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Tertiary sector: An engine of socio-economic development

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Abstract
This paper employed tools of empirical econometrics analysis to examine the relationship between human development vectors and economic growth in terms of contribution of services sector as public administration and community services in GDP. To examine this relationship, HD vector regressed on economic growth in corresponding indicator. Results showed that there is high positive correlation between economic growth and human development. To compare the mean difference between male and female for both indicators t–test for two independent samples is used which shows mean value of both indicators differ for both groups. It means economic development doesn't affect equally the health and education between male and female.

Keywords: Econometrics Analysis, Human Development Vectors,Regressed,Correlation

1. Introduction
In any nation, human development outcome are a function of economic growth, social policy and poverty reduction measures at micro level. The expansion of human functioning in terms of health and educational attainments and economic growth are linked to each other in two ways. For instant, investment in health and education can enhance economic growth similarly resource generated through economic growth can be used to enhance human development functioning. On the other hand if this income is by product of services sector which are one of the important indicators of knowledge economy in the world, human development boost more rapidly. It is a general observation that as share of services sector increases in the economy the human development in terms of education and health also increase. We can see, states which are getting high human development index as Kerala, Tamil Nadu etc also have highest share of services sector in GDP. It shows that, it is also important that from which sector economic growth is coming. In short economies which are performing better in services sector growth have high value of human development index which is new criterion of human development.
The enhanced economic growth of services sector generates important repercussion effect in the economy, which would further propel the growth trajectory in the long run. For example education as a input can lead to better health and nutritional status of individual, which improved learning ability and better attendance at school. Similarly, a healthy mother giving birth to a healthy child with higher chance of survival leads to lower fertility and smaller family size, which in turn increases the per capita availability of resources to improve health and education attainments. So this paper is an endeavor to show the relationship between economic growth in terms of contribution of public administration and community services as a component of service sector and human development indicators literacy rate and life expectancy at aggregated and disaggregated level of Indian economy. The paper is organized as follow section 2 describes the meaning of human development and relationship between human development and economic growth at micro and micro level in term of chosen variables. Section 3 devoted to data collection and model building of present relationship. In the section 3 Author explored the theory and empirics on review of literature. Section 4 reveals the findings of paper and last section provides some conclusions and suggestion for policy implication.

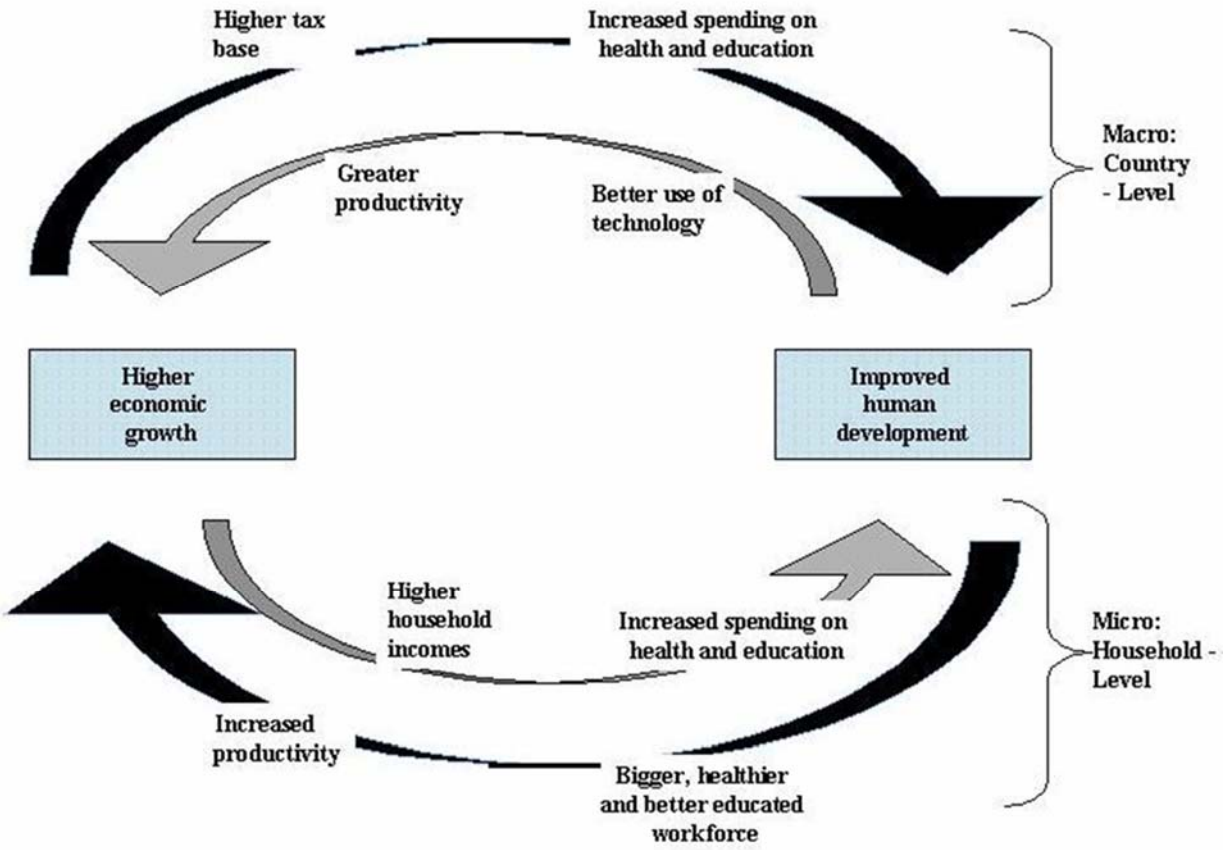
2. Meaning and Causality between Human Development and Economic Growth
Human development has defined as enlarging people's choice in a way which enables them to lead longer, healthier and fuller lives, has come to the fore as a fundamental objective of development, its relationship to economic growth has a crucial issue at micro and macro level.

