

## Dynamic Linkage between Human Development and Economic Growth: A Comparative Study of Punjab & Haryana

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### Abstract

Human development goes far beyond income and growth to cover the full flourishing of all human capabilities. Human development is the end- economic growth is a means. So, the purpose of growth should be to enrich people's lives. For many years growth has been a major economic goal of policy makers and political leaders as delivering a larger quantity of goods and services is the best way to improve people's standard of living.

This paper is designed to observe the trends in human development indicators as, literacy rates, enrolment rate, and infant mortality rates and how these are linked with trends for growth of net state domestic product of Haryana & Punjab. Linear regression technique have been used for analyzing the linkage between economic growth and human development indicators. The basic purpose is to find main predictors of growth. Results of the present study highlight the relation between economic growth and human development. The results of Punjab show that Infant mortality is negatively related with GDP growth while literacy rate and enrolment rate have a positive relation. On the other hand Infant mortality rate is negatively related, while enrolment rate is positively associated with NSDP of Haryana.

**Keywords:** ANOVA, Gross Domestic Product, Human Development Index, National Skills Development Programme, Ordinary Least Square, United Nations Development Programme.

### Introduction

Human Development (HD) goes well ahead of the Human Development Index (HDI), with which it is often equated. Human Development has been defined as 'a process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated, and to enjoy a decent standard of living.

The Human Development Index (HDI) is a statistical tool used to measure a country's overall achievement in its social and economic dimensions. The social and economic dimensions of a country are based on the health of people, their level of education attainment and their standard of living. Description: Pakistani economist Mahbub ul Haq created HDI in 1990 which was further used to measure the country's development by the United Nations Development Program (The Economic Times).

Ever since the HDI was first published, it has drawn critiques from many sides. Some critiques claim that it uses the wrong variables, and that it is not reflecting the human development idea accurately (Srinivasan , 1994). Sagar and Najam ,1998) opined that “the HDI presents a distorted picture of the world”. Others argued that the HDI depicts an oversimplified view of human development by relying on only a few indicators often derived from data of low quality (Murray, 1993, Srinivasan, 1994).

According to (Streeten ,1994) human development is necessary on account of the following reasons. Human development is the end while economic growth is only a means to this end. Human development is a means to higher productivity. It helps in lowering the family size by slowing human reproduction. Human development is good for physical environment. Reduced poverty contributes to a healthy civil society, increased democracy and greater social stability. Human development can help in reducing civil disturbances in a society and in increasing political stability.

Economic growth is the increase in the market value of the goods and services produced by an economy over time. It is normally measured as the percent rate of increase in real gross domestic product, or real GDP. ( Encyclopædia Britannic, 2007) Of more importance is the growth of the ratio of GDP to population (GDP per capita), which is also called per capita income. An increase in growth caused by more efficient use of inputs is referred to as intensive growth. GDP growth caused only by increases in inputs such as capital, population or territory is called extensive growth ( Romer, 1990).

For many years growth has been a major economic goal of policy makers and political leaders as delivering a larger quantity of goods and services is the best way to improve people’s standard of living. But quality of people’s lives can be poor in the midst of plenty so undoubtedly more economic growth is needed but more attention must go to the structure and quality of that growth-to ensure that it is directed to supporting human development, reducing poverty, protecting the environment and ensuring sustainability.

Human development is a process of enlarging people’s choices. The most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living. Additional choices include political freedom, guaranteed human rights and self-respect - what Adam Smith called the ability to mix with others without being “ashamed to appear in public. It is sometimes suggested that income is a good proxy for all other human choices since access to income permits exercise of every other option. This is only partly true for a variety of reasons:

- Income is a means, not an end. It may be used for essential medicines or narcotic drugs. Well being of a society depends on the uses to which income is put, not on the level of income itself.
- Country experience demonstrates several cases of high levels of human development at modest income levels and poor levels of human development at fairly high income levels.

