatory variables on the dependent variables has increased over the period of time. The per capita income has continued to be highly significant throughout the study period. The coefficient of gross domestic saving was significant in the year 1985 but it became insignificant in the year 1995 and 2005. The coefficient of health expenditure remained significant upto the year 1995 and in the year 2005 it became insignificant. It indicates that no further increase in health expenditure would result into the enhancement of human development level. The coefficient of urban population as a percent of total population remained negatively significant throughout the study period. The coefficient of share of non agriculture sector as a percent of GDP was non-significant in the year 1985 but it became significant in the year 1995 and continued till 2005. The coefficient of labour force in the non agriculture sector continued to be significant throughout the study period.

When the analysis is done for developing countries the study found that over a period of time from 1985 to 2005 the value of $\overline{R}^2$ increased to 88.6 percent in 2005 from 75.3 in 1985. The increase in $\overline{R}^2$ indicates that the effects of explanatory variable on the dependent variable have increased. The coefficient of per capita income and coefficient of percentage of labour force in non-agriculture sector and coefficient share of non-agriculture sector as a percent of GDP remained positively significant throughout the study period. The coefficient of urban population as a percent of total population remained negatively significant throughout the study period. The coefficient of gross domestic saving was positive but non significant in 1985. It became significant in 1995 when the variable per capita income was excluded from the list.

The coefficient of health expenditure was positively significant throughout the period of study when the variable per capita was excluded. The coefficient of education expenditure as a percent of GDP remained positive but non significant during the period of study. The coefficient of labour force as a percent of total population was positive but non-significant in 1985 and 1995 but became significant in the year 2005.

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