The current concept of development was developed by economist Mahbub UL Haq. Working with Amartya Sen and other gifted economists in 1990, Dr Haq published first human development report, which had been commissioned by the United Nations Development Programme, after this there is continuous publication of HDR consisting of outcome of indicators in three dimension namely.

a. A long and healthy life, as reflected in life expectancy at birth.
b. The acquisition of education and knowledge as reflected in the mean years of schooling (adjusted for out of school children) and literacy rate (age of years and above).
c. The standard of living and command over resources, as reflected in the monthly per capita expenditure adjusted for inflation and inequality.

2.1 Two ways relationship between Human Development and Economic Growth:

The two ways relationship is represented at micro and macro level. At macro level growth increases a country tax base and therefore allows for greater spending on health and education. On the other hand improved human development increase better use of technology which leads to greater productivity and ultimately enhance growth of economy.



At the micro level growth raises the income of poor people and thereby increases their ability to pay for activities and goods that improve their health and education. On the other hand improved human development in terms of better health and education increases the productivity of workforce and finally leads to more economic growth

3. Review of Literature:-

Although there are vast literature available on economic growth and human development but no study directly shows the relationship between service sector growth and human development. The literature on economic growth and human development shows that there are two ways relationship between both. ***Anand and Ravallion*** (1993) showed that most of effects of economic growth on HD to flow through governmental budgetary expenditures, centre and local, however the strength of this effect depends upon entirely on the effectiveness of expenditure targeting and delivering. The results of study also show that government must also identify the priority sector as primary education and health that have the highest potential for HD improvement. Government expenditure for HD should be distributed predominately to low income groups and areas since it is here that the highest marginal will be had. ***Ranis et al.*****(**2003) explored the two ways relationship between EG and HD. The results of study show that, HD is not only a product of EG but also an important inputs to it. Study also develops a measure of strength of EG and HD relationship and explores some of its empirical determinants. The study also explores that HD must be given priority for the achievement of higher EG as well as HD. Similarly ***Ranis*** (2004) also described this two ways relationship between human development and economic growth. The results of study show that nations may enter either into a virtuous cycle of high growth and large gains into human development, or a vicious circle of low growth and low rates of HD improvements. In these nations, levels of EG and HD are mutually reinforcing either leading towards an upward spiral of development or a poverty trap. The greater freedom and capabilities improves the economic performance and human development will have an important effect on growth. Similarly, to extent that increased incomes will increase the range of choice and capabilities enjoyed by household and government. ***Charkarborty and Mukherjee*** (2006) analyzed the relationship between economic growth

