ROLE OF PUBLIC EXPENDITURE IN EXPLAINING THE ECONOMIC AND SOCIAL DISPARITIES ACROSS INDIAN STATES

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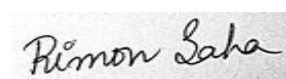THIRUVANANTHAPURAM, KERALA, INDIA

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Declaration

I hereby affirm that this thesis, **"Role of Public Expenditure in explaining the Economic and Social disparities across Indian States",** being submitted as part of the requirement of the Ph.D. Programme in Economics of the Jawaharlal Nehru University, was carried out entirely by myself. I also affirm that it was not part of any other programme of study and has not been submitted to any other Institution/University for the award of any Degree.

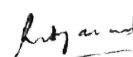Thiruvananthapuram

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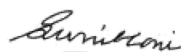
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Certificate

It is certified that this study is the bona fide work of **Ms. Rimon Saha** carried out under our supervision at the Centre for Development Studies, Thiruvananthapuram.

Prof. U. S. Mishra   **Prof. Manmohan L. Agarwal**

Supervisor   **Supervisor**

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Director

Centre for Development Studies

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Abstract

The thesis examines the inter-state disparities in the development outcomes and their progress towards Sustainable Development Goals (SDGs) along with investigating the relation between social expenditures and development in Indian states during 1991-2020 particularly stressing on the impact of such spending on inclusive development and development outcome. It also analyses the pattern of state spending in Human Priority Sectors (HPS) and identifies revenue resources utilised to fund such spending across high and low spending states highlighting the interaction between public borrowing and HPS spending (HPSEx). Moreover, to understand the motive behind development policy and administration of the policies towards inclusive development, we assess the influence of the political environment on state's development. Development here mainly relates to the key human development sectors namely education, health, family welfare and child nutrition and comprises of a select set of indicators representing each sector according to its relevance and data availability. Using the data for 15 major states in India, we find large inter-state disparities in terms of the development indicators and inadequate progress compared to the required progress towards realization of goals/targets conveying a possible failure as regard compliance of the states with the set SDGs given the current pace of improvement. Besides, we find substantial intra-state development disparities across the rural-urban region further dissuading the compliance with SDG. Such an observation evolves out of the verification that despite increased spending by states in these sectors there is no systematic association between HPSEx and the reduction of regional inequality or improvement in development outcomes. In assessment of such association, apart from conventional per capita expenditure, we propose an alternative in terms of the targeted per capita expenditure as these expenditures are expected to cater to certain target population rather than the whole population. While assessing the spending pattern, we find that High Spending States (HSS) are spending almost double compared to Low Spending States (LSS) with growing divergence. Probing further, we find HSS and LSS have substantial difference in the financing pattern of HPSEx, but in general they mostly utilize states' share of central revenue and non-tax receipts to fund HPSEx. However, we find that apart from state spending, the political environment also shapes state development through political ideology as we find centric and left centric states have significantly better performance in the development outcomes compared to others which reveals the significance of political factors in shaping the development of a state as formulation of public policies and its framework of implementation is largely guided by ideologies.

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List of Abbreviations

Sl. No.	Abbreviation	Expanded Form
1.	MDGs	Millenium Development Goals
2.	SDGs	Sustainable Development Goals
3.	LR	Literacy Rate
4.	GER I-XII	Gross Enrolment Ratio, I-XII
5.	GER HE	Gross Enrolment Ratio, Higher Education
6.	AM	Current use of Any Method
7.	TFR	Total Fertility Rate
8.	ANC	Antenatal Care
9.	ID	Institutional Delivery
10.	IMR	Infant Mortality Rate
11.	IMN	Immunization
12.	CS	Child Stunted
13.	CW	Child Wasted
14.	CU	Child Underweight
15.	HPS	Human Priority Sectors
16.	HPSEx	Human Priority Sectors Expenditure
17.	SES	Selected Educational Statistics
18.	NFHS	National Family Health Survey
19.	DLHS	District Level Household and Facility Survey
20.	SRS	Sample Registration System
21.	RBI	Reserve Bank of India
22.	PCE	Per Capita Expenditure
23.	PCTE	Per Capita Targeted Expenditure
24.	HSS	High Spending States
25.	LSS	Low Spending States
26.	FRBMA	Fiscal Responsibility and Budget Management Act
27.	HDI	Human Development Index
28.	GSDP	Gross State Domestic Product
29.	PCGSDP	Per Capita Gross State Domestic Product

CHAPTER ONE
INTRODUCTION

1.1 Introduction

The development disparities across Indian states are a common phenomenon since independence and such disparities have widened over time rather than any kind of convergence in due course of time. Evidence suggests increasing regional inequalities in India during the 1950's (Williamson, 1965) with no signs of the narrowing down of disparities in the following years rather there was an increase in regional disparity over the years (Venkatramaiah, 1969, Rao, 1973 and Nair, 1973). During the period 1961-62 to 1989-90 there was no convergence of Indian states in terms of per capita net state domestic product (Marjit and Mitra ,1996) rather the better performing states were becoming better and there was divergence in per capita income across Indian states over the year (Cashin and Sahay, 1996; Nagaraj, Varaudakis and Veganzones, 1997; Dasgupta et. al, 2000). Along with economic indicators, the story of disparity remains similar for development indicators as well. For instance, there was prominent and increasing inequality in poverty, women health and literacy rate across Indian states during 1985-1996 indicated by the Gini coefficient (Ahluwalia, 2000; Kurian, 2000;).

Given this persistence inter-state disparities, welfare states characterised by substantial social sector spending are assumed to correct these imbalances by redistributive policies based on the principle of social equity (Beckfield et al., 2015; Wilkinson & Marmot, 2003). Besides, social sector spending is presumed to be critical to improve distributional outcome given its long-term positive effects on the human capital, particularly spending on education and health, as it improves human capability (Zouhar et. al., 2021). Moreover, in order to have optimum distributional effects there has to be continuous adequate spending for a reasonable period of time given the nature of the relation between spending and inequality. However, given the series of policy reform adopted over the decades, social sector expenditure fluctuated thus worsening inequality status.

For example, in the 1991 reform package, certain stabilisation and structural adjustment programmes were introduced in an attempt to resolve the economic crisis. And one of the main measures to address the crisis was by compressing public expenditure whose growth in the 1980's leading to large budget deficits was held responsible for precipitating the crisis. Owing to such policies there was an apprehension of reduction of government expenditure in the social

sectors during the reform period accompanied by substantial amount of privatization leading to compromised state provisioning. However, studies reveal that there was no substantial decline in government spending as a whole but the two most vital expenditures namely education and health did experience a declining trend during the early phases of reform (till 1997) (Joshi, 2006). Nevertheless, in 2000 with the introduction of Millennium Development Goals (MDGs) India was prompted to renew the emphasis on social sector development. However, shortly afterwards India introduced the Fiscal Responsibility and Budget Management (FRBM) Act to be implemented by the Indian states in order to maintain fiscal discipline. Given the aim of the FRBM Act to control fiscal deficits, public expenditure did suffer a setback following the policy adoption. So, with a series of policy measures adopted during the post reform period have their own implications that have a bearing on fluctuating social sector expenditure thus disrupting the development process.

However, there was a renewed focus on inter-state disparities with the introduction of the Sustainable Development Goals (SDGs) in 2015. These goals are based on the principal agenda of 'leaving no one behind' and are mainly focussed to attain an inclusive development. India being a member state of the United Nations (UN) is committed to the achievement of the SDGs by 2030. The 2030 agenda for SDGs has 17 goals and 169 targets to achieve peace and prosperity for people and planet in a global partnership (UN, 2015). The SDGs are more universal and inclusive compared to the MDGs introduced in 2000. Since 2001, such universal goals have acquired a new salience in development thinking. Although goals related to public health, can hasten advancement towards complex development goals (McArthur, et. al, 2018), attaining the SDGs will require deep, structural changes across all sectors in society. Moreover, the time bound characteristics of SDGs calls for immediate action to improve health and education, reduce inequality, and enhance economic growth. Such attempts need policy integration across sectors and active participation of governments, and many non-government actors in operationalising the policies on ground towards their effective implementation. This raises the critical question of how to frame development strategies and policies surrounding the 17 SDGs and ensure a smooth trajectory of development of nations. Organizing such strategies not only needs recognition of the complex trajectories of development outcomes but also the capacity for implementation in keeping with the principles of equity and efficiency. To comply with the UN SDGs and to realise the ideal state of India's development requires viable strategies given the development imbalance across states.

1.1.1 India's initiatives and achievement in terms of MDGs

In 2000, MDGs were introduced in a global framework having 8 goals particularly focussing on improvement in education and health, gains in survival with due reductions in poverty and malnutrition. India announced several direct and indirect policy measures over the last decade to achieve the MDGs. Many direct intervention strategies were adopted towards improving community education across all levels. For example, the Sarva Shiksha Abhiyan (SSA) was aimed at universalizing elementary education among children aged 6-14 years whereas the Mid-Day Meals programmes were introduced in primary schools to incentivize children to attend school and arrest drop-out rates. The Rashtriya Madhyamik Shiksha Abhiyan (RMSA) was launched to enhance quality of secondary education and provide universal education for all children between 15–16 years of age. On the higher education front, Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs) and many central universities were set up in recent times to better the quality and reach of higher education.

Apart from policies aiming to improve education, India also introduced numerous policies for progress in community health. In an attempt to reduce infant mortality, child mortality, improving maternal health and contending deadly diseases, India adopted policies such as the National Rural Health Mission (NRHM) designed to reduce mortality rates. It aims to provide universal access to public health services and prevent deadly diseases. Furthermore, the Pradhan Mantri Swasthya Suraksha Yojana was launched to reduce the regional imbalances of the public health services with a special focus on vulnerable states. Again, the Janani Suraksha Yojna (JSY) was announced to promote institutional deliveries ensuring safe delivery and reduce maternal mortality. Other health policies such as the Rashtriya Swasthya Bima Yojana (RSBY) along with the National Urban Health Mission (NUHM) and the Ayushman Bharat Mission have been launched to increase universal access to health care. India also launched various policies focusing on holistic child development such as the National Policy on Children, the National Policy on Early Childhood Care and the Education and Integrated Child Development Services (ICDS). Accompanying direct education and health policies several other indirect policies were put in place to enhance community education and health such as the Nirmal Bharat Abhiyan (NBA), the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) for rural areas, the Jawaharlal Nehru National Urban Renewal Mission, the Valmiki Ambedkar Awas Yojana (VAMBAY), the Right of Children to Free and Compulsory Education Act, the Food Security Act and many more.

All these measures were taken with an expectation to improve India's development and fulfil the MDGs by 2015. Proper implementation of such policies is likely to ensure better educated and healthier population in future. With such extensive set of programme intervention targeted towards realization of MDGs within a stipulated period of time, it is to be noted that India made significant progress towards achieving MDGs. For instance, India made substantial progress in universalizing primary education, it had net enrolment ratio as 88.08% in primary education for the year 2013-14 and literacy rate for 15-24 years old as 86.1%. at the national level. However, the equality of primary education remains a chief concern as large numbers of children are still remaining out of school and a majority of them belong to backward class and rural areas.

In case of combating hunger and poverty we observe that Poverty Head Count Ratio (PHCR) reduced from 47.8% in 1990 to 21.9% in 2011-12 which can be attributed to interventions such as MGNREGA and NRHM. Nevertheless, India still has large section of population as close as 270 million (in 2012) citizens living in extreme poverty. But reduction in poverty was the only MDG that India achieved. With regard to undernourishment, India's progress was slow and unsatisfactory. In 1990, 53.5% of all Indian children were malnourished which declined to 40% in 2015 which was substantially below the target of reducing malnourishment to 26%. Although India was successful in reducing Under Five Mortality (U5MR) from 125 per 1,000 live births in 1990 to 49 per 1,000 live births in 2013 but survival risk is still higher for the vulnerable communities having very little access to reproductive and child health services. The situation becomes worse when accompanied by inequalities. For example, IMR is lowest in Kerala (12) and highest for Madhya Pradesh (54) having a difference of 42 which deters the attainment further.

On maternal health front, progress seems slow and off track. For instance, the decline in India's MMR from 556 per 100,000 live births in 1991 to 167 per 100,000 live births in 2009, while substantial, was far from the target of reducing it to 139 per 100,000 live births by 2015. In this regard, India faces the critical challenge to improve maternal health due to the large scale of undernourished expectant mothers. However, we notice a significant rise in the institutional delivery and deliveries by skilled personnel, institutional deliveries increased from 26% in 1993 to 72% in 2009 and deliveries by skilled personnel have amplified from 33% to 76.2% during the same period. It is believed that the Janani Suraksha

Yojana (JSY) a conditional cash transfer scheme has significantly contributed to increased institutional deliveries[1].

The progress, though notable, was unsatisfactory with respect to the international level, for example, East Asia, Latin America and the Middle East and North Africa fared better compared to Sub-Saharan Africa and South Asia, and within South Asia, India was observed to lag behind in complying with the MDGs (Agarwal, 2017). Besides, the progress was also very uneven. For instance, development indicators of states like Kerala are comparable to those in high income countries whereas Bihar's development is worse than many low-income countries. Given such developmental imbalances across Indian states the overall progress in terms of MDGs are highly misleading. Such uneven progress within India remains a major concern, especially in the era of SDGs which is framed with a central idea of inclusive development and popular agenda of "leaving no one behind." India being the signatory of the SDGs and its commitment towards timely achievement of goals shall frame strategies and policies which enables comprehensive development reducing inequalities as inequalities can deter the attainment of SDGs (The World Social Report, 2020).

1.2 Review of the Literature

1.2.1 Development imbalances within India

Similar to any other developing nation, India manifests development imbalances across many facets and is plagued with increasing disparities. Development outcome are widely different within India despite its betterment since independence. It witnessed increasing regional inequalities in terms per capita income during 1950s (Williamson, 1965) with no evidence of narrowing down of such disparities over the years (Venkatramaiah, 1969; Rao, 1973; and Nair, 1973). Rather we witness growing divergence of per capita income across Indian states (Cashin and Sahay, 1996; Nagaraj, Varaudakis and Veganzones, 1997; Dasgupta et. al, 2000). For instance, Marjit and Mitra (1996) based on the data for state per capita income for the period 1961-62 to 1989-90 observed no evidence of convergence for Indian states in terms of per capita net state domestic product; rather the richer states are becoming richer with time leading to increasing divergence. The persistence of uneven regional growth even after four decades of independence along with increasing regional inequality for the period 1950-1990 was observed

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[1] All information regarding the India's progress towards MDGs is collected from official website of UNDP
https://www.in.undp.org/content/india/en/home/post-2015/mdgoverview.html

(Prasad, 1988). Further during the post-reform period too, i.e., 1991-2012, India witnessed presence of wealth inequality and increase in the concentration of wealth among the top 10%, particularly after 2002 accompanied by rising annual growth rates of assets in favour of the top-most deciles (Anand and Thampi, 2016). This led to wealth concentration in the hands of the top 1% households, as reported by Tagade et. al., (2013), 75% of the total wealth is concentrated among the top 20% households in contrast to 3.4% being owned by the bottom 40% households during 2013. Along with state per capita income and wealth, the story of disparity remains similar in terms of other development indicators as well. We observe considerable increase in inequality and varying improvement in situation of poverty, women health and literacy rate across Indian states during 1985-1996 (Ahluwalia, 2000; Kurian, 2000;). At the same time, the increasing regional disparity in per capita consumption expenditures during 1983-94 became stable during 1993-2000 (Dholakia, 2003). Although we experienced the presence of regional disparity with regard to per capita consumption expenditures, the disparities have gradually narrowed as regard literacy rates, and drop outs in primary education.

Not only has the inequalities and disparities persisted between regions in India but also it is displayed across different social groups such as gender, religion, caste and class. We find gender inequality in terms of access to health, education, and employment. Given India's cultural framework (Menon-Sen and Shiva Kumar, 2001), a girl child receives less nurturing and care compared to a boy child and thus is more susceptible to disease and infections having poor health and lower life expectancy (Chand & Mehrotra, 2012). On education front, males having higher access to education (Vecchio and Roy, 1998) consequently have a higher literacy rate, 82.14%, compared to the female literacy rate of 62.46% (Census of India, 2011). Besides, conventional social practices based on religious or cultural standpoint, keep women away from engagement in paid economic activity resulting in lower participation in the labour force compared to their male counterpart.

Apart from gender inequalities, India experiences inequalities on the basis of caste and religion as well. The presence of inter-caste and inter-religion inequalities has been a consistent phenomenon in India. For example, Das (2002) observed large differences in earnings across socio-religious groups. Although inter-caste differences in earnings have reduced during 1987-1999 but disparities have increased between Muslims and non-Muslims. Moreover, lack of acceptable employment opportunities pushes the educated under-privileged class to undertake

low status employment fuelling the social inequalities further (Das, 2002). The disadvantaged groups namely Scheduled Castes or Scheduled Tribes have substantially lower wealth when compared with the forward caste groups whereas the Other Backward Classes and non-Hindus are located in the middle-income group. However, during 1991-2003, relatively well-off group strengthened their position in terms of wealth further weakening the process of inclusive development.

Such differences across the nation and community are unjust and unfair which in turn can increase social ills weakening social bonds among people. These imbalances have the potential to trigger social unrest and threaten political and economic institutions at large along with deterring the achievement of SDGs. So, the ideal means to address the social evil in a welfare state like India is to intervene in the natural capitalistic way of development since a large section of population is dependent on state provisioning of the basic services.

1.2.2 Public spending and inclusive development

Although India is committed to inclusive development and redress all forms of inequality but the extent of inequality is deeply rooted in its social construct that defeats honest attempts to rectify it. The hierarchical conception of society has been rehearsed time and again for a very long time. To address such profoundly ingrained inequalities, rigorous government intervention is needed. Public expenditure as a policy tool is expected to be critically important in promoting inclusive growth given its short run as well as long run effects on the income distribution and development disparities. For example, direct cash transfers or incentives to encourage the usage of public services has an immediate effect in mainstreaming the marginalised groups. Programmes such as Mid-Day Meals were able to increase the gross enrolment ratio in elementary education; other policies such as the Janani Suraksha Yojana increased the institutional delivery. Such targeted polices reduce income poverty and inequality directly in the short run by increasing access to valuable public services. However, in the long run spending on social sectors such as education and health improves the quality of life and can increase equality of opportunity if targeted to the people most in need. With proper targeting, social spending can bring about improvement in distributional outcomes by enhancing the human capital of children from disadvantaged backgrounds. It can also upgrade the employability of people from backward class thus improving their living standards and reducing poverty.

Recognizing the distributional impact of expenditure, there have been several governments attempts to decrease disparity by adopting pro-poor polices across social sectors. To combat regional inequality and achieve the desired income distribution there was continuous state intervention in the form of progressive tax policy and poverty alleviation programmes. Such interventions are intended to achieve balanced growth by implementing pro-poor federal transfers. Towards judicious execution of such transfers, two bodies came into existence one is the planning commission and other is the finance commission. Among these two commissions, the finance commission was being set up following Article 280(3) (a) and (b) of the Constitution and seeking to reduce vertical imbalances of resources and expenditures between the centre and the states and also to decrease the disparity of state level income and development. Despite the centre to state transfers Ghosh et. al (1998) observe that disparities in the income level were still increasing. Although the states with lower income are receiving more development resources compared to states with higher income indicating that the government had channelized its resources to reduce the horizontal imbalances across Indian states but the results were mixed and far from satisfactory. For instance, with regard to health sector, pro-poor public health expenditure has proved beneficial for Bihar to bring down the regional differentials but for West Bengal it remains inconsequential as observed between the two rounds of NSS (Bhadra, 2015). Although the resource transfer is progressive in nature and there is due effort by the central government to correct the imbalance among the states, the transfers to poor states are not adequate to maintain the resources and other productive assets already created (Prasad, 1988). On a positive note, Cashin and Sahay (1996) cited that convergence in the real per capita for the period 1961-91 was due to greater grants to poorer states compared to richer ones. We see that centre state transfers[2] have only been partially successful in reducing the economic and social disparities across states. Thus, despite systematic interventions, the persistence of disparities makes a case for enquiring into

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[2] The central assistance through the federal transfer is dependent on both planning and finance commission's recommendation as well as the financial status of states. Finance Commission in general make recommendations for the devolution of revenue resources according to the state budgetary gaps arising from existed resources and committed expenditure. In majority of the cases, the state expenditure on the revenue account in development sector is conditional upon already existing capital investment/establishment which needs revenue expenditure for its operation and maintenance. Given the pre-requisite of revenue expenditure, perhaps the developed/richer states have an edge in reporting higher needs of revenue expenditure compared to the poorer states who are yet to build the operational establishments. Besides, the negotiatory position of certain states might be better on account of similar political affiliations with center fetching them more central assistance and support. So, even though the federal transfers are supposed to be balancing device across states but the pre-requisite of having establishment to present budgetary gaps and transfer of funds under revenue account, may put the developed states in a favorable position than the poorer states.

alternative reasons behind the observed divergence. This raises the question of the effectiveness of the public expenditures policies to influence the development at large. Especially when redistributive impact of public expenditure is lower for developing countries compared to advanced countries given the differences in levels of development, scale and composition of spending. Thus, if there is no effective and efficient state intervention in social sectors then the inter-state disparities will rise dissuading all attempts to realise inclusive growth. This offers a basis for understanding the impact of spending on the development outcomes as well.

1.2.3 Development response of public expenditure

Knowing the importance of public spending on social sectors, India has increased its government spending since independence, particularly raising the social sector expenditures during the 80s for education, health, social welfare and housing and community services. Such expenditures grew at the rate of 7.7% per annum in constant prices. Furthermore, state social expenditures grew steadily at 7 to 8% in real terms where growth of central expenditure grew at 10.8% in the 80s in contrast to their decline at an annual rate of 2.6% in the 70s (Rao and Tulasidhar, 1991). Compared to 1980s share of social sector expenditures on health and education increased as a share of total expenditure in 1990s and 2000s and states exhibit a potential spending of about 80% to 85% of all expenditures on social sector schemes (Ramakumar, 2008). On examination of social sector expenditure (mainly social services and rural development schemes) in the central and state budget from 1990-91 to 2000-01, we notice that although there was no significant increase in social sector expenditures as a share of GDP but social expenditure as a share of total public expenditure increased in the mid-90s compared to the 80s. During 90s health expenditure as a percentage of GNP showed no significant change, and, education expenditure as a percentage of GNP showed a decline from 4.1% in 1990-91 to 3.8% in 1998-99 (Dev and Mooji, 2002).

The increased social spending and unsatisfactory development outcome in case of India renews the long unresolved debate of the capacity of public spending and its bearing on growth and development. The association between public expenditure and growth is extensively discussed in the economic literature but the debate of beneficial growth effects of public expenditure is far from settled. From a historical perspective, the classical economists were critical about the government's role in any general economic activity; and believed that the state is only there to keep people's political organization intact. They discarded the idea of public expenditure altogether thus dismissing its significance in generating economic growth. Later, with

evolution of Keynesian economic thought in the1930's public expenditure gained acceptance, in the context of stabilisation of the national economy. Since then, there is initiation of many growth theories adding to the growing body of literature that recognizes the effect of public expenditure on economic growth (see for example, Prebisch, 1963; Nurkse, 1971; Kormendi and Meguire, 1985; Romer, 1986; Lucas, 1988; Grier and Tullock, 1989; Barro, 1991; Levine and Renelt, 1991; Rebelo, 1991; Mankiw, Romer, and Weil, 1992; Barro and Lee, 1993; Fischer, 1993; Barro and Sala-i-Martin, 1999 and Rosenstein-Rodan, 2010). Modern economists argue that public expenditure is vital to achieving the social goals and to attain maximum social welfare. Economic resources get translated into the growth and development of the country mainly through government activity. Apart from spending on health, education and physical infrastructure, government expenditures also have a positive spill over by crowding in private investment thereby resulting in long term economic growth (Arrow and Kurz, 1970; Barro, 1990). Given the public good characteristics of non-excludability and non-rivalry, public expenditures have the potential of external effects that may enhance economic growth (Romer, 1986; Barro and Salai-i-Martin, 1999). However, there are other studies that remains doubtful of the efficiency of public expenditure and its due credibility in attracting private investments and dispute whether crowding in of private investment occurs and hold the view that public expenditure may not have positive growth effects (Khan, 1996; Devarajan, 1996).

Researchers have studied the effect of public expenditure on growth and development in India mainly using the growth accounting model. Hong and Ahmed (2009) using data on 14 Indian states for the period 1990-2002 observed that public expenditure has a large, positive and significant impact on per capita GDP growth and the share of spending on social public goods such as education and health contributes significantly towards poverty reduction. Expenditure reduces poverty via direct programmes meant for poverty reduction and also influencing education, health and other factors of human capital. It is also found that spending on higher and 'other education' reduces poverty by opening up more income earning opportunities but spending on elementary and secondary education has negligible or marginal impact on poverty as India has already invested huge sums of money on these two sectors of education (Jha, Biswal and Biswal, 2000). Human development is not only a dividend of public expenditure on human capability sector but also benefits from economic growth though the intensity of the two could be of different kind. On this question, Gopalakrishna and Rao (2012) found that public expenditure has a larger effect on human development compared to economic growth

based on an empirical inspection of 15 major Indian states for the period 1981-2005. Another observation made by Mohanty and Behera (2020), offers evidence on the positive impact of increasing public health care expenditure across Indian states on infant and child mortality rate, incidence of malaria cases along with life expectancy and immunization coverage. Although we have certain encouraging pattern of positive influence of public spending, the impact of public expenditure on growth and development indicator per se is not explicit and depends on a whole host of other factors such as efficiency of spending, leakages, targeted spending and so on.

An efficient spending involves the recognition of demographic composition since demographic structure of a population offers considerable insights regarding the differential need of various population segments. This feature is unique for each country and plays a significant role in shaping an economy (Cruz and Ahmed, 2018; Birdsall et. al., 2001; Kelley, 1976b ;). While population is fast ageing in the developed world (Mason, 2005), developing countries like India have more than 50% of the population in working age group with a reasonably low dependency ratio in present times (Mody and Aiyar, 2011). Such a difference in the structure and composition of the population has its own bearing on the varying needs and demands across populations. A country where population is ageing is expected to focus its public policies towards pension, medical care and long-term care as against countries with a substantial share of young population who may seek more resource allocation in education, employment opportunities and so on. As public provisioning is meant to ensure better well-being, it becomes imperative to recognise the needs and demands of the population based on its age composition and the policy derivatives thereof. The population demography therefore should form the basis of appropriate budgetary allocation.

Apart from age composition states should also emphasize in spending according to the need and demand of the population given the structural differences across the states which in turn determines the efficacy[3] of the development production function i.e., to generate certain level of development status some may require very little amount of public services compared to others. Moreover, the expenditure function might be different across states depending on population preference and demands (Hitiris and Posnet, 1992) and we must notice that the

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[3] Efficacy of expenditure can be related to various factors such as better administration of services, less leakage of public spending, assured quality service, less corruption and so on, which majorly depends on the structural differences across states. So, with difference in structural framework, it is highly likely to witness differences in the efficiency of development production function.

impact of the public spending also depends on the composition of the spending (Filmer and Pritchett, 1999). Besides, public expenditure follows a non-linear relationship i.e., the size of spending must be of certain threshold level to affect the outcome variable (Mondjeli, 2015), thus, if the spending is inadequate then it's unlikely to improve the outcomes as expected. So, substantial amount of public spending is important to influence the developmental outcome and India's spending on social sector remains inadequate compared to the international level as her spending capacity is constrained by revenue generation on one hand and other economic and political compulsions on the other.

1.2.4 Factors augmenting state spending on social sectors

The interplay of growth and development conditions to augment public spending is well documented in the literature. For example, Singh and Sahni (1984) using data relating to India for the period 1950-81 found that there is a two-way causality between state per capita income and public expenditure given the feedback mechanism between these two components. But there is difference in the lengths of the reciprocation time; growth in public expenditure takes longer time to reflect in growth of national income than levels of national income shaping public expenditure. Again, it can be presumed that the increase in the per capita income is immediately reflected in the growth of expenditure in education and health. However, social sector expenditure is not only determined by the growth and development conditions alone but also shaped by political factors.

The political environment of a state along with consciousness of citizenry plays a prominent role in social sector spending. Such a political environment comprises of variables such as nature of political party in power and ideology of the government that plays out in the decision of fiscal policies. For example, multiparty governments seem to spend less on public goods compared to single party in power since single party governments are more capable of fiscal adjustments programmes compared to multiparty governments and have greater likelihood of having a consensus and enforcing policy decisions. In this context Chaudhuri and Dasgupta (2006) demonstrate the fall in development expenditure in case of coalition governments but on the contrary Lalvani (2005), Dash and Raja (2013), and Dash and Raja (2014) argues that fragmented government spends significantly more in the development sector compared to single majority government in case of Indian states. Besides the nature of the party, political ideology of the party in power also plays an important role in allocation of spending. Apart from party characteristics, politically aware citizens also play an important role in augmenting

public spending specially in a democratic set up like India. Nooruddin and Simmons (2015) point out that rise in voter turnout augments the provision of public goods and reduces the supply of private goods. But the impact of voter turnout is conditioned by the nature of the political party. If the turnout rates are very low then party fragmentation reduces developmental spending, whereas if the turnout rate increases, then it interacts with the party fragmentation positively to improve social spending. However, the most important determinant of the spending pattern is the level of receipts of the state with the challenges in revenue generation to finance social sector spending particularly in developing country settings.

The capacity to fund social sector expenditures is constrained by government income sources such as revenue, borrowings and grants from centre and other sources. But all revenue resources do not affect the development expenditure in similar way, as Pinaki (2008) stated revenues facilitate development spending while increase in borrowings reduce social sector expenditures (Lora and Olivera 2007). But central transfers lead to increase in state's total expenditure (Chakraborty, Mukherjee, and Amarnath 2009) since states are largely dependent on central fund given India's federal set-up. However, if centre increases the off-budget expenditure on Centrally Sponsored Schemes which are essentially meant to aid development then states readjust their development spending which ultimately appears in shrinking of state's developmental expenditure. Nevertheless, the positive causal relation between revenue and expenditure is widely documented in literature, for instance, Friedman (1978) and Buchanan and Wagner (1977, 1978) have publicized that an increase in government revenue increases government expenditure. Blackley (1986), Ram (1988), Bohn (1991) and Hoover, and Shefrin (1992) advocated that an increase in government revenue results in increase in government expenditure in the case of United States of America. Similarly, for countries like Colombia, Ecuador and Guatemala, Ewing and Payne (1998) find evidences of significant positive impact of incremental revenue towards expenditure. However, the source of financing the expenditure has significant implication on the interplay of expenditure and development. For example, Barro (1990) explains the effect of tax financed government expenditure on production, he discusses that the saving rate and the growth rate initially increases with the productive government expenditure and then declines. The government spending can give rise to both higher and lower economic growth depending on the financing of the expenditure. To finance government expenditure, it needs to collect tax which in turn distorts the efficient resource allocation thus lowering growth rates. Another explanation offered by the supply side theories to explain the negative growth effects of public expenditure focuses on the biases of tax

collection against investment; i.e., a country whose tax structure has bias against investment and levies high corporate income tax, will have lower economic growth with higher government expenditures. Since higher tax collected for financing higher public expenditure will deter investment thus lowering the growth of the economy. Besides, to finance these expenditures the income tax increases, thus, leaving a lower return in the hands of the investors for the investment they made. So, the investors under this type of circumstances have less incentive to invest resulting the rate of growth of the economy to slow down. Thus, state government should strike a balance in choosing appropriate financing of public spending and be extremely cautious not to dampen the growth and development in the process. Along with other factors development is largely conditioned by the implementation and administration of the policies which is majorly driven by the political environment of the state.

1.2.5 Political factors and development imbalances within India

Implementation of public policies as a manifestation of political ideology play a crucial role in explaining economic progress (Kohli, 2006) and human development trajectories (Joshi and McGrath, 2015). Political variables are found to be potential attribute in shaping government policies (Dash and Raja, 2013) thus influencing holistic development (Dash and Mukherjee, 2015). The ideological differences across parties have been one of the primary sources of departure in public policy (Ganguly and Mukherji, 2011). For example, left wing parties encourages socialism adopting more of egalitarian development strategy while right-wing parties advocate for neoliberal capitalism (Noël and Thérien 2008; Joshi and O'Dell 2013). Left parties prioritise achieving a high degree of equality by improving human development such as focusing on education and health whereas political right agues in favour of improving human capacities and social achievements through material incentives and technological innovations. Moreover, the relationship between political determinants and human development become complex in case of politically fragmented countries, which give rise to a diverse array of ideologies and public policies. For instance, India, largest democracy in the world is politically fragmented at state level by distinct ideologies of regional and national political parties. India having a multi-party electoral system, government at the state level is formed by different national and regional parties having their own unique political ideologies. Thus, at state level political ideologies differ significantly in accordance with the party in power, for example leftist political parties have prominent presence in Kerala's politics, whereas Gujarat experience the influence of right-wing parties.

Ideologies are basis of competitions over providing plans for public policy (Freeden, 2003) and influences public policies at large. Such distinctly different public policies driven by ideologies may generate dissimilar level of human development across states. Besides, in a democratically elected political system, the ruling party at state level enjoys considerable power to affect the development of the state and its subject, so, any ideological disagreements across states may be a key source of development imbalances.

Apart from political ideology, other political factors, such as strength of the government, government stability, and political experience of the leaders, also could play crucial roles in the process of holistic development. Strength of the government can be defined by a single-party government and a coalition government, single-party government is considered to be stronger government compared to coalition government since well-supported governments are involved in sustainable decision-making, and attach more weight on the future costs of their decisions compared to coalition governments (Grilli et al. 1991). And regarding government stability, say, if the government is re-elected it will supposedly continue with similar public policies whereas change in government leads to change in public policies. So, if the party remain in power for longer years, continuation of a stable set of public policies could facilitate better holistic development of the state (Dash and Mukherjee, 2015). Even political experience of the leaders can positively influence the development of the state as experience politicians have better knowledge and understanding of the implementation of the public policies and intricacies related to public administration. Thus, policy framework and implementation to develop a state is largely driven by the political environment of the state.

