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Impact of Liberalization on the Health and Economic Indicators of Mizoram

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Abstract
Background: *Economic development depends on the quality of its people. By quality of people we mean the overall health of the people living in a country. Undoubtedly, better health of people, in turn will lead to better sustainable development.*
Materials and Methods:*The main objective of this study isto examine the impact of Liberalization on Healthcare with reference to the state of Mizoram in India. This study is based on secondary data. The data covers a period of 30 years, from 1981 – 2010. These years are chosen because the liberalization of the Indian economy started in 1991 and so the years 1981-1990 is taken as pre-liberalization and 1991-2010 taken as post liberalization period. A comparative study was made between pre and post liberalization period. Based on the objective suitable statistical tools have been applied to analyse the collected data. Compound Growth Model, Semi-Log Model and Time Series Trends were applied. Four variables were selected viz., Net State Domestic Product (NSDP), Per Capita Income (PCI), Infant Mortality Rate (IMR) and Life Expectancy.*
Results:*The analysis of the trend in the pre and post liberalization period shows that the growth in NSDP and life expectancy was more significant after the liberalization of the Indian economy. The growth in per capita income is higher during the pre-liberalization period and in the case of infant mortality rate, the rate declined during pre-liberalization period while it increased tremendously at the post-liberalization period. This may be due to the increase in population after the 1990's. Infant mortality rate is high in rural areas due to lack of proper care and lack of knowledge of mothers in the area.*
Conclusion: *The relationship between globalization and health in Mizoram is a little hazy as can be seen from the analysis. Most of the trend analysis of pre and post liberalization shows that the increment in NSDP and PCI as well as Life expectancy is more notable in the pre liberalization period, which is kind of disturbing.*
Keywords: *Liberalization, Net State Domestic Product, Per Capita Income, Infant Mortality Rate, Life Expectancy, Mizoram.*

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I. Introduction

Health is a vital component as well as crucial index of social and economic indicator in the development of a country. The Constitution of World Health Organization[1] defines health as '*a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity'.*

Economic development depends on the quality of its people. By quality of people we mean the overall health of the people living in a country. Undoubtedly, better health of people, in turn will lead to better sustainable development. Thus, health of the community should be viewed in a broad perspective than merely in terms of demographic indicators.

On a macro - level, health is a major cornerstone of economic development, while at the micro – level, health is essential to ensure that people can achieve a more 'economically productive life'. The classical view of the relationship between health and economic development is that wealth leads to health, with health an output of the development process. Better health itself contributes to economic growth. Bloom and Canning (2003)[2] and Gyimah – Brempong and Wilson (2004)[3] found that health capital indicators positively influence aggregate output. Improved health contributes to economic growth in four ways: it reduces production losses caused by worker illness; it permits the use of natural resources that had been

[1]Official Records of the WHO, no.2, p.100. 1946.
[2]Bloom, D.E and David Canning (2003): "The Health and Poverty of Nations from Theory to Practice", Journal of Human Development, 4 (1), 47-71
[3]Gyimah-Brempong, K, Mark Wilson (2004): "Health, Human Capital and Economic Growth in Sub-Saharan African and OECD countries", The Quarterly Review of Economics and Finance, 44 (2), 296-320

totally or nearly rendered inaccessible because of disease; it increase the enrollment of children in school and increases their learning capacity and it frees resources for alternative uses that would otherwise have to be spent on treating illness. Although several economists have addressed the health consequences of globalization, healthis most notable by its absence from even critical discussions of globalization in the economics literature. The report of the World Commission on the Social Dimensions of Globalization[4]gives only cursory mention to international health, confining tis references to HIV/AIDS and TRIPS (trade related aspects of intellectual property rights). Health is evidently not one of the discontents of globalization. However, the World Bank's[5] 2002 flagship publication on globalization lists good health and good healthcare provision, along with education, as essential preconditions for successful globalization, a view that is shared by many of those who are more critical of globalization, such as Andrea Cornia[6]. Indeed, since these conditions are not met in much of the world, including most of Africa, this argument is consistent with the critics view that globalization is often harmful to health in the poorest countries of the world.

Fischer notes that much of the current disagreement is around the essentially factual question of whether or not human well-being has improved over the past two-three decades. And as he points out, both life expectancy and child mortality have improved dramatically since 1970, with the notable exceptions of sub-Saharan Africa. That globalization might have had something to do with these improvements come from the idea that higher income promotes better health. In the 1980s and 1990s, there was a broad increase in world income and a reduction in poverty, both as a fraction of the world's population and in absolute terms. The link between income and health in poor countries is typically thought to be strong, so that it is entirely plausible that globalization-induced poverty reduction has improved population health.

II. Methodology

Problems associated with health in Mizoram

Since Mizoram is a hilly area, there are no adequate transport facilities to reach the remotest part of the state. As such, there exists inequality in healthcare and nutritional status among the various regions, particularly between rural and urban areas. Besides, availability of healthcare institutions is not enough in the rural areas. There is shortage of manpower. And the limited and delayed funds from central government caused problems in the health expenditure of the state.