- Present income of a country may offer little guidance to its future growth prospects. If it has already invested in its people, its potential income may be much higher than what its current income level shows, and vice versa.
- Multiplying human problems in many industrial, rich nations show that high income levels, by themselves, are no guarantee for human progress. The simple truth is that there is no automatic link between income growth and human progress. The main preoccupation of development analysis should be how such a link can be created and reinforced (United Nations Development Programme, 1990)

### Review of Literature

According to (Streeten, 1994) human development is necessary on account of the following reasons. Human development is the end while economic growth is only a means to this end. Human development is a means to higher productivity. It helps in lowering the family size by slowing human reproduction. (Little, 2003) suggests that the motivation is the central concept of human development which influences the economic development. (Debrah et al., 2000) found that Globalization led to strengthen the East Asia regional economic co-operation and promoting economic growth. (Sydhagen et al., 2007) argued that there is need for skills development and training to increase the labor skilled for economic development, this strategy has been appropriated for Sub-Saharan African region and the developing economies. (Gani et al., 1998) found interesting results regarding human resource strategy's contribution in economic development in case of Singapore concluded that Singapore's remarkable development was done by investment in human capital, especially in education. In 1970 it had a GDP per capita US\$3,021 but in 2009 it had US\$ 37,293. Further, (Crespo, 2007) applied Amartya Sen's Capability Approach to find the impact of education and human development on economic development in case of Mexico, concluded that the creation of technical university in a poor areas of Mexico has helped young graduates to achieve jobs and contributed in economic development. (Lind, 2004) evaluated the reliability of the HDI index by analyzing the various feature of HDI. It is expressed that HDI is not a very suitable index for policy recommendations. It is determined that HDI sensitivity for each of its component variable is very different, and an equal increase in any one dimensions of it may bring in different changes in HDI. (Wasantha Athukorala, 2003) has concluded that the path of direction is not in the way from FDI to GDP growth but GDP growth to FDI in the case of (Nissan and Niroomand, 2005) compared the convergence and divergence phenomenon between income and other basic need variables such as HDI. The study divided the sample of 100 countries among the three groups high, medium and low on the basis of their income levels and HDI. The phenomenon of convergence was established for HDI especially in the case of poor countries whereas the income measure showed a divergent part. We observed an improvement in quality of life in low income countries over time. However, it was inferred that richer countries are still performing better despite the improvement in poor countries in the domains of quality of life. So,

governments in developing countries are needed to allocate their funds more appropriately for better results in future. (Birdsall and Sabot , 1995) show that if the distribution of income in Brazil were as equal as that in Malaysia, school enrollments among poor children would be 40% higher. The effects of economic growth on government human development expenditures are bound to complement private expenditure channels. Studies by (Rajkumar et. all , 2002) have demonstrated that the effectiveness of public expenditure is conditional on the quality of governance, with government accountability likely to play an important role. While empirical evidence here is more spotty, theory suggests that a decentralized, locally accountable government system may have advantages in resource allocation and service delivery.

(Diener and Suh, 1997) prefer a multidimensional “dashboard” approach to a scalar composite index as a way to avoid an arbitrary choice of the functional form and an arbitrary weighting scheme, but also not to lose information unnecessarily due to aggregation across indicators. Although, the use of multiple indicators allows the researcher to observe an object of interest from multiple angles, it does not allow a parsimonious understanding of the phenomenon under consideration. (Aluko , 1975) refers to poverty as a lack of command over basic consumption needs, which means that there is inadequate level of consumption giving rise to insufficient foods, clothing and/or shelter, and moreover the lack of certain capacities such as being able to participate with dignity in society.

### **Objectives of the Study**

The present study has been undertaken to study the economic performance by growth indicators and to study the human development indicators with special emphasis on health and Educational indicators for Punjab & Haryana with special emphasis on performance in the 2001 onwards era. The basic purpose is to find main predictors of growth. Following are the broad objectives of current paper:

- To study trends in human development indicators from period 2001-2010 of Punjab and Haryana.
- To compare economic growth & Human Development indicators of Punjab and Haryana.
- To analyses the linkage between human development growth and economic growth factors of Punjab and Haryana

### **Research Design**

Research design is the conceptual structure within which research is conducted. “A research design is the arrangement of condition for collecting and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure”. With this as a base Description Research Design ,which includes survey and fact finding , the major purpose of descriptive research is for the description of the state of affairs , as if exists at present. The study has been based on descriptive method.

With a view to accomplish the stipulated set of objectives of the study, Least square linear regression method has been used for calculating Compound Growth Rate of important variables covered by the study. As the study relates to time series, it is quite possible to notice different trends. The growth of various heads of production will be analyzed with the help of Compound annual rate of growth.

$$Y = ab^t$$

The Compound annual rate of growth will be calculated by using the Semi log Model and applying the method of ordinary least square (OLS) as explained below:

$$\text{Let } Y = ab^t = (1+r)^t \dots\dots\dots(i)$$

$$\text{Therefore } \log Y = \log (ab^t) = \log a + t (\log b)$$

where  $Y_t$  =  $t^{\text{th}}$  observation on the variable Y for which rate of growth is to be calculated.

