Relationship between Economic Growth and Expenditure on Social Sector in India: An Econometric Investigation

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Abstract: The development process across the world observed a relationship between expenditure in social sectors and economic development. The growth-propelling role of the social sector has been widely discussed by academicians and policymakers. This paper examines the causal relationship between spending in the social sector and economic development using annual time series data from 1972-73 to 2021-2022 for India. A battery of econometric techniques for determining the causal relationship between social sector expenditure and economic development in India was used and the Augmented Dickey-Fuller and Phillips Perron unit root test was employed to test the stationarity. The results portray a significant bi-directional relationship between GDP per capita and expenditures on education, family welfare, housing, urban development, water supply and sanitation, nutrition, social security, welfare, labor and labor laws, and the welfare of scheduled castes and tribes. However, there exists a unidirectional causality from health expenditure to economic development. This result indicates the significant contribution of social spending to the economic growth of a developing country like India, which will be of substantial help to policymakers to devise appropriate policies.

Keywords: Social expenditure, per capita GDP, social development, human development, social stock exchange.

INTRODUCTION

Social sector expenditures, which include investments in areas such as education, healthcare, and social welfare, are generally considered to be important drivers of economic growth. There are several reasons for this:

i) Human capital development: Social sector expenditures help to build human capital, which is the knowledge, skills, and experience possessed by a population. Investment in education, for example, can help individuals acquire new skills that can improve their productivity and increase their earnings potential, which can in turn lead to economic growth.

ii) Health and productivity: Investments in healthcare can help to reduce illness and disease, which can have a positive impact on labor productivity. Healthy individuals are better able to work and contribute to the economy, leading to increased economic growth.

iii) Social safety nets: Expenditures on social welfare programs can help to provide a safety net for vulnerable individuals and families, reducing poverty and improving social welfare. This can help to improve social outcomes and reduce inequality, leading to a more stable and productive society.

Overall, social sector expenditures can contribute to economic growth by improving human capital development, increasing labor productivity, and providing a safety net for vulnerable individuals and families. However, it's important to note that the impact of social sector expenditures on economic growth may vary depending on the specific policies and programs implemented, as well as the broader economic and political context in which they are implemented. Social sector expenditure has played a significant role in transforming India in recent years, both domestically and on the global stage. Some of the notable changes are:

i) Health and Sanitation: One of the most significant improvements has been in the health and sanitation sector. Initiatives like the Swachh Bharat Abhiyan, which aimed to make India open defecation free, and Ayushman Bharat, which provides health insurance to the poor, have helped to improve access to basic healthcare and sanitation services, leading to better health outcomes and improved quality of life for many Indians.

ii) Education: India's investment in education has also improved over the years, with initiatives such as the Right to Education Act, which guarantees free and compulsory education to all children up to the age of 14, and the launch of digital education platforms like Swayam, which has made education accessible to millions of people across the

country. These investments have helped to improve literacy rates and increase the number of educated individuals in the country, which can have a positive impact on economic growth.

iii) Poverty reduction: Social sector expenditures have also played a role in reducing poverty in India. The National Rural Employment Guarantee Act (NREGA) has employed millions of rural workers, while initiatives like the National Food Security Act have ensured access to basic food and nutrition for the poor.

iv) Global recognition: India's social sector expenditure has gained recognition on the global stage, with programs like Ayushman Bharat being lauded by the World Health Organization and other international organizations. India's efforts in improving social welfare and human development have also helped the country move up in global human development rankings, reflecting the progress made in improving the quality of life for its citizens. In summary, India's social sector expenditure has played a vital role in improving the country's social and economic indicators, contributing to its transformation both domestically and on the global stage.

2. OUTCOME OF SOCIAL SECTOR EXPENDITURE

Social sector expenditure has had a positive impact on the economic growth of India. Investments in areas such as education, healthcare, and social welfare have helped to improve human capital development, increase labor productivity, and reduce poverty and inequality, all of which can contribute to economic growth. For example, investments in education can lead to an increase in skilled workers, which can help to boost productivity and economic growth. Similarly, investments in healthcare can reduce the incidence of illness and disease, leading to a healthier workforce and reduced absenteeism, which can also contribute to economic growth. Social sector expenditures can also provide a safety net for vulnerable individuals and families, reducing poverty and increasing social welfare. This can help to improve social outcomes and reduce inequality, which can have positive effects on economic growth by creating a more stable and productive society. In recent years, India has made significant investments in social sector expenditures, with initiatives like Ayushman Bharat, the National Rural Employment Guarantee Act, and the Swachh Bharat Abhiyan, among others. These investments have helped

