

Effectiveness of Foreign Aid and Social-Economic Variables on HDI: A Comparative Study between Bangladesh and India

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***Abstract:** This paper investigates the hypothesis that aid is meant to improve HDIs and assesses whether foreign aid can help recipient countries to reach some of their goal. This paper focuses on economic development rather than economic growth. To do this we examine whether aid flows have a positive impact on selected HDIs or not. In this research, we use the Human Development Index (HDI) as dependent variable, to represent quality of life and consider some human development indicators as explanatory variables along with ODA to justify whether there is any effectiveness of aid in India and Bangladesh for eradication of extreme poverty and to improve the quality of life. The empirical analysis shows that India is in better condition in terms of GDP per capital and GNI per capital growth, CO₂ emission and prevalence of HIV but Bangladesh is much ahead than India with respect to all social variables. This research also shows that the contribution of ODA in capital formation is much higher in case of Bangladesh but the GNI per capital growth is lower than in India which indicates that ODA is not using properly to improve the gross national income of Bangladesh. For better outcome from foreign aid, ODA must be coordinated through administrative framework and Government of Bangladesh should encourage the inflow of foreign aid.*

1. Introduction

Over the past few decades a considerable number of research has been carried out on developing countries like Bangladesh, India, Sri Lanka, focusing mainly on various economic aspects of development but many development economist nowadays have come to the consensus that development is a multidimensional concept and hence various non economic dimensions of progress need to be included in evaluating the performance and development of a nation (Gills, et. al. 1987). In this paper the focus is both on some social and economic variables on the HDI of Bangladesh and India.

One of the prominent indicators of development is Human Development Index (HDI). HDI is well recognized country specific measurement for standard of living.

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Traditionally, HDI measured the average achievements of a country on three basic dimensions such as Life Expectancy at Birth, Educational level and Per capita GDP in PPP\$. HDI continues to be used as it consistently draws attention of the government, corporation and international organizations to portions of development which focuses on aspects other than income like health and education. Later (2011) in order to improve the usefulness and versatility of HDI the gender inequality issue was incorporated.

If we make a comparison between Bangladesh and India on the basis of GNP per capita and expected years of schooling, two prominent indicators of HDI, Bangladesh is far behind than India in the last two decades but with respect to life expectancy at birth Bangladesh is in a better position. This paper specifically investigates the impact of some economic and social variables on the HDI of Bangladesh and India. These two countries have been chosen deliberately as they are very much similar in terms of ethnicity, culture, geography and history. In our research, we use the Human Development Index (HDI) as dependent variable, to represent quality of life and consider some additional human development indicators as explanatory variables such as Incidence of tuberculosis, Prevalence of HIV, Mortality rate, Mobile cellular subscriptions, Age dependency ratio, CO2 emissions, Final Consumption Expenditure, Inflation, GNI per capita growth etc. In this paper a further investigation is done to find whether net Official Development Assistance (ODA) contributes towards the improvement of HDI. ODA is taken as an additional independent variable because from time to time both Bangladesh and India relied on foreign assistance for their development activities. Shirazi et. al. (2008), in their paper suggested the development aid by donors to the developing world is expected to bring forth economic growth, reduced poverty and better living standards so it seemed rational to take ODA as an additional explanatory variable.

2. Objectives

- a) To carry out a review of the aid development literature on Bangladesh and India to find out role of Aid in the development process. A review of the literature on aid and Human Development Indicator is also done to find whether aid promotes human development.
- b) To develop a model taking HDI as dependent variable and some social and economic variable (as mentioned in the methodology) as explanatory variable whether they is positive or negative association between them and HDI.
- c) Finally to provide an insight into the areas where Bangladesh needs to concentrate more in order attain a better HDI position.

3. Methodologies

This paper is broadly divided into two parts. In the first part aid development literature of the world in general and Bangladesh and India in specific has been carried to find out the role aid has played in the development process. In the second part of the paper a comparative study has been conducted on Bangladesh and India focusing on some HDI indicators. To do secondary data for 2000 to 2012 fiscal years has been collected from various international sources like World Bank: World Development Indicators-2012, UNDP: World human development report 2012, etc. Typically studies on HDI focuses mainly on three variables such as Life Expectancy at Birth (a measure of long life span), Educational Level (a measure of the level of knowledge and educational achievements in a country) and Per Capita GDP in PPP\$ (a measure of decent standard of living). However in this study some additional variables which are considered as important in judging the HDI of a country and the amount of official development assistance (ODA) has been taken into consideration to give a more comprehensive view of HDI. Official development assistance (ODA) has been taken under consideration as an independent variable, to find out whether foreign aid contributes toward the Human Development Index. Human Development Index (HDI) is taken as a dependent variable and the explanatory variables are: Incidence of tuberculosis (per 100,000 people), Prevalence of HIV, total (% of population ages 15-49), Mortality rate, under-5 (per 1,000 live births), Mobile cellular subscriptions (per 1000 people), Age dependency ratio, CO2 emissions (metric tons per capita), Net ODA received (% of gross capital formation), Final Consumption Expenditure (Constant LCU), Inflation, consumer prices (annual %), GNI per capita growth (annual %). Data is presented in the Appendix-A. Using the collected data we would like to analysis and test our proposed regression model which is described in the following sections.

3.1 Literature Review

The question whether or not foreign aid enhances economic growth has long been debated and widely researched. Though from time to time considerable number of researchers attempts to add a piece to the aid effectiveness puzzle by evaluating the aid effectiveness in the recipient countries but unfortunately the result of most of the studies is rather mixed and inconclusive. Few of the findings of such studies are depicted below.

Positive Experience:

Foreign aids have a positive and significant effect on economic activity (Tarp, 2003; Lohani, 2004; Nasser, 2005; Masud, 2005; Moreira, 2005; Obaydullah, 2007; Selaya, 2007; Quibria, 2008). Dalgaard also (2004) noted that aid is generally effective, even in

“bad” environments; the degree to which aid enhances growth depends on climate-related circumstances. According to Abdul Nasser *et. al.* (2005) foreign capital flows can have a favorable effect on real income by supplementing domestic savings. According to Selaya (2007) aid has a significant positive marginal impact on labor productivity in both the tradable and non tradable sectors. Nowak-Lehmann (2010) presents that aid had an indirect and positive impact on recipients’ exports as bilateral aid enhances bilateral trade relations and thus bilateral trade.

