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## **EFFECT OF POPULATION GROWTH ON ECONOMIC DEVELOPMENT: THE CASE OF INDIA**

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### **Abstract:**

The population growth has a vital impact on economic development. India's population increased 235 percent over the year 1951 to 2011. The relationship between population growth and economic growth is of great interest both for demographer and for development economists. There are generally three different types of views on how population affects the economic development of a nation. One, supporting the positive impact of population growth on economic development. Two, supporting the negative effect of population growth on economic development. Three, believe that population growth has no relation with economic development. It is widely accepted that any growth in the economic development needs human capital as its main weapon and the rise in population can act as a provider of human capital. Population growth is the real strength and power of a country like India. With higher population, we will have high labor force and this will help in creating labor diversity in the nation and in turn this higher population will also help for the rise in output of the nation. No doubt, this population rise can be disastrous if we don't use them properly. This paper is an attempt to show how rising population of India can increase economic development of the country.

**Keywords: Economic Development, Population Growth, Rising Population, Human Capital**

### **INTRODUCTION**

Overpopulation is a growing problem throughout the world. India's population is currently growing at a rate of 1.4% per year which will far surpass China where population is currently growing at a rate of 0.7%.

The world experienced dramatic population growth during the twentieth century, with the number of inhabitants doubling from 3 to 6 billion between 1960 and 2000. India also saw very rapid population growth during this period – from 448 million to 1.04 billion – and to 1.21 billion in 2010. Table 1 shows the world's 10 largest countries in population. It is shown in the table that in 2050, India will surpass China and will be on number 1 with approximately 1680 million population.

**Table 1. The World's 10 Largest Countries in Population (in millions)**

<b>2014</b>		<b>2050</b>	
<b>China</b>	1394	<b>India</b>	1680
<b>India</b>	1371	<b>China</b>	1344
<b>United States</b>	328	<b>Nigeria</b>	411
<b>Indonesia</b>	265	<b>United States</b>	390
<b>Brazil</b>	209	<b>Indonesia</b>	320
<b>Pakistan</b>	201	<b>Pakistan</b>	307
<b>Nigeria</b>	196	<b>Brazil</b>	231
<b>Bangladesh</b>	166	<b>Congo, Dem Rep.</b>	216
<b>Russia</b>	147	<b>Bangladesh</b>	202
<b>Mexico</b>	131	<b>Ethiopia</b>	191

**Source: Population Reference Bureau, World Population Data Sheet, New York, 2018**

China's and India's population has a mere difference of 23 million and yet India stands at rank 7 in terms of nominal GDP while China stands at a proud 2. China realizes that its growing population is a hazard, not an advantage. So, China has implemented 'One Child Law' in its country.

The current population of **India** is **1,367,097,934** as of May, 2019, based on the latest United Nations estimates. India's population is equivalent to **17.74%** of the total world population. India ranks number **2** in the list of countries by population. 1 of every 6 people on the planet lives in India, and between 2001 and 2011 censuses, India grew by 17.7%, adding 181.5 million people. The country has doubled in size in just 40 years, and is expected to surpass China as the world's most populous country in the next couple of decades. India's current yearly growth rate of population is 1.08%. Table 2 shows the population of India from 1951 to 2011.

**Table 2 Population of India from 1951 to 2011**

Census Year	Population	% Change
1951	361,088,000	–
1961	439,235,000	21.6
1971	548,160,000	24.8
1981	683,329,000	24.7
1991	846,387,888	23.9
2001	1,028,737,436	21.5
2011	1,210,726,932	17.7

**Source: Census of India**

**Now the question arises-**

- Whether India's population is an asset to the nation or it will remain a liability?
- Why even after 72 years of independence, India is still a developing country with fast depleting resources?
- How can government have fruitful productivity if all its resources go in feeding its population and it is still not enough?

**RESEARCH OBJECTIVES**

1. To study the structure and some facts about India's population.
2. To find out how rising population of India can be turned into an asset.
3. To study the relationship between population growth and economic growth of India.