to improve social welfare and human development, contributing to India's overall economic growth and development. However, it's important to note that the impact of social sector expenditure on economic growth can vary depending on the specific policies and programs implemented, as well as the broader economic and political context in which they are implemented. Social sector expenditure in India is broadly under international standards, although there is always scope for improvement. International standards for social sector expenditure are set out by various organizations, including the United Nations and the World Health Organization. These standards typically emphasize the need for investments in healthcare, education, and social welfare, as well as the importance of reducing poverty and inequality. India has made significant progress in aligning its social sector expenditure with these international standards. For example, the government has launched various initiatives in recent years aimed at improving access to basic healthcare and sanitation services, reducing poverty, and increasing access to education.

However, there are still areas where India can improve in terms of aligning its social sector expenditure with international standards. For example, India's public spending on health remains low compared to many other countries, and there are still significant disparities in healthcare access between urban and rural areas. Similarly, while India has made progress in reducing poverty, there is still a long way to go in terms of reducing inequality and ensuring that vulnerable populations have access to basic social welfare services. In summary, while India's social sector expenditure is broadly per international standards, there is always room for improvement, and continued efforts are needed to ensure that investments in social welfare and human development are as effective as possible in contributing to India's overall development and progress.

The impact of state-wise social sector expenditure on the economic growth of various states in India can vary depending on a range of factors, including the level of investment, the specific policies and programs implemented, and the broader economic and political context in each state. However, there is evidence to suggest that social sector expenditure has had a positive impact on economic growth in many states. For example, in Kerala, a state that has traditionally invested heavily in social sector expenditure, there is evidence to suggest that investments in areas such as healthcare, education, and social welfare have contributed to a higher level of human development and a more productive workforce. Kerala has some of the highest literacy rates and life expectancy in India, which have contributed to higher levels of economic

growth and development. Similarly, in states like Tamil Nadu and Andhra Pradesh, investments in education and healthcare have been associated with improvements in human capital development, productivity, and economic growth. In these states, investments in social sector expenditure have contributed to higher levels of literacy and improved health outcomes, which have in turn led to higher levels of economic growth. However, it's important to note that the impact of social sector expenditure on economic growth can vary across different states, depending on a range of factors. For example, in some states, there may be challenges in ensuring that social sector investments are effectively targeted and implemented, which can limit their impact on economic growth. Similarly, in some states, broader economic and political factors, such as the availability of natural resources and the overall investment climate, may play a larger role in determining levels of economic growth. In summary, while social sector expenditure can have a positive impact on economic growth in many states, the specific impact can vary depending on a range of factors. Nevertheless, investments in areas such as healthcare, education, and social welfare are likely to be important contributors to long-term economic growth and development in most states.

3. SIGNIFICANCE OF SOCIAL & ECONOMIC PROGRESS

The extant literature in macroeconomics has accentuated the significance of both social and economic progress in the economic development of a nation [Sen, 2005; Devi, 2005]. India, too, has demonstrated immense interest in social and economic sector development as both contribute to economic growth. India's development expenditure as a percentage of total spending has hovered around 60 percent of the total expenditure across the past several decades (Figure 1). While the social development expenditure had increased from 28% in 1975 to 35% in 2019, the economic sector expenditure is steady at around 30% of total spending. In terms of GDP, the growth of developmental outlays, which was merely 1% of GDP during 1985-1986, jumped to 17% of GDP in 2020-2021. The social sector spending also increased from 0.27% of GDP in 1985-1986 to 9.58% of GDP in 2020-2021.

This paper has identified ten social sectors: i) Education, Sports, Art, and Culture (EASC); ii) Medical and Public Health (MPH); iii) Family Welfare (FW); iv) Water Supply and Sanitation (WSUPSA); v) Housing (HOU); vi) Urban Development (UDEV); vii) Welfare of Scheduled Caste, Scheduled Tribes and OBC (WSCST); viii) Labor and Labour Welfare (LLW); ix) Social

Security and Welfare (SSW); & x) Nutrition (NUT), and focus mainly on sector-specific spending and its causal linkage with economic growth. As a percentage of GDP, social sector spending in education is the highest (4%), while spending on other sectors hovers around 0.5 to 1% of GDP (Table 1).