Negative Experience:

According to Jempa (1997) foreign aid mostly crowds out private savings, consumption and had no significant positive impact on the recipient’s macroeconomic policies or growth. Similarly Debora (2000) also suggested that high levels of aid can be well-used in countries with strong institutions and high levels of aid may back fire, making governance reforms more difficult in case of countries with weak institutions. Satish (2004) analysis shows that, social aid and military expenditure have a negative effect in developing countries. Sachs et al (2004) argued that the impact of aid on developing countries is discouraging because it encourages the consumption of government not the consumption of general public. Vu Minh Duc (2006) attempted to explain that foreign aid significantly and negatively correlates with growth in developing countries. Gabriella (2007) also carried out the similar study on aid effectiveness and that is aid conditionality is ineffective for autocracies but not for democracies. Muhammad (2007) found that there is little evidence that foreign aid alone has contributed to economic growth in a country.

Mixed Experience:

Ekanayake *et. al.* (2010) shows that foreign aid has a positive effect if that is based on different income levels but at the same time it has an adverse effect on economic growth in developing countries (E. M. Ekanayake, 2010). Nowak-Lehmann (2010) express that the direct impact of development aid on recipient countries exports is insignificant on average. This finding shows a small impact of development aid on investment, domestic savings and the real exchange rate. Joseph Connors (2012) suggests that foreign aid, as currently practiced, is ineffective at reducing poverty or promoting market based reforms in developing countries.

On the other hand Burnside and Dollar (2000) conclude that aid would be more effective only if it were conditioned on good policy. According to David Dollar, countries that democratize receive more aid where non-democratize receive some emerge related foreign aid. Foreign aid helps autocrats only if aid donors should be able to influence autocrats only if they can make a credible commitment to give more aid in the future.

The benefits of foreign aid have recently been under severe scrutiny (Alesina and Dollar). Ann and Per-Åke Andersson (2007) covered the performance of 60 countries between 1995 and 2000. According to them when it comes to the relation between aid and efficiency, findings are inconclusive. There is no clear pattern to be found. As there is agreement that aid will promote growth and development there is also a wide body of literature that has a disagreement regarding the necessary and sufficient conditions for aid to have a positive contribution on the development process. David Dollar carried out a study on the aid effectiveness on the developing countries and concluded that the direction of foreign aid is dictated by political and strategic consideration, than by the economic needs and policy performance of the recipients.

Based on more recent data and instrumental variables Cédric Schneider (2010) test the Burnside and Dollar (2000) hypothesis that aid given to countries with good policy environments is more effective than aid given to countries with poor policy environments. The study shows that aid has a significant negative impact on GDP per capita growth and there is insignificant relationship between the interaction term Aid, Policy and GDP per capita growth. Bazoumana Ouattara and Eric Strobal (2004) identified no evidence that good policy enhances the growth effect of either that is project aid or programme aid.

Bangladesh Perspective:

The mixed success of foreign aid in Bangladesh can be traced to shared failures on the part of both the government and donors. Bangladesh is largely dependent on foreign aid for its development activities, to finance its saving investment gap and trade gap. The country has received some US\$50 billion in aid over 35 years of its existence (Muhammad, 2007). The literature about the effectiveness of foreign aid in Bangladesh is very abundant and few of those are cited below.

According to Nausheen *et. al.* (2011) mentioned in their research that foreign economic assistance as a whole has a negative impact on economic growth whereas domestic savings has a positive impact on real per capital GDP in Bangladesh. They also suggested that co-operation grant coming from the donor agencies for technical and investment purpose may not be working as expected and in some cases it appears to be counter-productive. Similarly Anisul Islam, (1992) analysis and finding indicated domestic resources exert a stronger impact on growth than foreign resources. Foreign resources do not show any significant contribution to growth and loans are more effective than grants and food aid is more effective than commodity or project aids. Muhammad (2007) examines the impact of aid on Bangladesh and its inability to lay the foundations

for its solid economic growth. It is argued that, it has been relatively ineffective in inducing the qualitative changes needed for achieving significant increases in production and improvement in income distribution. He suggested that major donors responded both to the country's development requirements as well as their own interests which hampers aid effectiveness in the country's development endeavors. The result also identify that aid can be effective at increasing growth while Bangladesh has good governance and macroeconomic policy environment in place. Rahim M. Quazi (2000) presented the radical anti-aid view, that aid has reduced both GDP growth and domestic savings in Bangladesh, instead of promoting the recipient country's welfare, aid actually depresses them. However, this paper also found that aid induces indirect positive effects on GDP growth through increased consumption demand, which offset much of the direct adverse effects of aid. (Rahim, 2007; Rahman, 1968, Sobhan and Islam 1990) found an inverse relationship between the inflow of foreign capital and the volume of domestic saving whereas some investigators document a very positive and significant effect on economic activity.

India Perspective:

India has received more foreign aid than any other developing nation since the end of World War II, estimated at almost \$55 billion since the beginning of its First Five-Year Plan in 1951 still they has had one of the lowest rates of growth of all developing countries and remains one of the poorest countries in the world after almost 45 years of aid-financed. As on 1992, India's annual per capita income remains around \$300. Almost 40 percent of Indians live below the official poverty line was the view of Shyam J. Kamath (1992). He also expressed that India is a paradigmatic case of the failure of government-sponsored aid. According to Ann Veiderpass and Per-Åke Andersson (2007) there is a positive relation between capital intensity and country efficiency. When it comes to the relation between aid and efficiency, however, their findings are inconclusive. The study covers the performance of 60 countries between 1995 and 2000 among them the lowest efficiency, between 14 and 15 per cent each year is found in India, Indonesia and Pakistan. The opposite direction found by Abdul Nasser et al (2005) and that is foreign capital flows can have a favorable effect on real income by supplementing domestic savings even in India. Christopher Colclough and Anuradha De (2010) suggested that the Government of India may use external resources and expertise for their children's education, but should minimize external impact on policy development. On the other hand Chowdhury *et. al.* (2008) found a positive long run relationship between growth rate of per capital GDP and aid as a percentage of GDP in Bangladesh and India.