$t$  = Time variable taking  $n$  values 1,2,3,.....,  $n$  and in this study  $n$  takes 9 and 10 values from 2000-01 to 2008-09 and 2000-01 to 2009-10 respectively, according to the availability of the latest data to fulfill the need of the analyze of this contemporary research.

$U_t$  = A random distribution (or error) term at  $t$  satisfy the user assumption of Ordinary least square

$r$  = rate of growth or Compound annual rate of growth.

$a$  and  $b$  are parameters of original model (i) and  $A$  and  $B$  are the parameters of transformed model (ii).

From (ii),  $a$  and  $b$  are calculated as follows:

$$\log a = A, a = \text{Antilog } A$$

$$\log b = B, b = \text{Antilog } B$$

$$\text{Since } (1+r) = b,$$

Since rate of growth is calculated in percent terms

$$r = (b-1)*100 = (\text{Antilog } B - 1)*100.$$

OLS and stepwise regression models have been used for analyzing the factors causing recession, by taking NSDP at constant market prices as the dependent variable and Enrolment rate, Infant Mortality rate and literacy rate have been taken as independent variables.

The relationship of NSDP at constant market prices with the variables like  $E$ ,  $I$ , and  $L$  can be represented by an equation of the following form:

$$Y = f(E, I, L)$$

Where,  $Y$  = NSDP at constant market prices

$E$  = Enrolment

$I$  = Infant Mortality

$L$  = Literacy

The best fit in the least-squares sense is that instance of the model for which the sum of squared residuals has its least value, a residual being the difference between an observed value and the value given by the model. Stepwise regression model is a method of computing OLS regression in stages. In stage one, the independent best correlated with the dependent is included in the equation. In the second stage, the remaining independent with the highest partial correlation with the dependent, controlling for the first independent, is entered. The process is repeated, at each stage partially for previously-entered independents, until the addition of a remaining independent does not increase R-squared by a significant amount (or until all variables are entered).

### Data Analysis and Interpretation

This section is sub divided into four parts, first part of this section discusses the human development Indices of various states of India. Second and third parts highlight growth rates of NSDP and human development indicators of Haryana & Punjab. Last section discusses the linkage between economic growth and human development indicators of Haryana and Punjab.

#### Part-I: Human Development Indices of Various States of India


**Table 1 : States with high and Medium High human development**

Rank	State/Union Territory	HDI (2011)
<b>High human development</b>		
1	Kerala	0.790
2	Delhi	0.750
<b>Medium human development</b>		
3	Himachal Pradesh	0.652
4	Goa	0.617
5	Punjab	0.605
6	North eastern India (excluding Assam)	0.573
7	Maharashtra	0.572
8	Tamil Nadu	0.570
9	Haryana	0.552
10	Jammu and Kashmir	0.529
11	Gujarat	0.527
12	Karnataka	0.519

Source: Indian Human Development Report 2011

As shown through table 4.1 Kerala tops with a HDI: 0.790 and Delhi is next on list with HDI of 0.750. These two states have high HDI. There are 10 states with medium Human development. Both Punjab and Haryana fall in this category. HDI of Punjab is 0.605 and is comparatively better than HDI of Haryana with an HDI: 0.552. Although study relates with Punjab and Haryana, an overview of states falling in category of low HDI is important. Table 1 depicts the states with low HDI.

**Table 2 : States with Low Human Development**

Low Human Development		
1.	West Bengal	0.492
2.	Uttarakhand	0.490
3.	Andhra Pradesh	0.473
4.	Assam	0.444
5.	Rajasthan	0.434
6.	Uttar Pradesh	0.380
7.	Jharkhand	0.376
8.	Madhya Pradesh	0.375
9.	Bihar	0.367
10.	Odisha	0.362
11.	Chhattisgarh	0.358
12.	 <b>India</b> ( <i>national average</i> )	<b>0.467</b>

Source: Indian Human Development Report 2011

As shown in table 2 there are still 11 states having low HDI. Bihar, Odisha and Chhattisgarh are having very low HDI. Average HDI of India is also low and is 0.467. Thus in terms of HDI

Although there is an improvement over the years, but still there is a long way to go.