Figure 1: Composite Expenditure of State and Central Governments as % of Total Expenditures
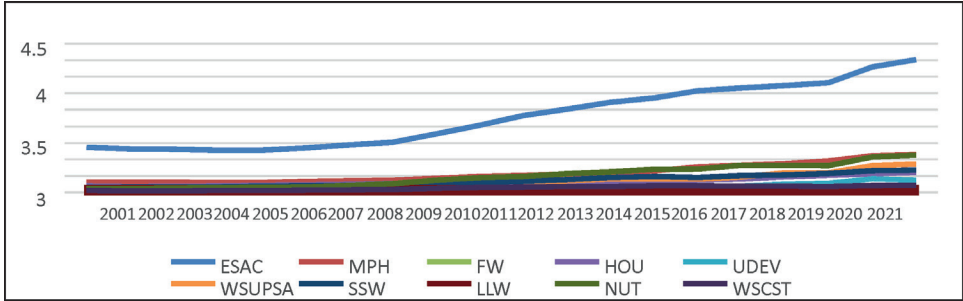
(Authors own Construct based on data from EPWRF)

Table-1: Social Sector Expenditure of India as% of GDP

Year	ESAC	MPH	FW	HOU	UDEV	WSUPSA	SSW	LLW	NUT	WSCST
2000 - 2001	1.367	0.306	0.055	0.196	0.041	0.069	0.150	0.028	0.114	0.057
2001 - 2002	1.314	0.299	0.055	0.181	0.039	0.079	0.159	0.025	0.112	0.050
2002 - 2003	1.312	0.299	0.051	0.192	0.044	0.085	0.164	0.025	0.132	0.048
2003 - 2004	1.279	0.296	0.049	0.198	0.046	0.113	0.167	0.027	0.143	0.056
2004 - 2005	1.284	0.296	0.046	0.221	0.052	0.121	0.185	0.027	0.149	0.059
2005 - 2006	1.350	0.326	0.047	0.231	0.046	0.118	0.198	0.028	0.160	0.068
2006 - 2007	1.439	0.349	0.048	0.241	0.060	0.176	0.211	0.039	0.206	0.076
2007 - 2008	1.513	0.368	0.052	0.278	0.073	0.242	0.239	0.034	0.263	0.090
2008 - 2009	1.774	0.420	0.064	0.305	0.100	0.365	0.289	0.040	0.367	0.119
2009 - 2010	2.037	0.478	0.076	0.270	0.089	0.378	0.301	0.044	0.440	0.147
2010 - 2011	2.321	0.510	0.082	0.245	0.114	0.323	0.339	0.049	0.481	0.162
2011 - 2012	2.526	0.560	0.088	0.248	0.113	0.346	0.390	0.050	0.567	0.180
2012 - 2013	2.726	0.616	0.104	0.259	0.141	0.406	0.448	0.064	0.620	0.184
2013 - 2014	2.866	0.653	0.106	0.288	0.140	0.398	0.478	0.071	0.693	0.200
2014 - 2015	3.079	0.770	0.147	0.373	0.190	0.394	0.455	0.071	0.710	0.194
2015 - 2016	3.167	0.821	0.147	0.404	0.192	0.463	0.512	0.062	0.821	0.190
2016 - 2017	3.239	0.870	0.147	0.471	0.242	0.598	0.532	0.061	0.821	0.185
2017 - 2018	3.324	0.952	0.159	0.515	0.277	0.593	0.577	0.070	0.807	0.178
2018 - 2019	3.803	1.115	0.185	0.570	0.409	0.814	0.657	0.092	1.078	0.206
2019 - 2020	4.021	1.145	0.195	0.605	0.364	0.856	0.673	0.106	1.129	0.216

Authors own Estimation

Although India is the fifth biggest economy globally, a significant portion of its population still relies on the government provisioning essential services. "The government is committed to investing in social sector viz. education, healthcare, skill development, providing employment opportunity, housing, sanitation, etc. to bring overall improvement in socio-economic indicators and achieving SDGs" (Economic Survey 2020-21 Volume 2, pp 361). Thus, the government of India commits to the development of the masses and ushers, the social obligation to eliminate illiteracy, malnutrition, poverty, unemployment, etc., by allocating resources towards meeting societies' needs. The Indian government, to uplift the quality of life of its citizens, has endeavored to set up the Social Stock Exchange (SSE), which would direct more resources into the social sector. The social sector spending has also been strengthened by the inclusion of CSR funds, i.e., 2-3% of companies' profit, as prescribed by the Companies Act 2013. The SSE panel and the Securities Exchange Board of India (SEBI) are framing guidelines for the government to identify the priority sector and direct their attention to uplifting the industry by delivering developmental policies. To achieve the SDG (Sustainable Development Goals) goals 2030, India is drawing the attention of investors for investment in Social sector Impact Bonds, Green bonds and making the funds available for the development of the social sector.