1.3 Analytical Framework-linking between public spending and development

Figure 1.1: Interaction of public spending with development process
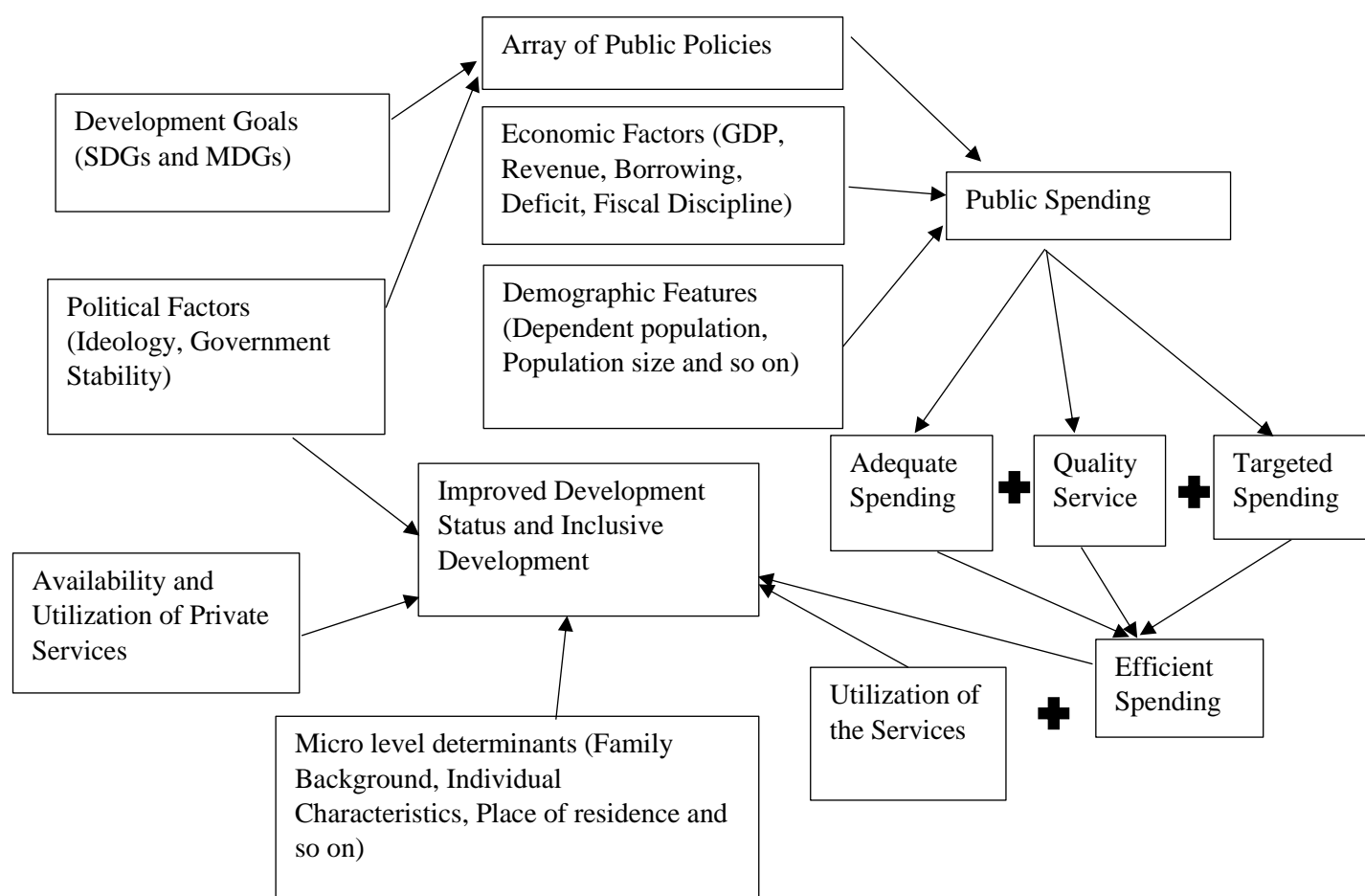
Source: Author's preparation based on literature

As mentioned earlier, the linkages between state spending and development are not straight forward or direct rather their interaction is complex and depends on several other factors. The above schematic diagram (figure 1.1) explains the process of development with regard to public spending and political environment. The complexities can be briefly summarized as an amalgamation of three interactive process with regard to our study, first, the interaction between political factors, commitment towards international goals and framework of public policies, i.e., the public policy frame work is driven by certain political factors such as ideology of the ruling party, stability of the government and so on. Public policies are also framed to comply with development goals currently SDGs or any other targets that needs to be achieved either at local level or state level. The second interaction is between the public spending and the public policies along with economic and demographic factors. These all together decides the amount of spending that the states can incur in the development sectors, however, the

relationship between state spending and the factors mentioned are empirically inconclusive which leaves the scope for further investigation. Thirdly, the interaction is between the spending and the development of the state which is complex given numerous underlying conditions. For instance, merely increasing public spending may not guarantee development rather we need efficient public spending that has better returns to development. However, there is no consensus regarding the impact of public spending on the development outcome empirically. Again, to spend efficiently it is important to spend adequately, target to the groups who are in need or spend according to the population size of direct beneficiaries along with ensuring the quality of the services. However, efficient spending must be accompanied with utilization of the provided services by the citizens to increase the likelihood of effect of expenditure on inclusive development of the states. Apart from spending, development of the states is also depended on the usage of private services, political motivation of the service, administration of the policies and several other micro-level determinants such as family background (caste, class, religion), place of residence, individual characteristics (education, age, gender etc.), which also has the potential to impact the utilization of the services. So, inclusive development and improvement of development parameters itself is a complex process with multifaceted interaction through numerous factors where efficient public spending is one of the crucial tools which act as a catalyst of the process given certain political environment. However, given the empirical inconsistencies at various interaction level it probed us to investigate the issue attempting to resolve the confusion.

1.4 Rationale and Objective of the study

Development imbalances is an important issue and recognizing the extent of it is vital to frame workable strategies and policies so that no one is left behind in the development process. It also requires that policy tools be used effectively and efficiently to achieve the SDGs within the stipulated time. In this regard, we notice an impressive overall progress in India towards the MDGs but the progress was uneven and non-inclusive with presence of high inequalities across region and social groups. Acknowledging the merit of government intervention to correct imbalances, India has been using several expenditure policies to combat such social evil. But the matter of concern is, despite such dedicated initiatives India is still far behind the goals which give rise to the question of efficiency and effectiveness of such policy initiatives. Besides, the development of a state depends on several other factors such as the pattern distribution of the public services among the citizens, extent of utilization of the public services

given its adequate provision, quality of public services, private expenditure on such services, and so on. For instance, free education is not universal at all level of education in India, and even if it is available is only availed in the elementary level. Especially absolutely free education above school level is mostly non-existent as free education means relieving only the tuition fees, thus, households from all income quartile bear a significant amount of expenditure on education (Bhattacharya, 2012). Similarly for the health sector also people mostly rely on private health care services compared to the public facilities, for instance, private share of health care spending in India is around 70% and even poor people spend almost 15% of their monthly income for medical treatment (Barik and Arokiasamy, 2016). So, the enhancement of the states' development is a product of both public as well as private expenditure and several other factors. Thus, it is important to understand how much public spending on these sectors contributes to the development status of the state given its limited usage and inadequate provision. Moreover, India's social spending is constrained by the limited capacity of revenue generation along with other economic and political factors. In this context it is important to find the factors which augment the public expenditure in the priority sectors and identify the revenue sources utilised to fund such expenditure. Apart from fiscal policies, active participation and inclination of the government for proper implementation of the policies are much needed in order to achieve inclusive development and such inclination is found to be mostly driven by political environment of the state. So, there is a need to study the influence of the political environment of the state on its development trajectories to understand the aim of the policies along with the nature of policy administration.

However, despite the growing concern about the development imbalances within India, there is no systematic study which addresses the state wise disparities and progress of the states in terms of SDGs or discusses the impact of the political environment and government intervention through public expenditure tools on development. Besides, no study has methodically identified the financing pattern of state spending on education and health sector despite large consensus regarding the limited resources constraining public spending.

Given this background and India's commitment towards the SDGs whose central theme is to promote inclusive development, it is pertinent to study the development trajectories within India while acknowledging the differential improvement of the Indian states and also find viable strategy to achieve the SDGs within the stipulated time. In this context, we attempt to examine the development disparities within India and identify the means to reduce such

disparities while recognizing the underlying intricacies of development trajectories across India particularly for health and education sector. This exercise will benefit the policy makers to realize the complexities involved with the development process and assist them to frame a workable strategy to achieve SDGs on time. The research objectives are stated as follows;

Research Objectives:

1. To examine inter-state disparities in education and health attainments along with assessing the progress of the states towards SDGs
2. To analyse the impact of state spending on regional inequality and development with regard to education and health indicators
3. To identify the pattern of state spending on Human Priority Sectors and recognize the financing pattern of such expenditure
4. To recognize the influence of political environment in improving the education and health indicators

1.5 Data sources and Methodology

To examine the development imbalances across states we considered four key human priority sectors such as education, health and other health related sectors namely family welfare and nutrition. We choose certain indicators to represent the development of these sectors as per their data availability and its bearing on the achievement of SDGs along with relevancy to the sector. For education sector we consider, literacy rate, gross-enrolment ratio for class I-XII, and gross enrolment ratio for higher education. Under family welfare we considered usage of contraceptive methods, total fertility rate and usage of maternal health care facilities such as antenatal care and institutional delivery. Infant mortality rate and immunization is considered to measure the improvement of health sector while child nutrition such as stunted, wasted and undernutrition is gauzed to understand the progress of nutrition indicators.

The information on education indicators is collected from Selected Educational Statistics published by Ministry of Human Resource Development, Government of India and data on Literacy rate is availed from the state level reports published by National Sample Survey Office. The data for infant mortality rate and total fertility rate is being collected from Sample Registration System Bulletin, and for other indicators we used state level reports from National Family and Health Survey (NFHS) and District Level Household and facility Survey (DLHS).

NFHS has four rounds of survey during 1991-2016, namely in 1992-93, 1998-99, 2005-06 and 2015-16 whereas DLHS was carried for the year 1998-99, 2002-04, 2007-08 and 2012-14. Both the surveys are conducted by International Institute of Population Sciences (IIPS) and based on similar sampling procedure. The survey follows a multi stage, self-weighted sampling procedure. Both are large scale, representative survey of the entire population of India and comparable at state level (Dandona et. al, 2016). Table 1.1 lists the selected indicators under each sector along with its data sources.

Table 1.1: List of Education and Health Indicators considered in the study

Indicators	Data Source
Education	
Literacy Rate (LR)	SES
Gross enrolment Ratio, I-XII (GER I-XII)	SES
Gross enrolment Ratio, Higher Education (GER HE)	SES
Family Planning and Maternal Health Care	
Current use of Any Method (AM)	NFHS, DLHS
Total Fertility Rate (TFR)	SRS
Antenatal Care (ANC)	NFHS, DLHS
Institutional Delivery (ID)	NFHS, DLHS
Child Health and Nutrition	
Infant Mortality Rate (IMR)	SRS
Immunization (IMN)	NFHS, DLHS
Child Stunted (CS)	NFHS, DLHS
Child Wasted (CW)	NFHS, DLHS
Child Underweight (CU)	NFHS, DLHS

Note: SES, NFHS, DLHS, SRS refers to selected educational statistics report, national family health survey state level reports, district level household and facility survey, sample registration system bulletin.

India being a federal country it is important for states to individually adopt strategies and measures to enable the development and achievement of the SDGs. Therefore, it becomes ultimately the state's responsibility to allocate adequate resources to the human priority sectors. Thus, we consider state spending to analyse impact of public spending on the development outcome. Data related to state spending on education, health, family welfare and nutrition are being obtained from Bulletin published by the Reserve Bank of India (RBI). State spending on each social sector includes both recurring and non-recurring expenditures obtained by adding revenue expenditure, capital expenditure and loans and advances for that sector. To understand whether the state spending is in keeping with the demographic composition of the targeted population we use data from the Census for information on population structure and normalise state spending with the same.

However, given the inadequate spending we find the financing pattern of state spending on the human priority sectors (HPS) by identifying the revenue sources impacting the pattern of expenditure. To understand the contribution of different sources of revenue to the enhancement of expenditure in HPS, we collect data on various state receipts from RBI Bulletin. We gather information on revenue and capital receipt and disintegrate the revenue receipt further to tax and non-tax receipt, states' revenue and states' share of central revenue. Besides, to examine the impact of public borrowing on HPS spending, we use outstanding liabilities of states to represent the public debt, and we collect the information of outstanding liabilities from RBI Bulletin.

Lastly to analyse the influence of the political environment on the development of a state we collect information on political variables such political ideology, strength of the government, government stability, and political experience of the leaders. Regarding political ideology, all parties are codified following the ideology codification of the Dash and Raja (2013) paper. They codified the party according to the party objectives and policies that they subscribed to and applied over the years. The ideology scale ranges from point 1 to 5 and the value stands for a precise position of a party's ideology. For instance, right wing party is coded 1, right-centric party is coded 2, centric party is coded 3, left-centric party is coded 4 and lastly, left-wing party is coded 5. In case of single-party government the ideology code is determined by the ruling party whereas for the coalition government, party ideology is being coded by the leading party, since any public policies to pass the office needs a majority of vote and it is highly likely to pass the office if leading party supports it. As the leading party in the coalition has higher chances to coming to a consensus and enforcing policy decisions compared to the follower party. Details of ideological codes of the Indian political parties is mentioned in table 1.2. We collect the data on government strength and stability from Election Reports on State released by Election Commission of India.

Table 1.2: Coding of Political Ideology

Serial No.	Party Name	Political Ideology	Ideological Stand	Ideology Scale
1	AIDAMK: All India Anna Dravida Munnetra Kazhagam	Social Democratic, Populist	Centre	3
2	BJD:Biju Janata Dal	Populist, Economic liberalism	Right-Centre	2
3	BJP:Bharatiya Janata Party	Economic liberalism	Right	1
4	BSP:Bahujan Samaj Party Dalit	Socialism, Socialism	Left-Centre	4
5	CPI:Communist Party of India	Communism	Left	5
6	CPI(M): Communist Party of India (Marxist)	Communism	Left	5
7	DMK:Dravida Munnetra Kazhagam	Social Democratic, Populist	Centre	3
8	HVP: Haryana Vikas Party	Social Democratic, Populist	Centre	3
9	INC: Indian National Congress	Populist, Democratic Socialism, Social Democracy	Centre	3
10	INLD: Indian National Lok Dal	Populist, Economic liberalism	Right-Centre	2
11	JD: Janata Dal	Populist, Economic liberalism	Right-Centre	2
12	JD(S): Janata Dal (Secular)	Populism, Social Democracy	Centre	3
13	JD(U): Janata Dal (United)	Integral Humanism, Conservatism	Right-Centre	2
14	JP: Janata Party Populist,	Economic liberalism	Right-Centre	2
15	LDF: Left Democratic Front	Communism	Left	5
16	LF: Left Front	Communism	Left	5
17	NCP: Nationalist Congress Party	Populist, Democratic Socialism, Social Democracy	Centre	3
18	RJD: Rashtriya Janata Dal	Populism	Centre	3
19	SAD: Shiromani Akali dal Religious (Sikh)	Populist, Economic liberalism	Right-Centre	2
20	SHS: Shiv Sena	Economic liberalism	Right	1
21	SP: Samajwadi Party	Populist, Democratic Socialism	Centre	3
22	TDP: Telugu Desam Party	Regionalist, Fiscally Conservative	Right	1
23	UDF: United Democratic Front	Populism, Democratic Socialism, Social Democracy	Centre	3

Source: Dash and Raja (2013)

In order to understand the intricacies of the development imbalances within India we begin with studying the inter-state disparities in the education and the health sectors and examine progress of these sectors along with projecting the development trajectories of the states for 2030 following the time line of SDGs. This exercise will also help us to understand the chances

of the states to achieve the SDGs based on its current progress. Further, we use the concept of non-linear pathway of progress to estimate the number of years required to reach the ultimate success acknowledging the increased difficulty faced to improve the status in the higher levels of outcome. Once we got an understanding of the underlying development inequalities and the scene of state progress towards SDGs, we move on to assess the influence of public expenditure[4] on enhancing the development outcomes since government intervention through public spending is considered to be the only viable tool to correct such imbalances in a welfare state like India. Besides Indian population is largely dependent on the public services given the high poverty levels and market failures in such services. In this regard we introduce a new concept of targeted population expenditure since recognition of demographic composition is vital to designing public policies and every policy is formulated with a target population. So, the size of public expenditure shall be in keeping with the population size of the direct beneficiaries[5] of that expenditure. So, we use per capita expenditure vis a vis targeted per capita expenditure[6] to analyse whether the spending is in keeping with the population structure of its direct beneficiaries.

After investigating the interrelationship between public spending and development attainment we attempt to recognize the pattern of state spending on these vital sectors since India spends well below the international standards in these social sectors. Thus, we identify the inter-state disparities in spending along with its response in keeping with the change in the population size of the direct beneficiaries. We also make an attempt to examine the financing pattern by detecting the revenue sources augmenting the HPS spending along with identifying the other factors that influences the HPS spending like public borrowing, fiscal discipline, political and demographic variables. Once we comprehend the interplay of fiscal policies with the development outcome and recognize the complexities of the process, we attempt to understand the motivation and administering of the public policies by studying the interaction of the government agents with the development outcomes in political space. We do so by reviewing the influence of the political factors especially political ideology on augmenting the

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[4] Although the impact of public spending on the development outcomes depends both on the quality and quantity of the expenditure but given the difficulty to assess quality of expenditure at macro level the study only focusses in quantity terms rather quality.

[5] Throughout the study the term direct beneficiaries and targeted population is being used alternatively and hold same meaning.

[6] The concept of targeted per capita expenditure is newly introduced by us and not a conventional method so to make the analysis convincible and robust we use both conventional as well as targeted per capita expenditure in the analysis throughout the thesis

development of state since the motivation and framework of public policies are largely driven by political ideologies of the ruling party and has considerable bearing on development of a state in terms of education and health. The study is conducted for the period 1991-2020[7] and is based on 15 major states in India since those states together comprises of 90% of the total population and data are readily available for them.

1.6 Structure of the thesis

The thesis comprises of seven chapters including the introductory chapter. Chapter 2 provides an overview of the performance and progress of Indian states in Education and Health sector along with evaluation of the states' trajectories towards SDGs. Chapter 3 introduces a new concept of targeted per capita expenditure and examine the responsiveness of expenditure allocation to the targeted population. In an attempt to understand the efficiency of the expenditure tool to correct development imbalance and improve development parameters, chapter 4 examines the differential responsiveness of development outcome and regional inequality towards state public spending in terms of education and health sectors. Chapter 5 examines the pattern of spending and identifies the sources of revenue generation significantly enhancing the spending on human priority sectors. To understand the policy framework and motivation of the policy tools, chapter 6 focuses on the political environment of the state and examines the influence of the political ideology in particular with regard to state development. Lastly, chapter 7 discusses the results and concludes. The chapters of the thesis are organized as follows:

- Chapter 1: Introduction
- Chapter 2: An overview of Performance and Progress of Indian states
- Chapter 3: Responsiveness of Expenditure Allocation to the Targeted Population
- Chapter 4: Responsiveness of Public Spending on the state of Development
- Chapter 5: Pattern and Financing of Human Priority Sector Expenditure
- Chapter 6: Political Environment and Development of the Indian States
- Chapter 7: Summary and Findings

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[7] The broad time line of the study is 1991-2020 but the time period of the analysis may differ from chapter to chapter depending on the availability of the data and area of focus. Although expenditure data is available for all the years but the data on the various development indicators are sparsely available over the time period. However, we tried to maintain the time line across chapters as far as possible given the availability and relevance.

CHAPTER 2
AN OVERVIEW OF PERFORMANCE AND PROGRESS OF INDIAN STATES

2.1 Introduction

The role of education and health in overall social and economic progress are widely recognized and the volume of research engaged in assessing the performance of these two sectors has been added over time especially after the introduction of the MDGs in 2000. India being a signatory to the UN declaration is supposed to comply with the targeted standards of health and education over time but India's performance in education and health are far from satisfactory and substantially lower compared to the desired level. The progress of India in terms of development indicators are poor compared to countries having similar characteristics, for example, China moved ahead of India in terms of literacy rate despite both having a high illiteracy rate in the early 1950's. Again, with regard to other educational attainments, India has remained far behind the middle income and other European countries (Kaur and Misra, 2003). Likewise, India's performance in overall health and education is low compared to other countries; it slipped to 150th rank in health care and 112th rank in educational attainment in 2019 as measured by the World Economic Forum (Medical Dialogues, 2019).

In addition to poor performance in these sectors, the presence of unfair distribution of outcomes highlights the social injustice in the country. For instance, evidence suggests the presence of large inter-state disparities in women's health and literacy rate during 1985-1996 in India (Ahluwalia, 2000; Kurian, 2000;) and presence of inequalities in education indicators such as attendance rates, dropout rates, enrolment rates and literacy rates across caste groups during 2015-16 (Deb, 2018). Although the rate of drop out declined over time and educational attainment improved, the inequality has increased within India across different socio-economic groups such as gender, caste, region and class (Dunn, 1993; Chaudhury and Sinha, 2019). The disparities are also visible in various forms of health indicators (Subramanian et. al, 2008) like access to health care facilities, health outcome, out of pocket expenditure and so on. Large differences are also detected in child health indicators such as immunization, stunted growth and under five mortality rates during 2005-06 (Joe et. al, 2008). Similarly, variations are also found in in-patient and out-patient care across Indian states and the extent of inequality is relatively higher among the rural population than their urban counterparts in 2004 (Ghosh, 2014). Such persistence of inequalities in utilization, availability and affordability of health care services are said to be due to various historical factors like policies and practices of British

colonial India and other socio-economic factors namely gender, caste and class (Baru et. al, 2010). However, the health inequalities across the regions and socio-economic groups can be explained by the inequalities in the health services as a result of weak public provisioning and unchecked commercialization (Baru and Bisht, 2010).

The inequality in education and health within India has been a matter of concern particularly following the SDGs laid down in 2015 wherein presence of inequalities itself limits the effectiveness of any attempts at improving the performance of the social sectors. Reducing such inequalities is crucial for any country as it seeks to improve the population's well-being, especially when these inequalities are avoidable, unfair and affect everyone. Besides, equitably educated and healthy societies turn out to be more productive and skilled compared to inequitable societies. However, inter-state disparities in education and health sectors can well be traced back to the differential rates of progress of the states over time. Although there is a large volume of studies that have shown the disparities in education and health indicators across various socio-economic groups in India during the post-independence period, inter-state disparities in some of the vital education and health indicators have not received detailed inspection. Moreover, the assessment of progress and the likelihood of the states to attain the SDGs on time with regard to the education and health sector is limited.

In this context, this chapter analyses the inequalities for certain selected vital indicators such as gross enrolment ratios, literacy rate, family planning indicators like usage of contraceptive methods, fertility rates, and maternal health and child health indicators. These are regarded as key indicators in the global indicators framework for SDGs to assess the health and education sectors in India subject to availability of data. The chapter assesses the performance of Indian states in education and health stressing on the disparities across them that have persisted or emerged anew during 1999-2016. It also evaluates the progress in these sectors and measures the required progress rate and time to achieve ultimate success along with the projected 2030 outcome based on non-linear pathway of the indicators.

The chapter discusses the methodology in section 2. Section 3 presents the results; we begin with a brief overview of state performance of education and health sectors followed by inter-state disparities and convergence analysis. We evaluate the current rate of progress and required rate of progress towards realization of the goal along with projected 2030 level of outcome. We further contrast the projected pathway based on current progress and required

pathway to realise the goal along with measuring the time required to reach the ideal value of success. Lastly, section 4 discusses the results and concludes.

2.2 Methodology

We consider three major social sectors namely, education, family planning and maternal health and child health and gather information on social indicators related to these sectors. Availability of the data led us to consider the period from 1999 to 2016 for study and the details of the indicators and their data sources were mentioned in table 1.1 in chapter 1.

To examine the pattern of disparities over time across the states with respect to education and health indicators, we calculate the coefficient of variation[8] for each indicator at two time points at a minimum of 10 years gap. Higher the value of coefficient of variation for a particular indicator higher is the inter-state disparity in that indicator. To test convergence hypothesis, we employ the methodology of beta convergence following the regression equation as $(x_t-x_{(t-1)})/x_{(t-1)} =a + bx_{(t-1)}$, where, x_t is the outcome variable for the reference year and $x_{(t-1)}$ is the outcome variable of the base year. And significant negative coefficient 'b' indicates states are converging. To assess the progress rate of the indicators we use a level sensitive progress index (Joe and Mishra, 2017) given by $P(h)= 2*(h_t-h_0)/[(2-h_t)*(2-h_0)]$ for achievement indicators and $P(h)= 2*(h_0-h_t)/[\{2-(1-h_0)\}*\{2-(1-h_t)\}]$ for failure indicators, where 'h' is the standardised attainment[9] which lies between 0 and 1, so, h_t is the standardised attainment for the reference period and h_0 is the standardised attainment for the base period. The index assigns higher weights for greater improvements. And for a similar level of improvements $|h_t-h_0|$, cases with better base levels (h_0) receive greater weights thus taking care of the non-linear pathway of progress. Using this progress index, we measure the current progress and evaluate the required progress to reach ultimate success by replacing h_t with the possible highest value of achievement[10] and h_0 with the latest value[11]. Along with the required progress rate we also project the 2030 value based on the current progress rate.

To find the projected 2030 value first we adjust the value to incorporate the concept of non-linear pathway of progress because per unit improvement takes longer and is more difficult

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[8] Coefficient of variation= $(\sigma/\mu)*100$, where σ is population standard deviation and μ is population mean
[9] Say, h* is the value of health attainment, a_h and b_h as the lower and upper bounds of the health variable, then h is presented as proportions i.e., $h=(h*/b_h)$ such that a=0, b = 1, and $0 \leq h \leq 1$.
[10] Say 1 for literacy rate and 0 for infant mortality rate
[11] Say value of 2016 for family welfare and maternal health

with higher level of base values so, we convert[12] the level values of each year as h`= h/(2-h) for achievement indicators such as literacy rate, institutional delivery and h`= (1-h)/(1+h) for failure indicators like infant mortality rate, child undernutrition where h represents the level values. We compute the 2030 adjusted value say h_n`= $h_t$`+ [N*(h_t`- $h_0$`)/t], where h_t` is the adjusted reference year value, $h_0$` is the adjusted base year value, t is the number of years in between base year and reference year whereas N is the number of years in between reference year and the year whose value is to be predicted (in our case it is 2030). We then reconvert the h_n` into level value $h_n$ by $h_n$=2$h_n$`/(1+h_n`) for achievement indicators and $h_n$= (1-$h_n$`)/(1+h_n`) for failure indicators. We also contrast the progress pathway of the projected value of 2030 and the success pathway of the indicators to measure the odds of success in 2030. Further we compute the number of years required to achieve complete success based on the current rate of progress say Y= [(h_u- h_t)/r]-T, where h_u is the value of ultimate success and h_t is the reference year value at level respectively, r= (|h_t`- $h_0$`|)/t , which represents the per year progress following non-linear pathway and the notations holds the same meaning as described earlier, and T is the number of years in between current year (2021 in our case) and the reference year used to calculate r. We adjust the projected time with T to situate the years in the present time.

2.3 Results

2.3.1 State performance in terms of education and health sector

India has made significant progress in education sector after the introduction of MDGs in 2000 particularly in literacy rate and enrolment ratios. There was increase in the literacy rate as well as enrolment ratios in school and higher education during 2001-2015 (Anderson and Lightfoot, 2019). But if we analyse the state wise performance of education sector, we observe that while Kerala has more than 90% literacy rate and other states like Maharashtra, Tamil Nadu and Assam has around 80% literacy rate, but BIMARU states apart from Madhya Pradesh has low literacy rate around 60% in 2001 and less than 70% in 2012 (table 2.1).

Enrolment in combined primary and secondary levels increased from 186 million students in 2000 to 261 million in 2015, and from 8.6 million in 2000 to 33.6 million in 2014 in higher education (Anderson and Lightfoot, 2019). But not all states had similar improvement in enrolment ratios, and in certain states the gross enrolment ratio showed a decline over the

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[12] The pathway of progress curve following non-linear progression are presented in Appendix 2A, figure 2A.1 for achievement indicators and figure 2A.2 for failure indicators. The figures are drawn using the converted/adjusted level values.

period. Along with this the enrolment gaps particularly from secondary to higher education is a matter of concern as it is indicative of the fact that many students have dropped out of the education system in between. For example, West Bengal shows a drastic drop of gross enrolment ratio for class 12 (59.2) to gross enrolment ratio for higher education (7.9) in 2001 (table 2.1). The gross enrolment ratio in higher education is lowest across all the states compared to other indicators. The student's enrolment for higher education in 2014 is very low in Bihar (13.9), Assam (16.8), West Bengal (17.4) and Orissa (17.7) whereas Andhra Pradesh (31.2) and Tamil Nadu (45.2) have higher enrolment ratio in higher education (table 2.1). However, such a drop in enrolment of higher education is reported mainly due to non-completion of the 12th grade higher secondary education (Mittal, et. al, 2020), so we find that a large number of students drop out just before the admission in colleges, especially in the BIMARU states. The temporal analysis of the sectors indicates that BIMARU states are trapped in vicious cycle of poor performance for decades performing persistently poor for a long time.

Table 2.1: Performance of Indian states in Education sector

States	LR		GER(I-XII)		GER(HE)	
	2001	2012	2001	2011	2001	2014
Andhra Pradesh	60	67	54.9	77.5	8.4	31.2
Assam	63	85	68.1	63.7	7.4	16.8
Bihar	47	66	41.0	76.3	6.2	13.9
Gujarat	69	77	68.2	82.1	9.0	20.0
Haryana	67	78	49.6	79.5	10.5	27.6
Karnataka	66	76	64.8	85.5	9.4	26.4
Kerala	90	94	58.7	90.3	6.7	28.7
Madhya Pradesh	63	72	63.1	97.7	7.0	19.6
Maharashtra	76	83	69.0	87.5	12.0	27.9
Odisha	63	72	62.1	78.4	8.3	17.7
Punjab	69	78	48.9	87.9	8.4	27.1
Rajasthan	60	66	67.5	82.8	5.7	20.0
Tamil Nadu	73	81	62.4	95.0	10.7	45.2
Uttar Pradesh	56	67	37.0	84.6	6.2	25.0
West Bengal	68	76	59.2	87.2	7.9	17.4

Source: Author's compilation using various state level reports
Note: LR, GER(I-XII) and GER(HE) stand for literacy rate, gross enrolment ratio for class 1 to 12 and gross enrolment ratio for higher education. LR represents literacy rates in percentage, GER are gross enrolment ratios which represents the total enrolment in a specific level of education.

The picture of disparities is quite similar in case of family welfare too. The family planning indicators such as usage of contraceptives indicate huge differences across the states but the total fertility rate shows no significant differences. We find Bihar has the highest fertility rates and the lowest usage of contraceptive methods whereas West Bengal and Punjab has high usage of contraception methods and states like Karnataka, Kerala, Maharashtra and Gujarat depict a

decline in contraceptive usage between 1999 and 2016. We observe that in Bihar and Uttar Pradesh even less than 50% of married couples used contraceptives during 2016 which is a matter of severe concern and needs immediate attention (table 2.2). Since, low usage of contraceptives may lead to untimely and unwanted pregnancy and increase birth abortion rates. It may also cause high levels of reproductive ill-health and increase the number of pregnancies among adolescents (Ong et. al, 2012) besides increasing the chances of HIV sexual transmission.

With regard to maternal health care services, we observe that in most of the states more than 30% of pregnant women did not avail adequate antenatal care (ANC) apart from Kerala in 1999. The situation improved in 2016 as more women sought care during their pregnancy but in Bihar only 14.4% women took all the necessary ANC. The utilization of ANC is also very low in other BIMARU states like Rajasthan (38.5) and Uttar Pradesh (26.4). Surprisingly Maharashtra also has very low utilization of ANC (35.7). However, institutional delivery (ID) has shown substantial improvement in all the states except in West Bengal. Although ID is performing fairly well in each state but for Bihar and Uttar Pradesh, it is below 70% and in Karnataka we find 94.3% delivery occurs in institutions (table 2.2). Such remarkable improvement in the ID can be directly linked to the Janani Suraksha Yojana (JSY) under the National Rural Health Mission (NRHM) which encourages ID and ensure safe motherhood through cash transfers.

Table 2.2: Performance of Indian states in Family Planning and Maternal Health sector

States	AM		TFR		ANC		ID	
	1999	2016	2001	2013	1999	2016	1999	2016
Andhra Pradesh	59.6	69.5	2.3	1.8	80.2	76.3	49.8	91.6
Assam	43.3	52.4	3.0	2.3	30.9	46.5	17.6	70.6
Bihar	23.5	24.1	4.4	3.4	15.9	14.4	14.8	63.8
Gujarat	59.0	46.9	2.9	2.3	61.2	70.6	46.3	88.7
Haryana	62.4	63.7	3.1	2.2	38.2	45.1	22.4	80.5
Karnataka	58.3	51.8	2.4	1.9	72.4	70.3	51.1	94.3
Kerala	63.7	53.1	1.8	1.8	98.6	90.2	92.9	99.9
Madhya Pradesh	44.1	64.8	3.9	2.9	27.1	72.2	22.0	90.3
Maharashtra	60.9	51.4	2.4	1.8	66.2	35.7	52.6	80.8
Odisha	46.8	57.3	2.6	2.1	48.0	62.0	22.6	85.4
Punjab	66.7	75.8	2.4	1.7	58.4	68.5	37.5	90.5
Rajasthan	40.3	59.7	4.0	2.8	23.6	38.5	21.5	84.0
Tamil Nadu	52.1	53.2	2.0	1.7	90.9	81.2	79.3	99.0
Uttar Pradesh	27.1	45.5	4.5	3.1	14.6	26.4	15.2	67.8
West Bengal	66.6	70.9	2.4	1.6	57.4	76.5	40.1	75.2

Source: Author's compilation using various state level reports
Note: AM, TFR, ANC and ID stand for usage of any contraceptive methods, total fertility rate, antenatal care and institutional delivery respectively. AM, ANC and ID are expressed in percentage whereas TFR represents the age-specific fertility rates of women in their child-bearing years.

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On a positive note, child health in India has shown some improvement over the years through a reduction in infant mortality rates and increased immunization and better child nutrition. We find that Kerala has the lowest mortality rates among infants whereas infants in Assam, Orissa, Madhya Pradesh and Uttar Pradesh have higher risk of deaths compared to other states. Moreover, in Assam, Gujarat and Uttar Pradesh around 50% of the children are not adequately immunized and only in three states, West Bengal, Punjab and Kerala, immunization values are above 80%. Kerala is performing best for all the indicators related to child nutrition whereas Uttar Pradesh is performing poorly in child stunting, Gujarat in child wasting and Bihar and Madhya Pradesh in child underweight indicator (table 2.3). This indicates that children in BIMARU states are supposedly at a higher risk of growing up as unhealthy adults as they have poor nutritional status during their childhood. This is despite the fact that it is important to ensure that children receive adequate care and facilities so that they are as healthy as they can be, as healthy children are more likely to grow up as healthy adults.

Table 2.3: Performance of Indian states in Child Health sector

States	IMR		IMN		CS		CW		CU	
	2001	**2013**	**1999**	**2016**	**2006**	**2016**	**2006**	**2016**	**2006**	**2016**
Andhra Pradesh	66	39	58.7	65.3	38.4	31.4	14.9	17.2	29.8	31.9
Assam	74	54	17.0	47.1	46.5	36.4	13.7	17.0	36.4	29.8
Bihar	62	42	11.6	61.7	55.6	48.3	27.1	20.8	55.9	43.9
Gujarat	60	36	53.0	50.4	51.7	38.5	18.7	26.4	44.6	39.3
Haryana	66	41	62.7	62.2	45.7	34.0	19.1	21.2	39.6	29.4
Karnataka	58	31	60.0	62.6	43.7	36.2	17.6	26.1	37.6	35.2
Kerala	11	12	79.7	82.1	24.5	19.7	15.9	15.7	22.9	16.1
Madhya Pradesh	86	54	22.6	56.3	50.0	42.0	35.0	25.8	60.0	42.8
Maharashtra	45	24	78.4	53.6	46.3	34.4	16.5	25.6	37.0	36.0
Odisha	91	51	43.7	78.6	45.0	34.1	19.6	20.4	40.7	34.4
Punjab	52	26	72.1	89.1	36.7	25.7	9.2	15.6	24.9	21.6
Rajasthan	80	47	17.3	54.8	43.7	39.1	20.4	23.0	39.9	36.7
Tamil Nadu	49	21	88.8	69.7	30.9	27.1	22.2	19.7	29.8	23.8
Uttar Pradesh	83	50	20.2	51.1	56.8	46.3	14.8	17.9	42.4	39.5
West Bengal	51	31	43.8	84.4	44.6	32.5	16.9	20.3	38.7	31.5

Source: Author's compilation using various state level reports
Note: IMR, IMN, CS, CW, and CU stand for infant mortality rate, immunization, child stunted, child wasted and child underweight respectively. IMR represents the number of infant deaths for every 1,000 live births. IMN, CS, CW and CU denotes to the percentage of children immunized, stunted, wasted and underweight respectively.

However, in addition to overall achievements its distributional aspect is equally pertinent to understand the extent of inclusive development and social justice in a country. The scenario of low performance along with the unequal distribution of the education and health outcomes makes the situation even more challenging in realising the SDGs. So, we examine the extent of disparity and trace inter-state convergence w.r.t the social sector in the next section.