**Table 3 : Human Development Indices of Haryana and Punjab vis-a vis Kerala**

State	1991	Rank	1991	Rank	2001	Rank	2011	Rank
Kerala	.500	1	.591	1	.638	1	.790	1
Haryana	.360	5	.443	5	.509	5	.552	9
Punjab	.411	2	.475	2	.537	2	.605	5

Human development is the process of enlarging people's choices by expanding human functioning and capabilities. At all levels of development the three essential capabilities are for people to lead a healthy and long life, to be knowledgeable and to have access to the resources needed for a decent standard of living. A composite index, the HDI index contains three variables- Life expectancy at birth, educational attainment (adult literacy and the combined gross primary, secondary and tertiary enrolment ratio) and GDP per capita. Income enters HDI as a proxy for a decent standard of living. Table 4.3 highlights the status of HDI of Haryana and Punjab over the last four decades. It is surprising that both the states ranks have gone down in terms of performance over the years. Punjab earlier was at second rank and now is at fifth rank. Haryana earlier at fifth rank is now at ninth rank. Kerala state has maintained its dominance since 1981. Thus in terms of Human development both Haryana and Punjab have to learn from the state of Kerala.

Before proceeding further, let us analyse the literacy rates of different states of India as per 2011 census. The data is depicted in table 3.

**Table 4. Literacy Rates of States**

S. No	State	Literacy Rate	Male Literacy Rate	Female Literacy Rate	Gender Gap
1	Andaman & Nicobar Islands	86.3%	90.1%	81.8%	8.30
2	Andhra Pradesh	67.70%	75.60%	59.70%	15.90
3	Arunachal Pradesh	67.00%	73.70%	59.60%	14.10
4	Assam	73.20%	78.80%	67.30%	11.50
5	Bihar	63.80%	73.50%	53.30%	20.20
6	Chandigarh	86.40%	90.50%	81.40%	9.10
7	Chattisgarh	71.00%	81.50%	60.60%	20.90
10	Delhi	86.30%	91.00%	80.90%	10.10
11	Goa	87.40%	92.80%	81.80%	11.00
12	Gujarat	79.30%	87.20%	70.70%	16.50
13	Haryana	76.60%	85.40%	66.80%	18.60
14	Himachal Pradesh	83.80%	90.80%	76.60%	14.20
15	Jammu and Kashmir	68.70%	78.30%	58.00%	20.30
16	Jharkhand	67.60%	78.50%	56.20%	22.30
17	Karnataka	75.60%	82.80%	68.10%	14.70
18	Kerala	93.90%	96.00%	92.00%	4.00
19	Lakshadweep	92.30%	96.10%	88.20%	7.90
20	Madhya Pradesh	70.60%	80.50%	60.00%	20.50
21	Maharashtra	82.90%	89.80%	75.50%	14.30
22	Manipur	79.80%	86.50%	73.20%	13.30
23	Meghalaya	75.50%	77.20%	73.80%	3.40
24	Mizoram	91.60%	93.70%	89.40%	4.30
25	Nagaland	80.10%	83.30%	76.70%	6.60
26	Orissa	73.50%	82.40%	64.40%	18.00
27	Puducherry	86.50%	92.10%	81.20%	10.90
28	Punjab	76.70%	81.50%	71.30%	10.20
29	Rajasthan	67.10%	80.50%	52.70%	27.80
30	Sikkim	82.20%	87.30%	76.40%	10.90
31	Tamil Nadu	80.30%	86.80%	73.90%	12.90
32	Tripura	87.80%	92.20%	83.10%	9.10
33	Uttar Pradesh	69.70%	79.20%	59.30%	19.90
34	Uttarakhand	79.60%	88.30%	70.70%	17.60
35	West Bengal	77.10%	82.70%	71.20%	11.50
-	<b>INDIA</b>	74.04%	82.14%	65.46%	16.68

To know development in a society, Literacy is another proper indicator of economic development. For purpose of census, a person in age limit of seven and above, who can both write and read with understanding in any of the language is considered as a literate in India.

As per Population Census of India 2011, the Literacy rate of India has shown as improvement of almost 9 percent. It has gone up to 74.04% in 2011 from 65.38% in 2001, thus showing an increase of 9 percent in the last 10 years. It consists of



male literacy rate 82.14% and female literacy rate is 65.46%. Although there has been a good improvement in literacy rate of India in last 10 years but there is still a long way to go.