Objective of the Study

The main objective of this study isto examine the impact of Liberalization on Healthcare with reference to the state of Mizoram in India.

Sources of Data

This study is based on secondary data.The data covers a period of 30 years, from 1981 – 2010. These years are chosen because the liberalization of the Indian economy started in 1991 and so the years 1981-1990 is taken as pre-liberalization and 1991-2010 taken as post liberalization period. A comparative study was made between pre and post liberalization period. More years could not be included in the pre-liberalization period because of non-availability of data for Mizoram.

Secondary data were collected from Directorate of Economics and Statistics, Govt. of Mizoram; National Family Health Survey 1, 2 and 3; indiastat.com; RBI Handbook of Indian Statistics (www.rbi.org.in); Economic Survey (various years); Health and Family Welfare Department, Govt. of Mizoram,SRS Office of the Registrar General and Census Commissioner of India.

Data for IMR of Mizoram was collected from the Compendium of India's Fertility and Mortality indicators, 1971-2007: based on the sample registration system, India; Office of the Registrar General and Census Commissioner, New Delhi. This data is for 30 years, i.e. 1981-2010.

Data for Life Expectancy of Mizoram was collected from Census of India and Tech group on Population, National Commission on Population, MOHFW, National Health Profile 2008; and the SRS, Registrar General of India, based Abridge life tables, 2002-2006; for the years 1981-2010.

Data for NSDP and PCI of Mizoram was collected from www.indiastat.com and www.rbi.org.in; for the period of 30 years, i.e. 1981-2010.

[4]World Commission on the Social Dimensions of Globalization (2004): "A fair Globalization: Creating Opportunity for all. Brief reviews of policy issues", www.ilo.org/wcsdg

[5]World Bank (2002): "Globalization, Growth, and Poverty: Building an Inclusive World Economy", A World Bank policy research report. Vol.1

[6]Giovanni Andrea Cornia (2004): "Inequality, Growth, and Poverty in an Era of Liberalization and Globalization", Oxford University Press.

Statistical Tools Applied

Based on the objective suitable statistical tools have been applied to analyse the collected data. The results of various quantitative techniques have been given in the analysis chapter. The hypotheses have been tested and the interpretation given.

- **Compound Growth model** has been fitted to predict the growth of Net State Domestic Product, Per Capita Income, Life Expectancy, Birth Rate, Death Rate and Infant Mortality Rate of Mizoram. Growth rate is used to measure the growth in these variables and to note whether it is increasing or decreasing, and to identify reasons for its decline, and to suggest suitable policy measures.
- **Semi-Log model**

$\text{Ln } Y_t = a + b \text{ (time)} + U_t$

Where,

$Y_t$is a Time Series variable.

This model has been fitted for time series data of various economic variables related to health and economic variables.

The **simple growth** rate has been found by multiplying the estimated 'b' value by 100.

The **compound growth** rate has been estimated by using the following formula

CGR = [anti Ln (b) – 1] x 100

- **Time seriestrend** has been projected for the various health and economic variables and is done up to 2020. Time series helps in the analysis of past behaviour of a variable. Analysis of past data discloses the effect of various factors on the variable under study. With the help of such analysis the future behaviour of the variable under study can be predicted.

Limitation of the study

Life expectancy for Mizoram was not available so all India level data was used.

III. Review of Literature

Martens, Akin, Huynen and Raza (2010)[7] studied the impact of globalization on health by using an indicator based approach linking the Maastricht Globalization Index (MGI) with health indicators, correcting for possible confounding factors. In order to link globalization with health, they used indicators of mortality like Infant Mortality Rates, Under-five Mortality rates and Adult Mortality Rates. They also used several possible confounding factors in the MGI-Health relationship: income level and income growth (GDP per capita; GNP per capita; or Growth of GDP per capita); water quality; Health Expenditures and Financing; Smoking; Secondary education; and availability of Public Health Resources(such as vaccinations). The study uses Spearman's Correlation analysis; Least Squares simple and multiple Linear Regressions. The data were drawn from World DataBank, World Development Indicators and Global Development Finance.The study finds that Infant Mortality rates, Under-five Mortality rates and Adult Mortality rates all show a negative association with the process of globalization. Specifically, technological Globalization and Socio-cultural Globalization are shown to have strong associations with the selected Health Indicators. The multivariate analyses show that different confounders have been found to be significant in the three final models. In all multivariate models, the association between globalization and the mortality indicators remains significant after controlling for confounding factors.

Daron and Simon (2006)[8] exploit the major international improvements from the 1940s to estimate the effect of life expectancy on economic performances. They construct predicted mortality using pre-intervention mortality rates from various diseases and dates of global interventions. Predicted mortality has a large impact on changes in life expectancy starting in 1940 but no effect before 1940. Using predicted mortality as an instrument, they found that a 1 percent increase in Life Expectancy leads to a 1.7-2 percent increase in population. Life Expectancy has a much smaller effect on total GDP, however. Consequently, there is no evidence that the large increase in life expectancy raised income per capita.

