Modeling The Dynamics of Healthcare And Economic Growth Nexus In India: An ARDL Approach

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Abstract- *This paper empirically investigates the relationship between health expenditures, health outcomes, and economic growth in India using data from the World Bank from1990-2023in a time series regression framework. Employing the Autoregressive Distributed Lag model to assess both short- and long-run dynamics. The empirical analysis begins with unit root testing using the Dickey-Fuller test. The ARDL model estimates reveal a strong positive impact of health expenditure and life expectancy on economic growth, highlighting the significance of healthcare investment in enhancing economic performance. Gross Capital Formation also demonstrates a significant positive effect. The ARDL bounds test confirms a long-run relationship among the variables. Diagnostic tests, including heteroscedasticity and serial correlation checks, confirm the model's robustness. Stability verification through CUSUM and CUSUMSQ tests further supports the reliability of the results. The findings underscore the critical role of health-related investments in driving economic development, providing policy implications for strengthening healthcare infrastructure to sustain long-term economic growth in India.*

Keywords- Economic growth; Health indicators; Mortality rate; Life expectancy; GDP; India

I. INTRODUCTION

Healthcare refers to maintaining or improving health through preventing, diagnosing, treating, and managing illness, disease, injury, and other physical and mental impairments in individuals, communities, or populations. The goals of healthcare typically include promoting health and wellness, preventing illness and injury, diagnosing and treating medical conditions, managing chronic diseases, providing rehabilitation and long-term care, and ensuring access to essential medical services for all individuals. A good healthcare system is important to reduce the burden on families and contribute to national growth. Health is increasingly recognized worldwide as a key aspect of individuals' and nations' development and economic well-being (Piabuo and Tieguhong, 2017). Indeed, there is widespread consensus in academic and policy circles that apart from being a human right, health leads to significant economic gains (Bloom et al., 2001; Well, 2007). Health is both a cause and a consequence of economic growth (Amar et al., 1999).Health being one of the major reasons for a man to gain productivity or profitability, as a healthy person can get the best in his life whether it is the matter of money or fame, he can acquire everything in his life which he desires. As indicated by the World Health Organization (WHO), health is denoted as the state of prosperity and social well-being.it is not just because of the absence of sickness or illness. The healthcare industry emerges as a significant contributor to the economy, generating employment opportunities, driving innovation, and attracting foreign investment. The role of healthcare spending in stimulating economic growth has been suggested in Mushkin's health-led growth hypothesis (1962). Health can affect economic growth through its impact on human and physical capital accumulation. Health affects economic growth by increasing labor productivity and decreasing the cost of illnesses. A healthy individual attains more money and fame than a less healthy individual. Nations with healthy employees can get success in every matter of life, Ahsan et al. (2014)

Health significantly enhances individual productivity and profitability, enabling people to achieve greater success in terms of wealth and recognition. The World Health Organization (WHO) defines health as prosperity and social well-being, beyond merely the absence of disease (WHO, 1999). Healthy individuals contribute more to national progress due to their higher productivity compared to their less healthy counterparts (Ahsan et al., 2014). Research suggests that poor health, including shorter life expectancy, accounts for approximately 50% of economic growth disparities between high- and low-income countries (Renny, 2012; World Bank, 2005). Lucas (1988) identified human capital, bolstered by health, as a key driver of economic development. Health impacts labor profitability both economically and socially, with healthy workers being more efficient and less prone to time loss, while poor health correlates with poverty and good health with prosperity (WHO, 1999). Grossman (1972) further emphasized the link between health utilization and resource allocation, underscoring the need to study health-economic relationships to inform pro-growth policies, particularly in economies like India.