2.3.2 Inter-state disparities and convergence of states with respect to the selected indicators

The presence of disparities is likely to be observed across the Indian states in most of the indicators (table 2.4). The indictors of the education sector have lower dispersion compared to other sectors. It shows a decrease in the variation over the years except for the higher education enrolment ratio. So, over the years states with low enrolment ratio in higher education are further lagging behind. Similar conclusion can be drawn from the convergence coefficient, except for gross enrolment ratio of higher education, the convergent coefficient for all other education indicators indicates significant convergence at 1% level. This is indicative of the fact that states which are lagging behind have improved over time and are catching up with the better performing states. But the pace of such convergence is disappointingly low so the catching up will be slower than desirable.

We also witness reduction in disparities for all the indicators of family planning. The dispersions are mostly between 20% to 30% and are found to be significantly converging across states over time. With regard to maternal health care services, ANC and ID have a disparity level of more than 50% in initial years but there was an impressive reduction in CV values over the study period as we observe the CV for ID dropped from 67 to 13 almost 54 points in 17 years. Although we notice significant state convergence of all the indicators of family planning and maternal health, the rate is very sluggish which indicates that convergence will take longer time than anticipated.

Besides, we also observe large inter-state disparities in terms of child health specially in the base year and increased disparities over the years particularly for infant mortality rate (IMR) and child stunting. However, indicators like immunization and child wasting portray large drop in disparities with significant coefficient of convergence. We notice that child wasting indicator is significantly converging with low coefficient but states are diverging with respect to immunization indicating that states will differ in level of child immunization over time. Nevertheless, IMR shows significant convergence over time with exceedingly negligible coefficient which has the potential to deter the achievement of SDGs within the stipulated time (table 2.4). The low convergence coefficient and huge inter-state disparities can be traced back to the differential progress of the states. So, we probe into measuring the current progress of the states along with reporting the required progress rate to materialise the targeted goals.

Table 2.4: Inter-state disparities and convergence in Education and Health sectors

Indicators	CV (Base Year)	CV (Final Year)	Direction of disparity	Convergence Coefficient	Prob>F
Education					
Literacy Rate	14.7	10.5	Decreasing	-0.01	0.00
GER(I-XII)	17.3	9.9	Decreasing	-0.03	0.00
GER (Higher Education)	22.0	32.2	Increasing	-0.07	0.54
Family Planning and Maternal Health					
Any Method	26.6	22.5	Decreasing	-0.01	0.02
Total Fertility Rate	29.5	25.6	Decreasing	-0.05	0.05
Antenatal Care	51.2	38.3	Decreasing	-0.02	0.02
Institutional Delivery	60.4	13.1	Decreasing	-0.01	0.02
Child Health					
Infant Mortality Rate	32.3	34.6	Increasing	0.00	0.08
Immunization	53.1	20.8	Decreasing	0.04	0.00
Child Stunted	19.6	21.4	Increasing	0.00	0.98
Child Wasted	32.3	18.3	Decreasing	-0.03	0.00
Child Underweight	26.0	23.8	Decreasing	0.00	0.42

Source: Author's calculation using various state level reports
Note: CV stands for coefficient of variation. CV values of the base year as well as reference year represent the percentage of variation across states in that particular year whereas convergence coefficient denote the degree of convergence during the period. Last column represents the level of significance of the convergence coefficient.

2.3.3 Progress and Pathways of Indian states towards SDGs

In this section we attempt to measure the current progress and required progress to achieve the ultimate success using the level-sensitive progress index defined in methodology section. Table 2.5 reports the current rate of progress in even number of columns and required[13] rate of progress in odd number of columns. We observe that regarding literacy rate all the states have noticeably lower progress rate compared to the required progress rate to achieve ultimate success (100%, in case of literacy rate) except Assam. Assam (27.9) has the highest progress and better progress than required (26.1) followed by Bihar (18.5) and Haryana (13.6). However, Bihar, Rajasthan, Uttar Pradesh and Andhra Pradesh are expected to progress at a 50% rate to reach the complete success which is far higher than their current progress rate. Unlike the literacy rate, states' progress in terms of GER(I-XII) is almost at par with the required progress rate except Assam (-4.9), Gujarat (17.9), Odisha (19.4), and Rajasthan (19.7) whose progress in enrolling eligible students at school level is much lower than necessary. Nevertheless, we observe an encouraging pattern for school level enrolment for Kerala (40.8), Madhya Pradesh (49.4), Tamil Nadu (45.1) and surprisingly Uttar Pradesh (50.6). But the scenario in higher education is worrisome since all states have low progress and is far below

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[13] Required, Ideal and Expected Progress bear the same meaning and are used interchangeably throughout the text

the required rate, especially Assam (5.3), Bihar (4.3), Odisha (5.4) and West Bengal (5.4) who need more than 90% progress rate to reach full enrolment in higher education (table 2.5).

Table 2.5: Current Progress and Required progress in Education sector

States	LR Prog	LR RProg	GER(I-XII) Prog	GER(I-XII) RProg	GER(HE) Prog	GER(HE) RProg
Andhra Pradesh	7.5	49.6	25.4	36.7	14.1	81.5
Assam	27.9	26.1	-4.9	53.3	5.3	90.8
Bihar	18.5	50.7	35.9	38.3	4.3	92.5
Gujarat	9.9	37.4	17.9	30.4	6.4	88.9
Haryana	13.6	36.1	33.0	34.0	10.5	84.0
Karnataka	12.0	38.7	26.7	25.3	10.3	84.8
Kerala	6.9	11.3	40.8	17.7	13.3	83.2
Madhya Pradesh	10.3	43.8	49.4	4.5	7.2	89.1
Maharashtra	9.6	29.1	25.1	22.2	9.8	83.8
Odisha	10.3	43.8	19.4	35.5	5.4	90.3
Punjab	11.3	36.1	46.0	21.6	11.3	84.3
Rajasthan	6.4	50.7	19.7	29.4	8.2	88.9
Tamil Nadu	10.6	31.9	45.1	9.5	23.5	70.8
Uttar Pradesh	11.5	49.6	50.6	26.7	11.1	85.7
West Bengal	9.8	38.7	35.3	22.7	5.4	90.5

Source: Author's calculation using various state level reports
Note: LR, GER(I-XII) and GER(HE) stand for literacy rate, gross enrolment ratio for class 1 to 12 and gross enrolment ratio for higher education. LR Prog, GER(I-XII) Prog and GER(HE) Prog denote the current progress between the base and reference period in percentage form. LR RProg, GER(I-XII) RProg and GER(HE) RProg denote the progress rate required to achieve the ultimate success in percentage form. To measure progress, we use $P(h)= 2*(h_t-h_0)/[(2-h_t) *(2-h_0)]$ for achievement indicators, where h_t is the standardised attainment for reference period and h_0 is the standardised attainment for the base period. We measure the required progress to reach ultimate success by replacing h_t as the possible highest value of achievement and h_0 as the latest attained value.

Similar scene is detected in contraceptive usage. We find that states are progressing slower than required and it is disconcerting to witness deterioration rather than progress in states like Gujarat (-11.2), Karnataka (-6.2), Kerala (-10.6), Maharashtra (-9.2) in contraceptive usage. However, Bihar needs to gear up for higher progress in contraceptive usage (86.3) and total fertility rate (40.4) if she wants to control the population explosion. Parallel to contraceptive usage antenatal care also experiences very low progress than the required rate. For instance, Bihar has deteriorated at a -0.9 rate instead of progressing at 92.2 rate to reach full coverage of ANC for expectant mothers. Nevertheless, the progress of ID is remarkable and far better than the required rate except for Bihar (current 38.9, required 53.2) and West Bengal (current 35.2, required 39.7) (table 2.6).

Table 2.6: Current Progress and Required progress in Family Planning and Maternal Health sector

States	AM Prog	AM RProg	TFR Prog	TFR Rprog	ANC Prog	ANC Rprog	ID Prog	ID Rprog
Andhra Pradesh	10.8	46.7	7.9	10.8	-5.3	38.3	51.3	15.5
Assam	7.9	64.5	13.0	18.8	12.0	69.7	44.9	45.4
Bihar	0.4	86.3	27.1	40.4	-0.9	92.2	38.9	53.2
Gujarat	-11.2	69.4	11.0	18.8	10.5	45.4	49.6	20.3
Haryana	1.4	53.3	16.7	17.1	5.5	70.9	54.8	32.6
Karnataka	-6.2	65.0	8.1	12.3	-2.5	45.8	54.9	10.8
Kerala	-10.6	63.9	0.0	10.8	-15.1	17.9	13.1	0.2
Madhya Pradesh	19.6	52.1	23.1	29.7	40.8	43.5	70.0	17.7
Maharashtra	-9.2	65.4	9.6	10.8	-27.7	78.3	32.1	32.2
Odisha	9.6	59.8	8.6	15.5	13.3	55.1	61.8	25.5
Punjab	11.0	39.0	11.1	9.4	10.8	47.9	59.6	17.4
Rajasthan	17.3	57.4	27.8	27.8	10.5	76.2	60.4	27.6
Tamil Nadu	1.0	63.8	4.5	9.4	-15.0	31.6	32.3	2.0
Uttar Pradesh	13.8	70.6	36.9	33.8	7.3	84.8	43.1	48.7
West Bengal	5.0	45.1	12.5	7.9	21.7	38.1	35.2	39.7

Source: Author's calculation using various state level reports
Note: AM, TFR, ANC and ID stand for usage of any contraceptive methods, total fertility rate, antenatal care and institutional delivery respectively. AM Prog, TFR Prog, ANC Prog and ID Prog denote the current progress between the base and reference period in percentage form. AM RProg, TFR RProg, ANC RProg and ID RProg denote the progress required to achieve the ultimate success in percentage form. To measure progress, we use $P(h)= 2*(h_t-h_0)/[(2-h_t)*(2-h_0)]$ for achievement indicators and $P(h)= 2*(h_0-h_t)/[\{2-(1-h_0)\}*\{2-(1-h_t)\}]$ for failure indicators, where h_t is the standardised attainment for reference period and h_0 is the standardised attainment for the base period. We measure the required progress to reach ultimate success by replacing h_t as the possible highest value of achievement and h_0 as the latest attained value.

Although Indian states have some success in ID improvement, child health progress remain unsatisfactory and diverse. For example, Gujarat (-2.4), Haryana (-0.5) Maharashtra (-27.9) and Tamil Nadu (-26.4) show considerable deterioration in terms of immunizing children and states like Assam are required to progress at the highest rate of 69.2% to attain full coverage of immunizing her children. Likewise, in case of child nutrition most of the states have fallen behind the required progress to ensure no undernourished children in the future. Especially for the child wasting indicator which is noticed to be majorly worsening. And particularly the children in Bihar are observed to be suffering the most given the slow and low progress of the state in terms of child nutrition (table 2.7). In light of the differential and insufficient progress rate to reach the ultimate success in education and health sectors across Indian states, we measure the 2030 level of outcome following the non-linear pathway formula to understand the odds of meeting SDGs on time.

Table 2.7: Current Progress and Required progress in Child Health sector

States	IMR Prog	IMR Rprog	IMN Prog	IMN Rprog	CS Prog	CS Rprog	CW Prog	CW Rprog	CU Prog	CU Rprog
Andhra Pradesh	1.4	2.0	6.9	51.5	5.1	18.6	-1.4	9.4	-1.5	19.0
Assam	1.1	2.8	21.5	69.2	8.0	22.2	-1.9	9.3	4.7	17.5
Bihar	1.1	2.1	38.5	55.4	6.7	31.8	4.1	11.6	10.7	28.1
Gujarat	1.3	1.8	-2.4	66.3	11.0	23.8	-4.9	15.2	4.2	24.5
Haryana	1.3	2.1	-0.5	54.9	9.1	20.5	-1.3	11.9	7.5	17.2
Karnataka	1.4	1.6	2.7	54.4	5.9	22.1	-5.4	15.0	1.8	21.4
Kerala	-0.1	0.6	3.4	30.4	3.0	10.9	0.1	8.5	4.2	8.8
Madhya Pradesh	1.7	2.8	26.4	60.8	6.8	26.6	6.4	14.8	15.6	27.2
Maharashtra	1.1	1.2	-27.9	63.4	9.4	20.8	-5.7	14.7	0.7	22.0
Odisha	2.2	2.6	36.8	35.3	8.5	20.6	-0.5	11.4	4.8	20.8
Punjab	1.4	1.3	24.0	19.7	7.7	14.7	-3.6	8.5	2.1	12.1
Rajasthan	1.8	2.4	28.3	62.3	3.7	24.3	-1.6	13.0	2.4	22.5
Tamil Nadu	1.5	1.1	-26.4	46.5	2.6	15.7	1.6	10.9	4.0	13.5
Uttar Pradesh	1.8	2.6	23.1	65.7	9.5	30.1	-1.8	9.8	2.3	24.6
West Bengal	1.0	1.6	45.0	27.0	9.3	19.4	-2.1	11.3	5.3	18.7

Source: Author's calculation using various state level reports
Note: IMR, IMN, CS, CW, and CU stand for infant mortality rate, immunization, child stunted, child wasted and child underweight respectively. IMR Prog, IMN Prog, CS Prog, CW Prog and CU Prog denote the current progress between the base and reference period in percentage form. IMR RProg, IMN RProg, CS RProg, CW RProg and CU RProg denote the progress required to achieve the ultimate success in percentage form. To measure progress, we use $P(h)= 2*(h_t-h_0)/[(2-h_t) *(2-h_0)]$ for achievement indicators and $P(h)= 2*(h_0-h_t)/[\{2-(1-h_0)\} *\{2-(1-h_t)\}]$ for failure indicators, where h_t is the standardised attainment for reference period and h_0 is the standardised attainment for the base period. We measure the required progress to reach ultimate success by replacing h_t as the possible highest value of achievement and h_0 as the latest attained value.

We observe almost all states are projected to have more than 80% of literacy rates apart from Andhra Pradesh and Rajasthan if they continue to progress as in past. Moreover, Assam and Kerala are expected to achieve full success of 100% literacy rate by 2030. With regard to gross enrolment ratios all states are projected to reach full enrolment of school students with the current rate of progress but enrolment in higher education is anticipated to be low with Bihar reporting the lowest (22.6) followed by Assam (27.2) and West Bengal (27.9), thus even after decades, higher education will remain a matter of concern in India (table 2.8).

Table 2.8: Projected level of outcome in 2030 at current rate of progress in Education sector

States	2030_LR	2030_GER(I-XII)	2030_GER(HE)
Andhra Pradesh	77.1	100.0	52.8
Assam	100.0	100.0	27.2
Bihar	88.6	100.0	22.6
Gujarat	88.2	100.0	31.9
Haryana	92.5	100.0	44.8
Karnataka	89.5	100.0	43.6
Kerala	100.0	100.0	49.7
Madhya Pradesh	84.4	100.0	33.0
Maharashtra	92.9	100.0	44.1
Odisha	84.4	100.0	28.1
Punjab	90.3	100.0	45.6
Rajasthan	74.8	100.0	35.0
Tamil Nadu	92.1	100.0	73.6
Uttar Pradesh	81.8	100.0	43.7
West Bengal	87.2	100.0	27.9

Source: Author's calculation using various state level reports
Note: LR, GER(I-XII) and GER(HE) stand for literacy rate, gross enrolment ratio for class 1 to 12 and gross enrolment ratio for higher education. 2030_LR represents estimated percentage of literacy rates for the year 2030, 2030_GER(I-XII) and 2030_GER(HE) are estimated gross enrolment ratio for class 1 to 12 and gross enrolment ratio for higher education for the year 2030 respectively using current progress rate. We compute the 2030 adjusted value by $h_n` = h_t` + [N*(h_t` - h_0`)/t]$ where, $h_0`$ is the adjusted base year value, $h_t`$ is the adjusted reference year value. The adjustment is done by converting $h` = h/(2-h)$ for achievement indicators. Further, t is the number of years in between base year and reference year whereas N is the number of years in between latest year and the year whose value is to be predicted (in our case it is 2030). We then reconvert the $h_n`$ into level value h_n by $h_n = 2h_n`/(1+h_n`)$ for achievement indicators.

Apart from education Bihar is also projected to have very low usage of contraceptive methods (24.6) and low antenatal care (13.1) given her deterioration over the previous decade. However, India will find full success in delivering all expectant mothers at institutions increasing the likelihood of reducing the maternal mortality rate and IMR related to child delivery in most of the states before 2030 (table 2.9).

Table 2.9: Projected level of outcome in 2030 at current rate of progress in Family Planning and Maternal Health sector

States	2030_AM	2030_ANC	2030_ID
Andhra Pradesh	76.7	72.9	100.0
Assam	59.1	57.3	95.6
Bihar	24.6	13.1	88.2
Gujarat	35.3	77.4	100.0
Haryana	64.8	50.4	100.0
Karnataka	46.0	68.5	100.0
Kerala	43.0	82.2	100.0
Madhya Pradesh	78.1	94.8	100.0
Maharashtra	42.5	-2.3	97.0
Odisha	64.9	71.7	100.0
Punjab	82.4	75.8	100.0
Rajasthan	72.5	49.0	100.0
Tamil Nadu	54.1	71.8	100.0
Uttar Pradesh	57.9	35.0	92.9
West Bengal	74.2	88.8	94.3

Source: Author's calculation using various state level reports
Note: AM, ANC and ID stand for usage of any contraceptive methods, antenatal care and institutional delivery respectively. 2030_AM, 2030_ANC and 2030_ID represents the percentage of women estimated to use contraceptive, seek antenatal care and opt for institutional delivery for the year 2030 respectively based on the current progress rate of the indicators. We compute the 2030 adjusted value by $h_n` = h_t` + [N*(h_t`- h_0`)/t]$ where, $h_0`$ is the adjusted base year value, $h_t`$ is the adjusted reference year value. The adjustment is done by converting $h` = h/(2-h)$ for achievement indicators. Further, t is the number of years in between base year and reference year whereas N is the number of years in between latest year and the year whose value is to be predicted (in our case it is 2030). We then reconvert the $h_n`$ into level value h_n by $h_n = 2h_n`/(1+h_n`)$ for achievement indicators.

But immunization of children will be lower than 50% in case of Gujarat (48.2), Maharashtra (24.0) and Tamil Nadu (48.2) if they keep deteriorating at the earlier rate. In terms of child nutrition all anthropometric failures will still be visible but it will only prevail in less than 15% of children by 2030 as all states will be able to reduce such failures. Yet, states like Gujarat, Karnataka, Rajasthan and Uttar Pradesh will witness more than 10% failures in all the three anthropometric measures if they progress at the same pace. Moreover, Kerala will be the only state which would be able to bring down the percentage of failures to less than 10% across all the three nutrition measures (table 2.10). However, the projections for 2030 reveal the persistence of inter-state differences through the decades negating the central idea of SDGs in terms of inclusive development. Given the differential attainment of 2030 we further delve into contrasting the projected pathway and required pathway of success of highest achiever and lowest achiever state to understand the regional imbalance.

Table 2.10: Projected level of outcome in 2030 at current rate of progress in Child Health sector

States	2030_IMN	2030_CS	2030_CW	2030_CU
Andhra Pradesh	70.3	10.2	9.3	14.9
Assam	65.3	10.9	9.9	9.7
Bihar	86.5	16.4	6.1	13.0
Gujarat	48.2	10.5	16.3	14.0
Haryana	61.8	9.3	10.8	8.0
Karnataka	64.7	11.9	16.8	13.8
Kerala	84.0	6.4	7.2	3.7
Madhya Pradesh	75.7	13.8	6.9	10.8
Maharashtra	24.0	9.4	17.0	14.8
Odisha	97.5	9.6	9.7	11.7
Punjab	100.0	6.1	11.5	7.9
Rajasthan	75.8	14.2	11.8	14.0
Tamil Nadu	48.2	10.0	7.6	7.5
Uttar Pradesh	69.6	14.4	10.1	15.1
West Bengal	100.0	8.5	11.3	10.1

Source: Author's calculation using various state level reports
Note: IMN, CS, CW, and CU stand for immunization, child stunted, child wasted and child underweight respectively. 2030_IMN, 2030_CS, 2030_CW, and 2030_CU denote the percentage of children estimated to be immunized, stunted, wasted and underweight respectively for the year 2030 based on the current improvement of the indicators. We compute the 2030 adjusted value by $h_n{}^` = h_t{}^` + [N*(|h_0{}^` - h_t{}^`|)/t]$ where, $h_0{}^`$ is the adjusted base year value, $h_t{}^`$ is the adjusted reference year value. The adjustment is done by converting $h^` = h/(2-h)$ for achievement indicators and $h^` = (1-h)/(1+h)$ for failure indicators. Further, t is the number of years in between base year and reference year whereas N is the number of years in between latest year and the year whose value is to be predicted (in our case it is 2030). We then reconvert the $h_n{}^`$ into level value $h_n$ by $h_n = 2h_n{}^`/(1+h_n{}^`)$ for achievement indicators and $h_n = (1-h_n{}^`)/(1+h_n{}^`)$ for failure indicators.

2.3.4 Projected pathway and Required pathway of success

In this section we try to gauge the potential of states to realise SDGs by contrasting the projected and required pathways of progress in the indicators over time. We restrict our analysis to two extreme performing states in terms of achievement, as pathways for other states will remain between these two states. Moreover, we only report the pathways of literacy rate, gross enrolment ratio in higher education, contraceptive usage, immunization and child underweight since the states are predicted to perform poorly in these indicators[14] in 2030. With regard to literacy rate, we find Rajasthan and Kerala are expected to have a 25% gap if it follows the projected pathway and the two states can only converge if Rajasthan follows the steep projection of ultimate success (figure 2.1). Similarly in higher education also the worst performing state Bihar is far from reaching 100% enrolment ratio, as we observe the growing

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[14] Projected value of GER(I-XII) and ID shows full success in most of the states in 2030 whereas most of the states deteriorated with regard to CW and ANC so their progress path couldn't be measured

divergence between Tamil Nadu (the highest achiever state) and Bihar over time (figure 2.2). Likewise contraceptive usage and immunization are also predicted to diverge between the lowest and highest achiever states based on their earlier progress (figure 2.3 & 2.4). However, the states' exhibit decreases in the inter-state distance in terms of child undernutrition yet Uttar Pradesh is expected to have 15% children underweight and will be far away from the required success pathway (figure 2.5). Such dire picture of the social sector outcome of Indian states in 2030 reduces the odds of achieving the SDGs on time and raises the question of practicality of such ambitious goals in case of India. These results are indicative of the fact that the time bound goals are too ambitious for Indian states given the current rate of progress which entice us to further probe into finding the time required by each state to achieve the ultimate success following the non-linear pathway of current progress.

Figure 2.1: Projected and Required pathways of success for literacy rate
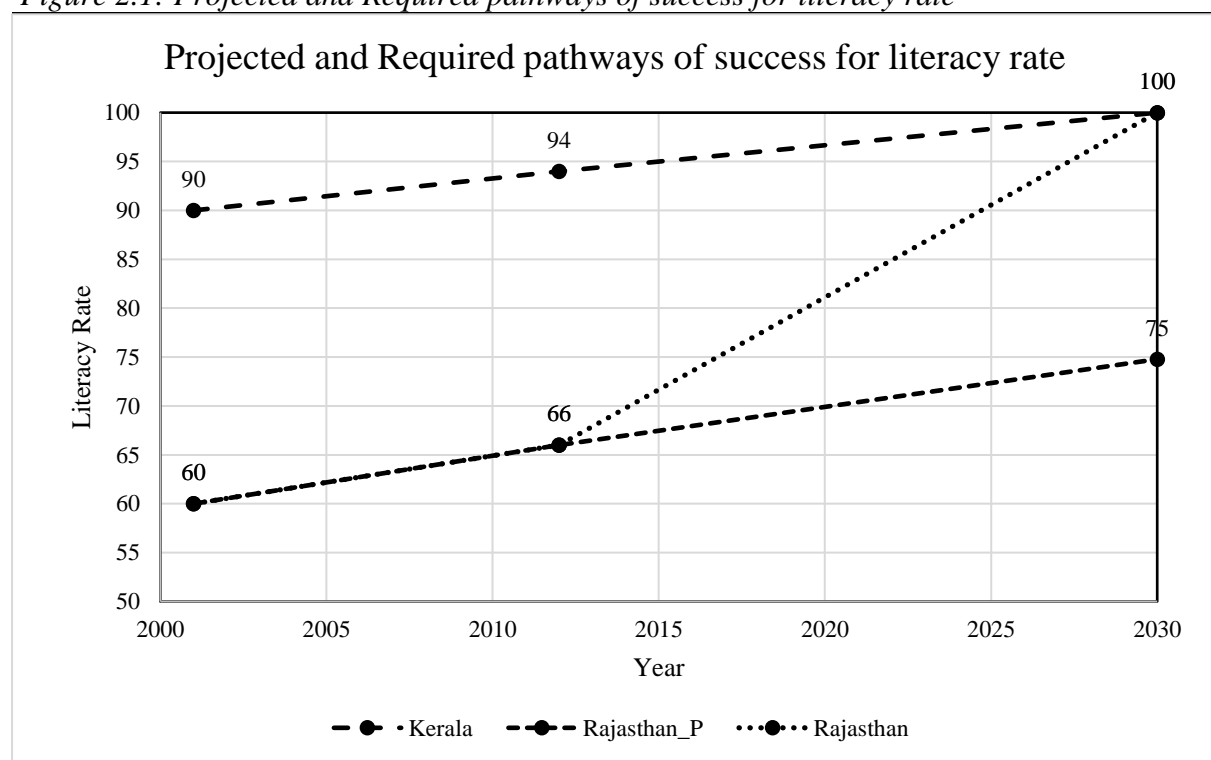
Source: Author's calculation using table 2.1 and 2.8
Note: State_P denotes the projected pathway to 2030 outcome level

Figure 2.2: Projected and Required pathways of success for GER(HE)
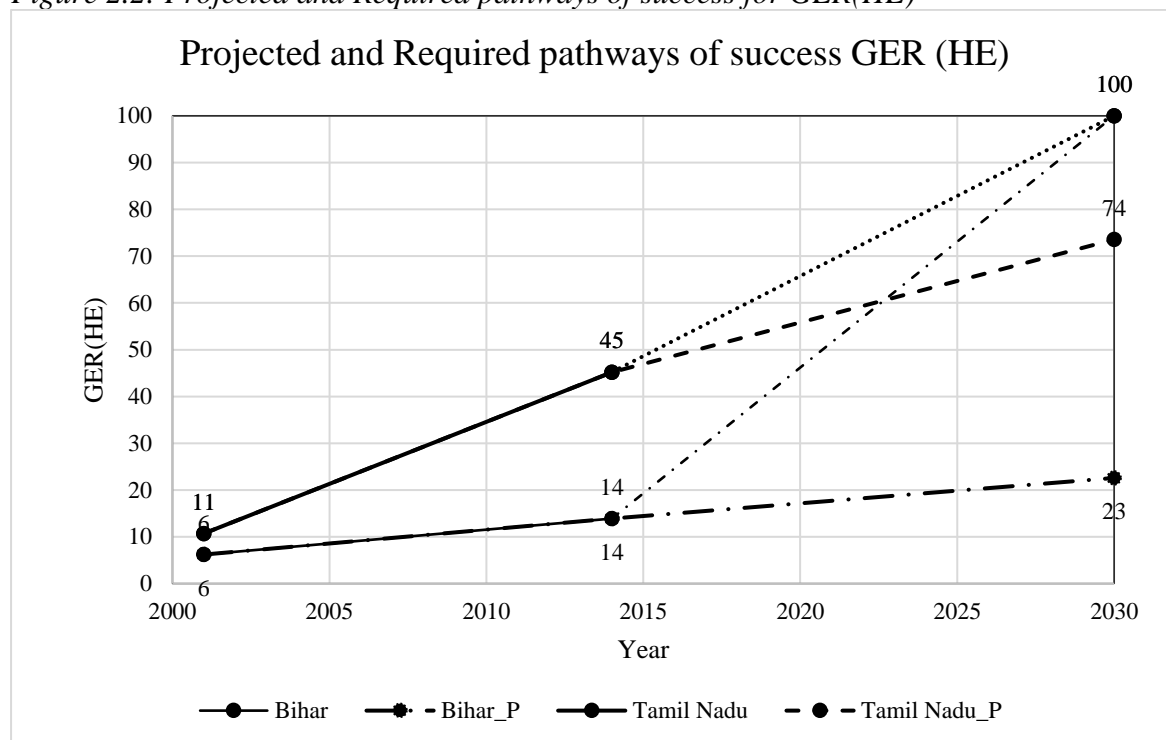
Projected and Required pathways of success GER (HE)

Source: Author's calculation using table 2.1 and 2.8
Note: State_P denotes the projected pathway to 2030 outcome level and GER(HE) represents the gross enrolment ratio in higher education

Figure 2.3: Projected and Required pathways of success for AM

Projected and Required pathways of success for AM
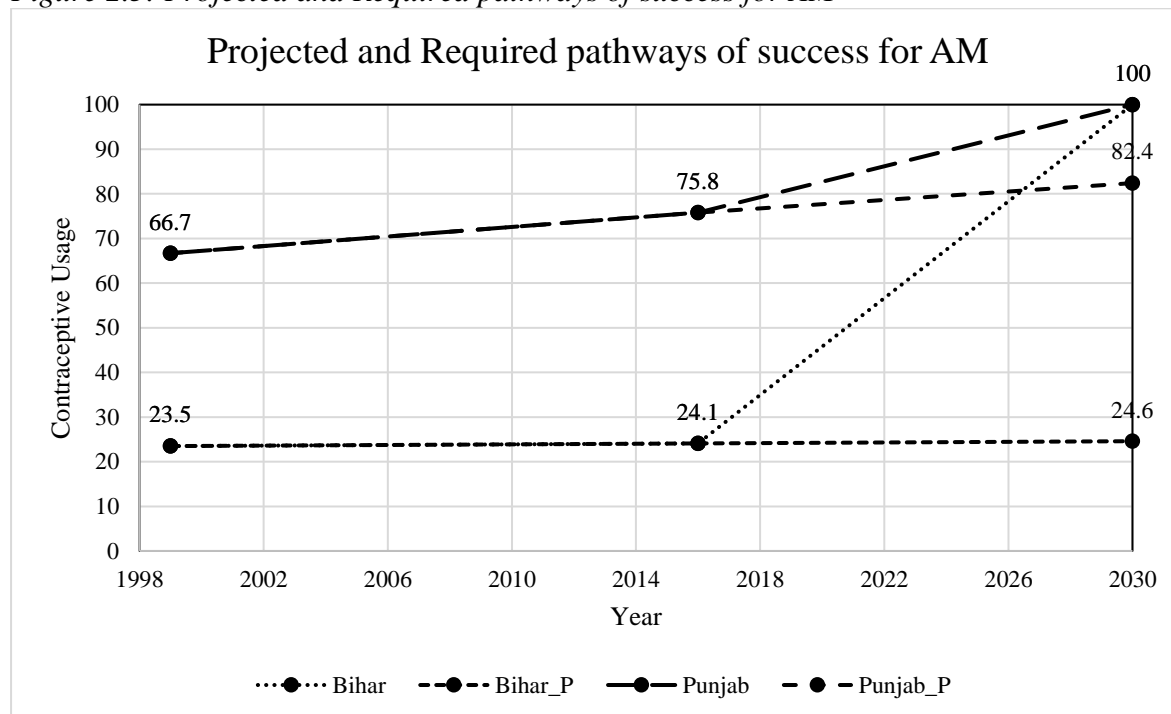
Source: Author's calculation using table 2.2 and 2.9
Note: State_P denotes the projected pathway to 2030 outcome level and AM represents the usage of any contraceptive methods

Figure 2.4: Projected and Required pathways of success for IMN
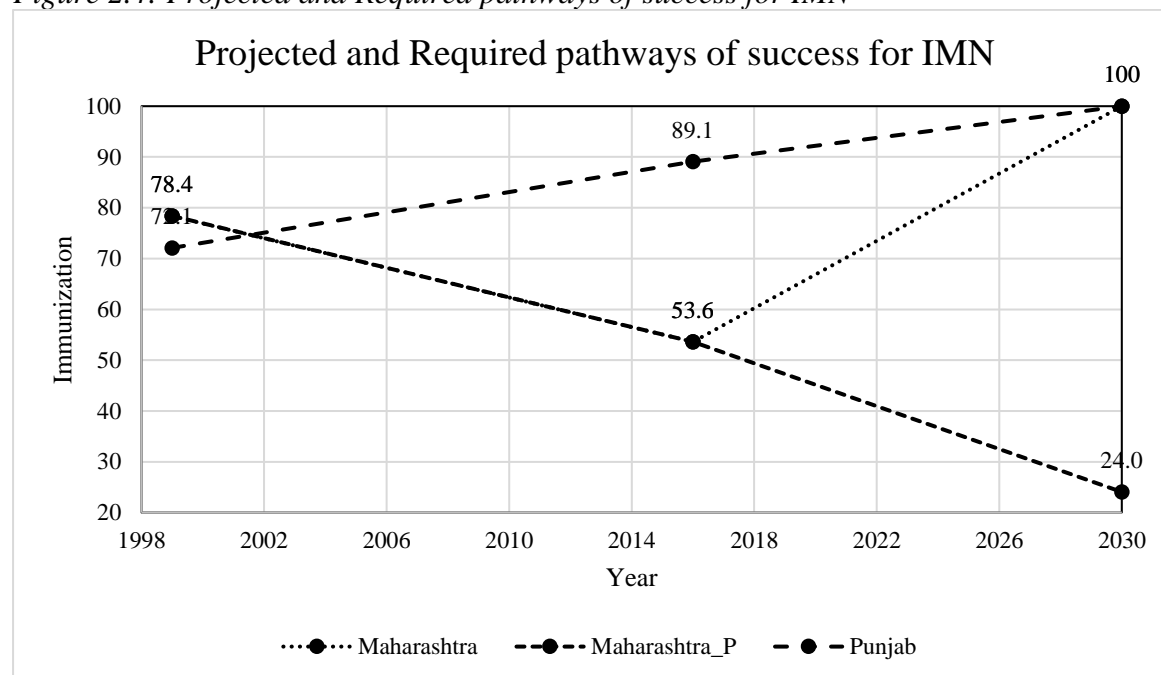
Projected and Required pathways of success for IMN

Source: Author's calculation using table 2.3 and 2.10
Note: State_P denotes the projected pathway to 2030 outcome level and IMN represents the immunization

Figure 2.5: Projected and Required pathways of success for CU
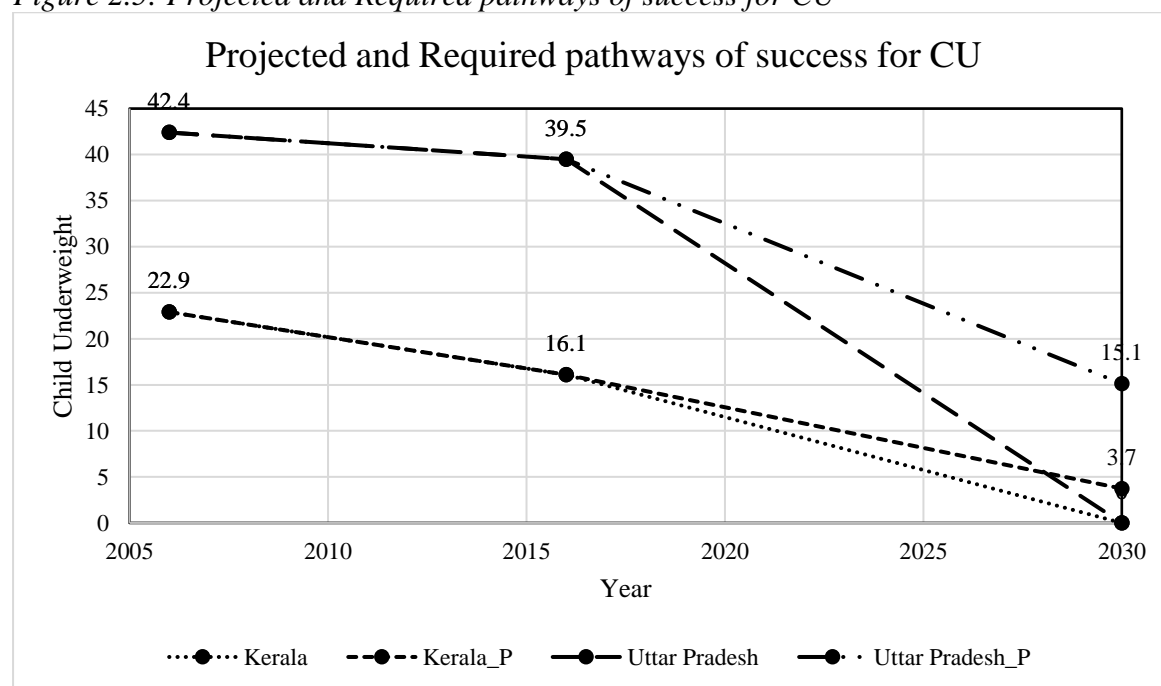
Projected and Required pathways of success for CU

Source: Author's calculation using table 2.3 and 2.10
Note: State_P denotes the projected pathway to 2030 outcome level and CU represents the child undernutrition

We find that Rajasthan needs almost 50 years from 2021 to reach 100% literacy followed by Andhra Pradesh which needs around 40 years. Further, to achieve full enrolment of the eligible age group in the institutes of higher education, states like Assam (196 years), Bihar (255 years), Orissa (192 years) and West Bengal (191 years) will require nearly 200 years from 2021, if they don't boost measures towards increasing the enrolment ratio in higher education. Similarly, to achieve the complete success in the usage of contraceptive will take hundreds of years for Bihar, Haryana and Tamil Nadu which signals how poorly the states are situated w.r.t to family planning measures. The story is analogous for antenatal care which needs several decades to reach the full utilization level across states except Madhya Pradesh (7 years). However, the scene is very diverse in case of immunization as West Bengal (1 year), Punjab (3 years) and Odisha (5 years) is projected to achieve 100% immunization of children within 5 years whereas Karnataka might need 230 years to achieve the same. Even the success with child nutrition can only be achieved in distant future given the existing rate of progress and we observe the required number of years to achieve no failure in terms of child underweight largely varies across states compared to other health indicators (table 2.11). The projected number of years to attain complete success in education and health sector indicates the abysmally low progress of states and hint on impracticability of the inclusive development in the near future without any systematic nudge to drastically improve the progress rate.