The paper is organized as follows: next section 4 details the theoretical background and perspective in the social sector spending, followed by a literature review in section 5. Section 6 entails the data and the methods followed by results and discussion in section 7. Finally, section 8 concludes the paper.

4. THEORETICAL PERSPECTIVE

i) Human Resource Development Approach

This approach assumes that social sectors enhance human capital. Human capital refers to "the stock of skills and productive knowledge embodied in people." It indicates to those agents in the economy who can generate income. The proponents of this theory stressed that human capital formation happens when people invest in schooling, health, on-the-job training, and searching for information about job opportunities and migration. Therefore, investments in sectors like education, health, and labor welfare improve labor-force productivity and are justified for two reasons: i) it helps to increase the financial rate of return in terms of an increase in the per capita income (due to education spending), and ii) improved firm-level productivity due to better health [Schultz, 1961; Becker, 1962]. Human development, as per several studies has proved to be

an alternative approach to social development. According to United Nations Development Program (UNDP), it is "the process of enlarging people's choices and focuses on the state of existence of people and includes empowerment, cooperation, equity in basic capabilities and opportunities, sustainability and security." It claims to put people in the limelight and improves their basic capabilities by increasing their intrinsic value through supportive measures of education, health, and nutrition. In nutshell, while the human development approach treats human beings as ends in themselves, the human resources development approach focuses on the means or the productivity aspects of human beings. One commonality between the two concepts is that human resource development provides the precondition for human development, which in turn contributes to economic growth.

ii) Social and Economic Development

It becomes imperative to highlight the outcome of social expenditure in the form of social development to understand the impact of social sector spending on economic development. The UNDP defines social development as "*sustainable human development which enhances human capabilities for enlarging human choices.*" The three main aspects of social development, i.e., social services, social transfers, and social integration. Social services are referred to as health and education services. Social transfers entail social security, livelihood generation, and remunerative employment, and finally, social integration reduces violence through peace (Streetan, 1981); Ghai (2000) confirms strong leadership committed to social service provision; strong state capacity, infrastructure, and the state's central role in providing social services; and the composition of social spending, especially on primary education and healthcare as the main contributing factors in determining social development. Researchers also report that "Social Development is a process of transformation in values, institutions, and practices, brought about the deliberate use of policy and planning instruments with the active involvement of concerned people to raise their levels of living and quality of life". On the other hand, economic development refers to the increase in per capita income, per capita value-added, etc., of the citizens of a country.

5.   LITERATURE REVIEW

The literature has observed mixed evidence on the relationship between public expenditure and economic development. Public spending in the social sector

influences development by creating socially inclusive, healthy, and economically solid societies and enhances productivity [Mundle, 1998; Arora, 2001; Guha and Chakraborty, 2003; Majumder, 2004; Dev and Ravi 2007; Kannan and Pillai, 2007; Sen and Karmakar, 2007]. There is a negative causal relationship between state spending on education and health on economic development in African nations, mostly due to corruption, bureaucratic defects, and underinvestment (Eggoh *et al.*, 2015). The studies made by Kormendi & Meguire (1985) witnessed no relationship between social sector expenditure and economic growth. Education and health are the primary components of the social sector spending for any country. For instance, Gupta & Verhoeven (2001) compared the education and health spending efficiency of 37 African countries with countries from Asia, Europe, and America and found massive inefficiencies for African countries versus others. These inefficiencies result from primarily high government wages and the intra-sectoral allocation of government resources but are unrelated to private spending. In another study, Gupta *et al.* (2002) highlighted that improved access to schools and reduced child mortality were the main concerns of governments in India. Hence, they have pumped significant investment into the education and health sectors. Public expenditure on healthcare facilities protects people from various health hazards, viz., malnutrition, and infant and maternal mortality, and helps in improving the quality of life of people and the development of human resources in an economy (Arora, 2001; Bloom & Canning, 2005; Majhi & Malik, 2018. Esfahani & Ramirez, 2003; Hong *et al.* 2011) argues that public expenditure on transport & communication accelerates economic growth by propagating different socio-economic activities in the most accessible mode. Further, health gain and improving the productivity of the masses through better sanitation and clean drinking water supply bear better results (Purohit, 2014; Pattayat& Rani, 2017). Public expenditure on social security uplifts the educational and health conditions of the weaker and vulnerable sections of society and provides stamina in enhancing their living standards (Ohlan, 2013; Sen &Sahu, 2017). Thus, public expenditure on education, health, and basic economic infrastructure brings a harmonious relationship between social and private interest and enhancement of labor productivity, contributing to the overall development of an economy.