Grossman (1972) clarified the requirements of health and capital. As both are correlated to one another. The utilization of health entails that, individuals appreciate when they have good health and a sound body. Because they don‘t want to sit idle in the days of sickness. They need to work to compete in the market, thus for the economic growth of India, the health sector must be improved which can ultimately bring prosperity. Health can spur economic growth, by enhancing efficiency of labor, enhancing labor supply, and enhancing the skills due to training or higher education. Improved health facilities and a better standard of living of people tend to contribute to a healthy economy. Labor can get wage scoresthatdo relate to the productivity of labor and this productivity increases by better health conditions. In any country, the level of productivity can only be increased by increasing the level of education for people.

The healthcare sector is represented by total healthcare expenditure and life expectancy. The studies conducted in this sphere reveal that healthcare input plays a significant role in a country's economic growth. In this regard, the Indian healthcare economic growth nexus has been proposed to be studied. Healthcare facilities help improve the health of the labor input and thus labor input becomes more productive in the process of Economic Growth. Along with the healthcare-related variables of healthcare expenditure and Life expectancy, this study will also study the controlled variables as the determinants of Economic Growth of India. Capital Formation, Labour Employment, Trade Openness, Inflation Rate, Foreign Direct Investment, and many other variables have been considered by researchers in modeling the Healthcare Economic Growth Nexus.

This paper empirically examines the relationship between healthcare and economic growth in India using a time series regression framework. The main premise behind this study is that the relationship between healthcare and economic growth can be analysed through the direct and indirect effects of total health expenditures per capita on changes in real GDP per capita. The paper starts with an investigation of the direct effect of health expenditures on economic growth controlling for standard growth determinants. Next, the paper investigates whether health expenditures have indirect effects on economic growth.

II. LITERATURE REVIEW

Akram, Padda, and Moha (2008) investigated the long-term impact of health on economic growth in Pakistan, emphasizing the importance of human capital. Time-series data were collected from 1972 to 2006. Utilizing cointegration and error correction models, the study examined the relationship between health indicators—such as life expectancy, mortality rate, and per capita GDP—and economic growth. The findings suggested that health improvements significantly influenced long-term economic growth, underscoring the need for policies that strengthened human capital. The study also highlighted the necessity for research on health demand dynamics in Pakistan and the roles of private versus public healthcare facilities in enhancing health-related human capital.

Bakare and Sanmi (2011) examined the relationship between healthcare expenditures and Nigeria's economic growth from 1970 to 2008. The dependent variable was economic growth, measured by GDP, while the independent variables included healthcare expenditure, gross capital formation, and labor force. The study concluded that there was a significant positive relationship between healthcare expenditures and economic growth. Despite increased government spending on healthcare, the impact on infant, under-five, and maternal mortality rates remained minimal. Additionally, the study emphasized the need for transparent public finance systems that connected specific expenditures to revenue decisions.

Inuwa and Modibbo (2012) examined the dynamic relationship between health expenditure and economic growth from 1980 to 2010. The study employed the newly developed ARDL bounds testing procedure and the Granger causality test. The results indicated that a long-run relationship existed between health expenditure and economic growth, suggesting a causal relationship in at least one direction. However, the study did not specify the direction of causality. Consequently, the Granger causality test revealed a strong bidirectional relationship between health expenditure and economic growth. It was thus deemed critical for the Nigerian government to incorporate health investment into macroeconomic policy, as differences in economic growth rates across countries were significantly attributed to health disparities, demonstrating that health investment enhanced economic growth.

Pradhan and Bagchi (2012) analyzed whether health expenditure and growth were cointegrated and indicated the presence of a long-run equilibrium relationship between them. The data was collected for the years 1980-2010. The Granger causality test verified the presence of a bidirectional causal relationship, suggesting that there was feedback between these two at the national level over the long and short terms. However, the relationship between health spending and growth became more nuanced at the state level, where there was no causal relationship at times, as well as unidirectional and bidirectional trends. According to the report, policymakers would have been better off looking more closely at state-

specific circumstances. Factors other than the health of their population might have had a major influence on the growth of their economies, especially in the more affluent and urbanized states.