In case of overall literacy, the top three states are Kerala with literacy rate of 93.90. Following it is Lakshadweep and Mizoram with literacy rates of 92.30% and 91.60%. Bihar with 63.08% literacy rate is the last in terms of literacy rate in India (Table 4).

### Gender-wise Literacy Trends

In male literacy Lakshadweep is at rank 1 with 96.10%, followed by Kerala with 96% and Mizoram with 93.70%. Haryana has higher literacy of males with 85.40% and at rank 19 than Punjab with 81.50% and ranked 24. In female literacy rate Kerala tops with 92.00%, followed by Mizoram with 89.40% and Lakshadweep with 88.20%. In Female literacy Haryana ranks at 23<sup>rd</sup> rank with 66.80%, while in Punjab is at 17<sup>th</sup> rank with 71.30%. In terms of gender gap (calculated as difference between male and female literacy rates) Meghalaya has the lowest gap with 3.40, followed by Kerala with 4.00 and third is Mizoram with 4.30. Punjab and Haryana are ranked at no 21 and 22. This shows they have to improve in terms of literacy (Table 4).

### Part-II: Haryana: NSDP and Human Development Indicators

**Table 5. NSDP Growth Rates of Haryana**

S No	Year	NSDP	YoY
1.	2001-02	65,505.00	
2.	2002-03	72,528.00	9.68
3.	2003-04	82,862.00	12.47
4.	2004-05	95,795.00	13.50
5.	2005-06	1,08,887.00	12.02
6.	2006-07	1,28,740.00	15.42
7.	2007-08	1,51,607.00	15.08
8.	2008-09	1,82,502.00	16.92
9.	2009-10	2,22,031.00	17.80
<b>Growth Rates</b>		<b>2.12</b>	

Self calculated

As seen by NSDP growth rates of Haryana depicted through Table 4.5, the rates have been increasing over the 2001 onwards era. The decadal growth rate is 2.12 per cent per annum. Year on Year (YoY) growth rates reflect an increase from 9.68 per cent in 2001- 02 to 17.80 per cent per annum in 2009-10. The impact of recessionary trends is visible in Haryana economy with the (YoY) growth rate falling from 15.42 to 15.08 per cent (Table 5).

**Human Development Indicators****Table 6 : Growth Rates of Human Development Indicators**

S No	Year	Infant Mortality	Literacy	Enrolment
1.	2001-02	68	55.85	72.02
2.	2002-03	67	68.59	71.03
3.	2003-04	67	68.59	71.13
4.	2004-05	62	67.91	74.15
5.	2005-06	59	67.91	70.38
6.	2006-07	60	67.91	79.31
7.	2007-08	57	67.91	79.31
8.	2008-09	55	67.91	84.25
9.	2009-10	55	67.91	84.11
<b>Growth Rates</b>		<b>1.70</b>	<b>1.09</b>	<b>2.78</b>

Self calculated

A look at human development indicators reflects that there has been an improvement in Infant Mortality; Literacy and Enrolment in the time period of the study. Literacy rate of Haryana has increased from 55.85 in 20001-02 to 67.91 in 2009-10. The decadal growth rate is 1.09 per cent per annum. The improvement is visible in enrolment rate as well from 72.02 in 20001-02 to 84.11 in 2009-10. YoY growth rates reflect variation over the years. In case of Infant mortality there is a decline from 68 to 55. The decadal growth rate is 1.70 per cent per annum. A comparison of these three indicators reflects higher decadal growth rate of enrolment, followed by infant mortality and literacy rate. Thus, overall results reflect an improvement in human development indicators (Table 6).

**Part-III: Punjab NDSP and Human Development Indicators****Punjab: NSDP****Table 7. NSDP Growth Rates of Punjab**

S No	Year	NSDP	YoY
1.	2001-02	79,611.00	-
2.	2002-03	82,249.00	3.31
3.	2003-04	90,089.00	9.53
4.	2004-05	96,839.00	7.49
5.	2005-06	108,637.00	12.18
6.	2006-07	127,123.00	17.02
7.	2007-08	152,245.00	19.76
8.	2008-09	174,039.00	14.32
9.	2009-10	200,382.00	15.14
<b>Growth Rates</b>		<b>2.24</b>	

As seen by NSDP growth rates of Punjab have been increasing over the 2001 onwards era. The decadal growth rate is 2.24 per cent per annum. Year on Year

(YoY) growth rates reflect an increase from 3.31 per cent in 2001- 02 to 15.14 per cent per annum in 2009-10. The impact of recessionary trends is visible in Punjab economy with the (YoY) growth rate falling from 19.76 to 14.32 per cent (Table 7).