Regarding the cyclicality of social spending, using the sample of middle-income economies, Doytch *et al.* (2010) examined the indicators of economic growth and social sector spending focusing on education and health. They

concluded that expenditure on education was acyclical whereas spending on health was pro-cyclical. But while comparing this result with the high-income countries, the spending on education and health is counter-cyclical. In another work, Del Granado *et al.* (2013) compare developed and emerging countries. The results portray that social spending on education and health is procyclical in developing countries and cyclical in developed countries. The study also indicates that the spending on health and education behaves in an asymmetric pattern i.e., procyclical during good times and cyclical during bad times.

Lucas (1988) regarded skilled and capable individuals as an important element not only in productive activities but also for sustainable economic and social progress. According to the policymakers, the skilled population shows substantial potential to initiate the process of economic growth. A study by Becker, Murphy and Tamura (1990) reasoned that for the uninterrupted development in per capita income, spending on education enhancement proved to be an imperative constituent in almost a hundred countries. Blundell, Dearden, Meghir, and Sianesi (1999) used progress regressions and proved the prominence of a skilled and educated labor force for the economy's efficiency and growth. In the study, education was found to be an important descriptive factor in general and higher education was the most pertinent factor specifically in the case of developed countries. There can be a causal relationship between economic growth and human resource development as evident from the results of the study conducted by Ranis, Stewart, and Ramirez (2000) where economic growth has been significantly influenced by human resource development and substantially robust economic growth paves the way for human resource development. Thus, the importance of education for economic progress through human growth started receiving acceptance and motivated many emerging economies to spend for the improvement and enhancement of the education sector. There is also theoretical literature available to support such a policy (Pissarides, 2000). Douglass (2010) claimed that the scholastic achievement of the people of the country enhances efficiency and global competitiveness. Dukkipati (2010) quoted that for India to maintain its economic growth in a global marketplace fuelled by the knowledge economy, it needs to nearly double the enrolment in higher education institutions by the end of 2012. But lack of required education facilities may transform the demographic dividend into a demographic catastrophe. He projected that expenditure on education; especially higher education expenditure is not at par with the economic progress. Bhatia and Dash (2013) observed that most

of the developed countries which have already accomplished the objective of education all spend considerably a higher proportion of GDP on education while underdeveloped and developing nations are required to expand and improve the resource allocation for the education sector. Musai, Mehrara, and Fakhr (2011) conducted a study on the association between education and the economic progress of 79 countries. According to their study, an increase in expenditure on education and so on the labor force intensifies economic growth. If education is related to economic growth significantly, then ideally, spending on education should be significantly related to economic growth. However, this is not a sufficient condition for growth. There are certain other factors also such as the country's institutional structure which determine whether investments in the education sector will affect growth significantly or not (Ghosh Dastidar *et al.*, 2013) .

Bhatia and Dash (2013) showed that the HDI of India and also the spending on education by the government used to be very low. They suggested that to improve human resource development, education being an essential component, the policymakers should plan for the facility of free education up to graduation level, which directly indicates a huge public expenditure on education. But, the youth of India can become assets only when government invests sufficiently in their capacity building otherwise they will become a liability to society. Shi Mei-ling (2014) used the regression equation and estimated that the income elasticity of individual education outlay as 1.074 and that of health outlay as 1.539, both more than 1 verifies that educating people of the country can greatly promote economic growth. According to the study by Mehdi and Chaudhry (2015), the size of India's workforce will go up by 249 million between 2015 and 2050 and China's will go down by 166 million during that period. Based on this prediction, India can also potentially overtake China in terms of economic growth by 2030, if policymakers get serious about augmenting its human capital. Mallick, Das, and Pradhan (2016) attempted to discover the relationship between expenditure on education and economic growth in 14 major Asian countries. The study employed a comprehensive data set of 14 major Asian countries (Bangladesh, China, Hong Kong, India, Japan, Malaysia, Nepal, Pakistan, The Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, and Turkey) covering from 1973 to 2012. By using panel cointegration tests, the study observed that a long-run relationship exists between education expenditure and economic growth in all the selected countries. Li, Loyalka, Rozelle, and Wu (2017) enunciated that

in China, adequate education was given to almost all the children up to the primary and middle school level with basic maths and language skills along with the training given to them to be meticulous citizens. This was sufficient to build the huge capacity of low-wage, low-skill labor force required for the manufacturing sector, which has driven the growth of China from the 1980s to the early 2000s. But this labor force cannot be considered human capital due to a lack of high skill and innovative aptitude. The authors suggested placing more emphasis on investment in human capital which they consider a more significant driver of the future growth of China.