Foreign Aid and Human Development:

By examining the impact of aid on changes in basic indicators of human development Boone (1996), suggest that aid effectiveness should not be measured by its impact on GDP growth. Aid could be increasing consumption rather than investment, which would explain that aid, can reduce poverty through either “higher consumption of the poor or greater provision of services to the poor.” Kosack (2003) found that, contingent on the extent of democracy in recipient countries, aid was positively associated with the level of well-being achievement among countries, as measured by the Human Development Index. Franco-Rodriguez et al. (1998), McGillivray and Ahmed (1999), McGillivray and Uttara (2005) found that aid results in higher public expenditure than would otherwise have prevailed. Satish (2004) concluded that foreign direct investment, domestic investment, and GDP per capita positively impact human development indicators. On the other hand Nadia *et. al.* (2005) shows that, NGO aid reduces infant mortality and does so more effectively than official bilateral aid. Fielding *et. al.* (2006) explored the impact of aid on human development indicators including health, education and fertility and they concluded that aid is expected to improve the outcome of wide variety of development indicators.

3.2 Regression Model and Its Interpretation

For our first regression the functional form is:

$$HDI_{it\ India} = \beta_0 + \beta_1 ChildMortality_{it} + \beta_2 Inflation_{it} + \beta_3 CO2\ emission_{it} + \beta_4 mobile_{it} + \beta_5 ODA_{it} + \beta_6 Consumption_{it} + u_{it} \dots\dots\dots (1)$$

$$HDI_{it\ Bangladesh} = \beta_0 + \beta_1 ChildMortality_{it} + \beta_2 Inflation_{it} + \beta_3 CO2\ emission_{it} + \beta_4 mobile_{it} + \beta_5 ODA_{it} + \beta_6 Consumption_{it} + u_{it} \dots\dots\dots (2)$$

Where

HDI_{it} = Human Development Index

ODA_{it} = Net ODA received (% of gross capital formation)

$Child\ Mortality_{it}$ = Mortality rate, under-5 (per 1,000 live births)

$Mobile_{it}$ = Mobile cellular subscriptions (per 1000 people)

$Inflation_{it}$ = Inflation, consumer prices (annual %)

$Consumption_{it}$ = Final Consumption Expenditure (Constant LCU)

$Emission_{it}$ = CO2 emissions (metric tons per capita)

After applying OLS we can write the estimated HDI_t as follows:

$$HDI_{it\ India} = \beta_0 + \beta_1 ChildMortality_{it} + \beta_2 Inflation_{it} + \beta_3 CO2\ emission_{it} + \beta_4 mobile_{it} + \beta_5 ODA_{it} + \beta_6 Consumption_{it} + u_{it} \dots\dots\dots (1)$$

$$HDI_{it\ India} = 1.854 + -3.289 ChildMortality_{it} + -0.126 Inflation_{it} + -1.884 CO2\ emission_{it} + 2.869 mobile_{it} + 0.511 ODA_{it} + -3.490 Consumption_{it} + u_{it} \dots\dots\dots (3)$$

$$HDI_{it\ Bangladesh} = \beta_0 + \beta_1 ChildMortality_{it} + \beta_2 Inflation_{it} + \beta_3 CO2\ emission_{it} + \beta_4 mobile_{it} + \beta_5 ODA_{it} + \beta_6 Consumption_{it} + u_{it} \dots\dots\dots (2)$$

$$HDI_{it\ Bangladesh} = 2.547 + -2.022 ChildMortality_{it} + -0.018 Inflation_{it} + 1.158 CO2\ emission_{it} + -4.996 mobile_{it} + -0.203 ODA_{it} + 9.714 Consumption_{it} + u_{it} \dots\dots\dots (4)$$

Now we would like to interpret the outcomes we got from equation (3 & 4) using OLS estimation on collected data and the detail output is presented in Appendix-B:

$\hat{\beta}_1$ shows a relationship between dependent variable HDI and explanatory variable Mortality rate, under-5 (per 1,000 live births) and is negative for both in India and Bangladesh. In India $\hat{\beta}_1 = -3.289$ implies that if mortality rate increases by one unit, other things remaining the same, HDI will decrease by 3.289 units. In Bangladesh $\hat{\beta}_1 = -2.022$ implies that, if mortality rate increases by one unit (per 1000 live births), other things remaining constant, the Human Development Index will decrease by 2.022 units in Bangladesh, which clearly indicate that the HDI depends strongly on mortality rate in both countries. Both the big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%).

The value of $\hat{\beta}_2$ is -0.126 for India and it indicates a negative relationship between dependent variable HDI_{it} and explanatory variable Inflation, consumer prices (annual %) in India. It implies that if Inflation increases by one percent, other things remaining the same, HDI will decrease by 0.126. The big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%). In case of Bangladesh $\hat{\beta}_2 = -0.018$ also indicates a negative relationship, implies if Inflation increases by one percent, other things remaining the same, HDI will decrease by 0.018. The big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%).

$\hat{\beta}_3$ is -1.884 for India and it indicates a negative relationship between dependent variable HDI and explanatory variable CO₂ emissions (metric tons per capita). It implies that if CO₂ emissions (metric tons per capita) increases by one unit, other things remaining the same, HDI will decrease by 1.884. Interestingly for Bangladesh $\hat{\beta}_3$ has a positive value of 1.158 and it indicates if CO₂ emissions (metric tons per capita) increases by one unit, other things remaining the same, HDI will increase by 1.158 unit. The big p-value for both countries indicates that it is not statistically significant at usual significance level (1%, 5% and 10%).

$\hat{\beta}_4$ is 2.869 for India and it indicates a positive relationship between dependent variable HDI and explanatory variable Mobile cellular subscriptions (per 1000 people). It implies that if Mobile cellular subscriptions (per 1000 people) increases by one unit, other things remaining the same, HDI will increase by 2.869. But for Bangladesh it shows a surprising result that is if Mobile cellular subscriptions (per 1000 people) increases by one unit, other things remaining the same, HDI will decrease by 4.996 units. The big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%) for both countries.