Table 2.11: Number of years required to reach ultimate success from 2021[15]

States	LR	GER(HE)	AM	ANC	IMN	CS	CU
Andhra Pradesh	39	56	43	NA	80	77	NA
Assam	*	196	98	71	37	67	75
Bihar	11	255	3333	NA	12	148	77
Gujarat	16	156	NA	43	NA	56	144
Haryana	9	83	440	165	NA	52	47
Karnataka	13	86	NA	NA	230	89	268
Kerala	1	63	NA	NA	85	56	29
Madhya Pradesh	21	137	25	7	23	107	52
Maharashtra	10	88	NA	NA	NA	52	666
Odisha	21	192	71	43	5	56	98
Punjab	12	77	32	44	3	35	94
Rajasthan	49	120	35	95	22	165	214
Tamil Nadu	11	23	780	NA	NA	114	59
Uttar Pradesh	23	81	62	166	31	96	266
West Bengal	18	191	94	13	1	46	75

Source: Author's calculation using state level reports
Note: 'NA' is reported for those states who deteriorated over time so their required years couldn't be calculated and '' represents the ideal value is expected to be achieved before 2021. LR, GER(HE), AM, ANC, IMN, CS, CU stands for literacy rate, gross enrolment ratio in higher education, use of any contraceptive methods, antenatal care, immunization, child stunted, and child underweight respectively. The values represent years required to reach the ultimate success given the current rate of progress. 'NA' is reported for those states who deteriorated over time so their required years couldn't be calculated and '*' represents the required value is expected to be achieved before 2021. Number of years required to achieve complete success is computed based on the current rate of progress say Y= [(h_u- h_t)/r]-T, where h_u is the value of ultimate success and h_t is the reference year value at level respectively, r= (h_0`- h_t`)/t which represents the per year progress where, h_0` is the adjusted base year value, $h_t$` is the adjusted reference year value. The adjustment is done by converting h`= h/(2-h) for achievement indicators and h`= (1-h)/(1+h) for failure indicators, t is the number of years in between base year and reference year and T is the number of years in between current year (2021 in our case) and the reference year used to calculate r.*

2.4 Concluding Remarks

We assess the performance and progress of the Indian states particularly in the education and health sectors to understand how Indian states are fair as regard inclusive development and recognize the odds of achieving the SDGs on time. We measure the performance of states by comparing and highlighting the existing inter-state disparities using different state level reports. We find BIMARU states along with Assam and Odisha to be more vulnerable states compared to others in the base year with regard to vital indicators of health and education. These states have persistently been poor performers compared to other states owing to slow improvement over the study period. We also locate large inter-state disparities in all the crucial indicators but this reduced over the years except for the three indicators i.e., gross enrolment ratio in

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[15] GER(I-XII) and ID wasn't reported as the projected value of those indicators show full success in most of the states by 2030 and CW wasn't reported as most of the states deteriorated during 2006-16 so years of ultimate success couldn't be calculated.

higher education, IMR and child stunted measure. However, the significant negative convergence coefficients indicate the states are converging but at an unacceptably low rate as the convergence parameter is low. This slow speed of convergence will trap the vulnerable states in the vicious cycle of poor performance and deter them from speedy catch up with the well-off states. Since such disparities are mostly the consequences of differential progress of the states so we measure the progress of the states and give insights of states' pathway to success by reporting required progress rate along with required years to achieve the full success. We also project the 2030 level of the education and health outcomes to understand how the states are situated with regard to SDGs. We find that the current progress rates are far below the required progress rate to achieve ultimate success and states mainly have low progress in case of gross enrolment ratio in higher education, contraceptive usage, antenatal care and child undernutrition. We also detect that the states have very little possibility of achieving SDGs given the low projected value in 2030 and the inclusive development is also unfeasible given the visible divergence between high achiever and low achiever state. Besides, large differential in years required to reach the ultimate success negates the central theme of SDGs of 'leaving no one behind'.

Such poor performance and low progress have the potential to discourage attempts to achieve the SDGs, and can only be mitigated by rigorous government intervention through public expenditure polices. Specially in a welfare state like India where majority of the population is solely dependent on public services given the large number of poor population and distorted market in the social sectors. Understanding the due merit of public spending to correct such imbalances India has spent meticulously in the social sectors since independence and has increased the spending largely following the commitment of MDGs in 2000. In this context we analyse how successful was such government intervention through public spending to correct the existing imbalance by improving the education and health attainments in the following chapters. But before we probe into such exercise, we introduce the new concept of targeted per capita expenditure given the bearing of the demographic composition on the public spending and contrast the conventional per capita with the targeted per capita spending.

CHAPTER 3

RESPONSIVENESS OF EXPENDITURE ALLOCATION TO THE TARGETED POPULATION

3.1 Introduction

Recognition of demographic composition is vital to designing public policies as the pattern of public spending is largely conditioned by the population structure of a country (Žokalj, 2016; Wolf and Amirkhanyan, 2010; Kelley, 1976a). Demographic structure of a population offers considerable insights regarding the differential need of various population segments. Demographic feature is unique for each country and plays a significant role in shaping an economy (Cruz and Ahmed, 2018; Birdsall et. al., 2001; Kelley, 1976b;). While population is fast ageing in the developed world (Mason, 2005), developing countries like India have more than 50% of the population in working age group with a low dependency ratio (Mody and Aiyar, 2011). Such a differential in the structure and composition of the population has its own bearing on the varying needs and demands across populations. A country where population is ageing is expected to have focused public policies towards pension, medical care and long-term care while countries with a substantial share of young population may seek more resource allocation in education, employment opportunities and so on. Thus, age structure undoubtedly should shape the resource allocation in the different budgetary categories. As public provisioning is meant to ensure better well-being, it becomes imperative to recognize the needs and demand of the population based on its age composition in provisioning of resources and the policy derivatives thereof. The population demography therefore should form the basis of appropriate budgetary allocation.

India despite having large demographic dividend in quantum as well as duration in terms of having an advantage of working age population did not realize its potential benefits owing to major bottle necks such as low-quality human capital, poor health, inadequate physical infrastructure and so on (Altbach and Jayaram, 2012). These bottlenecks were largely due to the inability to prioritise and target social spending towards making better human capital. Although India has substantially increased its social sector spending after independence (Dreze and Sen, 1995) the outcomes were far below desirable (Prachitha, 2019). With the differential pace of demographic transition, the emerging population structure dictates differential priorities towards making the most of such changes over time. Recognizing the transformation in the population age structure serves towards successful public policy formulation as it defines

changing needs and priorities. Moreover, most of the policies are formulated with a target population. For instance, the spending on rural development is aimed at bettering the condition of rural residents. So, the size of public expenditure should be in keeping with the population size of the direct beneficiaries of that expenditure. Thus, it's desirable that the target population be defined based on the changing age structure and composition of the population that will determine the quantum of public expenditure required for an efficient outcome. Such targeting essentially becomes pertinent in situations of constantly changing population composition on one hand and greater dependence on public provisioning on the other. Unfortunately, public expenditure allocations are largely read in per-capita terms overlooking the target population that may be different for the nation as a whole and its constituent states. Further such allocation may be efficient provided it is in keeping with the transient population composition. However, it is common practice to assess and evaluate social expenditure in per capita terms i.e., expenditure divided by the whole population thus overlooking the population structure of the direct beneficiaries.

Our discussion here focuses on some selected social sectors spending such as education, health, family welfare and nutrition that ought to respond to changing population count of its direct beneficiaries. These social sectors have a well-defined target population which undergoes change in its composition from time to time as a consequence of population transition. We begin with the review of targeted population of these social sector spending. Although poor people have higher usage of public services compared to rich (Gupta et. al, 2003), government has the responsibility to ensure the services to everyone in the targeted group i.e., those who can directly benefit from the service, irrespective of the class or social division[16]. So, we limit our study to the size and age structure of the population rather than detailing other relevant features and socio-economic characteristics. Although the changing population dynamic is gradual at the national level, the heterogeneity at state-level may be larger. So, we examine whether changes in state public expenditures in the selected social sectors in India are in keeping with the changing structure of the targeted population of those sectors across states

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[16] There are certain government programmes which are introduced targeting some specific socio-economic characteristics of the population say gender, caste, and income composition. And, government expenditure can also be based on historical trends such as expected inflation among others. However, we limit our study to the size and age structure of the population rather than detailing other relevant features and socio-economic characteristics to obtain generalised method of normalising since government has the responsibility to ensure the services to everyone in the targeted group irrespective of their economic and social class.

and emphasize the need for considering targeted per capita expenditure instead of conventional per capita expenditure in evaluation and monitoring.

3.2 Methodology

The empirical analysis here uses data from the Census for information on population structure as well as the Reserve Bank of India Bulletin for state level social sector expenditure. Our analysis of population dynamics and social spending pattern employs simple computational tools.

The targeted population of each sector is structured depending on the direct beneficiaries of those services. For example, the target group for education expenditure comprises of 6-21 years old population as the direct beneficiaries of education expenditure, which covers the ages of individuals in primary, secondary and higher education altogether (Grob and Wolter, 2007). Similarly, health may be the need for the entire population however children and elderly are more in need of health care compared with the adults (Christiansen and Bech, 2006) and therefore health spending needs to be responsive to the strength of these two segments of the population. So, health spending is expected to increase proportionately with the increase in the share of people in 0-14 years and 60 years above. Similarly, family welfare programmes are mainly focused to ensure safe motherhood and child survival; it also encourages population stabilization through responsible reproductive behaviour (Koenig, et. al., 2000). The target group for such expenditure is considered as women in their reproductive age i.e. (15-49 years) as addressing the needs of women's reproductive health is of utmost priority of the family welfare programme (Jejeebhoy, 1997). As regard the nutrition sector, 80% of government spending is directed towards children centric programmes and policies (Mishra and Sinha, 2012). So, the targeted group for this sector is considered as 0-6 years old children as they constitute the segment to be secured with proper and sufficient nutritional intake for having lifelong healthy days. The targeted beneficiaries[17] for each of these sectors are presented in table 3.1.

To understand whether the sector wise expenditure is in keeping with their targeted population we contrast the state-wise per-capita expenditure on various sectors against the same computed for the targeted population. Such a contrast is made to uncover the real gap in expenditure to

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[17] The computation of targeted per capita expenditure doesn't exclude people from the targeted age group if they do not avail the public services and/or use the private services instead, as it is a general measure which mostly focuses to the age group or the population segment for whom the public facilities shall be made available from a welfarist perspective.

manifest in differential outcomes on one hand and the lack of responsiveness of sector wise expenditure to the changing composition of the target population on the other. We begin the exercise with comparing per capita expenditure (PCE) and per capita targeted expenditure (PCTE) followed by comparing their indexed values across the states to comprehend the kind of disparities that gets masked while comparing the PCE across states. Further, a temporal verification of this aspect of mismatch is carried out based on the changing dynamics of the same during the period 2001-11.

Table 3.1: Sector wise targeted population

Sectors	Targeted group
Education	6-21 years
Health	0-14 and 60 years above
Family Welfare	15-49 years only women
Nutrition	0-6 years

Source: Author's deduction from existing literature

3.3 Results

A simple straight forward comparison of PCE and PCTE across the states and sectors reveals a clear pattern of PCTE being greater compared to PCE due to obvious reasons of targeted population being a subset of the population. However, this comparison conveys greater variability across states in terms of PCTE vis-a vis PCE implying that differences in PCE is perhaps limited in terms comparative evaluation as the variations are otherwise larger. For instance, the coefficients of variation of expenditures across state are greater for PCTE compared to PCE except for family welfare sector which reveals the PCE in general either understate or overstate the inter-state disparities. The disparities are largely understated in the nutrition and education sector while using PCE instead of PCTE (table 3.2). Such an observation offers the preliminary evidence towards making PCE ineligible for comparison as against PCTE.

Table 3.2: State-wise per capita expenditure and per capita targeted expenditure for 2011 in INR

State	Education		Health		Family Welfare		Nutrition	
	PCE	PCTE	PCE	PCTE	PCE	PCTE	PCE	PCTE
Andhra Pradesh	1780	5797	504	1489	99	352	363	3331
Assam	1965	5764	417	1088	55	206	121	812
Bihar	981	2607	175	380	29	130	71	384
Gujarat	2070	6506	471	1319	80	303	272	2106
Haryana	2510	7546	451	1219	41	159	55	410
Karnataka	2057	6860	483	1420	60	249	106	902
Kerala	2845	11101	776	2235	92	328	0	5
Madhya Pradesh	1374	3899	311	777	43	173	142	952
Maharashtra	2673	8832	435	1235	46	174	203	1709
Orissa	1646	5230	278	756	47	175	151	1201
Punjab	1960	6416	521	1513	55	206	46	418
Rajasthan	1702	4659	381	931	111	447	157	1007
Tamil Nadu	2168	7974	515	1597	98	344	298	2897
Uttar Pradesh	1317	3390	266	629	70	292	*	*
West Bengal	1751	5597	385	1123	52	190	75	647
Coefficient of Variation	26%	35%	33%	39%	38%	37%	78%	89%

Source: Author's calculation using Census 2011 and RBI Bulletin 2011
*Note: PCE and PCTE refers to per capita expenditure and per capita targeted expenditure. *Data not available.*

Taking this discussion further we present a comparative assessment of the PCE and PCTE across Indian states wherein we compare both the measures against the relative position of the target population. In this exercise, the revealing aspect is the kind of mismatch between the target population which indicates the need and PCTE that informs on the extent to which it remains responsive. While the target population when compared across the states situates the states in relative terms of need, the indexed values of PCE and PCTE presents a relative position of the states against the best. For instance, considering the education sector the target population of Uttar Pradesh is 1 against which southern states qualify to be having less than quarter compared with Uttar Pradesh. However, the same relative assessment in PCE indicates that states like Bihar, Uttar Pradesh and Madhya Pradesh have less than fifty percent of the PCE of Kerala which is the highest. This undoubtedly shows the regional imbalance in educational expenditure that informs on the departure from equivalence (figure 3.1). Further, when we consider the PCTE, the extent to which it departs from the indexed value of PCE informs on the responsiveness to target population. For instance, in some of the states this departure is minimal like Tamil Nadu, Karnataka and a few others as against states like Gujarat Uttar Pradesh, and Bihar (figure 3.1). Similar reading of the health sector finds the target population being widely different across the states and the PCE hardly corresponding to the quantum of target population (figure 3.2). Besides the PCTE values compare better across the

states as against PCE in case of few states wherein PCTE is greater than PCE. However, in states like Bihar, and Uttar Pradesh, PCTE is far lower to have equivalence in contrast with states like Punjab, Andhra Pradesh, Karnataka and Maharashtra (figure 3.2). Again, in nutrition sector apart from Karnataka, Punjab, Tamil Nadu and West Bengal, the indexed PCTE values departs highly from PCE values revealing more about the inter-state disparities compared to conventional PCE analysis. Similar patterns are observable in other sectors as well to conclude on the lack of responsiveness of expenditure to the changing need of the same (table 3.3).

Figure 3.1: Comparison of the indexed values of targeted population, PCE and PCTE for Indian states, 2011-Education Sector
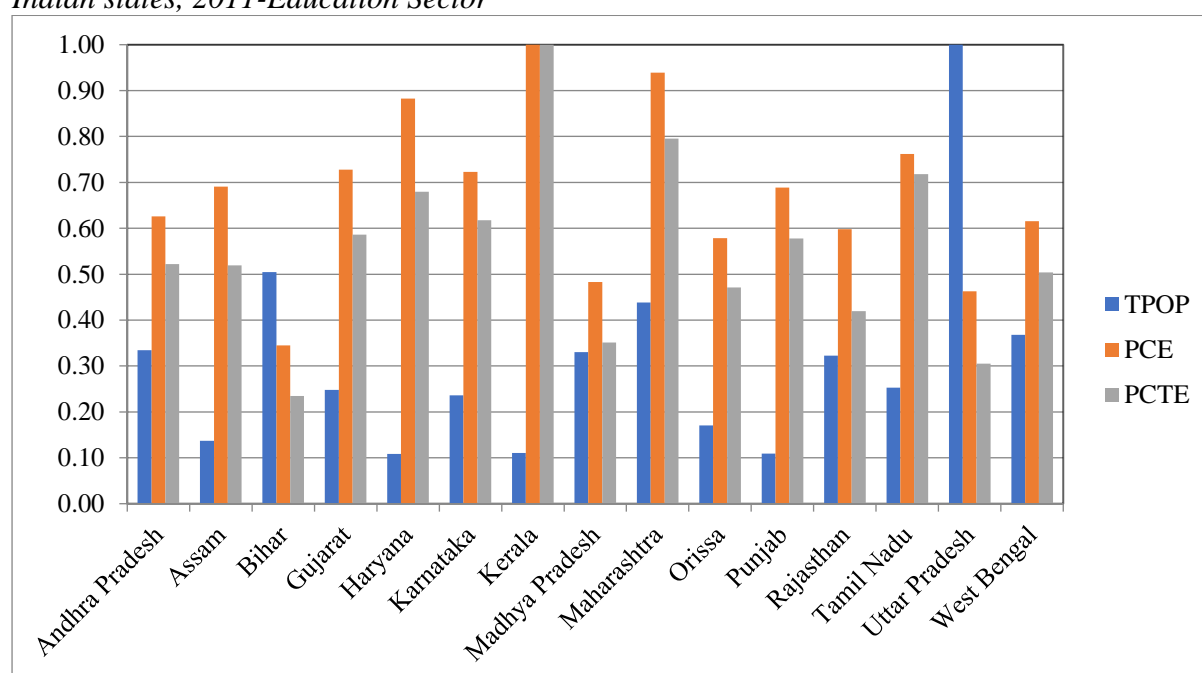
Source: Author's calculation using table 3.3
Note: TPOP, PCE, PCTE refers to targeted population, per capita expenditure and targeted per capita expenditure. The Y-axis represent the ratio of the state indicators with respect to the highest value state

Figure 3.2: Comparison of the indexed values of targeted population, PCE and PCTE for Indian states, 2011-Health Sector
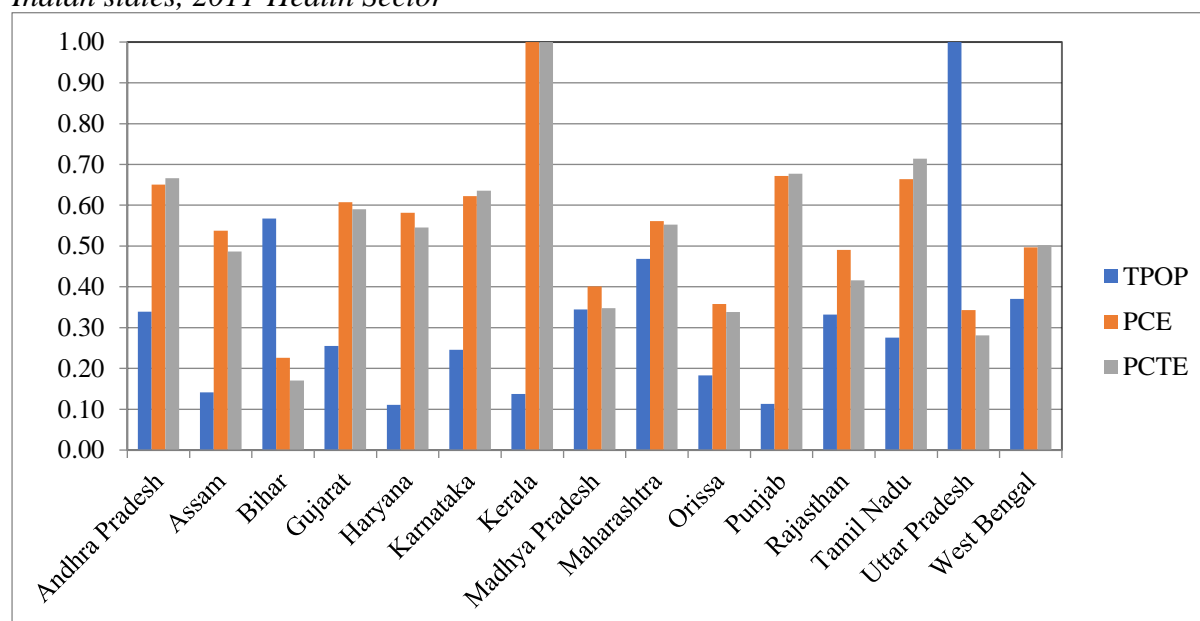
Source: Author's calculation using table 3.3
Note: TPOP, PCE, PCTE refers to targeted population, per capita expenditure and targeted per capita expenditure. The Y-axis represent the ratio of the state indicators with respect to the highest value state.

Table 3.3: Inter-state comparison of Targeted population, PCE and PCTE for the year 2011

States	Education			Health			Family Welfare			Nutrition		
	TPOP	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**
Andhra Pradesh	0.33	0.63	0.52	0.34	0.65	0.67	0.49	0.89	0.79	0.30	1.00	1.00
Assam	0.14	0.69	0.52	0.14	0.54	0.49	0.17	0.49	0.46	0.15	0.33	0.24
Bihar	0.50	0.34	0.23	0.57	0.23	0.17	0.48	0.26	0.29	0.62	0.20	0.12
Gujarat	0.25	0.73	0.59	0.26	0.61	0.59	0.33	0.72	0.68	0.25	0.75	0.63
Haryana	0.11	0.88	0.68	0.11	0.58	0.55	0.14	0.37	0.36	0.11	0.15	0.12
Karnataka	0.24	0.72	0.62	0.25	0.62	0.64	0.31	0.55	0.56	0.23	0.29	0.27
Kerala	0.11	1.00	1.00	0.14	1.00	1.00	0.19	0.83	0.73	0.11	>.01	>.01
Madhya Pradesh	0.33	0.48	0.35	0.34	0.40	0.35	0.38	0.39	0.39	0.35	0.39	0.29
Maharashtra	0.44	0.94	0.80	0.47	0.56	0.55	0.62	0.42	0.39	0.43	0.56	0.51
Orissa	0.17	0.58	0.47	0.18	0.36	0.34	0.23	0.42	0.39	0.17	0.42	0.36
Punjab	0.11	0.69	0.58	0.11	0.67	0.68	0.15	0.50	0.46	0.10	0.13	0.13
Rajasthan	0.32	0.60	0.42	0.33	0.49	0.42	0.35	1.00	1.00	0.34	0.43	0.30
Tamil Nadu	0.25	0.76	0.72	0.28	0.66	0.71	0.43	0.89	0.77	0.24	0.82	0.87
Uttar Pradesh	1.00	0.46	0.31	1.00	0.34	0.28	1.00	0.63	0.65	1.00	*	*
West Bengal	0.37	0.62	0.50	0.37	0.50	0.50	0.52	0.47	0.43	0.34	0.21	0.19

Source: Author's calculation using Census 2011 and RBI Bulletin 2011

*Note: TPOP, PCE, PCTE refers to targeted population, per capita expenditure and targeted per capita expenditure. The figures represent the ratio of the state indicators with respect to the highest value state. *Data not available.*

Following the above exposition on the kind of mismatch in expenditure on various sectors in relation to the targeted population across the states, we attempt an assessment of changing situation over a decade by considering the differences over time. The differences are computed as ratios between two time points to examine whether or not a decline or an increase in the target population is being responded to in allocation in the specific sector. Here we discover that as regard education and nutrition southern states have less of target population in the recent period vis-à-vis the past but the PCE has multiplied more compared with the states wherein this target population has literally decreased. This shows non-responsiveness of expenditure on one hand and differential state of priorities on the other. However, the PCTE values although not keeping with the quantum increase in target population compares well across the states justifying the relevance of PCTE against PCE. As regard health sector, almost all the states have an added burden and the PCE values too have been multiplied except some distinction in states such as Kerala, Tamil Nadu, Assam and Andhra Pradesh. But such distinction vanishes when we consider the change in PCTE because many of these southern states are unable to keep up with the changing target population. Similar exposition on the other two sectors puts forth the relevance of PCTE not only for eligible comparisons but also to infer on quality equivalence when it comes to outcomes (table 3.4). A validation exercise of computing rank correlation between target population and PCE vis-à-vis the target population and PCTE clearly indicates the strength of PCTE in providing a more revealing comparison (table 3.5).

Table 3.4: Change in Targeted population, PCE and PCTE from 2001 to 2011

State	Education			Health			Family Welfare			Nutrition		
	TPOP	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**	**TPOP**	**PCE**	**PCTE**
Andhra Pradesh	0.96	3.50	4.04	1.00	3.51	1.18	3.88	2.75	2.60	0.91	4.99	6.12
Assam	1.08	2.80	3.04	1.08	3.75	1.26	4.09	2.27	2.11	1.03	8.76	9.95
Bihar	1.25	2.65	2.66	1.23	2.69	1.26	2.74	1.29	1.28	1.14	15.95	17.55
Gujarat	1.10	3.21	3.49	1.11	3.73	1.22	3.99	4.55	4.46	1.04	10.56	12.17
Haryana	1.07	3.59	4.02	1.04	3.50	1.30	4.02	1.76	1.62	1.01	3.67	4.35
Karnataka	0.99	3.10	3.61	1.05	2.95	1.07	3.25	1.45	1.57	1.00	5.19	6.02
Kerala	0.93	3.64	4.09	1.03	3.78	1.02	3.83	2.84	2.92	0.92	0.72	0.82
Madhya Pradesh	1.15	3.90	4.07	1.10	3.13	1.30	3.44	2.93	2.71	1.00	10.79	12.97
Maharashtra	1.04	2.76	3.09	1.04	2.58	1.24	2.87	2.21	2.07	0.98	4.45	5.28
Orissa	1.04	3.45	3.78	1.06	2.64	1.19	2.84	2.73	2.62	0.99	11.96	13.84
Punjab	0.99	2.60	3.00	1.01	2.20	1.21	2.47	3.33	3.13	0.97	*	*
Rajasthan	1.17	2.78	2.88	1.09	2.76	1.32	3.06	2.88	2.65	1.00	6.54	7.95
Tamil Nadu	1.01	3.15	3.61	1.11	3.21	1.17	3.35	2.80	2.77	1.02	4.02	4.56
Uttar Pradesh	1.21	3.59	3.57	1.10	3.97	1.31	4.34	4.41	4.03	0.98	*	*
West Bengal	1.03	3.08	3.42	1.01	2.49	1.23	2.81	2.45	2.27	0.93	9.67	11.88

Source: Author's calculation using Census 2001, 2011 and RBI Bulletin 2001, 2011

*Note: TPOP, PCE, PCTE refers to targeted population, per capita expenditure and targeted per capita expenditure. The figures represent the ratio of 2011 value to 2001 value. *Data not available.*

Table 3.5: Spearman's Rank correlation between targeted population and PCE and targeted population and PCTE for the change 2001-2011

Sectors	TPOP & PCE	TPOP & PCTE
Education	-0.05	-0.43
Health	0.27	0.38
Family Welfare	0.24	0.24
Nutrition	0.39	0.36

Source: Author's calculation using table 3.4
Note: TPOP, PCE, PCTE refers to targeted population, per capita expenditure and targeted per capita expenditure

3.4 Concluding Remarks

This is a simple and unambiguous attempt at making a comparative assessment of sector specific allocations of expenditure in terms of PCE and PCTE. The central observation made relates to the insensitivity of PCE in sector specific terms as every expenditure does cater to a target population and not always the entire population. While carrying out this exercise, we find that the sector specific expenditures are differentially responsive across regions which gets manifested more when read in terms of PCTE rather than PCE. Further, comparative assessment of sectoral allocation of expenditure across states is perhaps made better with PCTE rather than PCE as PCTE is not merely computed based on target population but its change needs to be in keeping with the relative strength of the target population for a specific expenditure. While this simple exposition brings to light the lack of responsiveness of expenditure in certain sectors more than others, it also identifies the states with greater responsiveness than others. On the whole, it is perhaps desirable to consider PCTE for comparative evaluation of expenditure allocation as they will be more appropriate to explain differential outcomes as well. So, we consider both targeted per capita spending and conventional per capita spending in our following analysis to evaluate the responsiveness of the education and health outcomes towards the state public spending on these sectors.

CHAPTER 4

RESPONSIVENESS OF PUBLIC SPENDING ON THE STATE OF DEVELOPMENT

4.1 Introduction

Following the evidence on the presence of inter-state disparities with respect to certain selected development indicators in chapter 2, we also find the presence of development imbalances within state, well documented in literature, particularly across rural-urban regions[18] owing to their differences in structural transformation along the development path and its associated redistributive effects (Hnatkovska and Lahiri, 2013). The rural-urban disparities are apparent in various development dimensions namely education and health sector. For instance, we find substantial gaps in educational attainment and years of schooling between rural and urban population in India (Hnatkovska and Lahiri, 2013). Similarly in health front too, we observe urban children have better health compared to rural children in terms of nutrition and mortality indicators (Bharati et. al., 2009; Portner and Su, 2018). Besides we observe large differences in the usage of maternal health care services across the rural-urban region in Indian states (Nair and Panda, 2009). Thus, the predominance of the regional inequality in the two key human priority sectors within Indian state refutes all the dedicated initiatives of inclusive development and decelerates the accomplishment of the SDGs.

In this regard welfare states characterised by substantial social sector spending is assumed to correct these imbalances by its redistributive policies based on the principle of social equity (Beckfield et al., 2015; Wilkinson & Marmot, 2003). In addition, social sector spending is said to be instrumental in improving distributional outcome given its long-term positive effects on human capital, particularly spending on education and health sector, as it has the potential to improve the human development through the channel of human capability (Zouhar et. al., 2021). Also, it is widely believed that if such expenditures are targeted to provide the services to the disadvantaged children, it will increase the equality of opportunity thus leading to equal outcomes. Consequently, spending in these sectors will empower the population to be productively employed and escape the poverty trap. So, overall welfare states are expected to reduce the inequalities by extending the access to and services of education and health care facilities to its special need population such as unemployed, people with disabilities and others (Muntaner et al., 2011; Thomson et al., 2016). The problem, however, is the empirical

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[18] Intra-state disparities of development outcomes can be across various groups such as gender, caste, wealth, region, religion and so on. In our study we particularly focus on the rural-urban differences given its incidence and availability of data at state level

inconclusiveness of such claims and expectations which led to a lack of consensus regarding the mechanism of social expenditure in reducing the inequality among the researchers (Bambra, 2011; Beckfield & Krieger, 2009; Thomson et al., 2016). Further the available empirical evidence does not reveal a straight forward conclusion regarding the relationship between development inequalities and social sector spending (Mackenbach & McKee, 2013).

For instance, Galvez et. al., (2018) found positive effect of social sector expenditure in decreasing the health inequalities in Europe but inequalities in morbidity or mortality rates are found to be higher in Scandinavian countries with generous welfare policies compared to liberal countries such as United Kingdom (Bergqvist et al., 2013). Although the welfarist countries are found to have better development outcomes compared to others but relative inequality is found to be higher even with higher social sector spending through more universal welfare policies (Bambra, 2011; Mackenbach et al., 2008). Thus, the expected and assumed association between social sector expenditure and development imbalances across regions remains empirically puzzling and doesn't always produce the desired results.

Public spending may not only lead to inclusive development, but may also promote human development as spending on education and health care services is anticipated to enhance quality of life thus augmenting human development. For example, Baldacci et al (2004) found a significant direct impact of education expenditure on education indicators, they argue that an increase in education spending of 1% of GDP will increase schooling by 3 years. Similarly, public health spending is critical to improving health outcomes and ensure healthier communities. It is assumed that greater public spending on health enables the health agents to enhance their performance and improve the dynamics of health care provisioning resulting in better health outcomes at community level (Handler et. al, 2001; Meyer et. al, 2012). Under such a premise and in the era of SDGs countries are encouraged to raise their public spending on education and health to facilitate the realization of the SDGs within the stipulated time (IOM, 2012). In fact, Indian policy makers realizing the importance of spending on the provision of basic social services like education, health and health related sectors and following several policy recommendations, encouraged substantial increase in social expenditure since independence. For instance, education expenditure has been steadily increasing from around 1% of its GDP in 1950-51 to 4.02% in 2000-11. India as a welfare state has also amplified its spending in both education and health sectors since the launch of the MDGs in 2000. She introduced several schemes and measures, as mentioned in chapter 1 (page 14, section 1.1.1), and established institutions to cater to these needs. Given the theoretical underpinning of a

strong positive association between social spending by the state and development outcomes, Indian government was also advised to increase its public health spending to 2.5% of GDP by 2017 and 3% of GDP by 2022, by the High-Level Expert Group on Universal Health Coverage (UHC) in 2011. Such recommendations convey the seriousness and commitment towards promoting and enhancing community health.

Despite frequent reforms and revisions made on education and health front, the inequalities in health and education are still persistent across states. For example, while 96.2% of Kerala population are literate Andhra Pradesh (66.4), Rajasthan (69.7), and Bihar (70.9) have around 30% people who are not yet literate (NSS, 2018). Similarly, there is a regional divide in early age mortality like IMR; it remains at 10 in Kerala vis-à-vis 47 in Madhya Pradesh and almost 43% children are under-weight in Bihar as against the same being 16% in Kerala (NFHS-4 report). Such regional differences in health outcomes are accompanied by differences in access to health care facilities, out of pocket expenditure and so on. Inequalities were also observed in child health indicators such as immunization, stunted growth and under five mortality rates during 2005-06 (Joe et. al, 2008). Besides, India is ranked 131 among 188 countries on the basis of indices of life expectancy, educational attainment and per capita income in 2015 Human Development Report. Further, the education index for India depicted weak performance (Economic Survey, 2015-16), hinting on need for increasing investment in the education sector. Similarly, the need of government intervention in the provision of health care has also been argued in the literature (Self and Grabowski, 2003) but the association between the social outcomes and the public social spending has remain empirically inconclusive.