Naeem Ur Rehman Khattak and Jangraiz Khan (2012) examined if health accelerated economic growth in Pakistan. The paper was based on secondary data for the period of 1971-2008. The study used the growth accounting method, ordinary least squares, and Johansen cointegration test as analytical techniques. Health, labor, and R&D were identified as the key factors of economic growth in Pakistan by the ordinary least squares results. The findings of the cointegration test demonstrated that there was a long-term association between economic growth and health. The study concluded that economic growth was accelerated by health in Pakistan and that this relationship persisted through time. The study recommended raising government spending on R&D and health.

Nyamwange (2012) explored the relationship between economic growth and public healthcare expenditure in Kenya. The study aimed to investigate the effect of GDP on public healthcare expenditure from 1982 to 2012. The study used time series estimation techniques such as OLS regression, cointegration, and Granger causality tests. The dependent variable was public healthcare expenditure, and the independent variables were GDP per capita, population growth rate, Inflation/Consumer Price Index (CPI), and physicians per 1000 population. The study found that healthcare expenditure in Kenya was influenced by factors such as population growth, inflation, and the number of physicians per 1000 population and that there was a significant long-term relationship between GDP per capita and public healthcare expenditure.

Chor Foon Tang (2013) studied the relationship between healthcare spending, economic growth, relative pricing, and life expectancy in Malaysia using the Granger causality theory. The sample period for this study was from 1970 to 2010. It was discovered that the variables were cointegrated when the recently developed cointegration test proposed by Bayer and Hanck (2010) was applied to the Malaysian data. Life expectancy and relative pricing showed a bidirectional causal relationship with healthcare spending, according to the Granger causality test. Additionally, there was a one-way causal relationship connecting economic growth and life expectancy. In conclusion, healthcare spending affected economic growth indirectly through an increase in life expectancy and an improvement in health conditions. Spending on healthcare was crucial to raising the population's health status and promoting Malaysia's economy.

Yaqub, Ojapinwa, and Yussuff (2013) focused on investigating how the effectiveness of public health expenditure was affected by governance in Nigeria. In the empirical analysis, data from 1980 to 2008 were used. Using both the ordinary least squares and the two-stage least squares regression techniques, data on public health expenditure and governance variables described by the corruption perception index were regressed on infant mortality, under-five mortality, and life expectancy. The outcome demonstrated that when the governance indicators were taken into account, public health spending had a negative impact on infant mortality and under-five mortality

Weil (2014) examined the relationship between health and economic growth. The study presented a theoretical framework to understand the simultaneous determination of health and income. The dependent variable considered was economic growth, and the independent variables considered were life expectancy, infant mortality, and income per capita. It examined cross-sectional data across countries, within-country data, and historical data over time to analyze the correlation between health and income. The study also discussed the impact of health improvement on economic growth through various channels, such as direct productivity effects and the role of health as a component of economic growth.

Basumallik (2017) aimed to analyze the impact of health indicators on India's economic growth, using Gross National Income (GNI) per capita and various health metrics like life expectancy and mortality rates. Data were collected for the years 1961-2015. The study employed a multivariate framework and regression models, including Ordinary Least Squares and Two-Stage Least Squares, to test the causality between health and economic growth. The study revealed that OLS showed no significant relationship, but the two-stage least squares indicated a highly significant effect of health on economic growth. The paper concluded that health had a substantial impact on economic growth in India, emphasizing the need for improved health services and infrastructure.

Yusuf and Setiawan (2022) discussed the relationship between health and economic growth nexus for 1985-2021. The main objective of the study was to analyze the effect of health variables (Healthcare Expenditure, Human Development Index, Life Expectancy, and Mortality) on economic growth in Indonesia. It used secondary data and employed the Engle-Granger error correction model and Granger causality analysis. The dependent variable was economic growth, and the independent variables were healthcare expenditure, human development index, life expectancy, and mortality rate. The study concluded that

health played a crucial role in economic growth, and the government should have prioritized health infrastructure development, implemented cash transfer and health subsidy programs to improve public health, and reduced healthcare access barriers for the poor.