$\hat{\beta}_5$ is 0.511 for India and it indicates a positive relationship between dependent variable HDI and explanatory variable Net ODA received (% of gross capital formation). It implies that if Net ODA received (% of gross capital formation) increases by one percent, other things remaining the same, HDI will increase by 0.511 whereas for Bangladesh it shows the negative relationship of -0.203. For both countries the big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%).

$\hat{\beta}_6$ is -3.490 for India and it indicates a negative relationship between dependent variable HDI and explanatory variable Final Consumption Expenditure (Constant LCU). It implies that if Final Consumption Expenditure (Constant LCU) increases by one unit, other things remaining the same, HDI will decrease by 3.490 whereas for Bangladesh it will increase by 9.714 units. The big p-value indicates that it is not statistically significant at usual significance level (1%, 5% and 10%) both for India and Bangladesh.

Interpretation R^2

The value of R^2 is 0.231 for India and it implies that the model or explanatory variables explains only 23.10% movement of the dependent variable for India and the value of R^2 is 0.500 for Bangladesh and it implies that the model or explanatory variables explains 50% movement of the dependent variable in Bangladesh.

Comment on F-statistics

The null hypothesis of F-statistics is $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$. It implies that none of the explanatory variables explains the dependent variable. The big P-value 0.150 for India and 0.714 for Bangladesh indicates that we fail to reject the null hypothesis.

4. Data Analysis and Discussion

In this research we have analyzed data regarding foreign aid and its impact on human development index for India and Bangladesh from year 200 to 2012. Figure 1 shows the trend of HDI values for Bangladesh and India from year 2000 to 2012 which represent

quality of life as measures the average achievements in a country on three basic dimensions of human development as life expectancy at birth, education level and per capital GDP. This figure depicts the HDI trends of India is better than Bangladesh over time.

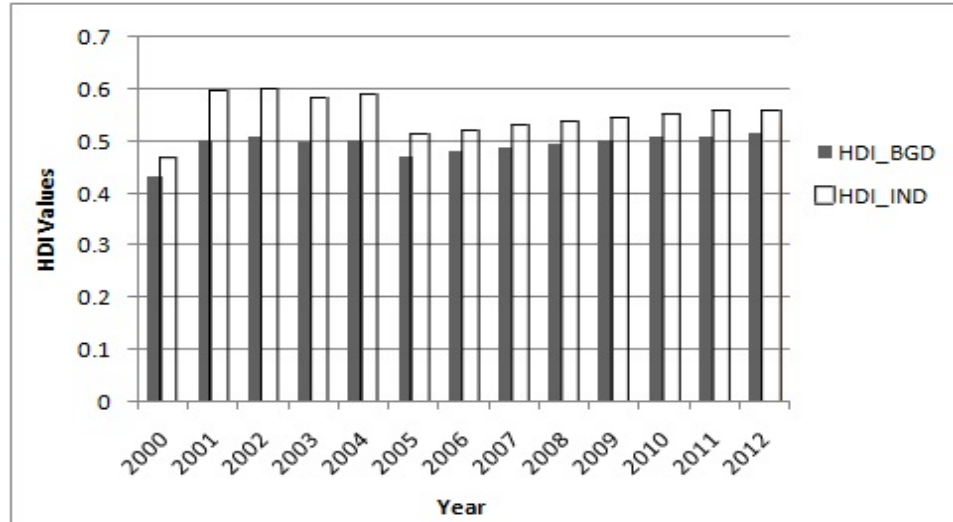


Figure 1: Trends of HDI values for Bangladesh and India (2000 to 2012)

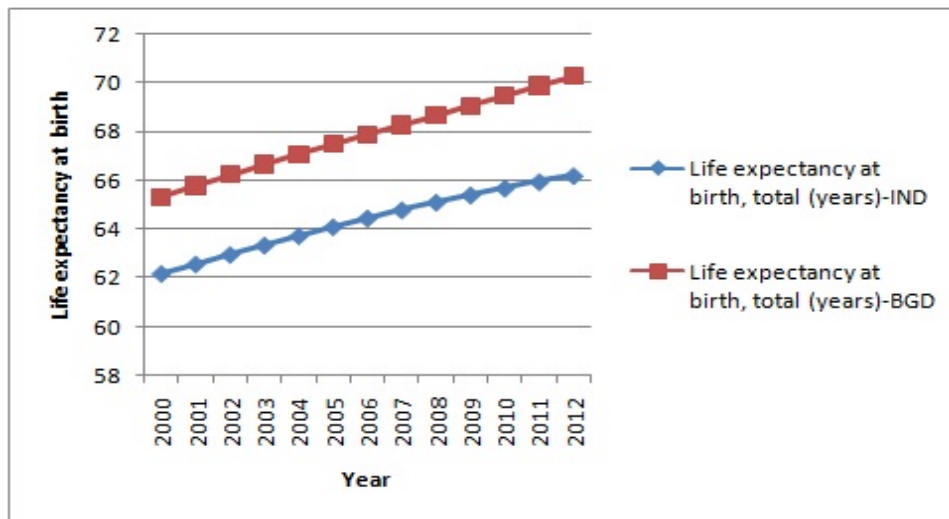


Figure 2: Life expectancy at birth, total (years) for Bangladesh and India (2000 to 2012)

Figure 2 depicts that the life expectancy at birth in Bangladesh is much higher than in India over the year. **Figure 3**, presents the mortality rate less than 5 years for Bangladesh and India from year 2000 to 2012, which most likely affect the health index of HDI, and

measures life expectancy at birth. It is reasonable to believe that the higher the mortality rate of children is, the lower the life expectancy will be. From our graph we can conclude that the mortality rate of India is higher than Bangladesh. Bangladesh achieves a remarkable success in this regard.