**DATA SOURCES**

The data for this model is collected from different sources like Reserve Bank of India (RBI), National Sample Survey Organization (NSSO), Population Census. The World Bank data is also used to re-verify the data.

**The rest of the paper is divided as follows: -**

Section I analyses the structure of India's population and its relation with economic growth

Section II presents a brief literature reviewed

Section III explains the Research Methodology used in the study

Section IV presents the main results obtained in the econometrics model

Section V proposes conclusion of the study

**SECTION 1: STRUCTURE OF INDIA'S POPULATION AND ITS RELATION WITH ECONOMIC GROWTH**

Structure of the population (09.02.2011) (Census) (Includes data for the Indian-administered part of Jammu and Kashmir) is shown in Table 3.

**Table 3 Structure of the India's Population**

Age Group	Male	Female	Total	Percentage (%)
0-4	58,632,074	54,174,704	112,806,778	9.32
5-9	66,300,466	60,627,660	126,928,126	10.48
10-14	69,418,835	63,290,377	132,709,212	10.96
15-19	63,982,396	56,544,053	120,526,449	9.95
20-24	57,584,693	53,839,529	111,424,222	9.20
25-29	51,344,208	50,069,757	101,413,965	8.38
30-34	44,660,674	43,934,277	88,594,951	7.32
35-39	42,919,381	42,221,303	85,140,684	7.03
40-44	37,545,386	34,892,726	72,438,112	5.98
45-49	32,138,114	30,180,213	62,318,327	5.15
50-54	25,843,266	23,225,988	49,069,254	4.05
55-59	19,456,012	19,690,043	39,146,055	3.23
60-64	18,701,749	18,961,958	37,663,707	3.11
65-69	12,944,326	13,510,657	26,454,983	2.18
70-74	9,651,499	9,557,343	19,208,842	1.59
75-79	4,490,603	4,741,900	9,232,503	0.76
80-84	2,927,040	3,293,189	6,220,229	0.51
85-89	1,120,106	1,263,061	2,383,167	0.20
90-94	652,465	794,069	1,446,534	0.12
95-99	294,759	338,538	633,297	0.05
100+	289,325	316,453	605,778	0.05
Unknown	2,372,881	2,116,921	4,489,802	0.37
<b>Total</b>	<b>623,270,258</b>	<b>587,584,719</b>	<b>1,210,854,977</b>	<b>100.00</b>

**Source: Census of India, 2011**

Economic development is one of the most debatable topics for world. There are a lot of theories which show that rise in population has negative effect on both economic growth and development of a country. All these debates have started after Malthus proposed his theory in the book "Essay on the Principle of Population". In his theory, he tried to find out the reason for diminishing returns in most of the countries and he said that Population growth is the major reason for this diminishing return. His theory goes in as follows:-

- Population increases by compounding.
- Food Production doesn't get compounded.
- New population will not get sufficient amount of food.
- Some adverse conditions like starvation, crisis etc cause decline in the population which leads to food production and population coming back to the equilibrium.

Recently this theory doesn't hold good. Now rising population can be turned into an asset.

How can Rising Population of India could be turned into an asset?

In the past, India's population has grown very rapidly and has imposed a substantial burden of youth dependency on the economy. But in recent years, India's demographic profile is more favourable to economic growth. Except China no country in the world has such a big man power as India has which is a blessing for the country. Such a huge and skilled man power along with resources can be turned into an asset.

- In India there is continuous rise in the young population, So India is also growing younger. The need of the hour is to exploit that young population only this growing population can be turned into an asset or it will remain a liability. Every third person in India today is a youth and in about seven years, the median individual age in India will be 29 years which will make India the youngest country in the world.