Chakroborty (2003) studied some developed and developing countries and found that social public expenditure has a higher effect on human development compared to per capita income. But Noss (1991), Tan and Mingat (1992), Mingat and Tan (1998), Flug, Spilimbergo, and Wachtenheim (1998) found that the contribution of public education spending on the education indicators measured by literacy rate and enrolment rate is either less or statistically insignificant. On the health front, studies (Wolfe, 1986; Bhalotra, 2007; Farahani et al., 2009; Hojman, 1996) argued in favour of positive linkages between public health expenditure and community health whereas other studies (Hitiris and Posnet, 1992; Judge et al., 1998; Filmer and Pritchett, 1999; Kaur and Misra, 2003; Deolalikar et al., 2005) either found a negative association or no significant linkage between the two. For instance, Baldacci et al (2004) found a significant positive impact of health spending on child survival rate, using a panel data from

120 developing countries for the period 1975-2000. It reported that 1% increase in heath spending will increase 0.6% of child (under 5) survival rate. Anand and Ravallion (1993) shows public spending on health has twice as high an impact in increasing life expectancy than per capita income for low-income countries. On a similar note, Le Grand (1987) found that morbidity rates decrease with increase in public health care expenditure in England and Wales. Similarly, Gupta et. al (2003) established a positive relationship between health statuses of the poor and public spending on health care. According to Mohanty and Behera (2020), infant and child mortality rates and incidence of malaria cases fall considerably along with an increase in life expectancy, immunization coverage with increase in public health expenditure across Indian states. On the contrary, Kim and Moody (1992), McGuire et. al (1993), Filmer and Pritchett (1997), and Filmer et. al (1998) report weak linkages between the public health outlays and the child mortality. So, there are two sets of literature one set found positive contribution and the other set found very small or insignificant contribution of public spending on the development indicators. Such inconsistency in the findings has led to lack of consensus among researchers regarding the impact of social spending on outcome. Establishing a robust association between social expenditure and outcome becomes more challenging given the complexities of a delivery system and its efficiency, especially, in case of developing countries like India where there exist large gaps in public services and infrastructure.

Given the unclear effects of social sector expenditure on development inequalities and inconsistencies in the linkage between public social spending and outcomes, it is imperative to study the impact of the spending on the imbalances and the possible bearing of public education and health expenditures on population education and health parameters correspondingly. With the motive to address the inconsistencies in such association and its contemporary relevance the chapter tries to assess the impact of public spending on regional inequalities in health and education sector in Indian states and examine the responsiveness of certain selected education and health indicators to state spending on education, health and health related sectors respectively. Besides, given the large inter-state development disparities, we also contrast the best performing and worst performing state and assess the linkage there of. This exercise is conducted for the period 1991-2016 for 15 major states in India which covers more than 90 % of Indian population.

The chapter is organized as follows, the next section explains the methodology used in the study, the third section elaborates the results and last section discusses the findings and concludes.

4.2 Methodology

To understand the role of state social spending in effecting development inequalities across rural-urban regions[19] and development outcome during 1991-2016, we have considered four important inter-related priority sectors, education, health, family welfare and nutrition and the indicators selected under each sector are listed in table 1.1 in chapter 1 along with the data sources. Data related to state spending on education, health, family welfare and nutrition for the years 1991-2016 are from the Bulletin published by the Reserve Bank of India (RBI). Since improvement in most of the outcome needs continuous government spending over the years and may not be affected by current expenditure, we have considered the average of expenditure of previous years to correspond to the outcome of the current year. For instance, 1993 outcome is linked with average expenditure of 1991 and 1992, and 1999 outcome is linked with average expenditure of 1993, 1994 and 1995 and so on.

Given the limitation of data, our analysis mostly employs simple computational tool. We begin with comparing inter-state rural urban disparities[20] over the study period for the selected development indicators followed by measuring the Spearman's rank correlation of the state expenditure and inequalities for the base year and the reference year to understand the links between them and changes in the association, if any. Further, to inspect the influence of state social expenditure on development inequalities across rural-urban India, we compare the increment of state expenditure with their change in inequalities over the period. To measure increment, we consider the base year value to be 1 and index the final year value in terms of base year value. We measure the increment[21] of the expenditure as compared to their base year and categorise the states into three distinct groups such as low, medium and high[22] according to their indexed value of increment in public spending. In a similar fashion, we also categorise the states into low, medium and high in terms of their decrease in inequality over the years, and cross tabulate the expenditure and inequalities of the states by their positioning in both

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[19] For rural-urban disparities across states the time period considered is 2006-16 given the unavailability of certain development indicators of rural and urban region for the major states considered. So, to keep the parity of the comparison we have considered the given time period where we have uniform information of the data required

[20] Inequalities in rural-urban is calculated by I=Urban outcome/Rural outcome for achievement indicators and I`=Rural outcome/Urban outcome for failure indicators, this measure reveals how much better one region is performing compared to others

[21] Degree of increment=x(t)/x (0), where x(i) is the value in i[th] year

[22] To categorize the states into low, medium and high according to certain value of the variable, first we calculate the range(maximum-minimum) of the variable then divide the range by 3, say x=range/3. The states which have values less than (minimum values + x) will be in low category, states with values between (minimum value + x) and (minimum value + 2x) will be under medium category and states with values greater than (minimum value + 2x) and less than equal to (minimum value + 3x) will be in high category.

dimensions. In this construct, states represented in diagonal cells can be considered as the ones where there is a perfect response of expenditure on inequalities and the rest of the states off the diagonal are the ones to be categorised as over responsive or under responsive. Besides, we also find the inequality elasticity with respect to state expenditure to understand the responsiveness of inequality towards change in expenditure using the following formula

$$Inequality\ elasticity^{23} = \frac{\%\ change\ in\ inequality}{\%\ change\ in\ expenditure}$$

To inspect the role of state expenditure on improving outcome, we begin with comparing the progress of state expenditure level with their outcome level over the period. To measure progress[24], we follow the similar methodology as mentioned above and then categorise the states into three distinct groups such as low, medium and high according to their indexed value of progress in the outcome over the years. Likewise, we also categorise the states into low, medium and high in terms of their increment in public spending, and cross tabulate the expenditure and outcome of the states by their positioning in both dimensions similar to the previous exercise. Further, we find the Spearman's rank correlation of state expenditure and outcome for the selected years; and compare the range[25] of the expenditure and the outcome level to understand the link between them.

In the presence of high inter-state development inequalities and stark differential achievement in MDGs across states, we contrast the two extreme performing states namely Kerala and Bihar to analyse the link between their outcome and state spending using time series techniques[26]. We assess their progress in education and health attainments using a level sensitive progress index (Joe and Mishra, 2017) as mentioned in chapter 2. Joe and Mishra (2017) progress indices are given by $P(h) = 2*(h_t - h_0)/[(2 - h_t)*(2 - h_0)]$ for achievement indicators and $P(h) = 2*(h_0 - h_t)/[\{2 - (1 - h_0)\}*\{2 - (1 - h_t)\}]$ for failure indicators, where, the notation have the similar meaning as described in chapter 2. The particular feature of non-linear progression of the indices, (i.e., for a similar level of improvement ($|h_t - h_0|$), cases with better base levels (h_0) receive greater weights) rightly enable us to assess the progress of Kerala and Bihar since the base year outcome level are largely different for the two states. Further, we engage in computing

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[23] From mid-point formula: % change can be calculated between two time point as: $\frac{V2 - V1}{(V2 + V1)/2}*100$, where V2 is the value for the reference year and V1 is the value for base year

[24] Progress=h(t)/h(0), where h(i) is the value of outcome in i^{th} year

[25] Range is being calculated after indexing the indicators in the unitary scale for the sake of comparability

[26] The imbalances were reinstated by the recent Niti Aayog report 2021, which highlighted Kerala having the best SDG index whereas Bihar has the worst among all.

expenditure[27] incurred for one unit progress[28] for Kerala and Bihar to assess the efficiency of state spending on improving development status. Lastly, we employ time series econometrics to validate our findings. Here, we use both targeted per capita and per capita spending to analyse the impact of government expenditure on the outcome level. The targeted population with respect to each sector is presented in table 3.1 in chapter 3.

4.3 Results

4.3.1 Overview of regional disparities over the years

The literacy rate in urban India is much higher than literacy rate in rural India, and we find that such differences with regard to literacy rate is highest in Bihar followed by Rajasthan and Orissa in the base period, however, the disparities have decreased over the study period, except for Assam. With regard to the reference period, we observe Andhra Pradesh has the highest inequality followed by Bihar. And Kerala has the lowest regional disparity over the years having very little difference across the regions (table 4.1).

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[27] All the expenditures are adjusted for inflation with respect to 1990 as a base year
[28] If, X% is progressed and Y_i is spent in i^{th} year, then $(Y_t - Y_0)/X$ expenditure is incurred to obtain 1% progress

Table 4.1: Education inequality[29] across region

State	LR_B	LR_F
Andhra Pradesh	1.46	1.41
Assam	1.10	1.11
Bihar	1.60	1.28
Gujarat	1.29	1.24
Haryana	1.20	1.18
Karnataka	1.38	1.26
Kerala	1.03	1.02
Madhya Pradesh	1.50	1.25
Maharashtra	1.25	1.18
Odisha	1.46	1.17
Punjab	1.27	1.15
Rajasthan	1.58	1.27
Tamil Nadu	1.27	1.17
Uttar Pradesh	1.33	1.17
West Bengal	1.25	1.23

Source: Author's calculation using state level reports
Note: LR stands for the percentage of literacy rate, B is for base year i.e., 2003 and F for final year, i.e., 2013. Inequalities in rural-urban with regard to literacy rate is calculated by I=Urban LR/Rural LR.

Table 4.2: Family Welfare inequality across region

State	AM_B	AM_F	TFR_B	TFR_F	ANC_B	ANC_F	ID_B	ID_F
Andhra Pradesh	1.00	1.00	1.06	1.26	1.07	1.07	1.40	1.09
Assam	1.21	1.06	1.93	1.64	2.13	1.35	3.17	1.36
Bihar	1.61	1.53	1.45	1.50	2.50	2.02	2.56	1.19
Gujarat	1.03	1.01	1.47	1.22	1.46	1.28	1.85	1.10
Haryana	1.07	0.91	1.32	1.22	1.43	1.16	2.20	1.00
Karnataka	0.93	0.88	1.16	1.12	1.22	0.98	1.49	1.02
Kerala	1.01	1.01	1.18	1.00	1.05	0.96	1.01	1.00
Madhya Pradesh	1.13	1.01	1.27	1.25	1.69	1.74	2.97	1.23
Maharashtra	0.99	0.98	1.21	1.24	1.32	1.09	1.68	1.09
Odisha	1.21	1.08	1.32	1.24	1.37	1.15	1.89	1.06
Punjab	0.96	1.01	1.11	1.00	1.11	1.02	1.24	0.97
Rajasthan	1.62	1.10	1.64	1.37	2.30	1.58	2.91	1.10
Tamil Nadu	0.98	1.03	1.12	1.27	1.04	1.00	1.09	1.01
Uttar Pradesh	1.42	1.32	1.37	1.43	1.81	2.00	2.28	1.07
West Bengal	1.09	0.96	1.56	1.19	1.56	1.03	2.34	1.16

Source: Author's calculation using state level reports
Note: AM, TFR, ANC and ID stand for usage of contraceptive methods, total fertility rate, antenatal care, and institutional delivery. B is for base year i.e., 2006 and F for final year, i.e., 2016. Inequalities in rural-urban is calculated by I=Urban outcome/Rural outcome for achievement indicators and I`=Rural outcome/ Urban outcome for failure indicators

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[29] The exercise couldn't be carried out for gross enrolment ratio due to the unavailability of data at rural and urban region for most of the states.

Similarly for the family welfare sector we notice that almost in all the indicators, urban region is performing better than rural area with some exceptional states like Karnataka and Maharashtra where rural region is found to have better usage of contraceptive methods. Although we notice substantial reduction in such inequality over the period but the disparities are still higher for the states such as Assam, Bihar and Uttar Pradesh. For instance, in Bihar and Uttar Pradesh, usage of antenatal care is double among urban residents compared to rural counterparts, and with regard to total fertility rate, rural mothers have 1.5 times more fertility rate in contrast to urban mothers in Assam as well as Bihar in 2016 (reference year). Unsurprisingly, Kerala is found to be the most egalitarian in its performance across rural-urban region in connection to family welfare indicators (table 4.2).

Table 4.3: Child health and nutrition inequality across region

State	IMR_B	IMR_F	IMN_B	IMN_F	CU_B	CU_F	CW_B	CW_F	CS_B	CS_F
Andhra Pradesh	1.62	2.06	1.19	0.92	1.38	1.25	1.03	1.21	1.24	1.25
Assam	1.82	1.79	0.92	1.60	1.32	1.44	0.87	1.33	1.19	1.70
Bihar	1.32	1.47	1.47	0.96	1.25	1.19	1.08	0.98	1.27	1.24
Gujarat	1.70	1.44	1.36	1.00	1.24	1.38	1.28	1.22	1.24	1.35
Haryana	1.42	1.10	1.36	0.88	1.05	1.05	0.92	1.01	1.27	1.03
Karnataka	1.38	1.68	1.14	0.92	1.40	1.20	1.17	1.08	1.39	1.18
Kerala	1.25	0.83	1.26	1.00	1.57	1.08	2.07	0.97	0.95	0.98
Madhya Pradesh	1.48	1.23	2.18	1.25	1.20	1.23	1.11	1.23	1.13	1.16
Maharashtra	1.52	1.04	1.37	0.99	1.36	1.30	1.26	1.05	1.17	1.31
Odisha	1.42	2.15	1.02	0.95	1.45	1.37	1.83	1.23	1.25	1.30
Punjab	1.32	1.55	1.11	0.99	1.32	0.94	0.93	1.07	1.08	0.89
Rajasthan	1.74	1.42	2.00	1.15	1.51	1.25	1.19	1.08	1.46	1.24
Tamil Nadu	1.15	1.28	0.93	1.10	1.27	1.20	1.05	1.07	1.06	1.12
Uttar Pradesh	1.43	1.29	1.61	1.06	1.37	1.22	1.23	0.99	1.15	1.28
West Bengal	1.29	2.00	1.12	0.89	1.66	1.28	1.29	1.29	1.51	1.19

Source: Author's calculation using state level reports

Note: IMR, IMN, CU, CW and CS stands for infant mortality rate, immunization, child undernutrition, wasted and stunting respectively. B is for base year i.e., 2006 and F for final year, i.e., 2016. Inequalities in rural-urban is calculated by I=Urban outcome/Rural outcome for achievement indicators and I`=Rural outcome/ Urban outcome for failure indicators.

However, the picture of child health across the regions is quite different from the education and family welfare sector, we find that the inequality is persistently higher in case of IMR compared to other child health indicators and has increased during 2006-16 for most of the states. For example, in 2016 mortality rates for the rural infants is found to be almost double in contrast to the urban infants in states such as Andhra Pradesh, Odisha and West Bengal. However, we witness an overall decrease in the regional disparities in immunization of children across all states except Assam. But with respect to the nutrition indicators the results are quite mixed. For example, Kerala witness a reduction in the regional disparities in terms of child undernutrition and child wasting indicators whereas Assam experience an increase in the inequality across all the nutrition indicators (table 4.3).

4.3.2   *Linkages between state spending[30] and regional inequality*

While studying the association of state expenditure with the persistent regional inequality we find that there is a negative correlation in the base period between the two but there exists no significant correlation between increases in such expenditures and reductions of the regional disparities expect for the literacy rate. Rather we find an insignificant positive relation between state spending and regional disparities in case of child nutrition indicators and family welfare indicators. Further analyzing the linkages between targeted per capita expenditure and inequalities we notice the linkage is weaker with regard to family welfare indicators whereas the linkage is stronger in case of the child health indicators as compared to the conventional per capita expenditure (table 4.4).

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[30] Here we have used both conventional per capita expenditure as well as targeted per capita expenditure (as explained in previous chapter) to understand the link between expenditure and outcome.

Table 4.4: Correlation coefficient of regional inequality and expenditure across Indian states

Indicators	Base Period		Reference Period	
Education	*Expenditure*	*Targeted Expenditure*	*Expenditure*	*Targeted Expenditure*
Literacy Rate	-0.67***	-0.69***	-0.52**	-0.57**
Family Planning and Maternal Health Care				
Current use of Any Method	-0.24	-0.06	0.00	0.05
Total Fertility Rate	-0.27	-0.17	0.02	0.06
Antenatal Care	-0.41	-0.24	-0.01	0.07
Institutional Delivery	-0.47	-0.31	-0.31	-0.30
Child Health and Nutrition				
Infant Mortality Rate	-0.25	-0.33	-0.40	-0.33
Immunization	-0.30	-0.40	-0.18	-0.23
Child Stunted	-0.17	-0.23	0.31	0.22
Child Wasted	-0.32	-0.29	0.26	0.22
Child Underweight	-0.25	-0.23	0.44	0.35

Source: Author's calculation using state level reports
Note: Base period refers to 2006 whereas reference period refers to 2016 except for literacy rate whose base period is 2003 and reference period is 2013 as per data availability. Expenditure refers to the conventional per capita expenditure whereas Targeted expenditure means expenditure divided by the population size of the direct beneficiaries. *** p<0.01, ** p<0.5, * p<0.1

Table 4.5: Responsiveness of education inequality towards increment in spending[31]

Education Expenditure	Literacy Rate		
	Low	*Medium*	*High*
Low		Kerala[32]	Madhya Pradesh
Medium	Gujarat, Haryana, West Bengal	Punjab, Tamil Nadu, Uttar Pradesh	Odisha. Rajasthan
High	Andhra Pradesh, Assam, Maharashtra	Karnataka	Bihar

Source: Author's calculation using state level reports

Likewise, the cross tabulation of the decrease in regional disparity and increase in state spending revealed no perfect response except in few states. For instance, Punjab, Tamil Nadu, Uttar Pradesh and Bihar show a similar degree of reduction in regional disparity in terms of literacy rate as well as increment of the states' spending (table 4.5).

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[31] The results are reported only for the conventional per capita expenditure since the states category i.e., low, medium and high with regard to increment in spending was similar for both conventional per capita expenditure and targeted per capita expenditure during 2006-16, so there were no significant differences in the results for the two.

[32] Although Kerala has high spending in most of the development sectors and has better performance in the most of the development parameters as well as less of inequality but while measuring progress it comes under the medium/low category of states given its relative progress between its base year and reference year. Since it has already attained better development and low inequality over the years so its scope of progress is low compared to other states thus her relative progress is showing up in the medium/low category of states instead of high categories.

Table 4.6: Responsiveness of Family Welfare inequality towards increment in spending

	Any Method		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Andhra Pradesh, Bihar, Karnataka, Kerala, Punjab	Assam, Haryana, Madhya Pradesh, Odisha, West Bengal	
Medium	Gujarat, Maharashtra		
High	Tamil Nadu, Uttar Pradesh		Rajasthan
	Total Fertility Rate		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Andhra Pradesh	Bihar, Haryana, Karnataka, Madhya Pradesh, Odisha, Punjab	Assam, Kerala, West Bengal
Medium		Maharashtra	Gujarat
High	Tamil Nadu	Uttar Pradesh	Rajasthan
	Antenatal Care		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Andhra Pradesh, Madhya Pradesh	Bihar, Haryana, Karnataka, Kerala, Odisha, Punjab	Assam, West Bengal
Medium		Gujarat, Maharashtra	
High	Tamil Nadu, Uttar Pradesh		Rajasthan
	Institutional Delivery		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Kerala	Andhra Pradesh, Karnataka, Punjab	Assam, Bihar, Haryana, Madhya Pradesh, Odisha, West Bengal
Medium		Gujarat, Maharashtra	
High	Tamil Nadu		Rajasthan, Uttar Pradesh

Source: Author's calculation using state level reports

Regarding the family welfare and the child health we find a large number of states demonstrating perfect response for the indicators like contraceptive usage and IMR, however, we didn't find any systematic pattern to link the decrease of regional disparities with increment in public spending in majority of the cases (table 4.6, 4.7 & 4.8). Overall, it is observed that apart from few states revealing perfect response between reduction of inequality and increment of spending, majority of them are either over responsive or under responsive thus limiting any tangible conclusion.

Table 4.7: Responsiveness of Child Health inequality towards increment in spending

Health Expenditure	Infant Mortality Rate		
	Low	*Medium*	*High*
Low	Andhra Pradesh, West Bengal	Punjab	Maharashtra, Rajasthan, Uttar Pradesh
Medium	Odisha	Assam, Bihar, Tamil Nadu	Kerala, Madhya Pradesh
High		Karnataka	Gujarat, Haryana
Health Expenditure	**Immunization**		
	Low	*Medium*	*High*
Low			Andhra Pradesh, Maharashtra, Punjab, Rajasthan, Uttar Pradesh, West Bengal
Medium	Assam	Tamil Nadu	Bihar, Kerala, Madhya Pradesh, Odisha
High			Gujarat, Haryana, Karnataka

Source: Author's calculation using state level reports

Table 4.8: Responsiveness of Child Nutrition inequality towards increment in spending

Nutrition Expenditure	Child Undernutrition		
	Low	*Medium*	*High*
Low	Assam, Gujarat, Haryana, Madhya Pradesh	Andhra Pradesh, Karnataka, Maharashtra, Odisha, Tamil Nadu	Kerala, Rajasthan
Medium			West Bengal
High		Bihar	
Nutrition Expenditure	**Child Stunted**		
	Low	*Medium*	*High*
Low	Assam	Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu	Bihar, Haryana, Karnataka, Rajasthan
Medium			West Bengal
High			
Nutrition Expenditure	**Child Stunted**		
	Low	*Medium*	*High*
Low	Assam	Andhra Pradesh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu	Kerala, Odisha
Medium		West Bengal	
High		Bihar	

Source: Author's calculation using state level reports

Table 4.9: Inequality elasticity with respect to per capita state expenditure

State	LR	AM	TFR	ANC	ID	IMR	IMN	CS	CW	CU
Andhra Pradesh	-0.07	0.00	0.37	0.00	-0.54	0.54	-0.58	0.01	0.19	-0.11
Assam	0.02	-0.73	-0.90	-2.48	-4.41	-0.03	0.92	0.36	0.43	0.09
Bihar	-1.12	2.52	-1.68	10.50	36.11	0.21	-0.82	-0.01	-0.06	-0.03
Gujarat	-0.15	-0.03	-0.29	-0.20	-0.79	-0.21	-0.39	0.10	-0.06	0.13
Haryana	-0.05	28.82	14.04	37.18	133.73	-0.37	-0.62	-1.04	0.47	0.00
Karnataka	-0.23	-0.39	-0.25	-1.54	-2.65	0.29	-0.32	-0.17	-0.08	-0.16
Kerala	-0.03	0.00	-0.47	-0.26	-0.03	-0.66	-0.37	0.02	-0.58	-0.30
Madhya Pradesh	-3.15	-0.28	-0.04	0.07	-2.08	-0.33	-0.98	0.02	0.09	0.02
Maharashtra	-0.11	-0.02	0.05	-0.37	-0.82	-0.90	-0.77	0.13	-0.21	-0.05
Odisha	-0.83	-1.14	-0.63	-1.75	-5.65	0.76	-0.13	0.04	-0.43	-0.06
Punjab	-0.32	0.15	-0.32	-0.26	-0.74	0.50	-0.36	Na	Na	Na
Rajasthan	-0.73	-0.43	-0.20	-0.42	-1.03	-0.41	-1.08	-0.23	-0.13	-0.26
Tamil Nadu	-0.33	0.06	0.14	-0.04	-0.09	0.19	0.30	0.13	0.04	-0.13
Uttar Pradesh	-0.53	-0.07	0.04	0.10	-0.73	-0.22	-0.89	Na	Na	Na
West Bengal	-0.05	-0.48	-1.03	-1.56	-2.57	1.12	-0.59	-0.18	0.00	-0.20

Source: Author's calculation using state level reports

Note: LR, AM, TFR, ANC, ID, IMR, IMN, CS, CW, and CU stands for literacy rate, usage of contraceptive methods, total fertility rate, antenatal care, institutional delivery, infant mortality rate, immunization, child undernutrition, wasted and stunting respectively. Elasticity is calculated using Inequality elasticity=$\frac{\% \text{ change in inequality}}{\% \text{ change in expenditure}}$ using mid-point formula i.e., % Change can be calculated between two time point as: $\frac{V2-V1}{(V2+V1)/2}*100$, where V2 is the value for the reference year and V1 is the value for base year. 'Na' is mentioned as data for nutrition expenditure is not available for Punjab and Uttar Pradesh.

With regard to the elasticity analysis, we find large variations in the responsiveness pattern across indicators as well as states. For instance, reduction in regional disparities in maternal health care services such as antenatal care, institutional delivery and child health status like IMR and immunization show higher response to the increasing state spending compared to other indicators. However, if we compare the states, we find Haryana has high elasticity with respect to contraceptive usage, total fertility rate, antenatal care and institutional delivery but the elasticity values are positive which means if there is 1% increase in the state spending the inequality will increase more than 1%, which negates the underlying presumption regarding the nature of the impact of the spending on the disparities (table 4.9). The dissociation of spending and inequality become more prominent if we use targeted per capita expenditure instead of conventional per capita expenditure and the results provide more clarity and meaning to the findings (table 4.10). So, in general, we observe that most of the values are inelastic indicating very little response of inequality measure with respect to change in the state spending over the time period which refute the supposition that welfare states through generous social sector spending is critically important and effective to improve the distribution of outcome.

Table 4.10: Inequality elasticity with respect to targeted per capita state expenditure

State	LR	AM	TFR	ANC	ID	IMR	IMN	CS	CW	CU
Andhra Pradesh	-0.06	0.00	0.42	0.00	-0.61	0.45	-0.48	0.01	0.16	0.01
Assam	0.02	-1.16	-1.43	-3.93	-7.01	-0.03	0.82	0.33	0.39	0.17
Bihar	-1.12	1.95	-1.29	8.11	27.89	0.20	-0.80	-0.01	-0.06	-0.04
Gujarat	-0.13	-0.03	-0.30	-0.21	-0.81	-0.20	-0.37	0.09	-0.05	0.11
Haryana	-0.04	2.02	0.98	2.60	9.36	-0.32	-0.53	-0.58	0.26	-0.59
Karnataka	-0.19	-0.25	-0.16	-1.00	-1.72	0.26	-0.28	-0.16	-0.08	-0.14
Kerala	-0.02	0.00	-0.44	-0.24	-0.03	-0.64	-0.37	0.02	-0.55	0.08
Madhya Pradesh	-2.29	-0.34	-0.05	0.09	-2.53	-0.29	-0.85	0.02	0.08	0.07
Maharashtra	-0.10	-0.02	0.05	-0.41	-0.92	-0.73	-0.63	0.11	-0.18	0.10
Odisha	-0.70	-1.87	-1.03	-2.88	-9.28	0.69	-0.12	0.04	-0.39	0.08
Punjab	-0.27	0.19	-0.38	-0.31	-0.90	0.37	-0.27	Na	Na	Na
Rajasthan	-0.65	-0.47	-0.22	-0.46	-1.11	-0.34	-0.91	-0.19	-0.11	-0.17
Tamil Nadu	-0.26	0.06	0.14	-0.04	-0.09	0.18	0.28	0.10	0.03	0.21
Uttar Pradesh	-0.51	-0.08	0.05	0.11	-0.78	-0.19	-0.76	Na	Na	Na
West Bengal	-0.04	-0.66	-1.40	-2.13	-3.51	0.86	-0.46	-0.17	0.00	-0.11

Source: Author's calculation using state level reports

Note: Here, Targeted expenditure means expenditure divided by the population size of the direct beneficiaries. LR, AM, TFR, ANC, ID, IMR, IMN, CS, CW, and CU stands for literacy rate, usage of contraceptive methods, total fertility rate, antenatal care, institutional delivery, infant mortality rate, immunization, child undernutrition, wasted and stunting respectively. Elasticity is calculated using Inequality elasticity=$\frac{\% \text{ change in inequality}}{\% \text{ change in expenditure}}$ using mid-point formula i.e., % Change can be calculated between two time point as: $\frac{V2-V1}{(V2+V1)/2}$*100, where V2 is the value for the reference year and V1 is the value for base year. 'Na' is mentioned as data for nutrition expenditure is not available for Punjab and Uttar Pradesh.

4.3.3 Progress of outcome vis a vis state expenditure in education and health sectors

The comparison of the increase in spending with improvement in the outcome clearly reveals that responsiveness is varying across indicators as well as states. For example, Bihar and Madhya Pradesh have high progress in literacy rate but low increase in education expenditure whereas Andhra Pradesh and Haryana have medium progress but high spending on education. Further, Punjab and Tamil Nadu show over responsiveness to education spending in terms of enrolment ratio in school going children and higher education respectively. However, in case of literacy rate we find majority of the states to be in the diagonal cells revealing a perfect response of education expenditure to outcome which is not the case for enrolment ratio. This is indicative of the fact that although literacy rate shows some positive response to the increased education spending but for enrolment ratio the response is quite low. The expenditure amount in per capita terms have been revised into targeted per-capita given that these expenditures are intended for a target population. But with regard to targeted expenditure, we observe little change in the position of states except for Tamil Nadu whose education indicators become less responsive to targeted expenditure compared to per capita expenditure (table 4.11).

Table 4.11: Progress of education expenditure and outcome of Indian states during 2000-11

	Literacy Rate		
Education Expenditure	*Low*	*Medium*	*High*
Low	Gujarat, Punjab, Tamil Nadu		Bihar, Madhya Pradesh
Medium	Kerala	Assam, Odisha, Rajasthan, Uttar Pradesh, West Bengal	
High		Andhra Pradesh, Haryana, Karnataka	
	GER(I-XII)		
Education Expenditure	*Low*	*Medium*	*High*
Low	Gujarat	Madhya Pradesh, Tamil Nadu	Bihar, Punjab
Medium	Assam, Odisha, Rajasthan	Kerala, West Bengal	Uttar Pradesh
High	Karnataka, Maharashtra	Andhra Pradesh, Haryana	
	GER(HE)		
Education Expenditure	*Low*	*Medium*	*High*
Low	Bihar, Gujarat, Madhya Pradesh	Punjab	Tamil Nadu
Medium	Assam, Odisha, West Bengal	Uttar Pradesh	Kerala, Rajasthan
High	Maharashtra	Haryana, Karnataka	Andhra Pradesh
	Literacy Rate		
Targeted Education Expenditure	*Low*	*Medium*	*High*
Low	Gujarat, Punjab		Bihar, Madhya Pradesh
Medium	Kerala, Tamil Nadu	Assam, Odisha, Rajasthan, Uttar Pradesh, West Bengal	
High		Andhra Pradesh, Haryana, Karnataka	
	GER(I-XII)		
Targeted Education Expenditure	*Low*	*Medium*	*High*
Low	Gujarat	Madhya Pradesh	Bihar, Punjab
Medium	Assam, Odisha, Rajasthan	Kerala, Tamil Nadu, West Bengal	Uttar Pradesh
High	Karnataka, Maharashtra	Andhra Pradesh, Haryana	
	GER(HE)		
Targeted Education Expenditure	*Low*	*Medium*	*High*
Low	Bihar, Gujarat, Madhya Pradesh	Punjab	
Medium	Assam, Odisha, West Bengal	Uttar Pradesh	Kerala, Tamil Nadu, Rajasthan
High	Maharashtra	Haryana, Karnataka	Andhra Pradesh

Source: Author's calculations using state level reports
Note: GER(I-XII), GER(HE) represents gross enrolment ratio of I-XII and higher education respectively

In the health sector we notice, Punjab, Uttar Pradesh and West Bengal have greater improvement in the infant mortality rate despite their low spending on the health sector, whereas Gujarat and Haryana have relatively greater spending but medium progress in outcome. Although Kerala exhibits smaller improvement in outcome with greater spending in the health sector, this could largely be an aberration given the already attained levels of infant mortality rate in the state from where further improvement may well be slower. But for immunization we see that majority of the states have low progress in outcome irrespective of their incremental expenditure, which indicates that immunization is less responsive to health expenditure (table 4.12). On revising per capita terms into targeted per-capita, we find the pattern of association between expenditures and outcomes is quite different. When we consider targeted expenditure, it is evident that many states depict a better outcome response in the sense that with lesser increment in expenditure component there is a reasonable improvement in the outcome. This is apparent from table 4.12 that most of the states are in the diagonal or up-diagonal position except three states disqualifying the same. For instance, the association between health outcome and targeted per capita health expenditure shows that with regard to infant mortality rate Assam is more responsive to targeted expenditure than per capita expenditure, where Karnataka portrays very little response. However, a similar pattern is not observed in case of immunization wherein most states fail to have the response in outcomes in relation to the expenditure. Overall, very few states belong to the diagonal cell (i.e., progress of spending matching with the progress of outcome) which negates any strong association of health spending to the health outcome.

Table 4.12: Progress of health expenditure and outcome of Indian states during 1993-2016

	Infant Mortality Rate (IMR)		
Health Expenditure	*Low*	*Medium*	*High*
Low		Assam, Bihar	Punjab, Uttar Pradesh, West Bengal
Medium		Andhra Pradesh, Rajasthan	Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu
High	Kerala	Gujarat, Haryana	Karnataka
	Immunization (IMN)		
Health Expenditure	*Low*	*Medium*	*High*
Low	Assam, Punjab, West Bengal	Uttar Pradesh	Bihar
Medium	Andhra Pradesh, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu	Rajasthan	
High	Gujarat, Haryana, Karnataka, Kerala		
	Infant Mortality Rate (IMR)		
Target Health Expenditure	*Low*	*Medium*	*High*
Low		Bihar	Karnataka, Uttar Pradesh
Medium		Assam, Rajasthan	Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, West Bengal
High		Andhra Pradesh, Gujarat, Haryana	
	Immunization (IMN)		
Target Health Expenditure	*Low*	*Medium*	*High*
Low		Uttar Pradesh	Bihar
Medium	Assam, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, West Bengal	Rajasthan	
High	Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala		

Source: Author's calculations using state level reports

The family welfare expenditures are expected to reflect in the usage of contraceptive methods and also reduce the total fertility rate. Family welfare expenditure is contrasted here with a range of outcome variables such as contraceptive use, total fertility rate, use of antenatal care and institutional deliveries. This contrast does not demonstrate a systematic connect with expenditure which could possibly be due to the outcome indicators being shaped by various other factors beyond family welfare interventions. The usage of contraceptive methods didn't show much improvement over the years even with high and medium increase in spending for

the states such as Gujarat, Karnataka and Maharashtra. Moreover, total fertility rate remains relatively high in majority of the states irrespective of the spending pattern. In case of antenatal care, Bihar, Haryana, Punjab, Assam and West Bengal reveal positive association between the increase of expenditure and health attainments. But maternal health care indicators such as institutional delivery does not respond to the spending pattern, except for Rajasthan and Uttar Pradesh. But the analysis with targeted expenditure reveals that health attainments of Maharashtra respond more to the targeted spending compared to per capita spending. For instance, its low progress in spending on family welfare is accompanied by low improvement in the usage of contraceptive methods, antenatal care and institutional delivery (table 4.13). The analysis of per capita expenditure over shadows the association between spending and outcome.