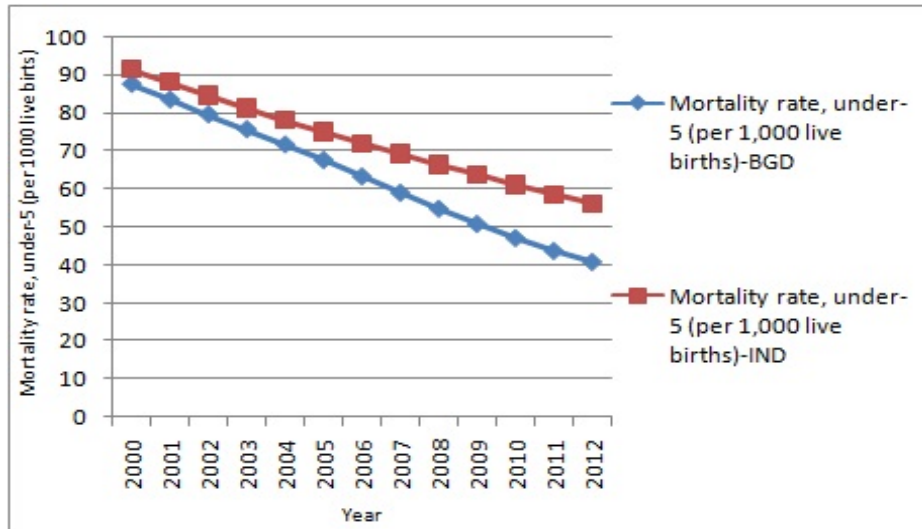


Figure 3: Mortality rate under-5 for Bangladesh and India (2000 to 2012)

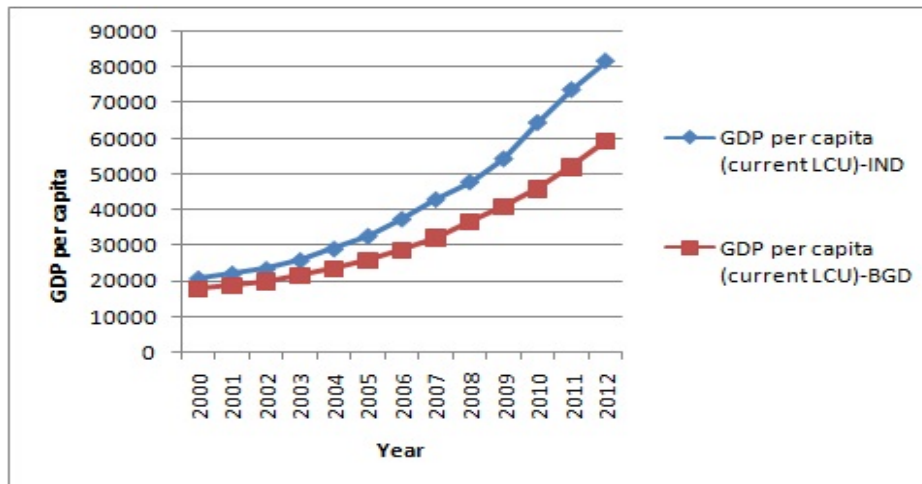


Figure 4: Trends of GDP per capital (current LUC) for Bangladesh and India (2000 to 2012)

Figure 4 shows that the GDP per capital for India is higher than Bangladesh as the size of economy is larger than Bangladesh. Although GDP per capital income was almost same for both countries in early 2000 decade but recently it increasing sharply in India.

Figure 5 shows a comparative analysis between Net ODA received (% of gross capital formation) and GNI per capita growth (annual %) for Bangladesh and India to find out the contribution of Net ODA in capital formation and how it will influence the gross-national income to reduce the poverty. It depicts that although the Contribution of ODA in capital formation is much higher in case of Bangladesh but the GNI per capita growth is lower than in India which indicates that ODA is not using properly to improve the gross national income

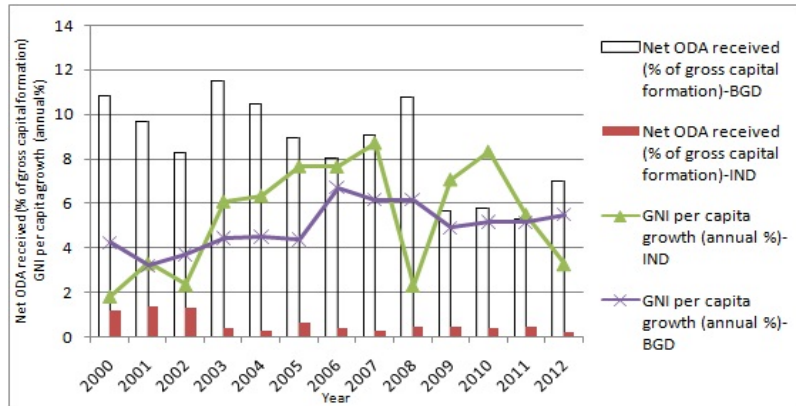


Figure 5: Trend of Net ODA received (% of gross capital formation) along with GNI per capita growth (annual %) for Bangladesh and India from 2000 to 2012

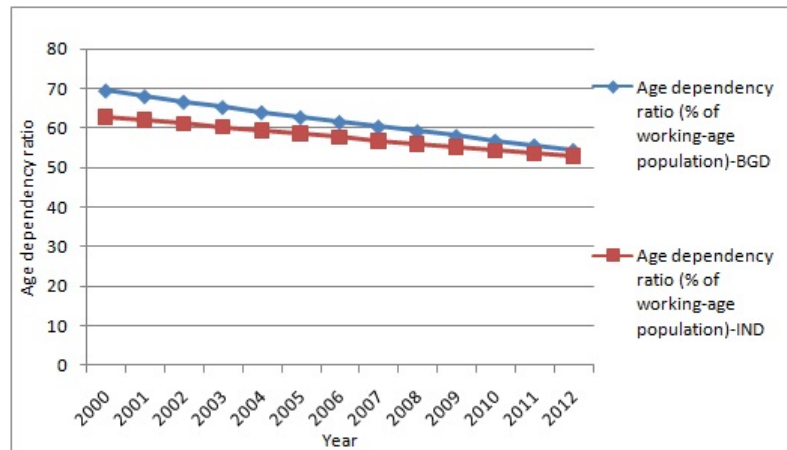


Figure 6: Age dependency ratio for Bangladesh and India for the year 2000 to 2012

Figure 6 presents the age dependency ratio (% of working-age population) for Bangladesh and India from year 2000 to 2012. This concludes that the age dependency ratio of India is lower than Bangladesh but the gap between two countries is reducing in recent years as it decreasing sharply from year 2007 to 2012 in case of Bangladesh.