- Currently more than 50% of India's population is below 25 which can be tapped for all round socio-economic growth of the nation as the youth has more innovative minds.
- The huge population offers a bigger pool of human resource and hence a bigger consumer market.
- In the past decade, India has emerged as a major back office to the world with global firms outsourcing work to take advantage of the country's less expensive, educated, young English-speaking workforce.
- India produces 2.5 million IT, engineering and life sciences graduates every year, besides about 650,000 post graduates in science and IT related subjects. The IT sector alone employs about 850,000 graduates and professionals while the pharmaceutical and biotechnology sectors are snapping up others.
- Near about 402 million Indians are aged between 15 and 59 - the working age - and this number is expected to grow to 820 million by 2020.

**But there are some hurdles in making rising population an asset**

- There is a need for increase in employment opportunities in the rural areas to make the productive use of people's skills. Indian population will become India's strength only when India has the power, strength and will to feed the people, provide them clothing and shelter, good education, health care and jobs.
- In India the problems of corruption, poverty and illiteracy is the biggest hurdle in turning the rising population into an asset. These have been creating hurdle in the country's progress as a whole.
- Government schemes like National Rural Employment Guarantee scheme in the rural areas should be implemented at a massive scale so that more and more people can join the national mainstream. The public schemes targeting the poor need to be implemented properly and honestly because after that it would be easy to bring the large chunk of the country's population into national mainstream so that they can play their decisive role in nation building.
- There is a need to make the rural population of the country more and more literate and bring them out of poverty. The schools in the villages need to be made more developed with the curriculum and education system matching with that of the schools in the cities.
- India needs various job schemes in the interior regions where there is not much industrial activity.

**SECTION II LITERATURE REVIEWED**

Most of the work reviewed in this article supports the idea that population growth is an important factor in overall economic growth and may even contribute to increased growth in per capita output in some cases.

**Mc Nicoll (1984)** in one of the research articles "Consequences of rapid population growth: an overview", shows that the negative impact of population growth in slowing the transition out of technological dualism is the main such effect. Consequences for social and political organization are briefly explored: rapid population growth may impel changes in the nature and role of the family and local community in forms of government administration; it may generate new political responses; and over the long term its differential impact seems likely to induce large shifts in international relations.

**Thomas Malthus (1993)** developed one of the earliest and best-known theories showing that population growth has a negative effect on the well-being. He believed that population has a tendency to grow more rapidly than food supplies so that population reductions through various types of misery are always required to keep the number of people at a level consistent with the amount of food available. The implication of Malthus's model is that average incomes will

always be driven down by population growth to a level that is just adequate for the population's subsistence.

**Richard P. Cincotta and Robert Engleman (1997)** in the research paper "Economics and Rapid Change: The influence of population Growth" stated that with some notable exceptions, economists are increasingly convinced that there are links from high fertility and resulting population growth on the one hand to persistent poverty and wage stagnation in developing countries on the other. High fertility and population growth appear to promote the transmission of poverty across generations. So, it is clearly seen that basically population explosion is creating a persistent chain of problems. To cure this problem study of factor creating it is important.

**Sedano (2008)** points out that the most important economic effects of the demographic transition occur through changes in the age structure of the population, particularly through changes in the dependency burden. Through a descriptive analysis, the author argues that in the case of Mexico there was no relation between changes in the dependency burden and the rate of economic growth, neither during the period of high economic growth (1950-1980) nor in the period of low economic growth (1981-1995). It is only after 1996 that a possible correlation between the two variables starts to arise.

**Puja Mondal (2010)** in the article namely "Population: Reasons of Population Explosion and its Consequences", mentioned that there are two main factors for the increase in human population. Decrease in death rate mainly maternal mortality rate (MMR) and infant mortality rate (IMR) and increase in span of life. That means these two factors should be controlled to control this uncontrolled problem.

**Charles Hirschman (2014)** in his papers shows that the transformation of the field of population and aging from a problem into research paradigm offers an instructive lesson for the field of population and development. There are many middle range hypotheses that could be pursued with micro level data that speak to some of the broader questions of socioeconomic development.