Although the human capital theory explained the role of education in increasing productivity, the signaling theory of education asserts that education is just a signal of the worker's ability. Both theories work simultaneously. In the case of India, Unni and Sarkar (2012) found that the education levels in disadvantaged social groups are low due to the unavailability of schools in the local region and therefore a large section of the population remains informal labor due to non-accessibility of formal education that is expected to enhance the productivity of the labor on the one hand and provide with a documented proof that signals about the ability of the worker on the other hand. Thus, access to formal education for the masses should be a priority by policymakers to ensure economic growth through human resource development.

6. METHOD

The study uses annual time series data on ten social sector expenditure and economic development variables (such as gross domestic product and per capita income) from 1972-73 to 2019-2020 for India (seeTable 2). The study considers expenditure on education, sports, art and culture, medical and public health, family welfare, water supply and sanitation, housing, urban development, the welfare of scheduled caste, scheduled tribes, and other backward classes, labor, and labor welfare, social security and welfare, and nutrition. We collect data from the EPWRF database.

A battery of econometric techniques for determining the causal relationship between social sector expenditure and economic development in India. The Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) unit root test to test the stationarity. The ADF test is as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Yt - 1 + \sum \alpha_j \Delta Y_{t-j} + \varepsilon t \qquad (1)$$

Table 2: List of Variables

GDPPC	Per Capita Gross Domestic Product
ESAC	Education, Sports, Art, and Culture
MPH	Medical and Public Health
FW	Family Welfare
WSUPSA	Water Supply and Sanitation
HOU	Housing
UDEV	Urban Development
WSCST	The welfare of Scheduled Caste, Scheduled Tribes and OBC
LLW	Labor and Labour Welfare
SSW	Social Security and Welfare
NUT	Nutrition

The null hypothesis i.e. has a unit root, is rejected when the absolute ADF test value is higher than the critical value. It implies that the coefficient is significantly other than zero and thus is stationary or does not contain a unit root. On the other hand, the Phillips-Perron (PP) test is a modified Dickey-Fuller test that corrects autocorrelation and heteroskedasticity in the error term ε_t. One advantage of this test over conventional ADF is it selects lag length by itself. It is given by the following equation:

$$Y_t = \mu + \alpha y_{t-1} + \varepsilon_t \tag{2}$$

Next to determine the optimal lag length the VAR model was used. The optimal number of lag lengths (k) is selected by using the Akaike (AIC), Hannan and Quinn (HQIC), and Schwarz's Bayesian (SIC) information criteria. Lutkepohl (1993) was followed to link the maximum lag lengths (max) and the number of endogenous variables in the system (m) to the sample size (T) using the formula m x kmax=T1/3. After estimating the optimal lag, we estimate the long-run relationship(s) between the variables included in vector Yt, where Yt includes several integrated series at the same level. The long-run relationships between the variables included in vector Yt are estimated using the Johansen Maximum Likelihood approach. Specifically, we denote Yt as a vector autoregressive process of order k (i.e., VAR(k))

$$Y_t = A_0 + \Sigma A_i Y_{t-i} + \mu_t \tag{3}$$

$$\Delta Y_t = A_0 + \pi Y_{t-I} + \Sigma r_i Y_{t-I} + \mu_t \tag{4}$$

where Yt denotes a vector containing social sector expenditure variables and per capita GDP. To examine the long-run relationship(s) among variables under study, Johansen's (1988) (45) test has been established to test for the

existence of cointegration relationships among the eleven variables of the model (r<11). This is equivalent to testing the hypothesis that the rank of matrix *M* in Eq. (4) is at most r. Reduced-rank regression can then be used to form a likelihood ratio test of that hypothesis based on the so-called trace statistic, or the maximum eigenvalue statistic.

Next, to ascertain the direction of causal flows, we employ the Toda and Yamamoto (1995)(46) causality test, as all series under consideration are found to be I(1). The advantage of using this test is, it can be applied in any of the following cases i.e., the VARs may be stationary around a deterministic trend, integrated of any arbitrary order, or co-integrated of any arbitrary order. Although, it is like the conventional Granger causality test but has one superior property i.e., with extra lags depending on the maximum order of integration of the series under consideration augments the results. In this approach, we construct a vector-autoregressive model (VAR) in their levels with a total of (k+dmax) lags, where k is the optimal number of lagged terms included which is determined by AIC / SIC criteria. Thus, if k = 1 and if two series yt and xt have different orders of integration, viz., I (0) and I (1) respectively so that dmax =1, then one extra lag is added to each variable. Thus a VAR with two lags is constructed and we conduct a wald test which follows an asymptotic χ^2 distribution and is applied if the series under consideration are I (0), I (1), or I (2). It can be also considered even if the series is non-cointegrated and/ or the stability and rank conditions are not satisfied, provided "the order of integration of the process does not exceed the true lag length of the model" (Toda and Yamamoto,1995(46)).