and human development for the 28 major Indian states during the time period 1983, 1993, 1999-2000 and 2000-04 using human development report methodology. The objective of this study is to exercise that at what degree and extent the per capita income has influenced the human development across the Indian states. The results of study show that per capita income is not translating into human development. The results also show that the need for further investigation to determine the underlying factors which influence human development of states. Similarly ***Joshi*** (2007) concluded that good governance explains more of HD outcomes (in health, education and longevity) than economic growth, per capita investment or per capita income for the Indian states during 1980s to early 2000s. The study also noted that though there exist positive relationship between HD and EG, but it is not automatic in either direction. ***Shome and Tandon*** (2010) explained that economic growth as measured by the GDP of an economy should lead to economic development and better quality of life for its citizens. However the results of study show that in many developing countries, the ranking according to GDP does not match its ranking in economic development. ***Khodabakhshi*** (2011) showed that per capita gross domestic production index in the Indian economy has good economic growth but its impact on other indicators of human development index is very low even on life expectancy has been ineffective**. Human Development Report** (2011) analyzed the global HD situation as well as country ranking where India,,s achievement can be ascertained. While India remained the low HD category throughout the nineties, in 2002 it graduated to medium HD category. In 2005 it secured a composite HDI score of 0.619 as compared to corresponding figure of 0.439 in 1990. India"s global HDI rank also changed from 132 in1999 to 134 in 2011, while number of countries covered also increased during the period. ***Baishya*** (2012) attempted to analyze the relationship among human development and economic growth for traditional Assamese fisherman of Niz-Saldon village in Sartherbari revenue circle of Barpeta district. The study shows that there is a strong correlation between GDP per capita and indicators of development such as life expectancy, infant mortality, adult literacy, political and civil rights and some indicators of environmental quality. However growth alone does not guarantee human development. There is need to change the social attitude of people, removing illiteracy, develop better agriculture methods and techniques and better infrastructure

Objectives of paper: the objectives of paper are to reveal

1. The role of services sector in human development using indicators life expectancy at birth and literacy rate at aggregated and disaggregated level in the context of Indian economy.
2. Paper also analyses the mean difference between female and male in both indicators.
3. And finally paper provides some conclusion and suggestions to improve the role of service sector in human development.

Methodology: Data collection

To endeavor the above objectives the study used the secondary data from different sources as Economic Survey various issues, Census of India, CSO etc.for the time period 1950-51 to 2010-11. Data is given in discontinuous series as from 1950-51 to 1960-61 till 2010-11.

Model Specification- The paper analyses the role of service sector through regressing the HDI vectors of literacy and life expectancy at birth on GDP from services sector. The independent t-test is applied to compare the mean difference between male and female of both indicators.

Model is

$Yi = b_1 X^{b2} e^{ui}$

Taking natural log both sides we get

$Log\ Yi = Logb_1 + b_2 \log Xi + Ui$

Y= human development vector in terms of literacy and life expectancy of population

Xi= GDP from services sector (public adminstritative and community services)

i= represent time from 1950-51 to 2010-11

Ui = random error term satisfying all assumptions of OLS method.

We have constituted two hypotheses

T-test (For independent sample)

$T= (X_1-X_2)/S * Sqt(n_1*n_2/n_1+n_2)$

Where X_1 = Mean value of human development indicators simultaneously for male

X_2 = Mean value human development indicators simultaneously for female

$N_1 = N_2$, No of observation for two groups respectively

S= Combined standard error for two groups.

Hypothesis one:

H_O = there is no significant difference between human development vectors in terms of life expectancy at birth and literacy rate and GDP from public administrative and community services at aggregated and disaggregated level.

H_1 = there is significant difference between human development vectors in terms of life expectancy at birth and literacy rate and. GDP from public administrative and community services at aggregated and disaggregated level.

Hypotheses two:

H_O = there is no significant difference between mean value of both indicators among male and female.

H_1 = there is significant difference between mean value of both indicators among male and female.

Findings

Table1: Relationship between literacy rate and GDP shares of community services at aggregated and disaggregated level (1950-51 to 2010-11)

	R Value	R^2	Unstandardized coefficient	t-value
Male	.892	.756	.277(.007)	4.423
Female	.985	.971	.660(.001)*	12.971
Total person	.975	.951	.317(.000)*	9.834

Source: Author's Calculation

1.* Indicates significance of parameter estimated at 5% level.
2. Figure in parenthesis is calculated standard error of estimates.