III. DATA& METHODOLOGY

3.1 Selection of Data and Variables

The primary objective of this study is to investigate the relationship between economic growth and healthcare in a time series data growth regression framework using data from India over the period between 1990 and 2023.

The study will adopt a quantitative research design to systematically analyze the relationship between healthcare expenditures and economic growth in India.

Table 1. Data Description

S.NO	Variables	Time Period	Data Type	Source of Data
1	Gross Capital Formation	1990-2023	Time Series	World Bank
2	Foreign Direct Investment	1990-2023	Time Series	World Bank
3	Healthcare Expenditure	1990-2023	Time Series	World Bank
4	Life Expectancy	1990-2023	Time Series	World Bank
5	Trade Openness	1990-2023	Time Series	World Bank
6	Infant Mortality Rate	1990-2023	Time Series	World Bank
7	Inflation Rate	1990-2023	Time Series	World Bank

Source:World Bank

3.2Empirical Model

The empirical results of this study point toward a strong positive relationship between health expenditures and economic growth on the one hand and health expenditures and health outcomes on the other hand.

The research aims to analyze health factors that influence economic development in India by using this equation:

GDP

$$\tau = \beta 0 + \beta 1(GCF)\tau + \beta 2(FDI)\tau + \beta 3(HE)\tau + \beta 4(LE)\tau + \beta 5(TO)\tau + \beta 6(MR) + \beta 7(IR) + \varepsilon$$

GDP= Gross Domestic Product
GCF=Gross Capital Formation
FDI= Foreign Direct Investment
HE= Health Expenditure
LE= Life Expectancy
TO= Trade Openness
MR= Mortality Rate
IR- Inflation Rate

The model we built is where GDP is a dependent variable. Gross capital formation, Foreign Direct Investment, Life Expectancy, Health Expenditure, Trade Openness, Mortality Rate, and Inflation Rate are Independent Variables. After testing the variables, we add the approximation to the above equation.We apply the estimation on the above equation after checking the stationary of the variables.

3.3 Empirical Technique

We will examine whether the variables are stationary to estimate the effects of health spending on India's economic growth. For this purpose, we will use the Dickey-Fuller test. If a unit root is present, the variables are non-stationary; otherwise, they are stationary. Life expectancy and the Inflation rate are stationary at level I(0), while all other factors become stationary at their first difference I(1). To estimate the effects on the model, we employ the Autoregressive Distributed Lag (ARDL) method.

The results are largely in line with growth literature as well as health economics literature.

3.3.1 ARDL (Autoregressive Distributed lag)

In 1999 Pesaran and Shin presented the ARDL model, and in 2001, Persaran el. reviewed it. The advantage of the ARDL method is that the first distinction is not all the variables 1 (I). Instead, ARDL attempts to tackle the problem of serial correlation while having explanatory variables lags within the model for other independent or lagging variables. Khalid, et.al | Quantitative Economics and Management Studies (QEMS), 2021, 2(3): 182–191 186

3.3.2 ARDL Rules

The most important obligation of ARDL was that autocorrelation does not exist. Normal distribution of the data. Heteroscedasticity should not arise in the data.

Either on first differences I (0) or I (1), or both, data should be stationary. In addition, ARDL cannot be used if certain of the variables are stationary at second difference I (2).

ARDL Simple Equation

$$Yt = \beta_0 + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \cdots + \beta_p y_{t-m} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \cdots + \alpha_q x_{t-n} + \varepsilon_t$$

IV. EMPIRICAL RESULTS

The data of the present study was fed into the E-views 9 for the mathematical calculation. All the data is gathered from world development indicators for the past 30 years (1990 to 2023). Initially the data is converted into logically acceptable format in order to understand the working position effectively. The statistical analysis of the variables, with the mean, limit, minimum and standard deviations from the results, is given in Table 2.