IV. Analysis

In order to study the impact of liberalization on healthcare in Mizoram, the researcher has taken four economic and health variables as indicators and studied the trends from 1981-2010, and calculated the compound growth rate. Since Liberalization of the Indian economy started from 1991, the years 1981-1990 are taken as pre-liberalization period while the years 1991-2010 are taken as post-liberalization period. Based on

[7]Pim Martens; Akin, Su-Mia; Huynen, Mand and Raza, Mohsim (2010) "Is Globalization Healthy: A Statistical Indicator analysis of the Impacts of Globalization on Health", Globalization and Health, 6:16 doi:10.11.86/1744-8603-6-16.

[8]DaronAcemoglu and Simon Johnson (2006) "Disease and Development: The Effect of Life Expectancy on Economic Growth", NBER working paper no 12269, http://www.nber.org/papers/w12269

this division, a comparison is made between these two periods using the four economic and health variables to see whether the increase or decrease in these five factors are more significant before or after Liberalization of the economy.

The variables chosen are:

- Net State Domestic Product (in rupees lakhs)
- Per Capita Income (in rupees thousands)
- Life Expectancy (in years)
- Infant Mortality Rate

Table 1: Economic and Health indicators of Mizoram during 1981-2010

Sl.no	Years	NSDP	IMR	Life Expectancy	PCI
1	1981	6218	34.0	54.4	1289
2	1982	7005	32.8	54.4	1383
3	1983	7766	30.0	54.4	1471
4	1984	9471	28.5	54.4	1724
5	1985	12199	33.3	54.4	2139
6	1986	15725	18.8	54.4	2658
7	1987	19413	17.8	54.4	3165
8	1988	25886	22.6	54.4	4077
9	1989	26007	21.4	58.3	4026
10	1990	28076	18.3	58.6	4135
11	1991	30560	20.0	58.6	4474
12	1992	41733	21.9	58.8	5941
13	1993	47810	21.5	59.3	6599
14	1994	61809	15.3	59.9	8319
15	1995	67178	20.9	60.3	8793
16	1996	85874	18.1	60.3	10958
17	1997	98293	18.5	62.1	12210
18	1998	102239	26.0	62.4	12393
19	1999	113896	18.4	62.6	13479
20	2000	140951	21.0	62.9	16443
21	2001	156728	19.0	63.1	17826
22	2002	175199	14.0	63.4	19430
23	2003	193268	19.0	63.1	20896
24	2004	208337	20.0	63.1	21963
25	2005	239960	25.0	64.7	24662
26	2006	266427	21.5	67.7	26698
27	2007	294409	29.7	67.7	28764
28	2008	341053	38.3	69.9	32488
29	2009	410719	36.0	69.9	38145
30	2010	494277	34.0	71.0	44758

Source: indiastat.com, SRS Registrar General, Jan 2011.

Table 2: Estimation of Compound Growth Rate for the economic and health indicators of Mizoram (1981-2010)

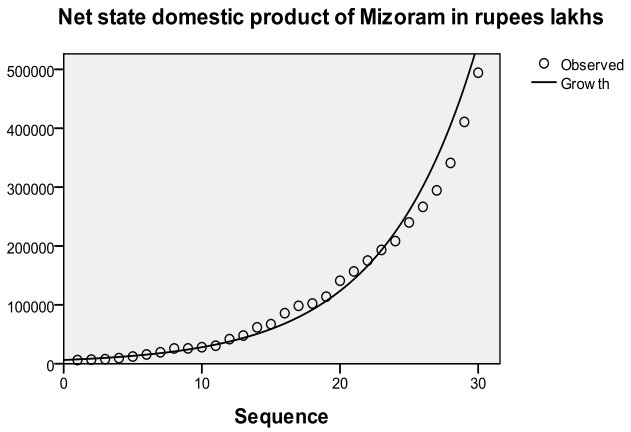
Variables	Constant	B	't'value	Sig value	R^2	F	SGR	CGR	Predicted (2020)
NSDP	8.755	0.148	49.431	0.001	0.989	2443.407	14.8	15.96	2408248. 80139
IMR	37.043	0.082	-7.486	0.001	0.692	30.331	8.2	8.42	23.09422
LE	3.960	0.009	23.356	0.001	0.951	545.501	0.9	0.91	76.03744
PCI	7.147	0.121	45.372	0.001	0.987	2058.638	12.1	12.87	163427. 22195

The first two variables are the economic indicators and the last two ones are the health indicators. Only these four indicators are chosen due to unavailability of data for other variables. First, the overall trends in the economic and health variables are examined and then later, they are classified into pre and post-liberalization period. In this section also, semi log growth model is used to estimate Compound Growth Rate, by making time as an independent variable, and NSDP, PCI, Life Expectancy and IMR etc. as dependent variable. This semi log growth trend equation gives an estimate of constant rate of increase or decrease per unit of time.