The rationale for including the variables Prevalence of HIV, In Percentage of Population between Ages 15 to 49 and the incidence of tuberculosis (per 100,000 people) are, that affect the health index therefore an indication of the country's health standard. **Figure 7** presents the incidence of tuberculosis (per 100,000 people) for Bangladesh and India from year 2000 to 2012. This concludes that the incidence of tuberculosis of India is lower than Bangladesh but the gap between two countries is increases in recent years due to decreasing rate in India.

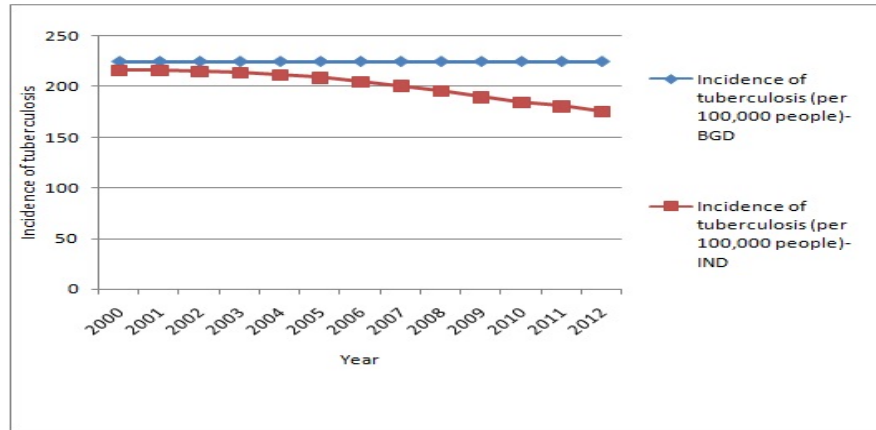


Figure 7: The incidence of tuberculosis for Bangladesh and India for the year 2000 to 2012.

Figure 8 presents the prevalence of HIV, total (% of population ages 15-49) for Bangladesh and India from year 2000 to 2012. This concludes that the prevalence of HIV, total of India is higher than Bangladesh but that is decreasing in India whereas it stable for Bangladesh.

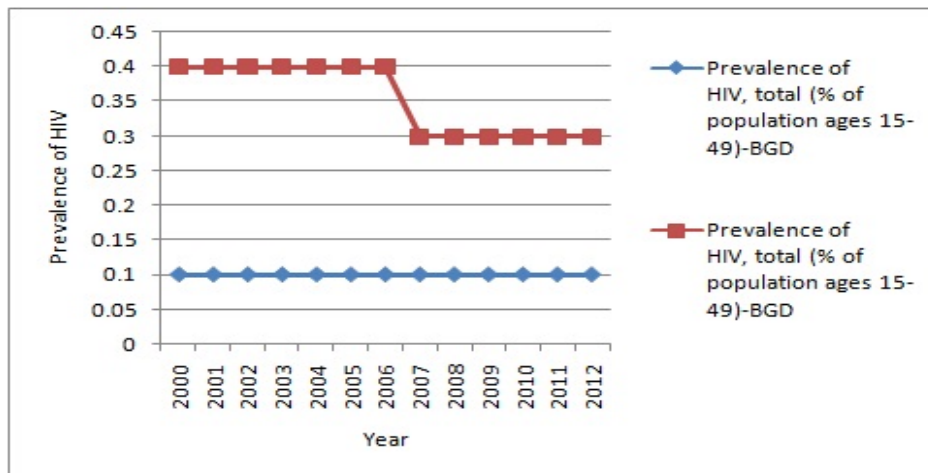


Figure 8: Prevalence of HIV, total for Bangladesh and India from year 2000 to 2012.

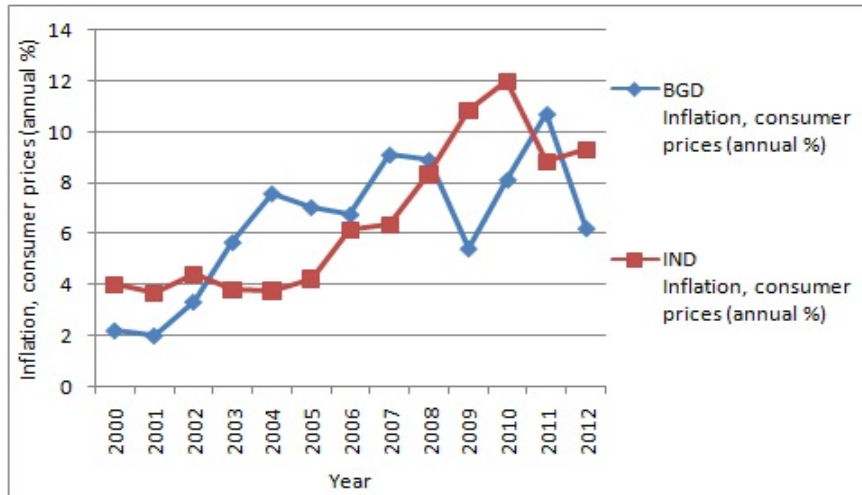


Figure 9: Inflation, consumer prices for Bangladesh and India from year 2000 to 2012.

Figure 9 presents the Inflation, consumer prices (annual %) for Bangladesh and India from year 2000 to 2012. We include this variable because it has an impact on the income index of HDI, will be negatively affected when inflation becomes too high. The figure depicts that the inflation fluctuating over time for both countries but comparable lower in recent years for Bangladesh.

Economic development typically involves improvements of quality of life by ensuring environmental sustainability. **Figure 10** shows that the contribution of India to reduce the CO₂ emission is higher than Bangladesh over the year to improve their quality of life.