#### Human Development Indicators of Punjab

**Table 8 : Growth Rates of Human Development Indicators**

S No	Year	Infant Mortality	Literacy	Enrolment
1.	2001-02	53	58.51	72.74
2.	2002-03	52	69.95	71.79
3.	2003-04	52	69.95	70.895
4.	2004-05	51	69.95	65.105
5.	2005-06	49	69.95	66.755
6.	2006-07	44	69.95	71.31
7.	2007-08	44	69.95	71.31
8.	2008-09	43	69.95	75.18
9.	2009-10	43	69.95	75.15
<b>Growth Rates</b>		<b>1.95</b>	<b>1.04</b>	<b>4.34</b>

A look at human development indicators reflects that there has been an improvement in Infant Mortality; Literacy and Enrolment in the time period of the study. Literacy rate of Punjab has increased from 58.51 in 2001-02 to 69.95 in 2009-10. The decadal growth rate is 1.04 per cent per annum. The improvement is visible in enrolment rate as well from 72.24 in 2001-02 to 75.15 in 2009-10. YoY growth rates reflect variation over the years. In case of Infant mortality there is a decline from 53 to 43. The decadal growth rate is 1.95 per cent per annum. A comparison of these three indicators reflects higher decadal growth rate of enrolment, followed by infant mortality and literacy rate. Thus, overall results reflect an improvement in human development indicators (Table 8).

#### Part-IV Relation Between Growth and Human Development

**Table 9. Model summary Haryana  
Model Summary<sup>c</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.756 <sup>a</sup>	.572	.510	3.23000	
2	.903 <sup>b</sup>	.815	.753	2.29411	2.918

a. Predictors: (Constant), VAR00009

b. Predictors: (Constant), VAR00009, VAR00007

c. Dependent Variable: VAR00011Variable

7= Infant Mortality RateVariable

8= Literacy RateVariable

9= Enrolment Rate

**Table 10 : ANOVA<sup>a</sup> Results for Regression model (Haryana)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.431	1	97.431	9.339	.018 <sup>b</sup>
	Residual	73.030	7	10.433		
	Total	170.461	8			
2	Regression	138.884	2	69.442	13.195	.006 <sup>c</sup>
	Residual	31.578	6	5.263		
	Total	170.461	8			

a. Dependent Variable: VAR00011

b. Predictors: (Constant), VAR00009

c. Predictors: (Constant), VAR00009, VAR00007

**Table 11. Coefficients<sup>a</sup> of Regression Model (Haryana)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	154.543	20.871		7.405	.000
	VAR00009	.930	.304	.756	3.056	.018
2	(Constant)	97.752	25.084		3.897	.008
	VAR00009	.814	.220	.662	3.699	.010
	VAR00007	-.687	.245	-.502	2.806	.031

a. Dependent Variable: VAR00011

The model selected variable Enrolment rate and Infant Mortality Rate. When variable Infant Mortality Rate was added to model, R increased from 0.756 to 0.903 and the value of adjusted R<sup>2</sup> increased from 0.510 to 0.713. Infant Mortality Rate (Variable 7) is negatively related, while Enrolment Rate (Variable 9) is positively associated with NSDP of Haryana. In terms of Beta value the value of Enrolment rate is higher than that of Infant Mortality Rate. The results highlight that with growth of NSDP, the infant mortality rate declines, and enrolment rate is increasing for Haryana economy (Table 9 to 11).

**Table 12. Model Summary Punjab**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.973 <sup>a</sup>	.947	.915	1.72693	2.883

a. Predictors: (Constant), VAR00004, VAR00003, VAR00002

b. Dependent Variable: VAR00013

Variable 2= Infant Mortality Rate

Variable 3= Literacy Rate

Variable 4= Enrolment Rate

**Table 13. ANOVA<sup>a</sup> Results for Regression model (Punjab)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	266.589	3	88.863	29.797	.001 <sup>b</sup>
	Residual	14.911	5	2.982		
	Total	281.501	8			