4.1. (a): Net State Domestic Product (NSDP)

NSDP is an important economic indicator for any state. It reflects the state's economic growth over a period of time. The changes in the NSDP of Mizoram over three decades are given in the figure below.

Figure 4.1(a):NSDP of Mizoram



Ln (NSDP) $Y_t = 8.755 + 0.148$ (time) + e_i

The above result shows the percentage increase in NSDP of Mizoram over three decades. The NSDP of Mizoram has grown at the rate of 14.8 percent. The R^2 value of 0.989 shows the co-efficient of determination. The predicted value for 2020 is 2408248.80139. The result shows that the NSDP of Mizoram has grown at the rate of 14.8 percent per annum. The compound growth rate of NSDP is calculated by

C.G.R = [AntiLn (0.148) - 1] x 100

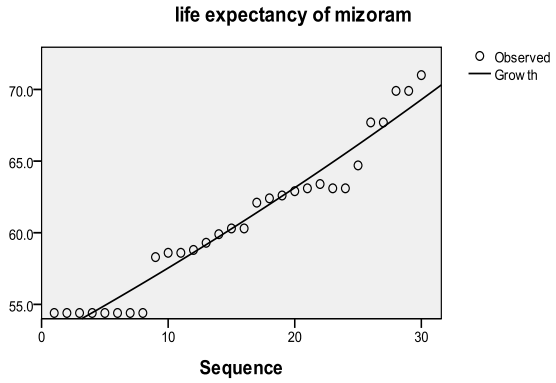
= [1.15951 - 1] x 100
= 15.96

The R^2 value of 0.989 shows the co-efficient of determination. The predicted value for 2020 is 2408248.80139 rupees. Thus, the result shows that the NSDP of Mizoram has grown at the compound growth rate of 15.96 percent per annum between 1981 and 2010.

4.1.(b): Life Expectancy

Life Expectancy is an important development and health indicator. It reflects the overall quality of life in a country and summarizes the mortality at all ages.

Fig. 4.1.(b): Life Expectancy of Mizoram



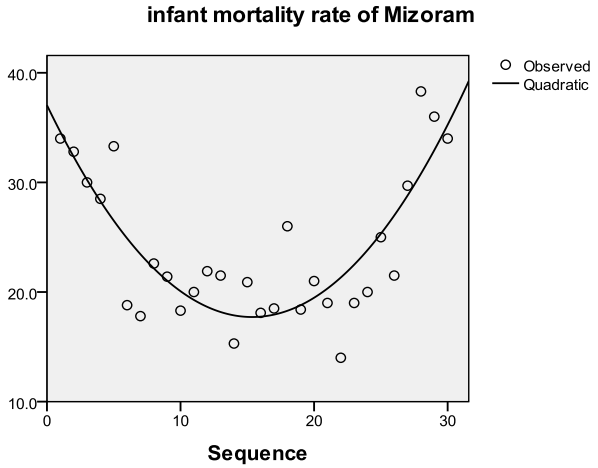
Ln (Life Expectancy) $Y_t = 3.960 + 0.009$ (time) + e_i

The above result shows the Life Expectancy of Mizoram over a period of three decades. The R^2 value of 0.951 shows the co-efficient of determination. The simple growth rate is 0.9 percent and the compound growth rate is 0.91 percent. The predicted value for 2020 is 76.03744 years. The result shows that the Life Expectancy of Mizos during 1981-2010 has increased at the compound growth rate of 0.91 percent per annum during 1981-2010.

4.1.(c): Infant Mortality Rate (IMR)

Infant Mortality Rate is the number of deaths of infants or children under one year of age per 1000 live births. The changes in the number of infant deaths in Mizoram over a period of 30 years are given in the figure below. The figure shows that there is a non-linear trend.

Fig. 4.1.(c):IMR of Mizoram



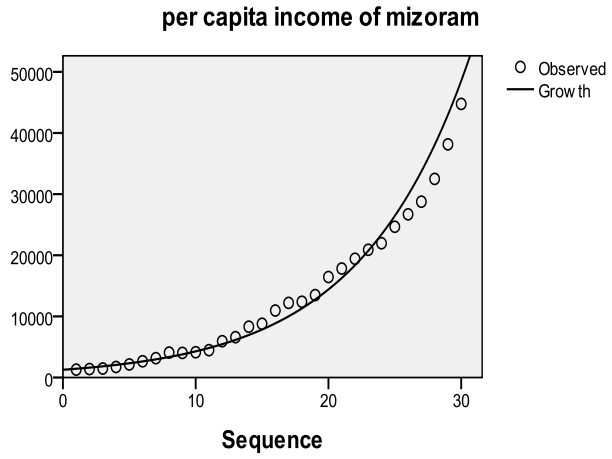
Ln (IMR) Y_t= 37.043 + 0.082 (Time) + e_i

In the above result, the R^2 = 0.692 indicates the co-efficient of determination. Here, it is seen that the infant mortality rate has increased at the rate of 8.2 percent. The compound growth rate is 8.41 percent. The predicted value for 2020 is 23.09422. The result shows that the infant mortality rate of Mizoram during 1981-2010 has increased at the compound growth rate of 8.41 percent per annum. This is a very disturbing fact, because generally with increase in income after liberalization of the economy, it is bound to be expected that the number of Infant deaths to decline. The reason behind this increase in IMR can be attributed to the increase in the number of infant deaths in rural areas, under worse sanitation and hygienic conditions with no proper care of mothers during pregnancy, which largely contributes to premature birth and infant deaths.