5Table 2. Descriptive Statistics

Variables	Mean	Maximum	Minimum	Standard Deviation
GDP	1127.265	2746.000	316.0000	697.5714
GCF	2.52e+13	9.21e+13	1.50e+12	2.52e+13
FDI	192748.4	495000.0	1640.00	172206.6
HE	0.434050	1.070940	0.097960	0.278934
LE	65.22565	70.91000	58.65200	3.864533
TO	0.361029	0.463400	0.234700	0.075135
MR	53.47911	82.00000	25.50000	18.18541
IR	0.066721	0.138700	0.033300	0.028610

Table 2 shows the descriptive statistics about the variables, variables are GDP, Life Expectancy, Mortality Rate, Gross Capital Formation, Inflation Rate, Foreign Direct Investment, Health Expenditure, and Trade Openness. The mean value of GDP is 1127.265, maximum value is 2746.000, minimum value is 316.0000 and the value of standard deviation is 697.5714. The mean value of LE is 65.22565, maximum value is 70.91000, 58.65200 is minimum value and the value of standard deviation is 3.864533. The mean value of MR is 53.47911, 82.00000 is the maximum value, 25.50000 is minimum value and the value of standard deviation is 18.18541. The mean value of GCF is 2.52e+13, maximum value is 9.21e+13, minimum value is 1.50e+12 and the value of standard deviation is 2.52e+13. The mean value of IR is 0.066721, maximum value is 0.138700, Minimum value is 0.033300 and the value of standard deviation is 0.028610. The mean value of FDI is 192748.4, 495000.0 is the maximum value, 1640.00 is minimum value and the value of standard deviation is 172206.6. The mean value of HE is 0.434050, maximum is 1.070940, value for minimum is 0.097960, and standard deviation is 0.278934. The value for TO mean is 0.361029, maximum is 0.463400, minimum is 0.234700 and value for standard deviation is 0.075135.

Table 3.Results of Unit Root Test

Variables	At Level	1st Difference	Decision
GDP	2.624347	-5.381786	I(1)
GCF	4.897418	-4.718347	I(1)
FDI	-0.142402	-8.378131	I(1)
HE	2.528076	-4.485914	I(1)
LE	-3.767520	0.679559	I(0)
TO	-1.637780	-6.418863	I(1)
MR	-8.293187	1.566660	-
IR	-3.441244	-8.293187	I(0)/ I(1)

The unit root test results indicate the order of integration for each variable in the dataset. Gross Capital Formation (GCF) is found to be I(1), meaning it is non-stationary at levels but becomes stationary after first differencing. Similarly, GDP, Foreign Direct Investment (FDI), Healthcare Expenditure (HE), and Trade Openness (TO) are all integrated of order I(1), suggesting they follow a unit root process and require differencing to achieve stationarity. In contrast, Life Expectancy (LE) is I(0), indicating that it is stationary at levels and does not require differencing. The results for Inflation Rate (IR) are mixed, showing stationarity at both levels and first difference, suggesting it could be either I(0) or I(1). Meanwhile, Mortality Rate (MR) has a highly significant test statistic at levels, implying it may already be I(0), though additional verification is needed. These findings are crucial for selecting appropriate econometric techniques, as models such as cointegration analysis require variables to be of the same integration order.
To verify the behavior of residuals we have applied diagnostic tests, which give the information regarding white noise error term.

Table 4. Diagnostic-Correlation Test

F-statistic	1.309348	Prob. F	0.2894
Obs*R-squared	3.270980	Prob. Chi-Square	0.1949

The value of Obs*R-squared 3.270980 chi-Square is insignificant (0.1949). So, there is no correlation between dependent and independent variables. The chi-square is negligible in the importance of Obs*R 3.270980(0.1949).