Table 4.13: Progress of family welfare expenditure and outcome of Indian states during 1999-2016

	Current use of Any Method (AM)		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Haryana	Bihar, Odisha, Punjab	Madhya Pradesh
Medium	Gujarat, Karnataka, Kerala, Maharashtra, West Bengal	Assam	
High	Tamil Nadu	Andhra Pradesh	Rajasthan, Uttar Pradesh
	Current use of Any Modern Method (AMM)		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low		Bihar, Haryana, Odisha	Madhya Pradesh, Punjab
Medium	Gujarat, Karnataka, Kerala, Maharashtra,		Assam, West Bengal
High	Tamil Nadu	Andhra Pradesh	Rajasthan, Uttar Pradesh
	Total Fertility Rate (TFR)		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low		Bihar	Haryana, Madhya Pradesh, Odisha, Punjab
Medium	Kerala	Gujarat	Assam, Karnataka, Maharashtra, West Bengal
High		Tamil Nadu	Andhra Pradesh, Rajasthan, Uttar Pradesh
	Antenatal Care (ANC)		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Bihar, Haryana, Punjab	Odisha	Madhya Pradesh
Medium	Gujarat, Karnataka, Kerala, Maharashtra	Assam, West Bengal	
High	Andhra Pradesh, Tamil Nadu	Rajasthan, Uttar Pradesh	
	Institutional Delivery (ID)		
Family Welfare Expenditure	*Low*	*Medium*	*High*
Low		Haryana, Punjab	Bihar, Madhya Pradesh, Odisha
Medium	Gujarat, Karnataka, Kerala, Maharashtra, West Bengal		Assam
High	Andhra Pradesh, Tamil Nadu		Rajasthan, Uttar Pradesh
	Current use of Any Method (AM)		
Target Family Welfare Expenditure	*Low*	*Medium*	*High*
Low	Haryana, Maharashtra	Bihar, Odisha, Punjab	Madhya Pradesh
Medium	Gujarat, Karnataka, Kerala, West Bengal	Andhra Pradesh, Assam	
High	Tamil Nadu		Rajasthan, Uttar Pradesh

Source: Author's calculations using state level reports

Table 4.13: Progress of family welfare expenditure and outcome of Indian states during 1999-2016 (continued)

Target Family Welfare Expenditure	Current use of Any Method (AM)		
	Low	*Medium*	*High*
Low	Haryana, Maharashtra	Bihar, Odisha, Punjab	Madhya Pradesh
Medium	Gujarat, Karnataka, Kerala, West Bengal	Andhra Pradesh, Assam	
High	Tamil Nadu		Rajasthan, Uttar Pradesh
Target Family Welfare Expenditure	**Current use of Any Modern Method (AMM)**		
	Low	*Medium*	*High*
Low	Maharashtra	Bihar, Haryana, Odisha	Madhya Pradesh, Punjab
Medium	Gujarat, Karnataka, Kerala	Andhra Pradesh	Assam, West Bengal
High	Tamil Nadu		Rajasthan, Uttar Pradesh
Target Family Welfare Expenditure	**Total Fertility Rate (TFR)**		
	Low	*Medium*	*High*
Low		Bihar	Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab
Medium	Kerala	Gujarat	Andhra Pradesh, Assam, Karnataka, West Bengal
High		Tamil Nadu	Rajasthan, Uttar Pradesh
Targeted Family Welfare Expenditure	**Antenatal Care (ANC)**		
	Low	*Medium*	*High*
Low	Bihar, Haryana, Maharashtra, Punjab	Odisha	Madhya Pradesh
Medium	Andhra Pradesh, Gujarat, Karnataka, Kerala	Assam, West Bengal	
High	Tamil Nadu	Rajasthan, Uttar Pradesh	
Targeted Family Welfare Expenditure	**Institutional Delivery (ID)**		
	Low	*Medium*	*High*
Low	Maharashtra	Haryana, Punjab	Bihar, Madhya Pradesh, Odisha
Medium	Andhra Pradesh, Gujarat, Karnataka, Kerala, West Bengal		Assam
High	Tamil Nadu		Rajasthan, Uttar Pradesh

Source: Author's calculations using state level reports

In the nutrition sector we find that all the indicators of child nutrition have improved over the years irrespective of the increase in nutrition expenditure but Assam is showing less

improvement accompanied by low increase in nutrition expenditure over the period. Apart from West Bengal switching to higher responsiveness cell, nutrition indicators have similar response to per capita as well as targeted per capita nutrition expenditure (table 4.14).

Table 4.14: Progress of nutrition expenditure and outcome of Indian states during 1993-2016

Child Stunted (CS)			
Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Assam		Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, West Bengal
Medium			Punjab
High			Andhra Pradesh, Uttar Pradesh
Child Wasted (CW)			
Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Haryana	Assam, Rajasthan	Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu
Medium		Punjab	
High		Andhra Pradesh	Uttar Pradesh, West Bengal
Child Underweight (CU)			
Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Assam		Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu
Medium			Punjab
High			Andhra Pradesh, Uttar Pradesh, West Bengal
Child Stunted (CS)			
Target Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Assam		Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu
Medium			Punjab
High			Andhra Pradesh, Uttar Pradesh, West Bengal
Child Wasted (CW)			
Target Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Haryana	Assam, Rajasthan	Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu
Medium		Punjab	
High		Andhra Pradesh	Uttar Pradesh, West Bengal
Child Underweight (CU)			
Target Nutrition Expenditure	*Low*	*Medium*	*High*
Low	Assam		Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu
Medium			Punjab
High			Andhra Pradesh, Uttar Pradesh, West Bengal

Source: Author's calculations using state level reports

4.3.4 Association between state spending and outcome

Measuring the progress between two points often hides the association between expenditure and outcome over the years. So, here we employ rank analysis between the sector wise spending and their respective outcome for each of the selected years to understand the degree of linkages between spending and outcome and the extent to which the responsiveness has changed over the time period. The Spearman's rank analysis for the education sector confirms the presence of significant strong positive association between literacy rate and education spending, but for enrolment ratio it shows low as well as insignificant association. However, when linked with targeted expenditure the association becomes stronger and significant with respect to enrolment ratio in higher education (table 4.15).

Table 4.15: Rank correlation between expenditure and outcome in education sector

Education Indicators	2000-01	2005-06	2010-11
Per capita Expenditure			
Literacy Rate	0.86***	0.77***	0.72***
GER (I-XII)	0.41	0.12	0.29
GER (HE)	0.45*	0.20	0.59**
Targeted Per capita Expenditure			
Literacy Rate	0.83***	0.81***	0.81***
GER (I-XII)	0.38	0.34	0.39
GER (HE)	0.52**	0.47*	0.58**

Source: Author's calculations using state level reports
Note: GER(I-XII), GER(HE) represents gross enrolment ratio of I-XII and higher education respectively. *** $p<0.01$, ** $p<0.5$, * $p<0.1$

In case of the health sector, the Spearman's rank analysis confirms the presence of significant strong negative association between infant mortality rate and public health spending, but for immunization the significant strong positive linkages in initial years does not persist in later years. Similarly, for total fertility rate and antenatal care the linkage is only significant for certain years. Although institutional delivery reveals significant association but the link between delivery in institution and spending on family welfare is very weak. Unlike infant mortality rate and immunization, the nutrition indicators show little or no association between the child nutrition indicators and state spending on nutrition sector and establishes no significant relation between the two (table 4.16).

Table 4.16: Rank correlation between per capita expenditure and outcome in health sector

Health Related Indicators	1993	1999	2004	2006	2008	2013	2016
Health							
Infant Mortality Rate	-0.83*	-0.60*	-0.79*	-0.85*	-0.78*	-0.68*	-0.78*
Immunization	0.71*	0.67*	0.82*	0.70*	0.74*	-0.06	0.33
Family Welfare							
Any Method	NA	-0.27	0.11	0.20	0.27	0.07	-0.24
Any Modern Method	NA	-0.15	0.32	0.35	0.41	0.25	0.11
Total Fertility Rate	NA	0.16	-0.41	-0.49*	-0.59*	-0.25	NA
Antenatal Care	NA	-0.05	0.45*	0.50*	0.58*	0.60*	0.35
Institutional Delivery	NA	-0.08	0.49*	0.52*	0.55*	0.48*	0.46*
Nutrition							
Child Stunted	0.46	-0.13	NA	-0.20	NA	-0.19	0.24
Child Wasted	0.44	-0.03	NA	0.05	NA	0.23	0.42
Child Undernutrition	0.05	-0.17	0.12	-0.11	NA	0.30	0.41

Source: Author's calculations using state level reports
*Note: *** p<0.01, ** p<0.5, * p<0.1*

As noted earlier it is more appropriate to seek an association between expenditures and the targeted population rather than the total population. But though the correlation between outcome and targeted expenditure shows stronger association than per capita expenditure in case of infant mortality rate and immunization this is not the case for other indicators, where we find the association with the targeted expenditure compared to per capita expenditure is weaker (table 4.17). However, the use of targeted per capita expenditure instead of per capita expenditure re-establishes the similar observation with more relevant information.

Table 4.17: Rank correlation between targeted per capita expenditure and outcome in health sector

Health Related Indicators	1993	1999	2004	2006	2008	2013	2016
Health							
Infant Mortality Rate	-0.85*	-0.75*	-0.81*	-0.86*	-0.87*	-0.75*	-0.82*
Immunization	0.75*	0.79*	0.86*	0.76*	0.84*	-0.02	0.35
Family Welfare							
Any Method	NA	-0.35	-0.11	0.02	0.18	0.08	-0.20
Any Modern Method	NA	-0.18	0.11	0.25	0.35	0.25	0.14
Total Fertility Rate	NA	0.33	-0.14	-0.33	-0.50*	-0.21	NA
Antenatal Care	NA	-0.21	0.19	0.36	0.47*	0.59*	0.34
Institutional Delivery	NA	-0.24	0.25	0.37	0.48*	0.50*	0.45*
Nutrition							
Child Stunted	0.31	-0.33	NA	-0.20	NA	-0.07	0.12
Child Wasted	0.42	0.06	NA	0.05	NA	0.27	0.42
Child Undernutrition	-0.04	-0.24	0.02	-0.11	NA	0.37	0.32

Source: Author's calculations using state level reports
*Note: *** p<0.01, ** p<0.5, * p<0.1*

4.3.5 Inter-state differences in outcome with respect to differences in public spending

To better understand the response of public spending on specific outcomes, we associate disparities in expenditure with disparities in outcomes. Such disparities are analysed with the help of indexing the worst against the best where best assumes the value 1. This is computed for all time periods for which data is available and presented in table 4.18 and 4.19 below. As regard education sector we find the disparities have increased in expenditure compared to base year and the differences is found to be higher in terms of targeted expenditure. However, the disparities have decreased in terms of literacy rate but increased for enrolment ratio specially the enrolment in higher education is observed to be widening across states consistently (table 4.18). Such inconsistencies in the direction of disparity confirms the fact that the disparities in education spending have little correspondence with its outcome differences.

Table 4.18: Education expenditure and outcome disparities across Indian states

Variables	2000-01	2005-06	2010-11
Education Expenditure	0.52	0.61	0.57
Targeted Education Expenditure	0.71	0.77	0.77
Literacy Rate	0.49	0.36	0.33
Gross Enrolment Ratio (I-XII)	0.34	0.64	0.48
Gross Enrolment Ratio (Higher Education)	0.52	0.68	0.70

Source: Author's calculations using state level reports
Note: Figures shows the range of the indexed values(highest-lowest). Indexing is done for the sake of comparability and the values are indexed with respect to the highest value of that indicator.

In case of health as well as family welfare expenditure, the disparities have widened according to these indexed values. Further such gaps become relatively greater when they are assessed considering the targeted expenditures. While comparing these disparities against the outcomes', it is observed that outcome disparities whether it be infant mortality rate or immunization have narrowed. Therefore, it can be said that expenditure disparities do not correspond to the observed outcome disparities across states as one widens and other narrows down. For family welfare sector, although total fertility rate and institutional delivery show decline in disparities over time, but usage of contraceptive methods and antenatal care shows no change in disparities, however, both per capita and targeted family welfare expenditure shows increase in disparities over time but targeted spending reveals less disparity compared to the per capita expenditure. The nutrition sector shows high and increasing disparities over time in states' spending. Although the child wasting indicator shows a decline in the disparities but both child stunting and underweight outcome experience increased disparities over the time period (table 4.19). This indicates that spending pattern has very low impact on the outcome variables and the disparities in the spending are very unlikely to explain the inter-state

disparities in education and health-related outcome. Even, within health sector we witness different relations for different indicators, thus it is difficult to conclude whether all the goals related to health and education will be met or not given a multitude of indicators as in SDGs.

Table 4.19: Health related public expenditure and outcome disparities across Indian states

Variables	1993	1999	2004	2006	2008	2013	2016
	Health						
Health Expenditure	0.52	0.56	0.69	0.75	0.65	0.73	0.77
Target Health Exp	0.57	0.63	0.74	0.81	0.74	0.80	0.83
Infant Mortality Rate	0.88	0.86	0.85	0.80	0.83	0.78	0.79
Immunization	0.84	0.87	0.82	0.72	0.63	0.37	0.47
	Family Welfare						
Family Welfare Expenditure	NA	0.53	0.55	0.61	0.69	0.73	0.81
Target Family Welfare Expenditure	NA	0.58	0.54	0.59	0.62	0.65	0.78
Any Method	0.50	0.59	0.54	0.39	0.47	0.28	0.40
Any Modern Method	0.63	0.65	0.61	0.60	0.59	0.47	0.66
Total Fertility Rate	0.67	0.61	0.61	0.59	0.56	0.53	NA
Antenatal Care	0.81	0.85	0.83	0.82	0.77	0.88	0.84
Institutional Delivery	0.87	0.84	0.81	0.78	0.75	0.37	0.36
	Nutrition						
Nutrition Expenditure	0.99	1	0.99	1	1	1	1
Target Nutrition Expenditure	0.99	0.98	0.99	1	1	1	1
Child Stunted	0.39	0.75	NA	0.57	NA	0.39	0.59
Child Wasted	0.72	0.74	NA	0.74	NA	0.38	0.41
Child Undernutrition	0.58	0.80	0.45	0.62	NA	0.46	0.63

Source: Author's calculations using state level reports
Note: Figures shows the range of the indexed values(highest-lowest). Indexing is done for the sake of comparability and the values are indexed with respect to the highest value of that indicator. The value for expenditure with respect to nutrition sector is 1 due to approximating the exact figure to the nearest value. 'NA' implies data not available.

To understand the responsiveness further we calculate the elasticity of development performance in terms of per capita expenditure and targeted per capita expenditure. We find that in most of the cases the response is inelastic indicating the non-responsiveness of development towards state expenditure. Besides, we do not find the desired sign for elasticity in all the cases. For instance, contraceptive usage and utilization of maternal health care services did not increase with the increase of expenditure in family welfare sectors in case of Bihar, Gujarat, Karnataka, Kerala and Maharashtra. Overall, institutional delivery and infant mortality rate shows better response to spending compared to other indicators (table 4.20). With respect to targeted expenditure, although development performance shows a better response but it is inelastic and doesn't have desired sign for all the cases especially contraceptive usage and antenatal care (table 4.21). So, these results reconfirm the previous finding of no systematic association between the development performance and state expenditure.

Table 4.20: Elasticity of development performance with respect to change in per capita expenditure

State	LR	GER(I-XII)	GER(HE)	AM	AMM	TFR	ANC	ID	IMR	IMN	CS	CW	CU
Andhra Pradesh	0.18	0.33	1.09	0.14	0.15	-0.26	-0.05	0.54	-0.75	0.44	-0.43	0.47	-0.07
Assam	0.20	-0.08	0.79	0.23	0.39	-0.37	0.48	1.43	-1.12	1.58	0.47	0.19	0.54
Bihar	0.48	0.91	0.98	-1.71	-0.52	1.98	0.68	-8.62	-136.84	325.32	-0.10	-0.11	-0.09
Gujarat	0.15	0.25	0.80	-0.22	-0.20	-0.24	0.14	0.60	-0.71	0.01	-0.24	0.21	-0.05
Haryana	0.13	0.43	0.84	0.05	0.28	-0.93	0.42	2.89	-0.70	0.16	-0.64	1.23	-0.02
Karnataka	0.14	0.26	0.82	-0.13	-0.10	-0.29	-0.03	0.64	-1.05	0.20	-0.11	0.03	-0.07
Kerala	0.04	0.49	1.21	-0.17	-0.10	-0.01	-0.09	0.07	-0.29	0.45	0.20	-0.11	0.17
Madhya Pradesh	0.39	0.60	1.25	0.57	0.56	-0.44	1.36	1.83	-1.04	0.85	-0.17	0.01	-0.11
Maharashtra	0.10	0.24	0.74	-0.23	-0.26	-0.44	-0.83	0.58	-1.27	-0.26	-0.22	0.06	-0.15
Odisha	0.23	0.25	0.72	0.40	0.23	-0.52	0.50	2.29	-1.17	1.01	-0.35	-0.36	-0.36
Punjab	0.13	0.74	1.22	0.19	0.31	-0.55	0.24	1.23	-1.65	0.66	NA	NA	NA
Rajasthan	0.22	0.24	1.22	0.34	0.30	-0.34	0.42	1.04	-1.11	1.48	-0.25	0.21	-0.15
Tamil Nadu	0.14	0.49	1.38	0.02	0.03	-0.13	-0.09	0.17	-1.63	0.10	-0.36	-0.18	-0.38
Uttar Pradesh	0.23	0.89	1.15	0.44	0.36	-0.37	0.50	1.11	-1.97	2.33	NA	NA	NA
West Bengal	0.16	0.41	0.56	0.07	0.21	-0.45	0.32	0.68	-1.37	1.46	-0.23	0.08	-0.19

Source: Author's calculations using state level reports and RBI Bulletin

Note: LR, GER(I-XII), GER(HE), AM, AMM, TFR, ANC, ID, IMR, IMN, CS, CW, and CU stands for literacy rate, gross enrollment ratio of I-XII, gross enrollment ratio of Higher Education, usage of any contraceptive methods, usage of any modern contraceptive methods, total fertility rate, antenatal care, institutional delivery, infant mortality rate, immunization, child undernutrition, wasted and stunting respectively. Elasticity is calculated using Development elasticity=$\frac{\% \text{ change in development}}{\% \text{ change in expenditure}}$ using mid-point formula i.e., % Change can be calculated between two time point as: $\frac{V2-V1}{(V2+V1)/2}*100$, where V2 is the value for the reference year and V1 is the value for base year. 'NA' is mentioned as data for nutrition expenditure is not available for Punjab and Uttar Pradesh.

Table 4.21: Elasticity of development performance with respect to change in targeted per capita expenditure

State	LR	GER(I-XII)	GER(HE)	AM	AMM	TFR	ANC	ID	IMR	IMN	CS	CW	CU
Andhra Pradesh	0.22	0.40	1.31	0.13	0.14	-0.24	-0.04	0.51	-0.94	0.55	-0.63	0.69	-0.11
Assam	0.23	-0.09	0.91	0.20	0.35	-0.34	0.43	1.29	-1.58	2.22	0.49	0.20	0.56
Bihar	0.50	0.95	1.02	-1.73	-0.53	2.01	0.69	-8.72	-37.41	88.93	-0.11	-0.11	-0.10
Gujarat	0.18	0.30	0.94	-0.21	-0.20	-0.24	0.13	0.59	-0.82	0.01	-0.28	0.24	-0.05
Haryana	0.15	0.49	0.96	0.04	0.21	-0.71	0.32	2.20	-0.88	0.20	-1.05	2.02	-0.04
Karnataka	0.16	0.31	0.97	-0.14	-0.11	-0.31	-0.03	0.68	-1.29	0.25	-0.12	0.03	-0.08
Kerala	0.04	0.53	1.32	-0.18	-0.11	-0.01	-0.09	0.07	-0.31	0.48	0.20	-0.11	0.17
Madhya Pradesh	0.46	0.71	1.47	0.50	0.50	-0.39	1.20	1.61	-1.21	0.99	-0.19	0.02	-0.12
Maharashtra	0.12	0.27	0.86	-0.21	-0.23	-0.40	-0.75	0.53	-1.62	-0.33	-0.25	0.07	-0.18
Odisha	0.27	0.29	0.82	0.35	0.21	-0.46	0.44	2.03	-1.38	1.20	-0.43	-0.44	-0.45
Punjab	0.17	0.97	1.58	0.17	0.27	-0.49	0.21	1.09	-2.47	1.00	NA	NA	NA
Rajasthan	0.25	0.27	1.38	0.32	0.28	-0.32	0.40	0.98	-1.37	1.83	-0.27	0.23	-0.16
Tamil Nadu	0.17	0.58	1.64	0.02	0.03	-0.13	-0.08	0.16	-1.96	0.13	-0.51	-0.26	-0.54
Uttar Pradesh	0.25	0.97	1.25	0.42	0.34	-0.34	0.47	1.04	-2.58	3.06	NA	NA	NA
West Bengal	0.20	0.49	0.68	0.06	0.19	-0.41	0.29	0.61	-2.12	2.26	-0.23	0.09	-0.19

Source: Author's calculations using state level reports and RBI Bulletin

Note: Here, Targeted expenditure means expenditure divided by the population size of the direct beneficiaries. LR, GER(I-XII), GER(HE), AM, AMM, TFR, ANC, ID, IMR, IMN, CS, CW, and CU stands for literacy rate, gross enrollment ratio of I-XII, gross enrollment ratio of Higher Education, usage of any contraceptive methods, usage of any modern contraceptive methods, total fertility rate, antenatal care, institutional delivery, infant mortality rate, immunization, child undernutrition, wasted and stunting respectively. Elasticity is calculated using Development elasticity=$\frac{\%\ change\ in\ development}{\%\ change\ in\ expenditure}$ using mid-point formula i.e., % Change can be calculated between two time point as: $\frac{V2-V1}{(V2+V1)/2}$*100, where V2 is the value for the reference year and V1 is the value for base year. 'NA' is mentioned as data for nutrition expenditure is not available for Punjab and Uttar Pradesh.

4.3.6 Contrast between Kerala and Bihar with regard to development outcome and spending

Given the wide disparities and observable inequalities across the indicators and expenditure across Indian States, we compare the best and worst performers in education and health sectors namely Kerala and Bihar[33]. In 2018, according to the NITI Aayog report Kerala was ranked 1 in the education index while Bihar and Jharkhand were ranked last among large states. In the same year Kerala was having the highest health index (74.01) whereas Bihar was one of the worst performers (32.11) along with Uttar Pradesh (28.61) and Odisha (35.97) (NITI Aayog, 2019). In terms of overall education and health spending as well as performance in those indicators Kerala and Bihar are often placed as one of the top and bottom states in India respectively. In this context, we contrast the two states' responsiveness of public spending on their outcomes. We begin with comparing their performances in education and health indicators over the period.

The analysis over the education and health indicators presents a clear contrast between the two extremes, and reveals how Bihar is ill-placed in terms of all the indicators. Considering an average performance over the entire time period, Kerala has only 10% population who are not yet literate where half of the population of Bihar is yet to be literate. Similarly, they have on an average 20% gap in the enrolment ratio of the school going children aged 6-17 years. The difference can also be witnessed in the health sector as Kerala's infant mortality rate averaged at 12.9 whereas for Bihar it is 56.2. During the period of comparison, the percentage of women utilizing antenatal care in Kerala is almost 65% higher than that of Bihar. In case of nutrition, more than 50% of children are underweight in Bihar whereas only one fourth of children are underweight in Kerala. Bihar also fared very poorly in education spending compared to Kerala, she also spends more than 3 times in health in contrast to Bihar and this difference is larger when we compare the targeted per capita expenditure (table 4.22). This confirms the wide variation in India in terms of the two key sectors of human development and state expenditure in those sectors. The outcome of Kerala can be compared with high-income and middle-income countries while Bihar has outcomes similar to that of the poorest countries in the world.

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[33] Bihar was divided into Bihar and Jharkhand in the year 2000, in our study Bihar is considered as undivided state to keep the parity of comparison over the years, the relevant variables are adjusted by population share

Table 4.22: Average and trend growth rate of Education and Health indicators

	Average		Trend Growth Rate	
	Kerala	*Bihar*	*Kerala*	*Bihar*
Education				
Literacy Rate	91.2	51.2	0.16	1.09
Gross Enrolment Ratio (I-XII)	84.4	61.4	2.19	4.10
Gross Enrolment Ratio (Higher Education)	17.6	10.0	1.75	0.59
Health				
Infant Mortality Rate	12.9	56.2	-0.20	-1.53
Immunization	73.3	33.5	1.05	2.33
Family Welfare				
Any contraceptive method	61.2	26.0	-0.46	0.49
Any Modern contraceptive Method	54.2	24.1	-0.20	0.43
Total Fertility Rate	1.8	4.0	0.00	-0.07
Antenatal Care	93.8	18.2	-0.27	0.13
Institutional Delivery	95.9	32.1	0.47	2.30
Nutrition				
Child Stunted	25.5	53.9	-0.56	-0.55
Child Wasted	14.8	25.0	0.10	-0.07
Child Underweight	20.2	53.8	-0.27	-0.42
Per capita expenditure				
Education	517.4	233.0	0.04	0.04
Health	142.8	51.0	7.62	2.12
Family Welfare	15.4	7.8	0.77	0.05
Nutrition	0.7	10.8	-0.09	1.01
Targeted Per capita expenditure				
Education	4484.3	1392.4	0.05	0.05
Health	408.1	136.6	22.65	6.54
Family Welfare	54.8	43.8	2.81	0.41
Nutrition	5.3	74.3	-0.67	7.28

Source: Author's calculations using state level reports
Note: The average value of the indicators is in percentage form apart from infant mortality and total fertility which represents rate, and enrolment figures are in ratio and the expenditure is in rupees.

Owing to the lower level of education attainment in the base year Bihar experiences higher growth rates over time for all the education indicators in contrast to Kerala except the parameter gross enrolment ratio in higher education. Similarly, Bihar also experiences higher growth rates over time for all the family welfare indicators compared to Kerala. Bihar shows promising rate of decrease in infant mortality rate (-1.53) and child underweight (-0.42). Besides, immunization (2.33) and institutional delivery (2.30) also show considerable positive trend during the study period, in case of Bihar. Although Kerala has impressive health attainments it is disconcerting to note that it has a negative trend for contraceptive measures and antenatal care. It may be noted that Kerala despite its high education and health achievement has much higher rate of spending in education, health and family welfare compared to Bihar (table 4.22).

Overall, the rate of increment of targeted per capita expenditure is higher compared to the per capita for both the states. Such particulars of inconsistencies i.e., high spending on social sectors despite having higher level of development status, can well be described by non-linear dynamics of improvement at different levels (Addison et al., 2005; Osorio, 2008; Easterly, 2009; Vandemoortele, 2009; Vandemoortele & Delamonica, 2010). Since, an improvement at a higher level is considered to be more difficult than a similar improvement at a lower level (Sen, 1981; Dasgupta, 1990; Kakwani, 1993; Prennushi et al., 2002; Waage et al., 2010; Fukuda-Parr et al., 2013), marginal public spending must increase disproportionately to realise improvement at better levels.

Alternatively, the poor performance of Bihar in comparison with Kerala can be well understood by assessing the temporal change during the study period. In all the indicators Bihar was already at disadvantaged position as it started with poor performance in the base year. During the initial years while Bihar had 46% literacy rate, Kerala had 91%. However, in terms of enrolment ratio in higher education both started with same ratio but Kerala increased its enrolment substantially as compared to Bihar. Nevertheless, in health, Bihar started with infant mortality rate around 60 while Kerala had infant mortality rate as low as 14. Similarly, even if Bihar experienced remarkable improvement in all the health indicators such as institutional delivery, contraceptive usage and child nutrition indicators she is still lagging far behind conditioned by her poor performance in initial years. It is disturbing to witness that despite such low performance during initial phases Bihar's spending on these sectors is far less than desirable (table 4.23). While Kerala has increased her education as well as health spending in substantial terms over the years, Bihar has failed to do so. Given the theoretical understanding of mandatory government intervention to enhance human development, there is no adherence to such a principle in Bihar. On the contrary, despite the fourteenth finance commission recommendation of empowering the states with higher discretion of expenditure, Bihar was the only state which reduced its spending in social sectors (Kapur and Srinivas, 2016).

Table 4.23: Contrast between Kerala and Bihar with regard to education and health sector

	Kerala		Bihar	
	Base Year	Reference Year	Base Year	Reference Year
Education				
Literacy Rate	91.0	94.0	46.0	63.0
Gross Enrolment Ratio (I-XII)	58.7	90.3	42.5	77.8
Gross Enrolment Ratio (Higher Education)	6.7	21.8	6.2	11.9
Health				
Infant Mortality Rate	14.0	10.0	64.9	35.8
Immunization	79.7	82.1	10.9	61.8
Family Welfare				
Any contraceptive method	63.7	53.1	24.5	28.0
Any Modern contraceptive Method	56.1	50.3	22.4	26.7
Total Fertility Rate	1.8	1.8	4.5	3.1
Antenatal Care	98.6	90.2	18.0	18.2
Institutional Delivery	92.9	99.9	14.8	63.3
Nutrition				
Child Stunted	28.0	19.7	57.4	47.6
Child Wasted	13.0	15.7	26.0	22.8
Child Underweight	21.7	16.1	52.0	44.8
Per capita expenditure				
Education	612.0	1424.0	323.0	613.0
Health	96.9	267.7	37.2	84.4
Family Welfare	16.9	25.0	12.4	5.9
Nutrition	0.6	0.0	1.1	16.9
Targeted Per capita expenditure				
Education	4943.0	12561.0	1501.0	2926.0
Health	271.5	775.2	97.7	233.5
Family Welfare	59.1	90.5	68.2	33.6
Nutrition	5.0	0.4	6.4	121.1

Source: Author's calculations using state level reports
Note: The value of the indicators is in percentage form apart from infant mortality and total fertility which represents rate, and enrolment figures are in ratio and the expenditure is in rupees. 1999 and 2016 is base year and reference year respectively.

While acknowledging that progress can be increasingly difficult with the process of improvement and at better level of outcomes, we employ Joe and Mishra (2017) level-sensitive progress index to assess inter-temporal performance of the two states. In this regard, highest absolute progress can be observed in Kerala's enrolment ratio for I-XII (40.77) followed by immunization (38.89) and institutional delivery (38.36) in case of Bihar. The progress of contraceptive methods and antenatal care is poor in both the states. However, Kerala shows better progress in child nutrition compared to Bihar despite latter having higher trend growth rates of the same. It may be noted that Kerala incurred much higher cost for each unit of progress in all the indicators. For instance, Kerala spent over 200 rupees for 1 unit progress in infant mortality rate while for Bihar it was around 9 rupees. In case of immunization also Kerala has spent 50 times higher than Bihar to achieve 1% progress. Kerala incurring higher rate of

spending per unit progress could be due to her better outcomes at base year, as already stated, marginal expenditure must increase disproportionately at better levels to achieve additional improvement. The very nature[34] of targeted expenditure shows higher spending per unit progress across all indicators for both the states (table 4.24).

Table 4.24: Progress of outcome and expenditure incurred per unit of progress

Indicators	Progress Index		Expenditure incurred per unit progress		Targeted Expenditure incurred per unit progress	
	Kerala	*Bihar*	*Kerala*	*Bihar*	*Kerala*	*Bihar*
Education						
Literacy Rate	5.2	16.1	156.4	18.0	1467.0	88.4
Gross Enrolment Ratio (I-XII)	40.8	36.7	19.9	7.9	186.8	38.9
Gross Enrolment Ratio (Higher Education)	8.8	3.1	92.6	92.7	868.9	455.7
Health						
Infant Mortality Rate	0.8	5.3	218.6	8.9	644.9	25.7
Immunization	3.4	38.9	50.5	1.2	148.8	3.5
Family Welfare						
Any contraceptive method	-10.6	2.3	-0.8	-2.8	-3.0	-14.8
Any Modern contraceptive Method	-5.4	2.8	-1.5	-2.3	-5.8	-12.3
Total Fertility Rate	0.0	17.7	NA	-0.4	NA	-2.0
Antenatal Care	-15.1	0.2	-0.5	-42.0	-2.1	-225.9
Institutional Delivery	13.1	38.4	0.6	-0.2	2.4	-0.9
Nutrition						
Child Stunted	10.8	8.4	-0.1	1.9	-0.4	13.6
Child Wasted	-4.1	4.2	0.1	3.8	1.1	27.3
Child Underweight	7.9	6.5	-0.1	2.4	-0.6	17.6

Source: Author's calculations using state level reports
Note: The value of the indicators is in percentage form apart from infant mortality and total fertility which represents rate, and enrolment figures are in ratio and the expenditure is in rupees. 1999 and 2016 is base year and reference year respectively. To measure progress, we use $P(h)= 2*(h_t-h_0)/[(2-h_t)*(2-h_0)]$ for achievement indicators and $P(h)= 2*(h_0-h_t)/[\{2-(1-h_0)\}*\{2-(1-h_t)\}]$ for failure indicators, where h_t is the standardised attainment for reference period and h_0 is the standardised attainment for the base period. Expenditure incurred per unit progress is calculated by $(Y_t - Y_0)/X$, where, X% is the progress and Y_i is spent in i^{th} year.

Surprisingly, Kerala deteriorated in most of the family welfare indicators regardless of increased spending in this sector whereas Bihar experienced progress despite decrease in the real public spending on family welfare sector. Similarly, Kerala progressed in child nutrition

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[34] Targeted per capita expenditure is greater than per capita expenditure as targeted population is a subset of the overall population.

even with reduced spending. For instance, 1% progress in parameters like child stunted and child underweight is accompanied with Kerala reducing her nutrition expenditure by 0.43 and 0.58 rupees respectively (table 4.24). We observe that the association between expenditure and outcome variable is not consistent for certain indicators, states and times. Such inconsistency in the association between expenditure and outcome variables invites further investigation of the responsiveness of outcome to their respective state expenditure in both the states.

Thus, we use the following model specification to understand the linkage between expenditure and outcome in the education and health sector.

Development Parameters = f (State Expenditure, Gross State Domestic Product, Poverty, Infrastructure and Time Trend)[35]

Apart from state spending, we consider per capita gross state domestic product (PCGSDP), infrastructure and poverty[36] as explanatory variables following Mohanty and Behera (2020). Such a formulation is backed by the observation that PCGSDP has a positive impact on education as well as health outcome, because with enhanced fiscal capacity, state can prioritize their spending on education sector (Chakrabarti and Joglekar, 2006) as well as the health sector (Pritchett & Summers,1996). It is also widely documented that infrastructure can lead to a better developmental outcome (Bhargava, 2001). Hence, we used an overall infrastructure index[37] from Nauriyal and Sahoo (2010) as a proxy to represent the stage of development of the state. The other explanatory variable, poverty, is said to have an adverse impact on education and health outcome, as people living in poverty have a higher chance to drop out from school in order to earn money and less likely to pursue higher education. Similarly, wealthier people are inherently endowed with better health than the poor with least dependence on the public health system. We employ ordinary least square regression to estimate the relationship between outcome and state expenditure.[38] The models with over all significance level at 5% are reported[39].

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[35] Outcomes, poverty and infrastructure index were linearly interpolated for the regression analysis given the limited data availability

[36] Information on state level poverty is being collected from Planning Commission Estimates

[37] Nauriyal and Sahoo (2010) uses per-capita road length/density of the road network, per-capita power consumption, tele-density per 1000 persons and per-capita cement consumption to construct a composite infrastructure index.

[38] We used Augmented Dickey-Fuller test for unit root. The variables are non-stationary at level and stationary at first difference, so we used growth rates of the variables in our regression analysis to avoid the stationarity problems

[39] To keep the parity of the comparison we adhered to similar explanatory variables for both the states

The result shows that expenditure has no significant impact on the outcome variables for Kerala except for infant mortality rate. To be precise, if growth rate of per capita health expenditure increases 1% there will be a significant 0.56% reduction in the growth rate of infant mortality rate. The other variable which turned out to be significant is infrastructure, which shows a favourable impact on gross enrolment ratio(I-XII), immunization and antenatal care and also reduces infant mortality rate and child undernutrition, but does not connect with contraceptive usage in an expected manner. We also observe that with the decrease in poverty level, institutional delivery and contraceptive usage increase significantly in Kerala. Given the higher level of achievement in health status in initial years the time trend shows that outcomes are improving at a decreasing rate over the years. Unlike Kerala, Bihar is experiencing an improvement in outcomes at an increasing rate over time owing to its low initial level. Since, low initial levels allow for more room to improve, so, Bihar having low development status is improving at a higher rate compared to Kerala. That is, Bihar's indicators are increasing in an increasing rate and Kerala's indicators are increasing at a decreasing rate. Although enrolment ratio and antenatal care are positively responding to state infrastructure in case of Bihar, it has a negative response to family welfare expenditure. Moreover, the per capita expenditure on family welfare significantly increases the total fertility rate, similar to that of Western European countries (Kalwij, 2010), in the present situation it suggests that increased spending on family welfare programs such as safe delivery, antenatal care perhaps encouraged women for positive fertility response (table 4.25). The analysis using targeted per capita expenditure instead of per capita expenditure strengthens the intensity of bearing on the considered outcomes (table 4.26). Overall, the result indicates that the extent of responsiveness of outcome to state expenditure vary between states depending on the type of indicators under consideration and do not have a straight forward linkage. The regression results reinstate the previous findings and assert that between the two extreme performing states like Kerala and Bihar, outcomes do not respond to the public expenditure as expected.