4.1.(d): Per Capita Income (PCI)

Per Capita income is the mean income per person within an economic aggregate such as country or state.

Fig.4.1.(d): PCI of Mizoram



Ln (PCI) Y_t = 7.147 + 0.121 (time) + e_i

The R^2 with a value of 0.987 shows the co-efficient of determination. The simple growth rate of PCI in Mizoram during 1981-2010 is 12.1 percent while the compound growth rate is 12.86 percent per annum. The predicted value for 2020 is 163427.22195. The result shows that the per capita income of Mizoram during 1981-2010 has increased at the compound rate of 12.86 percent per annum.

4.2: Pre and Post Liberalization Comparison of the trends in the economic and health indicators of Mizoram

In order to study the impact of Liberalization on Health, the years are divided into two parts viz. 1981-1990 which is taken as pre-liberalization period and 1991-2010 which is taken as post-liberalization. Below are given the tables and figures with explanation for each variable.

Table: 4.2. (a): Mizoram pre liberalization period (1981-1990)

Variables	Constant	B	't'value	Sig. value	R^2	F	SGR	CGR
NSDP	8.825	0.178	17.012	0.001	0.970	289.410	17.8	19.49
IMR	3.584	-0.064	-4.356	0.002	0.678	18.979	-6.4	-6.61
LE	3.968	0.008	3.722	0.005	0.606	13.852	0.8	0.81
PCI	6.969	0.143	14.297	0.001	0.958	204.415	14.3	15.38

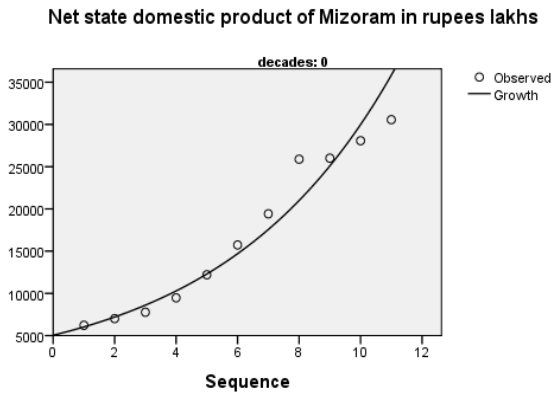
Table: 4.2.(b): Mizoram post liberalization period (1991-2010)

Variables	Constant	B	't'value	Sig value	R^2	F	SGR	CGR
NSDP	10.642	0.128	46.039	0.001	0.992	2119.627	12.8	13.66
IMR	2.793	0.031	3.335	0.004	0.396	11.125	3.1	3.15
LE	4.056	0.010	13.562	0.001	0.915	183.920	1.0	1.1
PCI	8.692	0.103	37.768	0.001	0.988	1426.407	10.3	10.85

4.2. 1: Net State Domestic Product

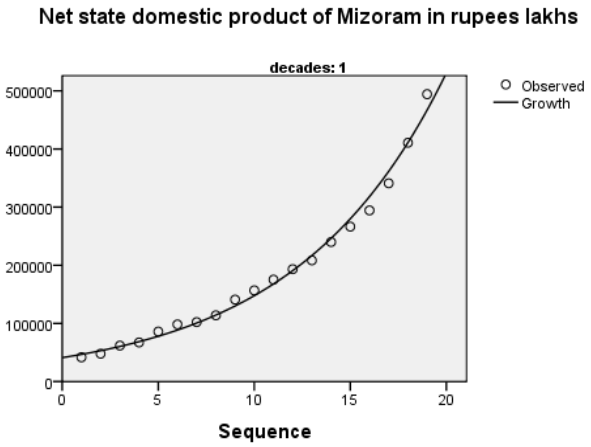
The above two tables show the trend in the Net state domestic product of Mizoram before and after the Liberalization of the Indian economy in 1991. For the period 1981-1990, the R^2 value of 0.970 shows the co-efficient of determination. The simple growth rate of NSDP is 17.8 percent and the compound growth rate is 19.49 percent per annum. Now, for the period 1991-2010, the net state domestic product of Mizoram shows a simple growth rate of 12.8 percent. The compound growth rate is 13.66 percent per annum. The $R^2 = 0.992$ shows the co-efficient of determination. The result reveals that the NSDP of Mizoram has increased at a faster rate during the pre-liberalization period than the post-liberalization period. This can be due to the fewer number of years in the pre-liberalization period studied.