7. RESULTS AND DISCUSSIONS

The results of ADF and the PP test (given in Table 3) confirm the stationarity of the study variables. The results demonstrate that no variables in their levels have stationarity, as the test statistics fail to reject the null hypothesis of the unit root test. It indicates that the variables are non-stationary in their level; hence to check them at a higher order of differencing. Therefore, the first difference of the variables was considered and the results reject the null hypothesis of the unit root test at the individual level of significance. The result shows the integration of order one with the first difference of the variables under study.

Following that the variables are stationary in their first difference; we conduct the Johansen Cointegration Test (results reported in Table 4) to check for the long-run relationship between the variables. The results, i.e., the trace

statistics and the max eigenvalues, reflect that the social sector expenditure variables and GDP per capita have a long-run relationship. This result gave us hope for striving towards the study's primary objective, i.e., testing for the hypothesized causality between public expenditure on various social sectors and per capita GDP.

Table 3: Unit Root Test Results

	ADF Test		*PP TEST*		
	Level	*1st Diff*	*Level*	*1st Diff*	*Order of Integration*
GDP	6.25	-3.47**	10.68	-3.36***	I(1)
GDPPC	1.17	-3.24**	6.34	-4.17*	I(1)
ESAC	9.09	-6.26*	10.13	-5.17*	I(1)
MPH	11.76	-3.74**	6.74	-8.24*	I(1)
FW	4.93	-4.94*	10.17	-5.01*	I(1)
HOU	11.27	-4.92*	3.18	-6.89*	I(1)
UDEV	6.06	-6.01*	6.49	-5.83*	I(1)
WSUPSA	0.36	-10.74*	6.44	-3.25**	I(1)
SSW	7.84	-4.91*	8.59	-5.90*	I(1)
LLW	3.26	-3.83**	8.13	-3.67**	I(1)
NUT	2.97	-4.76*	2.46	-4.84*	I(1)
WSCST	5.56	-3.95**	6.61	-3.94**	I(1)
*, ** , *** denotes significance at 1%, 5% and 10% respectively .					

Table 4: Johansen Cointegration Test Results

Null Hypothesis	Trace Stat	5% critical value	Max Eigen Value	5% critical value
Ho: r ≤ 0	1270.56	334.98	283.23	76.58
Ho: r ≤ 1	996.32	285.14	234.70	70.54
Ho: r ≤ 2	764.63	239.24	197.68	64.50
Ho: r ≤ 3	566.94	197.37	165.67	58.43
Ho: r ≤ 4	397.28	159.53	113.96	52.36
Ho: r ≤ 5	278.32	125.62	87.9	46.23
Ho: r ≤ 6	193.39	95.75	71.5	40.08
Ho: r ≤ 7	111.86	69.82	57.1	33.88
Ho: r ≤ 8	62.69	47.86	32.5	27.58
Author's Estimation				

Table 5 presents the results of the Toda and Yamamoto causality tests. It shows bi-directional causality between the per capita GDP and education expenditure. It indicates that India has significantly increased education spending from merely 1% of GDP in 2000 to more than 4 % of GDP by

2019 due to education's importance in growth. It has uplifted the education sector by facilitating access to schools, providing better teachers' training, equipping schools with modern technology, providing students with learning resources, etc. (similar outcomes reported in the work of Sutherland *et al.*, (2010). Further, the study observed a unidirectional causal flow from health to per capita GDP, indicating that safeguarding and uplifting the health conditions of the citizens of the country helps in growth. Although India's growth process has multiplied in the past decades, health expenditure has not grown at the same speed (i.e., 0.36% of GDP in 2000 to 1.145% of GDP in 2019-20).