There is, however, little connection between dependent and single variables

Table 5. Diagnostic- Heteroscedasticity Test

F-statistic	0.691630	Prob.F	0.6786
Obs*R-squared	5.369486	Prob.Chi-square	0.6150
Scaled explained	5.898654	Prob Chi-square	0.5516

The F-statistic and Obs*R-squared tests suggest no evidence of heteroscedasticity, as their p-values are greater than 0.05. If the probability value of Obs* R-squared is insignificant, heteroscedasticity is absent. The probability and value of the obs* R square at the chi-square level (0.6150) is negligible according to the Breusch pagan Godfrey test. Thus, there is no hero present in the model.The residuals seem to have constant variance, which is a good sign for the reliability of the model's standard errors and inference.

Table 6. ARDL Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔLn (GDP (-1))	-0.042276	0.226233	0.186870	0.8540
ΔLn (GCF)	2.27E-11	5.96E-12	3.814023	0.0014
ΔLn (FDI)	5.42E-05	0.000187	0.289967	0.7753
ΔLn (HE)	29033.27	13276.33	2.186845	0.0430
ΔLn (LE)	157.6483	46.12174	3.418090	0.0030
ΔLn (TO)	1158.865	333.2282	3.477694	0.0029
ΔLn (MR)	7.556342	18.07132	0.418140	0.6811
ΔLn (IR)	-645.3076	415.0917	-1.554614	0.1385
CointEq (-1)	649.2511	5459.913	0.118912	0.9067

Model chosen for ARDL (1,1,1,1,1,1,0,0).Variables like health expenditure, life expectancy, and trade openness appear to be strong drivers of the dependent variable (likely GDP growth), while FDI and lagged GDP growth show no significant influence.Health Expenditure (ΔLn(HE)), Life Expectancy (ΔLn(LE)), and Trade Openness (ΔLn(TO)) exhibit strong, positive, and statistically significant effects (p-values of 0.0430, 0.0030, and 0.0029, respectively. Gross Capital Formation (ΔLn(GCF)) is also statistically significant (p = 0.0014), but its extremely small coefficient (2.27E-11) implies a negligible economic effect despite statistical relevance.FDI has a positive but insignificant effect (p = 0.7753 > 0.05).Lagged GDP growth, FDI, mortality, and Inflation rates show no reliable short-run impact. However, the positive and insignificant error correction term undermines confidence in the long-run relationship, suggesting the need for further testing.

Table 7. ARDL Bounds Test Results

Test Statistic	Value	K
F-statistic	3.351590	5
Critical Value Bounds		
Significance	1(0) Bound	1(1) Bound
10%	1.92	2.89
5%	2.17	3.21
2.5%	2.43	3.51
1%	2.73	3.9

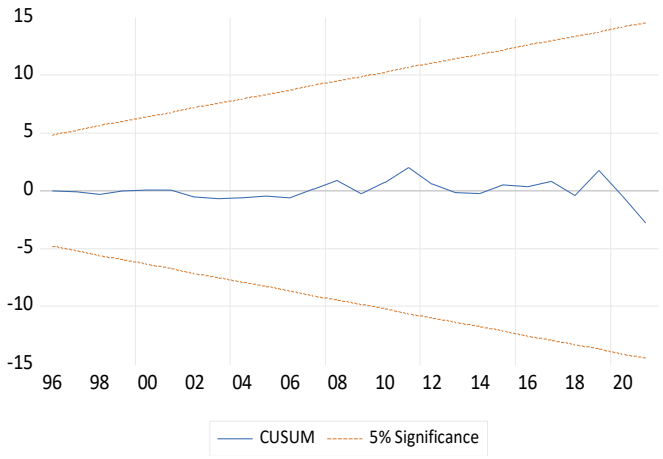
The F-statistic (3.351590) exceeds the I(1) critical value at the 10% (2.89) and 5% (3.21) significance levels, indicating strong evidence of a long-run cointegration relationship among the variables at these levels.At the conventional 5% significance level (commonly used in econometric analysis), it is confidently concluded that there is a long-run relationship between the variables in the ARDL model