Fig. 4.2.1.(a): NSDP of Mizoram pre liberalization



Ln (NSDP) $Y_t = 8.525 + 0.178$ (time) + e_i

Fig. 4.2.1. (b): NSDP of Mizoram post liberalization

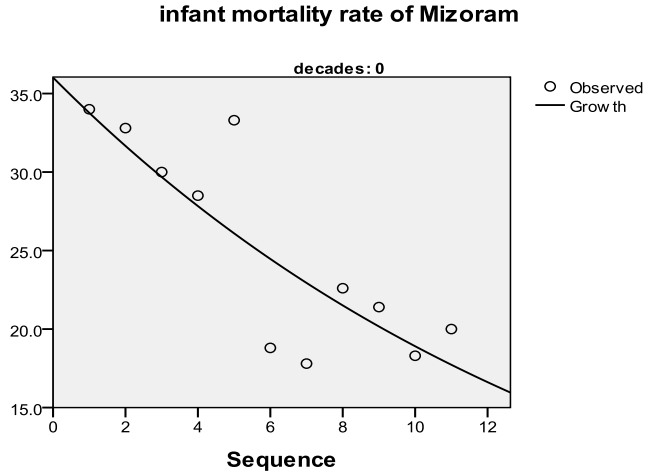


Ln (NSDP) Y_t = 10.624 + 0.128 (time) + e_i

4.2.2: Infant Mortality Rate(IMR)

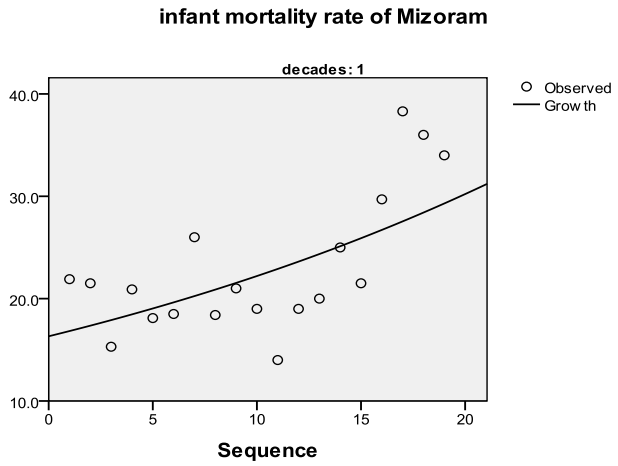
The infant mortality rate of Mizoram in the pre liberalization period has shown a negative slope. The IMR of Mizoram has declined at the rate of 6.4 percent. The compound growth rate has also shown a negative rate of -6.61 percent. The R^2 = 0.678 explains the co-efficient of determination. During the post-liberalization period, the IMR has again shown a positive growth rate in spite of the fall in the pre-liberalization period. The IMR of Mizoram has undergone sudden change in the post liberalization period. It increased at the rate of 3.1 percent per annum. The R^2 value of 0.396 explains the co-efficient of determination. The compound growth rate is 3.15 percent per annum in the post-liberalization period. Thus, the result reveals that the Infant Mortality Rate of Mizoram declined in the pre-liberalization period while it increased in the post-liberalization period.