a. Dependent Variable: VAR00013

b. Predictors: (Constant), VAR00004, VAR00003, VAR00002

**Table 14. Coefficients of Regression Model (Punjab)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	150.077	33.811		4.439	.007
	VAR00002	-2.017	.232	-1.763	8.692	.000
	VAR00003	.105	.172	.072	.610	.568
	VAR00004	1.486	.197	1.414	7.559	.001

a. Dependent Variable: VAR00013

The value of R is .97 and the value of R<sup>2</sup> is 0.947 and Adjusted R<sup>2</sup> is 0.915. The model explains 91.5% of variation. ANOVA results highlights that the F value is 29.797 which is significant this conveys that the model is acceptable. Infant Mortality rate (Variable 2) has Beta value of 2.017 and is significant. Enrolment rate has beta value of 1.486 and is significant. The model has not chosen literacy rate as a predictor for model. Thus the two predictors are infant mortality rate and enrolment rate. The Durbin -Watson (DW) is 2.883 which are also acceptable. The results of regression analysis highlights that Infant mortality is negatively related with GDP growth while literacy rate and enrolment rate have a positive relation (Table 12 to 14).

### Conclusion

The present study also observed that the economic indicators depict a higher rate of growth in the nineties. Gross domestic product grew at a rate of six per cent in this period-the period associated with liberalization, privatization and globalization. The rate of growth of manufacturing in this period was quite high which resulted in a 6.6 per cent growth of industry during the period. The Human development Index for India has improved from 0.510 in 1990 to 0.547 in 2011.

Human Development Indicators reflect that there has been an improvement in Infant Mortality; Literacy and Enrolment during the period 2001-2010 of in Haryana. The decadal growth rate of Haryana is 1.09 per cent per annum. The progress is visible in enrolment rate as well from 72.02 in 2001-02 to 84.11 in 2009-10 of Haryana. YoY growth rates reflect variation over the years. In case of Infant mortality there is a decline from 68 to 55 of Haryana. Thus, in terms of human development indicators, and Haryana state is stepping forward. The

impact of recessionary trends is further visible in Haryana economy with the (YoY) growth rate falling from 15.42 to 15.08 per cent.

A look at human development indicators reflects that there has been an improvement in Infant Mortality; Literacy and Enrolment in the time period of the study for Haryana. Literacy rate of Haryana has increased from 55.85 in 2001-02 to 67.91 in 2009-10. NSDP growth rates of the state have been increasing over the 2001 onwards era. Regression analysis was done to find relationship between human development indicators and economic growth. NSDP of states was taken as a proxy for economic growth.

As seen by NSDP growth rates of Punjab have been increasing over the 2001 onwards era. The decadal growth rate is 2.24 per cent per annum. The impact of recessionary trends is visible in Punjab economy with the (YoY) growth rate falling from 19.76 to 14.32 per cent.

A look at human development indicators reflects that there has been an improvement in Infant Mortality; Literacy and Enrolment in Punjab during the period of the study. A comparison of these three indicators reflects higher decadal growth rate of enrolment, followed by infant mortality and literacy rate. Thus, overall results reflect an improvement in human development indicators.

From the various studies carried out in India as well outside, it had been revealed that there is significant relationship between various human development indicators and economic growth. From the Regression model revealed that selected enrolment rate and Infant Mortality Rate as predictors of growth. Infant Mortality Rate (Variable 7) is negatively related, while Enrolment Rate (Variable 9) is positively associated with NSDP of Haryana. In terms of Beta value the value of Enrolment rate is higher than that of Infant Mortality Rate. The results highlight that with growth of NSDP, the infant mortality rate declines, and enrolment rate is increasing for Haryana economy.

The results of regression analysis for Punjab highlights that Infant mortality is negatively related with GDP growth while literacy rate and enrolment rate have a positive relation. Overall, from this model it is observed that human development indicators and economic growth are related and these indicators can be used to predict the economic growth.

Thus overall results of the two states do suggest that human development indicators are good predictors of economic growth of the economy. In terms of overall performance, there is similarity in performance indicators of human development as well as economic growth.

Thus it can be inferred that economic growth and human development generally go together and tend to be mutually reinforcing. Human development can contribute to economic growth in many ways. Healthy well-educated people make an economy more productive but human development alone cannot transform an economy. Even skilled and vigorous people need machinery, buildings and infrastructure. Enhanced human development expenditures cannot be sustained over a long period unless supported by accelerated economic growth. Policies are needed to ensure that the pattern of growth benefits the poor and that the resources generated are invested in building human capabilities.

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