Table 4.25: Regression results of Kerala and Bihar using per capita state expenditure

	Kerala					Bihar				
	Expenditure	*GSDP*	*Poverty*	*Infrastructure*	*Time trend*	*Expenditure*	*GSDP*	*Poverty*	*Infrastructure*	*Time trend*
Education										
GER(I-XII)	-1.91	11.47	2.73	84.93***	2.42	-0.08	-0.42*	0.14	7.01***	2.50***
GER(HE)						-0.28	0.94	-0.15	30.03***	7.49**
Health										
IMR	-0.56*	-1.57*	-0.95	-11.27**	-2.21**					
IMN	0.03	0.16	0	1.51*	-0.02					
Family Welfare										
AM	-0.02	0.01	-0.12*	-0.60*	-0.33					
AMM	-0.01	0.01	-0.07**	-0.20	-0.17***					
TFR						0.04**	-0.08	-0.05	0.24	-0.09
ANC	0.01	0.01	0.01	0.26**	0.02	-0.07*	-0.23	0	11.01***	2.85***
ID	-0.01	0	-0.04**	-0.14	-0.08***	-0.04	0.25	0	-1.57**	-0.49
Nutrition										
CS	0	-0.01	0.02	-0.18**	-0.02					
CU	-0.01	-0.01	-0.07	-0.74*	-0.33					

Source: Author's calculations using state level reports

Note: GER(I-XII), GER(HE), IMR, IMN, AM, AMM, TFR, ANC, ID, CS, and CU stands for gross enrolment ratio of I-XII, gross enrolment ratio of higher education, infant mortality rate, immunization, usage of any contraceptive methods, usage of any modern contraceptive methods, total fertility rate, antenatal care, institutional delivery, child stunting and undernutrition respectively. And GSDP stands for gross state domestic product. *** p<0.01, ** p<0.5, * p<0.1.

Table 4.26: Regression results of Kerala and Bihar using targeted per capita state expenditure

	Kerala					Bihar				
	Expenditure	*GSDP*	*Poverty*	*Infrastructure*	*Time trend*	*Expenditure*	*GSDP*	*Poverty*	*Infrastructure*	*Time trend*
Education										
GER(I-XII)	-1.72	11.4	2.67	85.64***	2.38	-0.10	-0.42*	0.14	7.01***	2.50***
GER(HE)						-0.23	0.87	-0.14	29.98***	7.46**
Health										
IMR	-0.59*	-1.59*	-0.96	-11.22**	-2.21**					
IMN	0.03	0.16	0	1.5*	-0.02					
Family Welfare										
AM	0	0	-0.12	-0.56	-0.32***					
AMM	0	0.01	-0.07**	-0.18	-0.17***					
TFR						0.04**	-0.07	-0.05	0.22	-0.09
ANC						-0.07*	-0.24	0	11.02***	2.84***
ID	0	0	-0.04**	-0.13	-0.08***	-0.04	0.25	0	-1.56**	-0.49
Nutrition										
CS	0	-0.01	0.02	-0.18**	-0.02					
CU	-0.01	-0.01	-0.06	-0.74*	-0.33***					

Source: *Author's calculations using state level reports*

Note: *GER(I-XII), GER(HE), IMR, IMN, AM, AMM, TFR, ANC, ID, CS, and CU stands for gross enrolment ratio of I-XII, gross enrolment ratio of higher education, infant mortality rate, immunization, usage of any contraceptive methods, usage of any modern contraceptive methods, total fertility rate, antenatal care, institutional delivery, child stunting and undernutrition respectively *** p<0.01, ** p<0.5, * p<0.1.*

. **4.4 Conclusion and Discussion**

The study uses state level reports to comprehend the scene of development imbalances across rural-urban region particularly as regard the four key human priority sectors such as education, health, family welfare and nutrition and verifies the possible impact of state spending on such disparities. This involves a detailed inspection of the role of state spending on the indicators/parameters representing the priority sectors as mentioned. Results indicate apparent disparities across rural-urban region especially in states such as Assam, Bihar and Uttar Pradesh and such disparities are largely observable in domains like antenatal care, institutional delivery and infant mortality rate. But the temporal inspection observes a decline in such disparities during the study period which entice us to examine the association of such declines with the increment of state spending on these sectors. Because theoretically the increase in social spending is supposed to reduce inequalities and empirically the relation between the two remain inconclusive. While analyzing the relation between spending and inequalities using correlation and elasticity measures, we find that there is no orderly pattern of the influence of spending on regional disparities rather the linkages between these two dimensions are largely diverse across the indicators as well as states. Although some states and certain indicators exhibit positive impact of public spending in reducing inequalities but mostly inequality measures do not respond much to increase in spending.

While analysing the impact of state spending on the outcome, we observe that differential rate of state spending is not in keeping with the progress of the indicators and is widely varied across states. However, when we read such spending in terms of the targeted population of the direct beneficiaries, we find the indicators become further disassociated with the spending pattern. While the temporal change is assessed with ranking of both expenditure and outcomes across states, there emerges a positive association between the two as indicated by rank correlation except for the outcomes of family welfare and nutrition. In fact, the indicators which revealed positive association or responsiveness to the state spending are widely used indicators in literature for relating the development with state social spending such as literacy rate, gross enrolment ratio and infant mortality rate. And the indicators exhibiting null to no association with public spending are rarely used indicators to assert such association despite their importance in development such as family welfare indicators and certain health indicators. So, our findings are in line with the results of the previous empirical studies discussing the association between development and public finance in case of India. For instance, the observation related to responsiveness of infant mortality rate to the state spending is similar to

the finding of Mohanty and Behera (2020) study on Indian states. Again, the result of non-responsiveness of nutrition indicators to the state spending is also in line with Joe. et al., 2016 as they found null to no association of increased development expenditure and reduction of child undernutrition in case of Indian states. However, given that our study is based on 12 indicators and we find majority of the indicators to have null to no association with the states' social spending, we can conclude that public spending does not have any orderly impact on states' development. Although there is systematic improvement in all outcome indicators over time as a part of the development process, state spending does not seem to have any significant bearing on such improvement in the indicators. We are unable to establish the expected association between increased public social spending and education and health outcomes. On the contrary, in some cases, reduced spending on social sectors by states coincided with better performance in outcome variables. Further, inter-state disparities in outcomes have very little to do with the disparities in spending.

Owing to the observations made above, we contrast Kerala and Bihar, the two-extreme performers with regard to the two key sectors namely education and health to understand the nuances of the association between spending and outcome. We discover association of public spending varies across indicators and for both the states. We find impressive progress of Bihar with regard to the health and family welfare indicators while Kerala has better progress in nutrition and education sectors specially in the enrolment ratio. Cost borne by Bihar per unit of progress in education and health attainments is much lower than that of Kerala. This phenomenon could be explained by the fact that states making progress from an already attained better situation need to bear disproportionately higher marginal cost for each unit of progress as progress follows a nonlinear path to reach the highest level of attainment. The regression result re-affirms our finding, as it asserts very little impact of state spending on social indicators. However, infrastructure turned out to be an important determinant of the education as well as health outcome. Although poverty levels relate to health attainment in Kerala, it doesn't have much influence in Bihar.

The ineffectiveness of state spending to reduce the regional disparities should not come as a surprise given the complex nature of interaction between the two. Theoretical assumption of the policies of welfare state to be equity promoting may not be empirically established due to various reasons. Firstly, the redistributive impact of public spending depends on its size, composition, growth rate and financing pattern (Zouhar et. al., 2021). Specifically, with regard to developing countries the influence of state spending to reduce disparities is found to be lower

in comparison to developed countries given the unproductive and lower level of spending along with limited coverage of social protection (Lustig, 2015). Secondly, with unsophisticated tax administration, if financing of these expenditures is realized through regressive taxation such as consumption taxes, it is quite likely that poor people may turn to be the net payers of those taxes reducing their purchasing power and net welfare (Lustig, 2018). Thirdly, the effect of social spending largely depends on the quality of the expenditure which is mostly driven by cost-effective service delivery, level of corruption and wasteful expenditure (Zouhar et. al., 2021). Fourthly, the influence of public spending also depends on the considered priorities while making spending decision, and these priorities are expected to vary across the countries based on their level of development. For example, developing countries are anticipated to prioritize the extension of social safety net coverage and improve the provision of basic public facilities whereas policies in the developed countries are likely to be more focused in ensuring sustainable pension systems and better targeting of the benefits (Clements et al., 2014, Clements et al., 2015). So, in order to foster inclusive development, it is vital to set the priorities right while taking spending decision. Lastly, the redistributive impact of the state spending can be largely limited due to periodic requirement of the compliance with fiscal consolidation policies, i.e., to restore fiscal balance and macroeconomic stability. So, it is often necessary to adopt to fiscal adjustment policies which may lead to increase in the tax revenue and decrease in the public spending thus adversely affecting the inequality. For instance, India had to adopt to Fiscal Responsibility and Budget Management (FRBM) Act around 2003 to achieve fiscal stability thus limiting its capacity to spend on the social sectors worsening inequality.

Similarly, the insignificant response of social attainments to public spending should not be startling as well, as it is in line with certain empirical studies. The influence of public spending on community wellbeing is not an immutable parameter, and is likely to vary widely across state and time, hence the results will be sensitive to the type of sample used. There are several indications of this finding just like before. For example, there may be structural differences across the states which determines the efficacy of the health and education production function i.e., to generate certain level of outcome some may require very little amount of public services compared to others. Secondly, the expenditure function might be different across states depending on population preference and demands (Hitiris and Posnet, 1992). Thirdly, the impact of public spending depends on its composition and efficacy as already mentioned (Filmer and Pritchett, 1999). Further, the expenditure on the social sector in India is not only meagre compared to international standards, but largely covers salary payments and utilized in

maintaining existing facilities rather than extension of public services (Kaur and Misra, 2003). Such unproductive spending constrains the effect of spending on improvement in the outcome. This is a matter of concern in a developing country as any small changes in efficacy could have a significant bearing on the attainment level given the meagre resources spent on these sectors. Moreover, the insignificant and weak association between outcomes and spending can be probably due to inadequate public spending that has a non-linear relationship and needs to qualify a certain threshold level to impact the outcome variable (Mondjeli, 2015). Fourthly, people might prefer private services to public services given the inadequacy and inefficiency involved with the later. For instance, health attainments become more responsive to relative health care price when the expenditure is low and inefficient (Hitiris and Posnet, 1992). Besides, state level-analysis may not be able to unfold the details regarding the quality of public services and other micro determinants of attainments. Similarly certain macro variables such as governance, trust and confidence on government sector, private facilities, and efficiency of the expenditure might have its own implication on community well-being which remains missing in our exploration due to paucity of information.

In this context, the impact of public spending for Kerala and Bihar is also not surprising. This could very well be due to the difference in their production function given Kerala's place in the trajectory. Moreover, development preference of Kerala ought to be different from Bihar simply because of their positioning in terms of achievement and people's expectation. Again, the non-linear relationship and large difference in the level of education and health expenditure explains the differential impact and efficiency of translating the spending into better outcomes.

Given the underlying interactive effects, it is very likely to witness ineffectiveness of the spending on the development imbalances particularly in developing countries. However, with careful designing of public expenditure policies, it is possible to ensure equity promoting fiscal policies. For instance, to moderate the adverse effects of fiscal consolidation on the population certain compensating measures can be adopted simultaneously to protect the most vulnerable section. Otherwise, these temporary shocks can leave permanent effects on the disadvantaged groups in particular. For example, the negative short terms effects can have long lasting impact on the lives of infants, children and women from disadvantaged background as these shocks may lead to discontinuation of school and lack of proper nutrition thus interrupting the process of human capital accumulation which may in turn reduce the future equality of opportunity resulting in persistent inequality. In addition, revenue generation policies should be designed with caution to ensure that poor people do not end up being net payers instead of net

beneficiaries. Nevertheless, even if taxation becomes regressive in nature, the overall impact can be progressive if distribution of the benefits from the public services are made in a progressive manner. Thus, it is important to analyze the distributional impact of expenditure jointly with the revenue collection strategies as well as with the pattern of taxation to find a policy mix which will be effective enough to counter balance the negative impact and enhance the impact of the expenditure policies.

Based on this exercise, it would be naïve to suggest state spending is being ineffective in enhancing community wellbeing rather than recognising the complexity of the linkages between the two beyond a one-to one linear association. As discussed earlier the potential of public spending can assume several possibilities and frontiers that need not necessarily be limited to outcomes alone. We therefore stress that state spending on these sectors must be accentuated to an optimum level to be adequate to influence the outcomes. But given the limited resources, recognizing the factors that can accentuate the state social spending to the optimum level is very important to assure significant improvement of the outcomes. In this context we analyse the pattern and determinants of the priority sector spending in Indian states in the following chapter. Rather than restricting our analysis to education and health related spending in the following chapter, we consider the pattern of human priority sector spending as a whole which includes spending on water sanitation and rural development besides the four key priority sectors in discussion. The following chapter includes all the human priority sector because investment in the human priority sectors together is considered as a blue print for achieving the SDGs and augment human capital.

CHAPTER 5

PATTERN AND FINANCING OF HUMAN PRIORITY SECTOR EXPENDITURE

5.1 Introduction

The growing development disparities across Indian states have been a matter of concern to many economists and researchers. In terms of social indictors, India remains far below expectation in international comparison and has large inter-state disparities. Huge differences and divergences are also documented with regard to per capita social sector expenditure across Indian states. There has been intensive research to discover the causes of these development disparities. In this context, public expenditure in development sectors has been recognized as a key to mitigate such disparities. Besides, investment in human capital through optimal spending in the human priority sectors is considered as a blue print for achieving the SDGs in addition to achieve economic as well as social development (Baldacci et al, 2004 and Bloom and Canning, 2003).

The priority sectors are vital sectors which need sufficient public spending in a sustainable fashion as spending on these sectors is considered one of the key approaches to augment human development and capabilities (Chakraborty, 2003, Hong and Ahmed, 2009). Thus, in order to achieve the SDGs as well as improve the performance of human priority sectors (HPS), expenditure on HPS is imperative, particularly for a developing country since poorer households in developing countries tend to use more government services than do richer households (Gupta et. al, 2003). However, India being a federal country it is important for states to individually adopt strategies and measures, to enable achievement of the SDGs, especially when states are now more empowered to spend on their own discretion after the recommendations of the fourteenth finance commission (Chakraborty, 2015). Moreover, it is difficult for Indian states to grow only on the basis of transfers as richer states will fail to help the poorer states beyond a point. So, it becomes ultimately a state's responsibility to allocate adequate resources in the HPS.

The limited time available to achieve the SDGs necessitates the government to step in to empower the underprivileged population to ensure development of society as a whole. Especially when the targets laid down by the SDGs for India are particularly ambitious given its large section of poor people, and limited resources. So, to achieve the goals India needs to spend strategically and spend on those sectors which are of utmost priority in achieving human

development, specifically when market forces will not help achieve the desired social development given missing markets, market distortions and the large extent of deprivation in developing countries (Stiglitz, 1997). Besides, with the increased demand for adequate state expenditure in HPS in the era of SDG targets, Indian states need to stress raising more revenue from domestic sources to finance the increased expenditure. However, structural characteristics, e.g., a large informal sector and the underground economy, and the prevalence of an unsophisticated tax administration constrains the government's capacity for revenue growth (Khattry, 2003). Faced with lack of capacity to raise revenue and increased demand to spend on the human priority sectors, planning and implementing fiscal policies becomes very intricate. Given the growing divergence between revenue generation and expenditure need, it is essential to recognize the pattern of expenditure across states and identify revenue resources utilized to finance those expenditure.

But all sources of revenues do not affect the development expenditure similarly. As Pinaki (2008) stated revenues facilitate development spending while increase in borrowings reduces social sector expenditures (Lora and Olivera 2007). However, central transfers lead to increase in state's total expenditure (Chakraborty, Mukherjee, and Amarnath 2009) since states are largely dependent on central funds in India's federal set-up. But if the centre increases off-budget expenditure on Centrally Sponsored Schemes which are introduced to improve development, then states cut their own developmental spending thus reducing total developmental expenditure. Nevertheless, the positive causal relation between revenue and expenditure is widely documented in the literature. For instance, Friedman (1978) and Buchanan and Wagner (1977, 1978) have said that an increase in government revenue increases government expenditure. And Blackley (1986), Ram (1988), Bohn (1991) and Hoover, and Shefrin (1992) showed that an increase in government revenue causes an increase in government expenditure in the case of the United States of America. Similarly, for countries such as Colombia, Ecuador and Guatemala, Ewing and Payne (1998) find evidence of significant positive impact of revenue on expenditure. Craigwell et al. (1994) and Moalusi (2004) establish that there is a significant causal relationship between government revenue and expenditure in Barbados and in Botswana respectively. Furthermore, Obioma and Ozughalu (2010) and Ogujiuba and Abraham (2012) found a long-run relationship between government revenue and expenditure in Nigeria for the time period 1970-2007 and 1970-2011 respectively. On account of impact of different sources of revenue on expenditure, Maynard and Guy (2009) reports that positive causality exists from tax revenue to government expenditure, Petanlar and

Sadeghi (2012) revealed a positive long-run relationship between oil revenue and government expenditures.

In spite of the growing consensus that government expenditure must be increased to achieve the SDGs, not many attempts have been made to explore the pattern of HPS spending and its sources of financing at the state level in India. We, therefore examine state wise patterns of expenditure on the HPS and identify the revenue sources substantially increasing HPS expenditure to understand the financing pattern of states for the period 2001-19[40].

The chapter is arranged as follows, section 2 discusses the methodology, section 3 elaborates the results. We begin with a brief overview of state expenditure in the HPS followed by inter-state disparities of the same. We also examine the pattern of state receipt during the study period. Given inter-state disparities we contrast HPS state expenditure and receipts by classifying the two groups of states into high and low spending states. This is followed by exploring the association between government spending and receipts for these two categories of states. We further identify the financing pattern by investigating the level of impact of various categories of state receipts on HPS spending followed by analysing the relation of state borrowing to spending. Section 4 discusses the results and concludes.

5.2 Methodology

The information on state expenditure necessary to find the pattern of expenditure on the HPS is found in the RBI Bulletin and on population in the Census of India. This study normalizes expenditure by targeted population. By targeted population we mean those who need the services the most and are direct beneficiaries of the services as described in table 3.1 in chapter 3. For the current analysis, additionally, we consider the targeted population for water sanitation to be the entire population since it is targeted to all and for rural development expenditure, we consider the targeted population to be the rural population. So, for each sector, expenditure is normalized by using the targeted population and will be denoted as targeted per capita expenditure from here on. To analyse the financing pattern of states, we collect data on state receipts from the RBI Bulletin. We assemble information on revenue and capital receipts and differentiate revenue receipts further into tax and non-tax receipts, states' revenue and

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[40] We chose this period to understand the pattern of the HPS spending right after the introduction of the MDGs in 2000

states' share of central revenue. We also collect information on the outstanding liabilities[41] of states to recognize the link between public borrowing and spending pattern of states.

We begin with analysing the pattern of states' expenditure in the HPS, to understand the pattern, we undertake comparative analysis of the states[42] after presenting an overview of state expenditure on HPS. We offer an overview by examining the average targeted per capita expenditure and its responsiveness to the targeted population growth during the study period. Furthermore, we study the trend growth rate of expenditure for each sector along with the percentage of total HPS expenditure (HPSEx) spent in each sector. To examine inter-state disparities of HPSEx over the years we examine the relative position of the states in the expenditure ladder with respect to the ideal[43] state and also compute coefficient of variation for each sector across states over the study period. We also employ the Mahala Nobis Distance Score (MDS) to measure the distance of each state from the representative state every 5 years. MDS gives the distance between two points in a multivariate space, the lower the MDS the closer the point is to the benchmark points (highest value/average value in our case), if the MDS is 1 or lower than 1 it means that the state is among the benchmark group, the higher it is from 1 the further it is from the benchmark group and acts as an outlier state. The value can be greater than 1 on account of both low as well as high value as compared to benchmark value. MDS can be represented as $D^2 = (x-m)^T . C^{-1} . (x-m)$, where D^2 is the square of the Mahala Nobis Distance, x is the vector of observations, m is the vector of mean values/reference values of independent variables, and C^{-1} is the inverse covariance of independent variables (Mahalanobis, 1936). Next, we examine the pattern of receipts by studying the average per capita receipts and trend growth rates of the receipts along with its MDS with respect to the average value to understand inter-state disparities in receipts (if any). Given the disparities in expenditure of state on the HPS we group the states into high spending and low spending states and contrast their spending and receipts.

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[41] Outstanding Liabilities include Total Internal Bond (State Development Loans, Power Bonds, Compensation and other Bonds, National Small Saving Fund, Ways and Means Advances from RBI), Loans from Bank and FIs (Loans from LIC, GIC, NABARD, SBI and other Banks, NCDC, other institutions and other Loans), Loans and Advances from Centre, Provident fund etc., Reserve funds, Deposit and Advances (Net Balances), and Contingency Funds.

[42] The study is based on 15 major states i.e., non-special category states as these states together comprises of 90% of the Indian population

[43] In this case highest spending state is being considered as the ideal state since most of the states are lagging far behind the international standards of outcome and spending more in these human priority sectors is one of the most reliable ways of achieving the SDG on time.

Furthermore, in an attempt to find the connection between receipts and expenditures we cross tabulate the states with respect to their level (high/low) of spending and receipts. We also cross plot MDS of receipt and HPS expenditure in x-y plane and fit a linear trend line to identify the association between inter-state disparities of expenditure and receipts, if any. We further compute correlation coefficients and expenditure elasticities with respect to various categories of receipts to understand the association between the two.

Finally, panel data estimation technique is used to capture the extent of impact of different revenue sources on HPS expenditure. The model specification of panel data estimation is, HPS expenditure = f (Receipt, Population size, Dependent Population, Political ideology, Election Year). We further investigate the degree of impact of various receipts by step-wise disaggregating the receipts as well as revenue receipts into three set such as Capital receipts[44] and Revenue receipts; Capital Receipt, Tax Receipt and Non-Tax receipt; Capital Receipt, States' Revenue, and Share in Central Revenue[45] (see Appendix 5A).

Apart from the variables of interest we include a set of control variables consisting of demographic variables[46] such as population size and dependent population, political variables namely, political ideology and election year. Population size represents the ratio of state's population to India's population, and dependent population is the ratio of non-working age population to working age population[47]. Demographic variables such as population size are expected to influence the decision of HPS spending positively since a larger population size requires greater provision of public facilities. But dependent population may have mixed effects on expenditure. For instance, a state with greater dependent population is expected to spend more to provide the larger non-working population but due to greater dependent population it has lower taxable income which restricts the capacity to tax and generate adequate revenue to fund HPS spending.

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[44] Capital receipts include External Debt, Internal Debt, Loans and Advances from the Centre, Recovery of Loans and Advances, Inter-state Settlement (net), Contingency Fund (net), Small Savings, Provident Funds (net), Reserve Funds (net), Deposit and Advances (net), Suspense and Miscellaneous (net), Appropriation to Contingency Fund (net), Miscellaneous Capital Receipts, Remittances (net) and holdings in Public Accounts (net).
[45] The receipts are taken as a ratio of GSDP for the panel data estimation
[46] Under demographic variables we limit our variables to population size and age structure of the population rather than detailing other features and socio-economic characteristics such as gender composition, caste composition, religion composition to keep parity with the analysis of the previous chapters which examines the spending with regard to targeted population size chosen according to age criterion. Besides, Human Priority Sector expenditure as a whole is for the whole population rather than any specific population based on gender, caste or religion, as it includes all the six-priority sectors. And dependent population is included since it is assumed to deter the taxation capacity of the government.
[47] Non-working age is referred to age group 0-14 years and above 65, whereas working age refers to age group 15-64

Political variables such political ideology and election year are categorial variables. Political ideology is coded following Dash and Raja (2013) codification, details of which is provided in introductory chapter in table 1.2. Traditionally, left wing political parties believe in more government intervention in contrast to right wing parties, so, we expect that a state ruled by left wing party will have more government spending compared to state with right wing party. Election year is a binary variable, the year before election is coded 1 and others as 0, this will capture any effect of election on spending pattern; it is assumed that the year before election witness more spending compared to other years in these sectors to attract vote banks. So, the year before election is expected to positively influence spending on the priority sectors.

Capital receipts are the amalgamation of several debts, loans, and other finances, and given differences in the capacity of borrowing[48] across states we analyzed the financing of HPSEx further by studying the influence of public debt on HPS spending by replacing capital receipts by public debt in the previous model specification. Thus, we introduce public debt as our variable of interest in our panel data estimation instead of capital receipts[49] along with two other control variables such as Fiscal Responsibility and Budget Management Act (FRBMA) and Centre State Relationship (CSR). FRBMA is supposed to bring fiscal discipline and it is believed that adoption of the act will reduce government expenditures in terms of both capital and revenue expenditures (Ashwani and Sheera, 2017). But surprisingly, although it reduced capital expenditure, revenue expenditure increased after the enactment of FRMBA (Kumar and Saumya, 2011). So, we introduce the variable to examine its interaction with HPS spending. Another control variable that is included in the model specification is CSR which represents the relation of states with the centre in terms of political affiliation. It is anticipated that if same party or allies' rule at the centre as well as in the state, then the state might receive favourable treatment from the centre with regard to better central assistance[50]. The FRBMA and CSR are categorical variables, FRBMA takes 1 for years after the states have introduced the act to achieve fiscal stability as directed by the Government of India otherwise it takes 0. Similarly, for CSR, it takes 1 if the state and centre are ruled by the same party or allied[51] party otherwise it takes 0 (See Appendix 5A)[52].

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[48] It is believed that high-income states have better borrowing option compared to low-income states
[49] Capital Receipt is replaced by Outstanding Liabilities of the states to avoid double counting
[50] Central assistance can be in terms of more funds and transfers or smooth and timely availability of sanctioned funds
[51] The parties which are a member of the ruling coalition party or has offered the support externally
[52] The model specification of the analysis is provided in the Appendix 5A

We use panel random effect[53] model to estimate the coefficient of the independent variables in case of high as well as low spending states and contrast the level of impact to understand the degree of influence of various revenue generation resources for the two group of states. The study is conducted for the period 2001-2019[54] for 15 major Indian states as these states together comprises of 90% of the Indian population.

5.3 Results

5.3.1 Overview of Expenditure in Human Priority Sector

The overall pattern is described in terms of average per capita expenditure[55] in each priority sector and their growth over 2001-2019. The highest spending state in HPS is Kerala followed by Tamil Nadu whereas the lowest spending state is Bihar followed by Uttar Pradesh. Kerala spent the most on education and on health and moderately on family welfare and rural development but low on nutrition and water sanitation. However, Tamil Nadu spent a considerable amount for nutrition, Haryana on water sanitation and Rajasthan on family welfare, whereas, Bihar spent very less on water sanitation, family welfare and nutrition. But all states in general spend more on education compared to other sectors (table 5.1).

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[53] Panel Random effect model can be stated as, $Y_{it} = \beta X_{it} + \gamma Z_{it} + \alpha + u_{it} + \varepsilon_{it}$, where, Y_{it} is HPS expenditure, X_{it} is a vector of our variable of interest i.e., various categories of receipts and borrowing, Z_{it} represents the set of control variable comprising of demographic and political factors. While, u_{it} is between-entity error and ε_{it} is within-entity error. The variables are stationary at levels and has no significant presence of autocorrelation confirmed by Im-Pesaran-Shin unit-root test and Wooldridge test for autocorrelation in panel data respectively. Hausman specification test was used to choose random effect model over fixed effect model.
[54] During the period Andhra Pradesh was bifurcated in 2014 into Andhra Pradesh and Telangana, to maintain the parity in comparison over years we consider Andhra Pradesh as undivided state and adjust the required variables according to population
[55] The expenditures are all inflation adjusted taking 1991 as the base year.

Table 5.1: Average Targeted Per Capita Expenditure

State	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
Andhra Pradesh	832	243	527	173	36	73	1883
Assam	1109	242	93	87	50	43	1625
Bihar	535	93	66	133	23	31	880
Gujarat	1040	286	341	129	67	60	1922
Haryana	1224	283	83	140	140	37	1907
Karnataka	1140	302	181	128	70	58	1880
Kerala	1828	443	1	168	46	61	2546
Madhya Pradesh	674	181	130	165	43	31	1224
Maharashtra	1419	274	249	152	39	33	2166
Orissa	898	219	116	153	57	36	1478
Punjab	1110	322	34	45	45	37	1593
Rajasthan	877	216	153	183	118	98	1647
Tamil Nadu	1306	320	533	168	49	85	2461
Uttar Pradesh	562	139	0	98	19	77	895
West Bengal	870	243	107	160	26	36	1442
Total	1028	254	174	139	55	53	1703

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors and expenditure are in real terms

To examine the parity of spending pattern with the population pattern, we contrast change in population[56] vis a vis change in expenditure of each sector during 2001-2019 for each state. Bihar is the only state where spending growth is less than population growth in priority sector as whole and particularly in education, health and family welfare. Water sanitation and family welfare are sectors where growth of expenditure is less than that of population in many of the states[57]. Punjab is under spending on health and Kerala is under spending on nutrition and rural development (table 5.2).

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[56] Here the change or growth is calculated as I=Base year value/Reference year value

[57] Diagrammatic representation of Population versus Expenditure Growth for Water Sanitation and Family Welfare is presented in Figure 5A.1 and 5A.2 respectively in Appendix 5A

Table 5.2: Targeted per capita expenditure versus population growth

State	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
Andhra Pradesh	Over	Over	Over	Over	Over	Over	Over
Assam	Over	Over	Over	Over	**Under**	**Under**	Over
Bihar	**Under**	**Under**	Over	Over	Over	**Under**	**Under**
Gujarat	Over	Over	Over	Over	**Under**	Over	Over
Haryana	Over	Over	Over	Over	Over	Over	Over
Karnataka	Over	Over	Over	Over	Over	**Under**	Over
Kerala	Over	Over	**Under**	**Under**	Over	Over	Over
Madhya Pradesh	Over	Over	Over	Over	Over	**Under**	Over
Maharashtra	Over	Over	Over	Over	**Under**	Over	Over
Orissa	Over	Over	Over	Over	Over	Over	Over
Punjab	Over	**Under**	NA	Over	Over	Over	Over
Rajasthan	Over	Over	Over	Over	**Under**	Over	Over
Tamil Nadu	Over	Over	Over	Over	Over	Over	Over
Uttar Pradesh	Over	Over	NA	Over	Over	Over	Over
West Bengal	Over	Over	Over	Over	**Under**	Over	Over

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors and growth in targeted per-capita exceeding the growth in targeted population represents `Over' and the reverse represents `Under' and increment is measured by I=Base year value/Reference year value

While analysing growth trends of expenditures over these years, we find Bihar was not only spending less on an average but also has the lowest growth rate in education along with Maharashtra, whereas Madhya Pradesh has the highest growth rate in education and is catching up with the high spending state of Kerala (table 5.3). Assam records the highest growth in health expenditure followed by Haryana and the least is by Andhra Pradesh. Orissa is catching up in education and health with a growth rate of 8.5% on the latter. Although per capita expenditure on nutrition is low on an average, states such as Bihar, Assam, Karnataka, Madhya Pradesh and West Bengal have more than a 10% growth rates, whereas Kerala and Orissa have negative growth rates. For rural development Kerala has a low growth rate whereas Haryana, Orissa and West Bengal have more than a 10% growth rate. Water sanitation and family welfare in general have low growth rates, 4% and 3.5% respectively. Besides, Bihar over the years is reducing its per capita expenditure at a rate of 1.3% in the family welfare sector. States such as Andhra Pradesh, Maharashtra and Punjab have less than 5% growth rates in priority sector spending and on an average the states have only 6% HPS expenditure growth rates (table 5.3).

Table 5.3: Growth Trend of targeted per capita expenditure (in percentage)

State	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
Andhra Pradesh	4.4	3.7	7.4	5.0	-0.1	4.1	4.9
Assam	5.4	9.2	10.3	8.0	6.1	1.6	6.2
Bihar	4.1	5.4	16.4	7.9	6.7	-1.3	5.1
Gujarat	4.5	7.7	10.5	6.2	2.1	7.3	6.0
Haryana	6.7	9.0	4.7	13.5	3.7	0.1	7.0
Karnataka	5.0	6.8	11.3	8.9	7.5	2.2	6.1
Kerala	6.4	7.1	-1.7	3.4	4.8	3.9	6.2
Madhya Pradesh	7.0	7.0	12.1	7.7	4.4	1.3	7.3
Maharashtra	4.1	5.8	7.8	7.8	1.0	2.0	4.8
Orissa	6.4	8.5	-3.0	11.9	8.1	1.5	7.0
Punjab	4.2	4.2	1.7	7.9	1.8	2.7	4.4
Rajasthan	5.2	7.0	9.6	12.6	2.6	9.0	6.5
Tamil Nadu	6.1	5.8	5.3	6.7	0.3	7.4	5.8
Uttar Pradesh	5.2	6.1	Na	6.0	6.4	10.4	5.9
West Bengal	4.6	5.4	14.5	12.3	4.4	0.8	6.0
Total	5.3	6.6	7.6	8.4	4.0	3.5	6.0

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors, 'Na' represents not available.

With regard to significance attached to each priority sector among all in terms of quantum of spending we find in general around 61% of HPSEx is on the education sector whereas health receives 15% and nutrition receives 10%. The lowest HPS spending is received by water sanitation and family welfare, which receive as low as 3% (figure 5.1). This indicates higher priority and strong preference towards the education sector. However, given the multitude of indicators to be improved under the SDGs this lopsided pattern of spending has potential to distort the attainment of holistic development within the limited time frame. Regarding state wise spending pattern, the observation is quite alike as we find ten out of fifteen states spend more than two thirds (60%) of HPS expenditure on education. The two extreme cases are Kerala (72%) and Andhra Pradesh (44%). In the case of health, the percentage ranges from 11% in Bihar to 20% in Punjab. On nutrition the percentage expenditure is less than 1% in Kerala and 28% in Andhra Pradesh. Rural development spending ranges from as high as 15% in Bihar to as low as 3% in Punjab. The other two sectors i.e., water and sanitation, and family welfare, have very low percentage allocation and do not vary much among the states (table 5.4).