Fig. 4.2.2. (a): IMR of Mizoram pre liberalization



Ln (IMR) Y_t= 3.584 – 0.064 (time) + e_i

Fig. 4.2.2. (b) IMR of Mizoram post liberalization

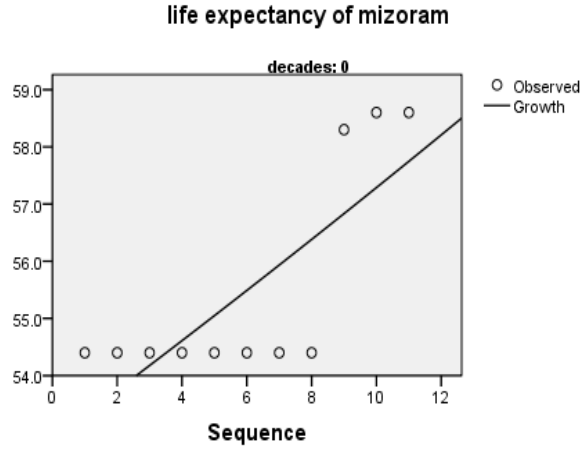


Ln (IMR) Y_t= 2.793 + 0.031 (time) + e_i

4.2.3: Life Expectancy

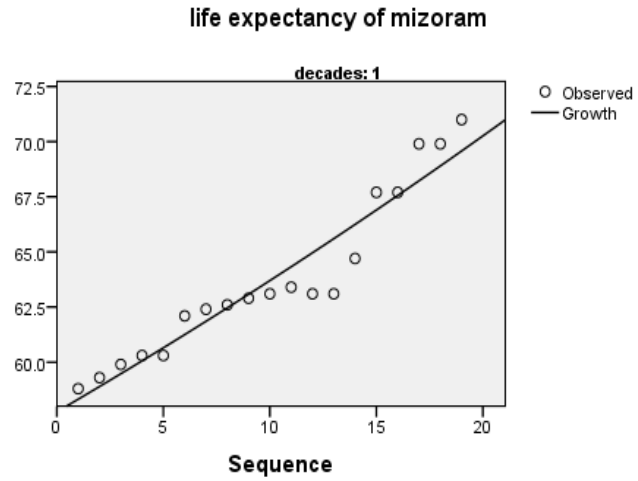
The simple growth rate of Life expectancy for Mizoram in the pre liberalization period is 0.8 percent and the compound growth rate is 0.81 percent. The R^2 with a value of 0.606 shows the co-efficient of determination. The result shows that the Life Expectancy of Mizoram during the pre-liberalization period (i.e. 1981-1990) increased at the compound growth rate of 0.81 percent. For the post liberalization period, the simple growth rate of Life Expectancy of Mizoram stands at 1 percent and the compound growth rate is 160.38 percent. The R^2 = 0.915 shows the co-efficient of determination. The Life Expectancy of Mizoram has grown at a compound growth rate of 1.1 percent per annum in the post-liberalization period. Thus, the result shows that the Life Expectancy of Mizoram has shown more progress after liberalization than pre liberalization period.

Fig. 4.2.3.(a): Life Expectancy of Mizoram pre liberalization



Ln (Life Expectancy) Y_t = 3.968 – 0.008 (time) + e_i

Fig. 4.2.3.(b): Life Expectancy of Mizoram post liberalization

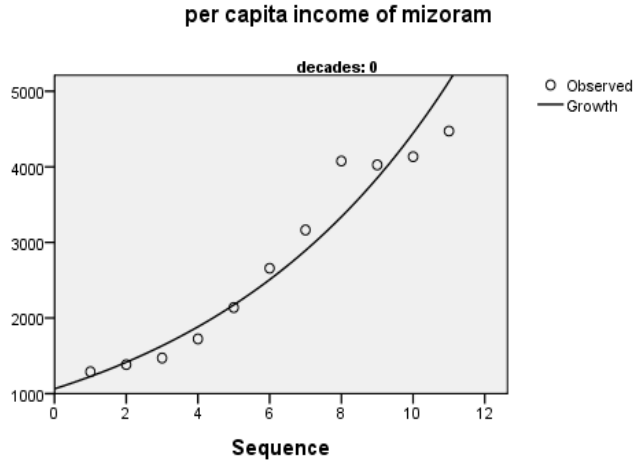


Ln (Life Expectancy) $Y_t = 4.056 + 0.010$ (time) + e_i

4.2.4.:Per Capita Income

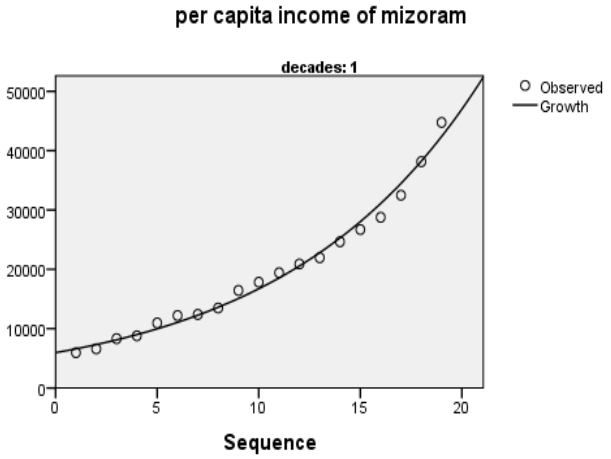
The per capita income of Mizoram during the pre-liberalization period has shown a simple growth rate of 14.3 percent. The R^2 value of 0.958 shows the co-efficient of determination. The compound growth rate is 15.38 percent. For the post liberalization period, the simple growth rate of Mizoram's Per Capita Income stands at 10.3 percent. The compound growth rate is 10.85 percent. The R^2 value of 0.988 explains the co-efficient of determination. The result shows that the increase in the per capita income of Mizoram is more significant/higher during the pre-liberalization period compared to post-liberalization. This can be attributed to the decline in NSDP of Mizoram and the rapid increase in population of the state after 1991.