Table 5: Toda and Yamamoto Causality Test

	F-stat	Prob
GDPPC - ESAC	2.62	0.09
ESAC- GDPPC	17.84	0.00
GDPPC - MPH	0.41	0.67
MPH- GDPPC	13.35	0.00
GDPPC - FW	3.57	0.04
FW- GDPPC	13.82	0.00
GDPPC - HOU	2.89	0.07
HOU- GDPPC	25.48	0.00
GDPPC - UDEV	5.68	0.01
UDEV- GDPPC	6.61	0.00
GDPPC - WSUPSA	6.85	0.00
WSUPSA - GDPPC	5.36	0.01
GDPPC - SSW	0.82	0.45
SSW - GDPPC	10.59	0.00
GDPPC -LLW	13.05	0.00
LLW- GDPPC	21.00	0.00
GDPPC - NUT	9.60	0.00
NUT - GDPPC	5.86	0.03
GDP PC- WSCST	2.51	0.09
WSCST - GDPPC	11.52	0.00

Author's Estimation

Expenditure on other social sectors areas like family welfare, housing, urban development, water supply, sanitation, nutrition, social security, welfare, labor welfare, and welfare of scheduled castes and tribes show a bi-directional causality with GDP per capita. The results suggest that the budgetary allocation of the government of India on the social sector is helping to enhance the quality of life of its citizens and contributing towards social development which ultimately

results in accelerating the development processof the economy. As the causality is bi-directional it can also be said that India's growth is also an impactfulfactor for the government to make expenditure on the social sector, as with economic growth people's income level increases, and demand for better social facilities gets created in the system.

8. DISCUSSION & CONCLUSION

Investment in social sectors makes the labor force more productive, healthy, competitive, and efficient, all of which taken together contribute to higher economic growth. There is a renewed focus on attaining social sustainability to achieve the objective of sustainable growth and demands a greater emphasis on investment in human capital to improve life expectancy, and ensure the availability of human capital with appropriate skill sets to support business activity while in that process also helping to develop innovative capacity and entrepreneurship in the Indian economy in the light of the World Development Report (WDR) 2013 that observed that providing key services like health and education can help create the right jobs while also contributing to improved standards of living and inclusive growth. The use of policies with a focus on strengthening the human resource base is considered extremely relevant for India which is expected to contribute a significant proportion of the global labor force in the coming years. In this Indian context, development initiatives undertaken by planners have been driven by these concerns and are reflected in increasing importance being assigned to the provisioning of social services by the central and state governments since the inception of the Plan era. While there has been a steady increase in the share of social sector expenditure in total plan expenditure, which is noteworthy, total public sector expenditure[1] on important social sector heads remains low when compared with international standards. The combined expenditure of the central and state governments in India on education is just about 2.8 percent of GDP while that on the health sector is even lower at 1.0 percent of GDP. In contrast, countries of the European Union spend 5.5 percent of GDP (from their general government account) on education and 7.5 percent of GDP on health. Canada's public spending on health alone is over 11 percent of its GDP and that on education is nearly 5 percent. India would be the youngest nation by 2030 indicating that the population demand for education would be on the upsurge and that's why government responsibility for providing education facilities would also be on the rise. This demands higher budgetary allocation of at least 6 percent of GDP,

which was kept on recommended by National education policies and various education commissions but never actually incurred more than 4 percent. This lack of financial support can affect negatively the human resource development of our nation which is labor-abundant. The lack of basic education infrastructure is one of the outcomes of such scanty resource allocation to the education sector that not only affects the access to education for all but also the quality of the human resource. Insufficient resource allocation from the central government for education and training is making education a private good in India rather being a public good. Even education is also considered a merit good by various experts and ought to be subsidized or provided free at the point of use so that consumption does not depend primarily on the ability to pay. In India, many are still deprived of education and health services due to the inability to pay for them and that's why HDI is pretty low. Though, the education structure of India is regarded as one of the leading in the world but just not sufficient as per the growing demand. Policymakers, experts, academicians, and researchers are showing concerns about the quality enhancement of education and health services and considering the quality aspect as a crucial factor for the skill gap of human resources. The skill gap hampers employability and raises questions about the education sector, which has taken the responsibility of equipping the youth with the required skills to be a productive part of the economy. In the case of India, not only the quality but the quantity is also an important concern for policymakers.

This study has examined the causal relationship between the social sector expenditure and economic development in India using the data for the period 1972-73 to 2020-2021. This analysis is important for the government of India in its effective resource allocation among different sectors and policy formulation on the implementation of welfare schemes. The results show a significant bi-directional causal flow between GDP per capita and expenditures on education, family welfare, housing, urban development, water supply and sanitation, nutrition, social security, welfare, labor and labor laws, and welfare of scheduled caste and tribes. Hence, to improve the country's ranking in the human development index and poverty alleviation index, optimal management of public expenditure is vital for the government of India.

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