Table1 represents the relationship between economic growth and human development using the indicators literacy rate and GDP from community services for the time period 1950-51 to 2010-11 at aggregated and disaggregated level. At the aggregated level the value of coefficient of correlation is 0.975 which shows high degree positive correlation between

human development and economic growth with corresponding indicators. The coefficient of determinant value 0.951 represents that, 95.1 percent variation in human development can be explained by economic growth. The Unstandardised coefficient value is. 317 which is positive and statistically significant at 5 % level of significance. Similarly coefficient of correlation value for male and female are. 892 and. 985 respectively, again positive and high correlation at disaggregated level. The coefficient of determination explains where 71.6 percent variation in human development due to economic growth for male it is 97.1 percent for female. The beta coefficient value is positive and statistically significant at 5 percent level of significance for female and not significant for male. The calculated t –value is more from table value at both aggregated and disaggregated level which reveals to reject null hypotheses and selection of alternate hypotheses that is there is significant difference between human development and economic with corresponding indicators at aggregated and disaggregated level.

Table2: Relationship between life Expectancy at birth and GDP shares of community services at aggregated and disaggregated level (1950-51 to 2010-11)

	R Value	R^2	Unstandardised coefficient	t-value
Male	.934	.872	.197(.002)	5.844
Female	.938	.881	.209(.002)	6.074
Total person	.936	.890	.208(.001)	6.358

Source: Author"s Calculation.

1. * Indicates significance of parameter estimated at 5% level.
2. Figure in parenthesis is calculated standard error of estimates.

Table2 reveals the relationship between economic growth and human development using the indicators life Expectancy at birth and GDP from community services for the time period 1950-51 to 2010-11 at aggregated and disaggregated level. At the aggregated level the value of coefficient of correlation is 0.936 which shows high degree positive correlation between human development and economic growth with corresponding indicators. The coefficient of determinant value 0.890 represents that, 89 percent variation in human development can be explained by economic growth. The Unstandardised coefficient value is. 208 which is positive and statistically significant at 5 % level of significance. Similarly coefficient of correlation value for male and female are. 934 and. 938 respectively, again positive and high correlation at disaggregated level. The coefficient of determination explains where 87.2 percent variation in human development due to economic growth for male it is 88.1 percent for female. The beta coefficient value is positive and statistically significant at 5 percent level of significance for female and male. The calculated t –value is more from table value at both aggregated and disaggregated level which reveals to reject null hypotheses and selection of alternate hypotheses that is there is significant difference between human development and economic with corresponding indicators at aggregated and disaggregated level.

Table3: Mean Difference between male and Female for Literacy Rate

Human Development Indicators	Calculated t-value	Table Value	Level of Significance
Literacy Rate	1.566	2.12	0.005

Author"s Calculation.

Table 3 compares the mean difference between male and female for human development indicators literacy rate in the context of Indian economy for the period 1950-51 to 2010-11. The table shows that calculated value of t (1.566) is less than table value (2.12). It means we accept the null hypothesis and concludes there is mean difference between male and female for literacy rate. It reveals that economic growth doesn"t affect male and female equally for literacy rate.

Table 4: Mean Difference between male and Female for Life Expectancy at birth

Human Development Indicator	Calculated t -value	Table Value	Level Significant	of
Life Expectancy at	0.040	2.12	0.005	
Birth				

Author"s Calculation.

Table 4 compares the mean difference between male and female for human development indicators literacy rate in the context of Indian economy for the period 1950-51 to 2010-11. The table shows that calculated value of t (0.040) is less than table value (2.12). It means we accept the null hypothesis and concludes there is mean difference between male and female in life expectancy at birth rate. It reveals that economic growth doesn"t affect male and female equally I health facilities.

6. Conclusions and Suggestions

Findings of the paper show that, economic growth and human development are strongly correlated to each other at aggregated and disaggregated level. The value of R is more in the case of female for both indicators in comparison to male. There is no doubt that, growth is one of the important indicators for human development at national and state level. But there are many factors as distribution of this growth, unemployment rate, and poverty rate, level of corruption which is the hindrance in this two ways causality at micro and macro level. So with increase the growth rate, government should take steps to meet these challenges. Secondly if this growth is by product of services than, it automatically enhance the rate of development because it is general observation of economic theory as economy moves from primary sector to secondary to tertiary, it is again the symbol of development for an economy. So, economic growth of services sector is crucial for making sustained towards development. The paper also compares the mean difference between male and female for both indicators of human development and results show that, there is significant difference between male and female for both indicators, it means to percolate this growth in development among male and female, there is need of separate strategy.

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