Table 8. Long-Run Coefficients of ARDL

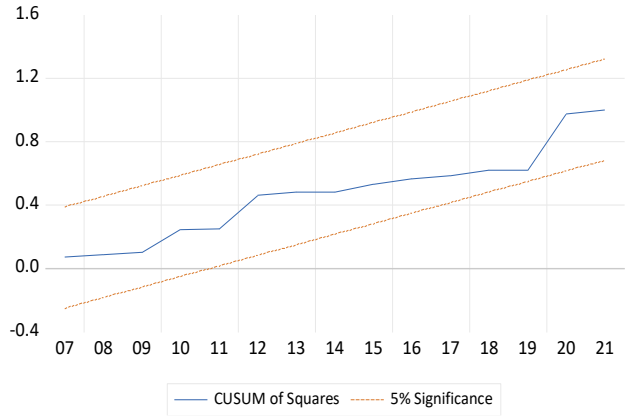
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.068964	0.397482	0.173501	0.8642
LNGCF	4.20E-11	5.49E-12	7.649868	0.0000
LNFDI	0.000329	0.000328	1.004063	0.3294
LNHE	57359.23	15564.05	3.685367	0.0018
LNLE	-49.13290	70.31024	-0.698801	0.4941
LNTO	119.1692	419.1789	0.284292	0.7796
LNMR	7.889897	18.89583	0.417547	0.6815
LNIR	-673.7929	480.7996	-1401401	0.1791
C	677.9105	5711.444	0.118693	0.9069

Selected model for ARDL (1,1,1,1,1,1,0,0). Gross Capital Formation (GCF) shoesstrong positive effect on economic growth (p = 0.0000). Healthcare Expenditure (HE) alsoshows strong positive effect on economic growth (p = 0.0018).Inflation rates do not significantly influence GDP in the long run, indicating other factors might be more critical in shaping economic performance.In the developing countries, income of people is low so they face a lot of health problems but are unable to pay for their treatment, and they cannot actively participate in economic growth activities.

In order to check the stability of model, cusum stability tests are applied at 0.05% of significance level



The above figure shows CUSUM plot to verify the consistency of the chosen ARDL model by using Recursive estimates. The blue line lies, as seen in the above figure, between 5% and the significant amount, which indicates that the model suits the 5%



The above figure shows CUSUM of squares plot to verify the consistency of the chosen ARDL model by using Recursive estimates. The blue line lies, as seen in the above figure, between 5% and the significant amount, which indicates that the model suits the 5%

V. CONCLUSION

A health indicator is a measure designed to summarize information about a given prioritized topic in population health or health system performance. The data is time series data which is collected from World bankfrom 1990 to 2023. This study involves descriptive statistics and co-integration technique as the prerequisite tests, the unit root test is engaged to check the stationarity of the data.Diagnostic tests confirm that the model is free from autocorrelation and heteroscedasticity, ensuring statistical reliability. CUSUM and CUSUMSQ tests validate the stability of the model, making the results more credible.The ARDL model is used in this paper after checking the stationarity and the bound test. The result shows both long-run and short-run relationships. In the long run relationship, Gross capital formation and healthcare expenditure shows strong positive impact on the growth rate of the economy.Khalid et al. (2001) found that the relationship between the rate of survival of adults and economic development has been positive. Health expenditure has a strong positive and statistically significant impact on GDP growth in both the short and long run. This implies that investing in healthcare leads to better economic performance by improving human capital and productivity. Life expectancy, Trade openness, and Foreign Direct Investment are positively associated with GDP. Gross Capital Formation significantly impacts economic growth, implying that investment in infrastructure, industries, and assets strongly contributes to GDP.Inflation does not considerably affect GDP, suggesting that moderate inflation may not necessarily hinder economic growth. This means that the health indicator has an overall progress effect on the nation's development. Overall, the growth rate does not rely strongly on the health measures in the short term, although it has a poor impact of variables on the country's growth rate. The factors in the long term are a big stimulus for the country's growth.

VI. POLICY IMPLICATION

The study provides clear policy implications, emphasizing the importance of healthcare investments in economic growth. Findings suggest that government spending on health can boost productivity and GDP, offering insights for policymakers.

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