**Piketty (2014)** shows that only the growth in per capita GDP would give rise to improvements in economic well-being.

### **SECTION III RESEARCH METHODOLOGY**

#### **a) Simple Regression Model**

We have used the following simple regression model expressing the relationship between real GDP growth a proxy for economic growth and important macroeconomic variables having their impact on the economic growth. We presume that the economic growth is greatly influenced by the population growth, foreign investment and unemployment rate.

In equation form we have

$$Y = B_0 + B_1 PG + B_2 UN + B_3 FI + u$$

$Y$  = GDP growth

$PG$  = population growth

$UN$  = Unemployment Rate

$FI$  = Foreign Investment growth

$u$  = white noise error term

#### **b) Stationarity Tests**

Considering that the time series in the model span more than 50 years, it was necessary to perform a stationarity test that incorporates the possibility of a structural break in the series. The test applied was the Banerjee, Lumsdaine and Stock (1992) test.

#### **c) Cointegration Tests**

Considering that, as in the case of the tests of stationarity for the individual variables, the sample period included in the model is quite long, covering more than 50 years, we decided to

use a cointegration test which allows for the possibility of a structural break in the cointegrating equation. This was done through the Gregory and Hansen (1996) cointegration test.

**SECTION: IV RESULT**

Our analysis has shown that the population growth had a positive impact on the economic development in India. We can also find that Population Growth, Unemployment and Foreign Investment has explained 81.25% variation of Y. The p values are well below 0.05 and the multiple R2 is 0.97982. Therefore, the above three independent variables can be considered and they explain about 97.89% of changes in GDP and thus the final equation we obtained is:  
 $Y = -2148.5 + 3.456 PG - 523.25 UN + 426.24 FI$

From this we can say that for every unit increase in population, the GDP grows by 3.456 units. This shows that Population growth has a positive impact on the economic development of India.

The results of stationarity test shows that both population and GDP per capita are stationary in their differences even in the presence of a structural break in both series as shown in the Table 4.

**Table 4: Banerjee, Lumsdaine and Stock test for Stationarity**

Variable	Augmented Dickey-Fuller Test t-statistic	p- value	Logs	Unit Root	Stationarity
LPCGDP	-3.150	0.312	1	Yes	Not stationary
D LPCGDP	-4.296	0.02	0	No	stationary
LPG	-2.840	0.223	4	Yes	Not stationary
D LPG	-6.875	0.003	3	No	stationary

Source: own estimates

The results of Co-integration test are shown in Table 5.

**Table 5: Gregory-Hansen Test for Cointegration**

Testing Procedure	Test Statistics	Breakpoint	Date	Asymptotic Critical Value		
				1%	5%	10%
ADF	-6.06	26	1976	-5.47	-4.95	-4.68
Z <sub>t</sub>	-5.48	25	1975	-5.47	-4.95	-4.68
Z <sub>t</sub>	-42.25	25	1975	-57.17	-47.07	-41.85

Source: own estimates

It can be seen in that table that the ADF\* and Z<sub>t</sub>\* tests reject the null hypothesis of no cointegration, with breaks in 1976 according to the ADF\* test and in 1975 according to the Z<sub>t</sub>\* test. Since the Z<sub>a</sub>\* test indicates that it is not possible to reject the null hypothesis of no cointegration with a structural break in 1975, we decided to use 1976 as the year in which the structural break occurs in the cointegrating equation.

**SECTION: V CONCLUSION**

The relationship between population growth and economic growth is of great influence both for demographer and development economists. The economic literature developed around this issue encompasses three school of thoughts with different arguments and findings about the relation. The Malthusian school (Negative Effect), the revisionist school (positive effect), the transition theory (transient effect). However, there are no consensus about which of these theories is correct.

The objective of this study was to analyse the dynamic relationship between population growth and economic growth for a period 1951-2011 through Simple Linear Regression, Stationarity and cointegration Test. The Gregory- Hansen, Co-integration test confirmed the existence of long run relationship between population and economic growth in India. It was found that in the long run population has positive effect on per capita GDP. The econometrics findings of this paper suggest that in India there is positive impact of population growth on economic growth.

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