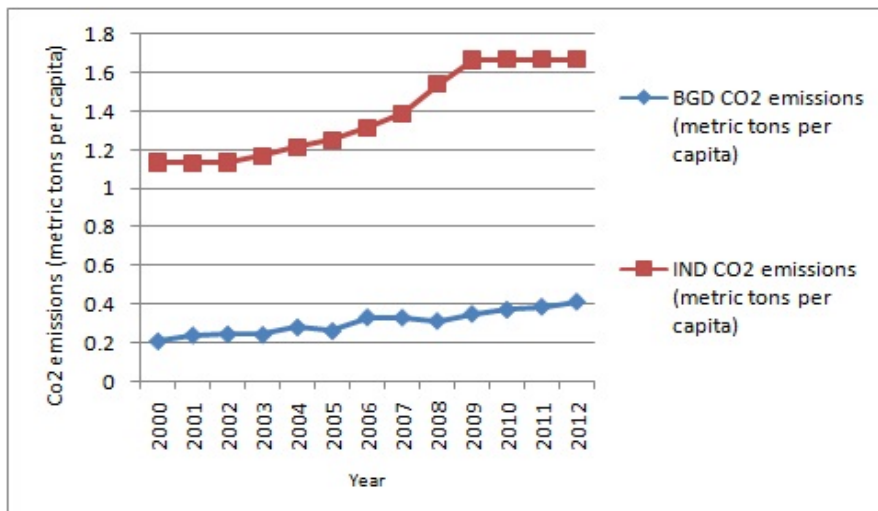


Figure 10: CO₂ emission for Bangladesh and India for year 2000 to 2012.

5. Conclusion

This paper investigates whether foreign aid has positive impacts for Bangladesh and India considering Human development indicators. It basically examines whether foreign aid can help recipient countries (Bangladesh & India) to reach some of their goal or not. This research considers OLS model for empirical data analysis of major HDI indicators as well as some social and economic variables over the year 2000 to 2012 for both the countries. In this research, we use the Human Development Index (HDI) as dependent variable, to represent quality of life and consider some human development indicators as explanatory variables such as incidence of tuberculosis, prevalence of HIV, mortality rate under 5 years age, mobile cellular subscriptions, age dependency ratio, CO2 emissions, net ODA received, final consumption expenditure, inflation, GNI per capita growth, etc., to justify whether there is any effectiveness of aid in India and Bangladesh. The empirical analysis shows that there is a negative relationship between dependent variable HDI and explanatory variable mortality rate under -5 both for India and Bangladesh and it also shows the more negative relationship but the measurement value is more negative in India than Bangladesh. This clearly indicates that the HDI depends strongly on mortality rate in both countries. The results indicate a negative relationship between HDI and Inflation, consumer prices (annual %) in India for both the countries.

Analytical result indicates a negative relationship between dependent variable HDI and explanatory variable CO2 emissions (metric tons per capita) in India. On the other hand it has positive relationship for Bangladesh. The result also shows a positive relationship between HDI and Mobile cellular subscriptions India but negative in Bangladesh. The finding indicates a positive relationship between dependent variable HDI and explanatory variable net ODA received (% of gross capital formation) for India but negative relationship for Bangladesh. There is a negative relationship between dependent variable HDI and explanatory variable final consumption expenditure (constant LCU) for India but positive relationship for Bangladesh.

For better outcome from foreign aid, ODA must be coordinated through administrative framework so that it has clearly identifiable focal point. Government of Bangladesh should sustain the current reforms in the various sectors of the economy to encourage the inflow of foreign aid. The reforms are based on the need to encourage rapid growth and development, and to reverse the negative effects of foreign aid. Donors should improve aid predictability by using a multi-year framework for future aid commitments and providing information to recipient countries on the future path of aid disbursements. The donor and policy maker as well local administration should have transparency to reduce the uncertainty associated with aid flows and improve fiscal planning.

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Appendix-A

Country Name	Indicator Name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Bangladesh	Age dependency ratio (% of working-age population)	60.8006132	60.15719602	60.4259391	60.4077713	64.11160304	62.8532202	61.6381016	60.4559329	59.2839394	58.1067169	56.92045385	55.7202935	54.2670126	
India	Age dependency ratio (% of working-age population)	62.8228222	61.9607474	61.1197624	60.27267316	59.4243882	58.5674980	57.708487	56.83404737	56.01263029	55.19701674	54.4066717	53.6747297	52.9795889	
Bangladesh	CO ₂ emissions (metric tons per capita)	0.21051956	0.4092076	0.4902688	0.49407493	0.2044773	0.26265597	0.33227802	0.33927954	0.33805374	0.35003441	0.37568901	0.38654	0.412531	
India	CO ₂ emissions (metric tons per capita)	1.13846286	1.18238943	1.13993204	1.17199583	1.24202216	1.25197074	1.31921635	1.39202108	1.5419566	1.66576839	1.6662947	1.66647	1.66672	
Bangladesh	Final consumption expenditure (constant LCU)	15844200000.0	16594200000.0	17531070000.0	18254000000.0	18927300000.0	19712990000.0	20572600000.0	21083000000.0	21803000000.0	22978000000.0	24535500000.0	25639000000.0	27285100000.0	28442900000.0
India	Final consumption expenditure (constant LCU)	191932740000.0	201657730000.0	205291126000.0	216418836000.0	227026000000.0	246516431900.0	266471310719.31	291016593060.60	319405261393.0	339785746064.81	367917000000.0	400200000000.0	429516000000.0	
Bangladesh	HDI	0.43	0.502	0.509	0.5	0.594	0.472	0.481	0.488	0.455	0.502	0.508	0.511	0.515	
India	HDI	0.463	0.59	0.555	0.576	0.585	0.507	0.515	0.525	0.533	0.54	0.547	0.551	0.554	
Bangladesh	Incidence of tuberculosis (per 100,000 people)	25	25	25	25	25	25	25	25	25	25	25	25	25	
India	Incidence of tuberculosis (per 100,000 people)	216	216	215	214	212	209	205	201	195	190	185	181	176	
Bangladesh	Inflation, consumer prices (annual %)	2.0055209	2.00713742	3.32584933	5.6807734	7.50753685	7.04601602	6.76261171	9.10594949	8.9104805	5.4247262	8.12676392	10.740046	6.2102827	
India	Inflation, consumer prices (annual %)	4.00493662	3.64807256	4.39199745	3.8056592	3.7672948	4.24633323	6.14522388	6.36996746	8.51016444	10.8779112	11.9928692	8.87945297	9.31244605	
Bangladesh	Mobile cellular subscriptions (per 100 people)	0.20757174	0.83593523	0.79463571	0.9807201	1.99454675	6.2877628	13.2857592	23.4678283	30.1828488	34.3334451	44.9453882	55.1926723	62.8022896	
India	Mobile cellular subscriptions (per 100 people)	0.34206051	0.617271701	1.20786542	3.80025945	4.7032372	7.99706759	14.528824	20.155375	28.5105988	44.1205108	62.3004907	78.1980895	69.5223302	
Bangladesh	Mortality rate, under-5 (per 1,000 live births)	87.7	83.6	79.7	75.9	71.8	67.7	63.4	59.1	54.9	50.9	47.2	43.8	40.9	
India	Mortality rate, under-5 (per 1,000 live births)	91.5	88.1	84.7	81.3	78.2	75.1	72.1	69.3	66.5	63.8	61.2	58.6	56.3	
Bangladesh	Net ODA received (% of gross capital formation)	10.8955555	9.621416101	8.23012002	11.4003393	10.48504933	8.2054748	8.0030041	9.05246172	10.7300193	5.62657788	5.77959673	5.29520427	6.96806731	
India	Net ODA received (% of gross capital formation)	1.9448082	1.971213615	1.9436782	0.4523883	0.33817317	0.6594819	0.4069194	0.29514782	0.4883498	0.34522124	0.44486634	0.47095155	0.28666306	
Bangladesh	Prevalence of HIV, total (% of population ages 15-49)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
India	Prevalence of HIV, total (% of population ages 15-49)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	