Fig. 4.2.4. (a): PCI of Mizoram pre liberalization



Ln (PCI) $Y_t = 6.969 + 0.143$ (time) + e_i

Fig. 4.2.4. (b): PCI of Mizoram post liberalization



Ln (PCI) Y_t = 8.692 + 0.103 (time) + e_i

4.3: Impact of Liberalization on Healthcare of Mizoram

The Liberalization of the Indian economy started in 1991. Now, to analyse the impact of liberalization on health indicators of Mizoram, we ran the following regression function.

$$\text{Ln}(Y_t) = \alpha_0 + \alpha_1 D_t + \beta_1 (T) + \beta_2 (D_t\, T) + U_t$$

Where,

Y_t = Dependent variable
D_t = 0 for pre liberalization period (up to 1990)
= 1 for post liberalization period (from 1991)
T = Time.
U_t = Error term

4.3.1: NSDP

Table: 4.3.1: Regression result for NSDP of Mizoram

Ln (Y_t) = -311.49 + 0.147 (D_t) + 0.162 (Time) – 0.0000014 (D_tT)
t (1.89) (20.38) (-3.71)
sig (0.069) (0.001) (0.001)
R^2 = 0.99 F= 1582.99

The above result shows that the Net State Domestic Product of Mizoram has increased at the rate of 16.2 percent per annum during the period 1981-2010. Though the product slope dummy turned out to be significant the slope value before and after Liberalization is almost same in terms of magnitude.

4.3.2: PCI

Table:4.3. 2: Regression result for PCI of Mizoram

Ln (Y_t) = -250.603 + 0.156 (D_t) + 0.130 (Time) – 0.0000011 (D_t T)
t (2.22) (18.06) (-3.26)
sig (0.036) (0.001) (0.003)
R^2 = 0.909 F = 279.54

The above result shows that the Per Capita Income of Mizoram has increased at the rate of 13 percent per annum during the period 1981-2010. Though the product slope dummy turned out to be significant, the negative sign indicates that the per capita income has grown in Mizoram at lesser rate in the post liberalization period compared to per liberalization period.

4.3.3.Life Expectancy

Table:4.3.3: Regression result for Life Expectancy of Mizoram

$\text{Ln}(Y_t) = -9.254 + 0.009\,(D_t) + 0.007\,(\text{Time}) - 0.0000002\,(D_tT)$
t (6.41) (4.88) (2.38)
sig (0.527) (0.001) (0.025)
$R^2 = 0.960$ F = 208.28

The above result shows that the Life Expectancy of Mizoram has increased at the rate of 0.7 percent per annum during the period 1981-2010. Though the product slope dummy turned out to be significant, the negative sign indicates that the Life Expectancy of Mizoram has increased at slower rate in the post liberalization period compared to pre liberalization period.

4.3.4.IMR

Table:4.3.4: Regression result for IMR of Mizoram

$\text{Ln}(Y_t) = 110.089 - 0.004\,(D_t) - 0.054\,(\text{Time}) + 0.0000038\,(D_tT)$
t (-0.29) (-3.915) (5.795)
sig (0.977) (0.001) (0.001)
$R^2 = 0.611$ F = 13.59

The above result shows that the Infant Mortality Rate of Mizoram has declined at the rate of 5.4 percent per annum during the period 1981-2010. Though the product slope dummy turned out to be significant the slope value before and after Liberalization is almost same in terms of magnitude.

V. Discussion

The trend analysis shows the growth rate of the economic and health indicators of Mizoram. The result shows that the NSDP of Mizoram has grown at the rate of 14.8 percent per annum during 1981-2010 while the per capita income has grown by 12.1 percent per annum. The life expectancy of Mizo also increased by 0.9 percent per annum and the infant mortality rate has grown at 8.2 percent during the study period. The Compound Growth Rate were also calculated using the following formula

CGR = [anti Ln (b) – 1] x 100

And it shows that the NSDP of Mizoram has grown at the compound growth rate of 15.96 percent per annum between 1981 and 2010.The Life Expectancy of Mizos during 1981-2010 has increased at the compound growth rate of 0.91 percent per annum. The infant mortality rate of Mizoram during 1981-2010 has increased at the compound growth rate of 8.41 percent per annum and the per capita income of the state has increased at the compound growth rate of 12.86 percent per annum during 1981-2010.

The analysis of the trend in the pre and post liberalization period shows that the growth in NSDP and life expectancy was more significant after the liberalization of the Indian economy. The growth in per capita income is higher during the pre-liberalization period and in the case of infant mortality rate, the rate declined during pre-liberalization period while it increased tremendously at the post-liberalization period. This may be due to the increase in population after the 1990's. Infant mortality rate is high in rural areas due to lack of proper care and lack of knowledge of mothers in the area. No proper sanitation and waste disposal create havoc for the newly born infants and they catch disease easily, thus increasing the number of infant deaths in the villages.

The impact of Liberalization in the health and economic indicators was evaluated using the regression model where the data was converted into log form. Although there are significant changes in the post liberalization, the product slope dummy shows that the slope value before and after liberalization is almost the same in terms of magnitude.

VI. Conclusion

The relationship between globalization and health in Mizoram is a little hazy as can be seen from the analysis. Most of the trend analysis of pre and post liberalization shows that the increment in NSDP and PCI as well as Life expectancy is more notable in the pre liberalization period, which is kind of disturbing. Although the product slopes dummy turned out to be significant, the slope value before and after liberalization is almost the same in terms of magnitude.

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