Appendix-B

Result of Regression Analysis (Bangladesh)

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.707 ^a	.500	-.200	.0241391	1.669

a. Predictors: (Constant), Final consumption expenditure (constant LCU), Inflation, consumer prices (annual %), Net ODA received (% of gross capital formation), CO2 emissions (metric tons per capita), Mobile cellular subscriptions (per 100 people), Mortality rate, under-5 (per 1,000 live births), Age dependency ratio (% of working-age population)

b. Dependent Variable: HDI

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.003	7	.000	.714	.670 ^a
	Residual	.003	5	.001		
	Total	.006	12			

a. Predictors: (Constant), Final consumption expenditure (constant LCU), Inflation, consumer prices (annual %), Net ODA received (% of gross capital formation), CO2 emissions (metric tons per capita), Mobile cellular subscriptions (per 100 people), Mortality rate, under-5 (per 1,000 live births), Age dependency ratio (% of working-age population)

b. Dependent Variable: HDI

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.547	4.902		-.520	.626
	Mortality rate, under-5 (per 1,000 live births)	-.003	.019	-2.022	-.150	.886
	Inflation, consumer prices (annual %)	-9.226E-5	.005	-.011	-.018	.986
	CO2 emissions (metric tons per capita)	.400	.609	1.158	.657	.540
	Age dependency ratio (% of working-age population)	.033	.081	7.340	.414	.696
	Mobile cellular subscriptions (per 100 people)	-.005	.005	-4.996	-	.363
	Net ODA received (% of gross capital formation)	.002	.007	.203	.298	.778
	Final consumption expenditure (constant LCU)	5.226E-13	.000	9.714	1.019	.355

a. Dependent Variable: HDI

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.465491	.519565	.493846	.0155783	13
Residual	-.0324908	.0254415	.0000000	.0155817	13
Std. Predicted Value	-1.820	1.651	.000	1.000	13
Std. Residual	-1.346	1.054	.000	.645	13

Result of Regression Analysis for India**Model Summary^b**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.480 ^a	.231	-1.307	.0569096	1.760

a. Predictors: (Constant), Final consumption expenditure (constant LCU), Net ODA received (% of gross capital formation), Prevalence of HIV, total (% of population ages 15-49), Inflation, consumer prices (annual %), Mortality rate, under-5 (per 1,000 live

births), Mobile cellular subscriptions (per 100 people), CO2 emissions (metric tons per capita), Incidence of tuberculosis (per 100,000 people)

b. Dependent Variable: HDI

ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.004	8	.000	.150	.988 ^a
	Residual	.013	4	.003		
	Total	.017	12			

a. Predictors: (Constant), Final consumption expenditure (constant LCU), Net ODA received (% of gross capital formation), Prevalence of HIV, total (% of population ages 15-49), Inflation, consumer prices (annual %), Mortality rate, under-5 (per 1,000 live births), Mobile cellular subscriptions (per 100 people), CO2 emissions (metric tons per capita), Incidence of tuberculosis (per 100,000 people)

b. Dependent Variable: HDI

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.854	20.068		.092	.931
	Prevalence of HIV, total (% of population ages 15-49)	-.351	1.149	-.486	-.306	.775
	Mortality rate, under-5 (per 1,000 live births)	-.011	.029	-3.289	-.365	.733
	Incidence of tuberculosis (per 100,000 people)	.002	.065	.715	.029	.978
	Inflation, consumer prices (annual %)	-.002	.047	-.126	-.034	.974
	CO2 emissions (metric tons per capita)	-.310	.698	-1.884	-.445	.679
	Mobile cellular subscriptions (per 100 people)	.004	.007	2.869	.564	.603
	Net ODA received (% of gross capital formation)	.048	.103	.511	.466	.666
	Final consumption expenditure (constant LCU)	-1.658E-14	.000	-3.490	-.105	.922

a. Dependent Variable: HDI

Excluded Variables^b

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Age dependency ratio (% of working-age population)	116.053 ^a	.680	.545	.366	7.634E-6

a. Predictors in the Model: (Constant), Final consumption expenditure (constant LCU), Net ODA received (% of gross capital formation), Prevalence of HIV, total (% of population ages 15-49), Inflation, consumer prices (annual %), Mortality rate, under-5 (per 1,000 live births), Mobile cellular subscriptions (per 100 people), CO2 emissions (metric tons per capita), Incidence of tuberculosis (per 100,000 people)

b. Dependent Variable: HDI

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.517619	.574914	.544692	.0179999	13
Residual	-.0556823	.0407775	.0000000	.0328567	13
Std. Predicted Value	-1.504	1.679	.000	1.000	13
Std. Residual	-.978	.717	.000	.577	13

a. Dependent Variable: HDI