Figure 5.1: Expenditure share (in %) of each sector in total Human Priority Sector expenditure
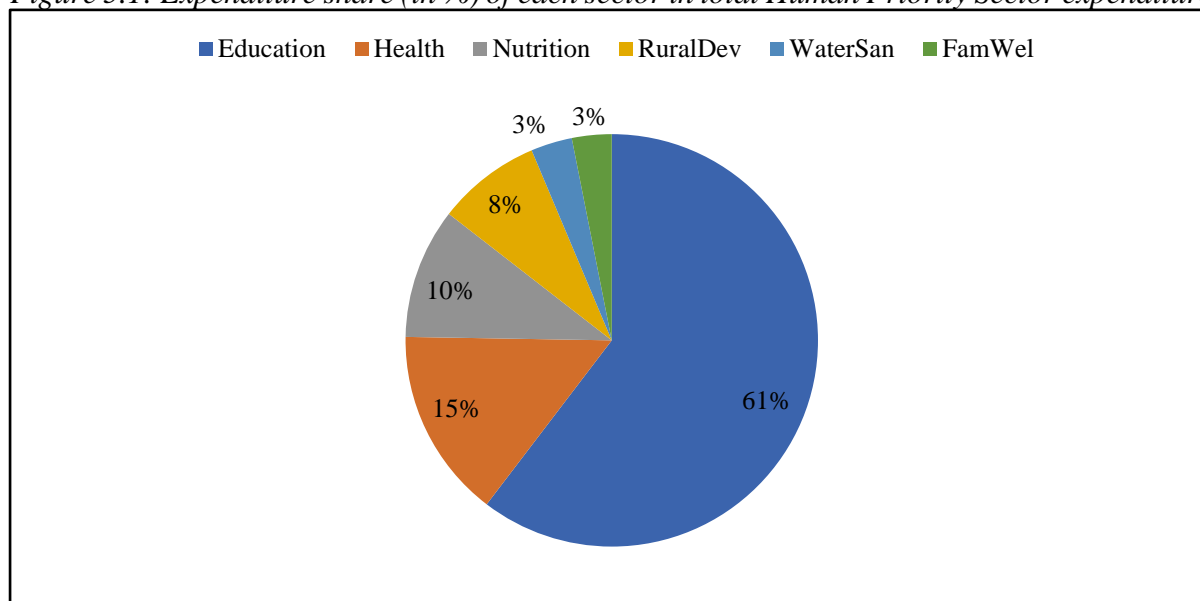
Source: Author's calculation using RBI data
Note: RuralDev, WaterSan and Fam Wel represents rural development, water sanitation and family welfare sector respectively.

Table 5.4: State-wise expenditure share (in percentage) of each sector in total Human Priority Sector expenditure

State	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
Andhra Pradesh	44	13	28	9	2	4	100
Assam	68	15	6	5	3	3	100
Bihar	61	11	8	15	3	4	100
Gujarat	54	15	18	7	3	3	100
Haryana	64	15	4	7	7	2	100
Karnataka	61	16	10	7	4	3	100
Kerala	72	17	>1	7	2	2	100
Madhya Pradesh	55	15	11	13	4	3	100
Maharashtra	66	13	11	7	2	2	100
Orissa	61	15	8	10	4	2	100
Punjab	70	20	2	3	3	2	100
Rajasthan	53	13	9	11	7	6	100
Tamil Nadu	53	13	22	7	2	3	100
Uttar Pradesh	63	16	0	11	2	9	100
West Bengal	60	17	7	11	2	2	100
Total	60	15	10	8	3	3	100

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors

5.3.2 Inter-state disparities in HPS spending

Comparison of states' HPS-expenditure with respect to the ideal[58] state reveals that Bihar is spending only 29% of what Kerala is spending in the education sector and BIMARU[59] states spend less than 50% of what Kerala does in the education sector including Andhra Pradesh, Orissa and West Bengal (table 5.5). This also holds for the health sector where BIMARU states along with Orissa spend less than 50% of Kerala. The pattern of spending is very different for the nutrition sector where Kerala spends only 1% of Tamil Nadu. And Assam, Bihar and Haryana spend less than 20% of Tamil Nadu. In rural development, Rajasthan is spending the highest and Punjab is just spending 24% of Rajasthan but others are spending around 50% of Rajasthan except Assam. In water and sanitation sector, Uttar Pradesh and Bihar are spending less than 20% of Haryana. In family welfare sector, Rajasthan is spending the highest whereas Bihar is spending only 31% of Rajasthan (table 5.5).

Table 5.5: Inter-state comparison of average targeted per capita expenditure (in percentage) on each sector compared to the ideal state

State	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
Andhra Pradesh	46	55	99	94	26	74	74
Assam	61	55	18	47	36	43	64
Bihar	29	21	12	72	16	31	35
Gujarat	57	65	64	70	47	61	76
Haryana	67	64	16	76	**100**	38	75
Karnataka	62	68	34	70	50	59	74
Kerala	**100**	**100**	>1	91	33	62	**100**
Madhya Pradesh	37	41	24	90	31	32	48
Maharashtra	78	62	47	83	28	34	85
Orissa	49	49	22	83	40	36	58
Punjab	61	73	6	24	32	38	63
Rajasthan	48	49	29	**100**	84	**100**	65
Tamil Nadu	71	72	**100**	92	35	86	97
Uttar Pradesh	31	31	0	54	13	78	35
West Bengal	48	55	20	87	18	37	57

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors. Ideal state is the highest spending state and spending of other states are presented as a percentage of the ideal state, so ideal state receives 100.

While examining the coefficient of variation (CoV) on sectoral expenditures across the states during 2001-2019, we find that it is almost constant for education and health. But for the remaining sectors it declines except for family welfare and HPS at the aggregate level. The highest disparity at the beginning is for nutrition and the lowest for family welfare. In water

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[58] For each sector we divide all the other states' value by the ideal state, which gives the value of the ideal state as one and others lesser than one and represent the result in percentage form.
[59] It consists of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh

sanitation it decreased from 66% at the beginning to 49% towards the end of the period. But in family welfare it increased from 26% to 62% (table 5.6). The summary of CV for all states is given in figure 5.2 which shows that education and health have had the least dispersion over the period of analysis whereas nutrition shows the highest dispersion during the same period.

Table 5.6: Coefficient of variation of targeted per capita expenditure of each sector across state

Year	Education	Health	Nutrition	Rural Development	Water Sanitation	Family Welfare	HPS
2001	0.30	0.36	1.49	0.56	0.66	0.26	0.28
2002	0.32	0.40	1.23	0.46	0.68	0.34	0.30
2003	0.34	0.39	1.14	0.60	0.70	0.25	0.31
2004	0.34	0.37	1.22	0.52	0.71	0.29	0.32
2005	0.35	0.36	1.16	0.57	0.65	0.26	0.34
2006	0.31	0.35	1.07	0.55	0.58	0.32	0.30
2007	0.31	0.31	1.03	0.44	0.68	0.24	0.28
2008	0.33	0.32	1.01	0.40	0.67	0.26	0.29
2009	0.34	0.33	1.34	0.36	0.73	0.34	0.31
2010	0.34	0.32	0.98	0.33	0.73	0.32	0.30
2011	0.32	0.36	0.95	0.31	0.71	0.31	0.31
2012	0.35	0.39	0.89	0.33	0.89	0.37	0.31
2013	0.35	0.38	0.91	0.35	0.74	0.43	0.31
2014	0.35	0.38	0.96	0.30	0.79	0.45	0.31
2015	0.35	0.36	0.93	0.39	0.71	0.69	0.31
2016	0.35	0.34	0.94	0.44	0.66	0.78	0.30
2017	0.38	0.36	0.97	0.38	0.58	0.68	0.29
2018	0.38	0.37	0.95	0.38	0.52	0.64	0.28
2019	0.34	0.35	0.96	0.38	0.49	0.62	0.28

Source: Author's calculation using RBI data
Note: HPS denotes human priority sectors

Figure 5.2: Coefficient of variation of targeted per capita expenditure of each sector
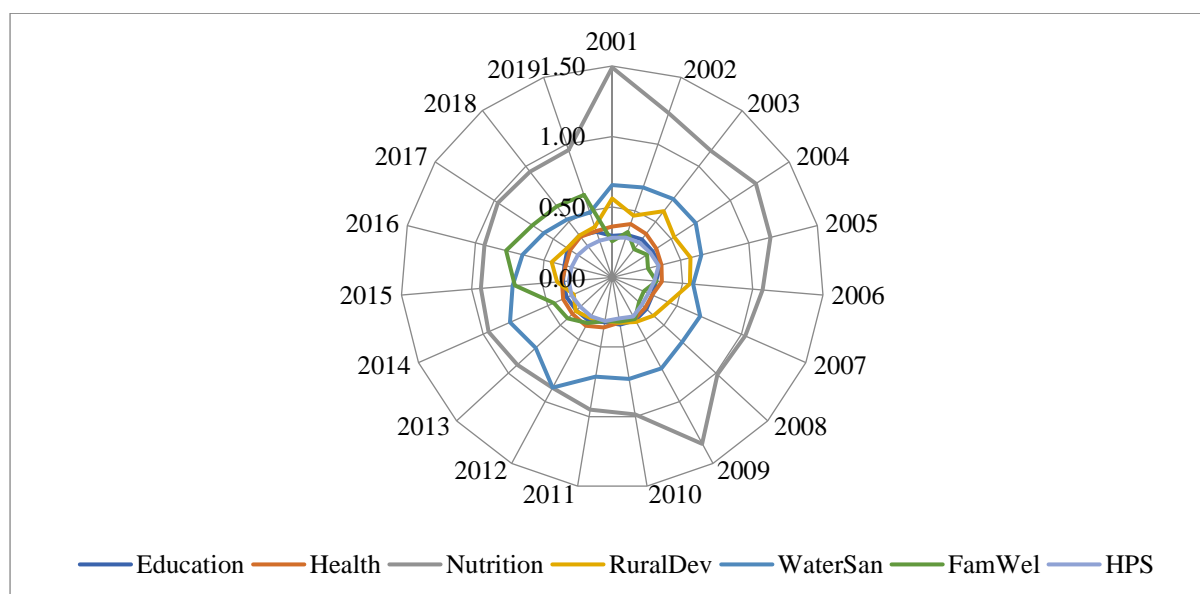
Source: Author's calculation using RBI data
Note: HPS, RuralDev, WaterSan and Fam Wel represents human priority sector, rural development, water sanitation and family welfare sector respectively.

Table 5.7: Mahala Nobis Distance Score of Human Priority Sector Expenditure with respect to highest spending state

State	2001	2006	2011	2016	2019	Overall
Andhra Pradesh	1.3	1.5	1.5	0.0	2.2	1.2
Assam	1.4	1.7	2.1	1.7	NA	1.6
Bihar	3.1	3.0	3.6	3.2	2.2	3.1
Chhattisgarh	2.7	2.0	1.3	0.0	0.2	1.0
Gujarat	1.6	1.3	1.1	1.7	2.2	1.1
Haryana	0.8	0.7	0.0	0.5	0.0	0.0
Jharkhand	1.1	0.0	2.3	1.4	1.8	1.3
Karnataka	1.2	1.2	1.1	1.4	1.9	1.1
Kerala	0.2	0.8	0.4	0.2	1.3	0.0
Madhya Pradesh	2.9	2.8	2.5	1.8	2.5	2.3
Maharashtra	0.0	0.3	0.8	1.7	1.2	0.6
Odisha	2.3	3.0	2.3	1.2	0.3	1.5
Punjab	1.0	2.1	2.3	2.8	3.4	2.1
Rajasthan	0.9	1.3	1.4	0.7	0.6	0.5
Tamil Nadu	0.8	1.0	0.6	1.2	1.5	0.6
Uttar Pradesh	3.3	3.2	3.3	3.1	NA	3.6
West Bengal	1.8	2.8	2.3	2.4	2.6	2.1
Total	1.5	1.7	1.7	1.5	1.6	1.4

Source: Author's calculation using RBI bulletin
Note: The benchmark states will have zero Mahala Nobis Distance Score

We measure the MDS for Indian states with respect to HPSEx to identify the outliers during 2001-2019 at intervals of 5 years. We calculate the MDS with respect to the highest spending states considered as the benchmark for the selected years. We find that Bihar and Uttar Pradesh

consistently report the maximum distance score from the highest spending states from 2001 to 2016 except the year 2019 when Punjab is observed to be furthest from Haryana (the benchmark state). The states closer to the benchmark state belong to a cluster and are perceived to have similar spending pattern. In our case Kerala, Maharashtra, Rajasthan and Tamil Nadu belong to similar cluster having less than 1 MDS (table 5.7).

5.3.3 Pattern of various state receipts

In this section we study the pattern of various receipts across states in terms of average per capita receipts, its trend growth rates and MDS values. We find states generate higher funds under capital account compared to the revenue account, and tax receipts are observed to be major contributors to revenue receipts in contrast to non-tax receipts across the states. Karnataka, Kerala and Tamil Nadu have high state receipts whereas Bihar and Jharkhand have very low receipts. The two major contributors of the high receipt states are also noted to be capital receipts and tax revenue receipts. Nevertheless, the disparity in states' own receipts and receipts from the share in central revenue is quite significant and therefore the contribution also varies widely (table 5.8).

Table 5.8: Average Receipt across States

State	Receipts	Revenue Receipt	Capital Receipt	Revenue Receipt Non-Tax	Revenue Receipt Tax	States Revenue	Share in Central Revenue
Andhra Pradesh	9139.8	2330.1	6808.6	590.5	1739.6	1544.2	786.0
Assam	10898.2	1867.6	9030.6	768.6	1098.9	674.1	1193.4
Bihar	4724.2	1153.7	3569.2	270.4	883.3	303.4	850.3
Chhattisgarh	9523.6	2227.9	7295.8	718.4	1509.4	1191.7	1036.1
Gujarat	10598.2	2306.2	8292.8	536.6	1769.5	1751.0	555.2
Haryana	10504.0	2710.7	7793.3	707.1	2003.6	2197.4	513.3
Jharkhand	4786.9	1685.5	3353.3	585.0	1100.5	755.9	929.6
Karnataka	12346.1	2608.5	9747.0	513.3	2095.2	1825.6	782.8
Kerala	11602.4	2597.1	9005.3	520.1	2077.0	1872.6	724.5
Madhya Pradesh	8656.7	1822.9	6830.8	509.0	1313.8	920.1	902.8
Maharashtra	8571.4	2418.8	6152.5	484.6	1934.2	1887.9	531.0
Odisha	9003.3	2091.8	6911.5	708.6	1383.1	969.3	1122.5
Punjab	9159.3	2451.8	6707.5	760.1	1691.7	1867.7	584.1
Rajasthan	8188.1	1865.2	6322.9	554.4	1310.8	1076.5	788.7
Tamil Nadu	12271.5	2564.2	9710.6	483.5	2080.7	1883.2	681.0
Uttar Pradesh	8847.4	1443.7	7404.9	331.1	1112.6	684.8	758.8
West Bengal	8715.8	1468.5	7248.6	341.1	1127.5	700.4	768.1

Source: Author's calculation using RBI bulletin
Note: The receipts are in rupees and in real per capita terms

We also observe receipts under capital account have the highest growth rate and double the revenue receipts. The increase in the generation of revenue through non-tax sources varies from

-1.3 (Punjab) to 9.2 (Kerala). Punjab's performance in terms of collecting revenue through non tax sources and states' share in the revenue is appallingly poor. Gujarat and Haryana also show a growth rate of less than 3% in collection of revenue from non-tax sources. The increasing dependence on share in central revenue is wide-ranging. For instance, the share has increased at a 9.9% rate a year for Chhattisgarh compared to Assam witnessing only 5.5% increase year wise (table 5.9).

Table 5.9: Log trend growth rate of State Receipt

State	Receipts	Revenue Receipt	Capital Receipt	Revenue Receipt Non-Tax	Revenue Receipt Tax	States Revenue	Share in Central Revenue
Andhra Pradesh	9.6	6.0	13.0	5.3	6.2	5.5	7.0
Assam	11.9	5.2	17.1	6.3	6.4	4.7	5.5
Bihar	9.2	6.0	11.5	8.0	5.4	6.3	5.9
Chhattisgarh	11.6	8.2	16.6	8.9	7.9	6.8	9.9
Gujarat	8.0	4.4	10.6	2.0	5.2	4.0	5.6
Haryana	6.5	4.2	10.1	2.9	4.6	3.4	7.8
Jharkhand	11.1	4.9	17.3	4.8	5.0	4.2	5.4
Karnataka	11.7	5.5	16.0	4.5	5.7	4.8	7.0
Kerala	10.8	6.3	14.2	9.2	5.6	6.1	6.9
Madhya Pradesh	11.7	6.1	16.0	6.6	6.0	4.7	7.6
Maharashtra	9.3	4.8	13.1	3.8	5.1	4.0	8.4
Odisha	11.5	7.3	14.3	8.3	6.8	7.4	7.2
Punjab	5.4	2.5	7.8	-1.3	4.1	0.7	8.4
Rajasthan	8.9	5.9	11.7	6.1	5.9	5.6	6.3
Tamil Nadu	10.1	5.0	14.5	6.2	4.7	4.5	6.3
Uttar Pradesh	10.0	6.5	12.9	8.5	6.0	6.0	7.0
West Bengal	10.0	5.9	12.1	6.0	6.0	4.8	6.9

Source: Author's calculation using RBI bulletin

While we measure the distance score from the average value, differences are observed in revenue generation; overall Bihar, Jharkhand and Punjab are identified as lying furthest from the average receipts. Bihar is recognized as the outlier having the largest MDS in terms of all categories of receipts except the state share of central revenue. This is indicative of the fact that Bihar lies furthest from the average value of each category of receipts generating the least revenue among all states (table 5.10).

Table 5.10: Mahala Nobis Distance Score with respect to average value

| State	Receipts	Revenue Receipt	Capital Receipt	Revenue Receipt Non-Tax	Revenue Receipt Tax	States Revenue	Share in Central Revenue
Andhra Pradesh	0.64	0.64	0.64	0.51	0.60	0.49	0.25
Assam	1.03	0.35	1.15	1.26	1.00	1.01	2.14
Bihar	1.47	1.84	1.28	1.47	1.55	1.65	0.36
Chhattisgarh	0.40	0.50	0.48	0.97	0.30	0.22	1.04
Gujarat	0.59	0.44	0.63	0.48	0.52	0.74	1.03
Haryana	0.80	1.22	0.77	0.80	1.11	1.48	1.30
Jharkhand	1.44	0.87	1.42	0.39	1.09	0.93	0.62
Karnataka	0.86	0.96	0.76	0.38	1.25	0.84	0.17
Kerala	0.78	0.91	0.71	0.74	1.23	0.89	0.33
Madhya Pradesh	0.45	0.56	0.48	0.33	0.57	0.64	0.44
Maharashtra	0.45	0.63	0.48	0.56	0.92	0.96	1.24
Odisha	0.53	0.33	0.53	0.86	0.44	0.59	1.44
Punjab	1.21	0.86	1.29	1.54	0.46	1.03	1.07
Rajasthan	0.33	0.48	0.32	0.35	0.57	0.40	0.20
Tamil Nadu	0.87	0.91	0.79	0.40	1.27	0.94	0.50
Uttar Pradesh	0.60	1.30	0.61	1.14	1.03	1.04	0.20
West Bengal	0.33	1.24	0.41	1.07	0.99	1.00	0.29
Total	0.75	0.83	0.75	0.78	0.87	0.87	0.74

Source: Author's calculation using RBI bulletin
Note: The benchmark value is average value

5.3.4 Contrasting High Spending and Low Spending States

Given the presence of large variations in expenditure across states we further delve into categorizing the states as per their expenditure in HPS and contrast the groups. We categorize the states into high and low spending states depending on the grand average expenditure in the HPS as a whole. States which are above the grand average HPSEx are considered as high spending states (HSS) and those below as low spending states (LSS). Figure 5.3 shows that HSS have spent almost twice the LSS during the study period and the divergence between the two categories of states increased over time.

Figure 5.3: Average Per Capita Expenditure of High and Low Spending states

Per Capita HPS Expenditure
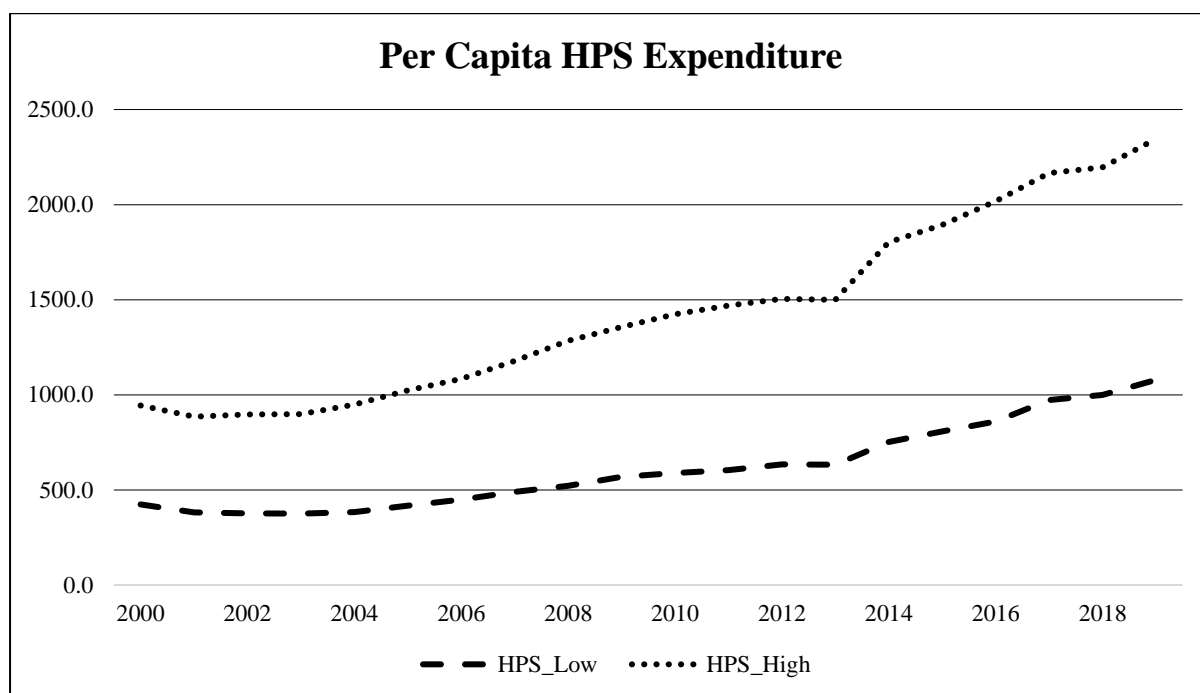
Source: Author's calculation using RBI bulletin data
Note: HPS_Low and HPS_High denotes human priority expenditure in high spending states and human priority expenditure in low spending states

On an average we notice that HSS spend 107 rupees[60] higher on education compared to LSS. Overall, HSS spend an extra 200 rupees per person in HPS in contrast to LSS. We also observe that there is significant difference in revenue generation also. States with higher receipts collect almost 1200 rupees extra per person compared to low receipt states. Unsurprisingly the low receipt states receive more of central revenue share compared to the high receipt states. The observation hints to the presence of positive association between receipts and spending and motivates us in analysing the association between the two (table 5.11).

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[60] All expenditures are adjusted for inflation taking 1991 as base year.

Table 5.11: Difference in expenditure[61] and receipts between high and low spending states

Category	Low Spending State	High Spending State	Difference (Low-High)
Education	349.6	456.9	-107.3***
Health, Family & Nutrition	107.9	164.0	-56.1***
Water and Sanitation	42.6	74.7	-32.1***
Rural Development	104.9	123.4	-18.5**
HPS	603.4	822.3	-218.9***
Receipts	8555.4	9750.1	-1194.8**
Revenue Receipt	1756.3	2334.6	-578.3***
Capital Receipt	6798.8	7465.5	-666.7*
Revenue Receipt Non-Tax	525.3	569.4	-44.1*
Revenue Receipt Tax	1231.1	1765.3	-534.2***
States Revenue	875.7	1602.5	-726.8***
Share in Central Revenue	880.6	732.1	148.5***

Source: Author's calculation using RBI bulletin
Note: All values are in rupees and real per capita terms *** p<0.01, ** p<0.05, * p>0.05 &p <0.10

5.3.5 Association between spending and receipts

In this section we attempt to assess the type of association between HPSEx and various sources of revenue. We begin by cross tabulation of states with respect to their level (high/low) of HPSEx and state receipts. We observe that majority of the states are spending according to state proceeds, i.e., states with high receipts have high spending whereas states with low receipts have low spending. However, Assam is the only state which is spending low despite having high receipts and states such as Andhra Pradesh, Jharkhand, Maharashtra, Rajasthan are spending high even with low generation of state fund (table 5.12).

We further cross plot the MDS of HPSEx and receipts to identify the systemic association between the two kinds of disparities, if any. We observe that Uttar Pradesh, Kerala, Haryana, Madhya Pradesh and Maharashtra have large distances from the benchmark value in terms of expenditure but a lower distance from the bench mark receipts, the picture is worrisome in case of Uttar Pradesh as it spends far lower owing to its high distance from the average value but is closer to the benchmark in receipts. Bihar is the only outlier state in conjunction of high distances of both receipts and expenditure. Thus, it is not only furthest from the benchmark expenditure it is also furthest from the generation of receipts justifying the pattern of its expenditure (figure 5. 4).

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[61] All expenditure from hereon is per capita expenditure since the following panel data estimation uses certain demographic variables such as population size and dependent population so targeted per capita expenditure is replaced with conventional per capita expenditure.

Table 5.12: Cross tabulation of states according to spending and receipts

	High Spending	*Low Spending*
High Receipt	Chhattisgarh, Gujarat, Haryana, Karnataka, Kerala, Tamil Nadu	Assam
Low Receipt	Andhra Pradesh, Jharkhand, Maharashtra, Rajasthan	Bihar, Madhya Pradesh, Odisha, Punjab, Uttar Pradesh, West Bengal

Source: Author's calculation using RBI bulletin

Figure 5.4: Distribution of HPS Expenditure and Receipt Disparities across states
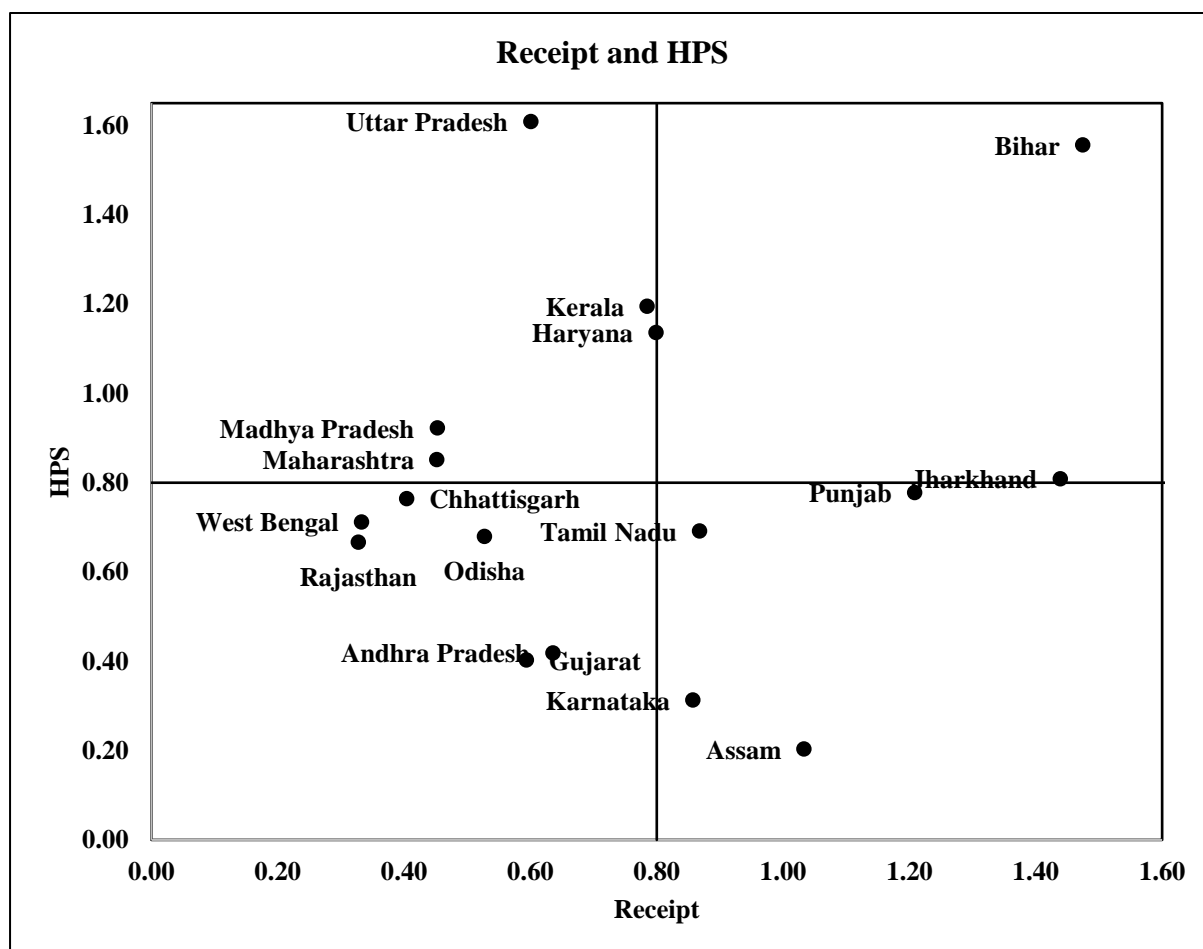
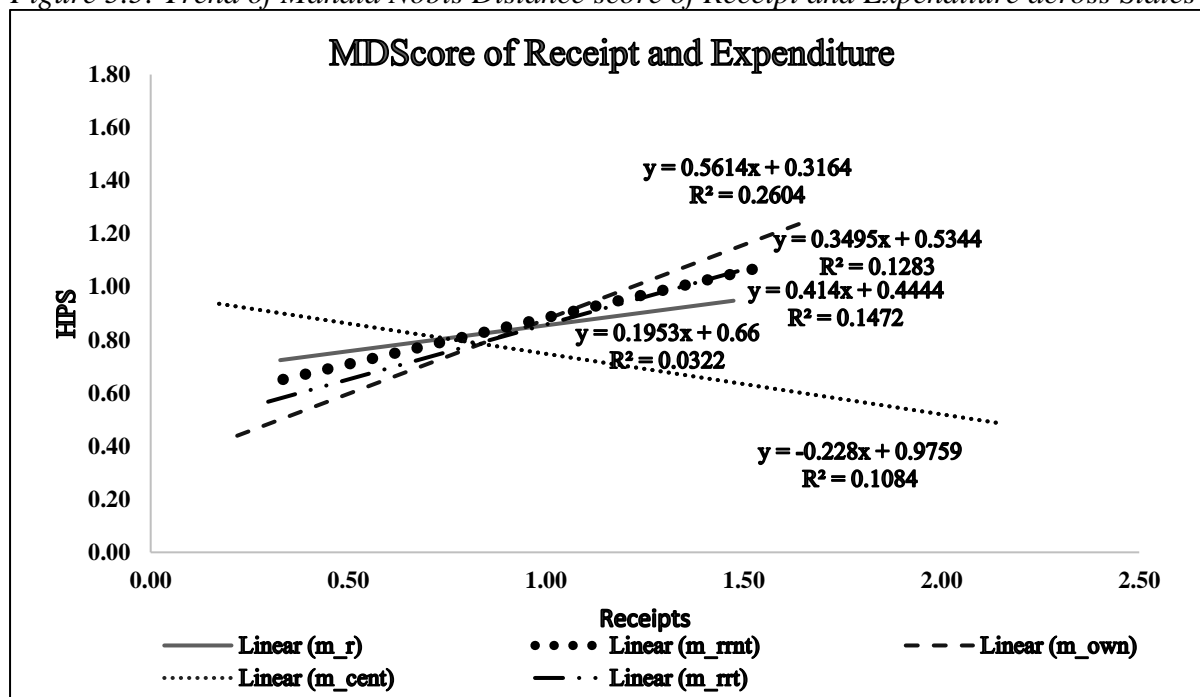*Source: Author's calculation using RBI bulletin*
Note: HPS denotes human priority sector and the disparities measured in Mahala Nobis distance score

Besides, we also measure the linear trend between the two disparities to further explain the disparity in HPSEx by the disparities in receipts. While analysing the trend we notice that the disparity in HPSEx is best explained by the disparity in states' own revenue compared to any other sources of receipts, it reveals that if the disparity in states' own revenue increases 1 unit, then disparity in HPSEx will increase 0.56 unit (figure 5.5).

Figure 5.5: Trend of Mahala Nobis Distance score of Receipt and Expenditure across States

Source: Author's calculation using RBI bulletin
Note: HPS denotes human priority sector; m_r, m_rrnt, m_own, m_cent, m_rrt represents Mahala Nobis Distance score of receipt, revenue receipt non tax, states revenue, share in central revenue and revenue receipt tax respectively with respect to average value.

However, we find a significant positive correlation between spending on different sectors of HPS and various categories of receipts. For example, the education and health sector reveal strong positive correlation compared to the other sectors across all receipts. In particular, they show higher association with revenue receipts and tax revenue receipts but a lower association with capital receipts. Rural development shows the least association with the sources of revenue compared to the other HPS and has almost no association with states' own revenue sources (table 5.13). Although we find encouraging association between the two, we further analyse the response of HPS spending to the increase of various sources of revenue to understand the degree of utilization of each source of revenue to fund HPSEx.

Table 5.13: Correlation coefficient between receipt and human priority sector expenditure

	Education	Health, Family & Nutrition	Water and Sanitation	Rural Development	HPS
Receipts	0.64	0.66	0.35	0.26	0.65
Revenue Receipt	0.88	0.87	0.51	0.37	0.89
Capital Receipt	0.57	0.60	0.30	0.23	0.57
Revenue Receipt Non-Tax	0.64	0.59	0.49	0.44	0.70
Revenue Receipt Tax	0.86	0.87	0.45	0.29	0.85
States Revenue	0.77	0.74	0.45	*0.05*	0.70
Share in Central Revenue	0.50	0.53	0.28	0.68	0.65

Source: Author's calculation using RBI bulletin
Note: All the figures of correlation coefficient are significant at 1% level except coefficient in italics. HPS denotes human priority sector.

5.3.6 Responsiveness of HPS expenditure towards state receipts

To measure the responsiveness of HPSEx towards various categories of receipts we first compute expenditure elasticity for each category of receipts. We find that HPSEx has an inelastic increment w.r.t receipts as a whole i.e., with 1 unit increase in receipts, the value of HPSEx will increase less than 1 unit. However, with disaggregated analysis we find that HPSEx is highly elastic in terms of share in central revenue and non-tax revenue receipts (table 5.14).

Table 5.14: HPS Expenditure elasticity with respect to various receipts

State	Receipts	States Revenue	Share in Central Revenue	Revenue Receipt Non-Tax	Revenue Receipt Tax
Andhra Pradesh	0.15	0.55	0.97	1.25	0.48
Assam	0.10	1.04	0.59	0.91	0.65
Bihar	0.14	1.65	0.57	1.90	0.55
Chhattisgarh	0.09	0.63	0.77	1.08	0.50
Gujarat	0.08	0.43	1.41	1.47	0.43
Haryana	0.10	0.42	1.87	1.31	0.45
Jharkhand	0.20	1.01	0.84	1.33	0.70
Karnataka	0.08	0.42	1.03	1.56	0.37
Kerala	0.10	0.50	1.33	2.01	0.45
Madhya Pradesh	0.08	0.64	0.68	1.17	0.45
Maharashtra	0.12	0.45	1.79	1.84	0.44
Odisha	0.09	0.72	0.62	1.01	0.50
Punjab	0.08	0.34	1.31	0.99	0.38
Rajasthan	0.12	0.79	1.09	1.56	0.65
Tamil Nadu	0.09	0.44	1.27	1.81	0.40
Uttar Pradesh	0.07	0.69	0.64	1.57	0.42
West Bengal	0.09	0.88	0.84	1.93	0.55

Source: Author's calculation using RBI bulletin
Note: HPS denotes human priority sector. The figures represent the HPS expenditure elasticity with respect to various category of receipt. Elasticity is calculated using Expenditure elasticity=
$\frac{\%\ change\ in\ expenditure}{\%\ change\ in\ GSDP\ or\ various\ receipts}$ *using mid-point formula i.e., % change can be calculated between two time point as:* $\frac{V2-V1}{(V2+V1)/2}$*100, where V2 is the value for the reference year and V1 is the value for base year.*

To further investigate the responsiveness of HPSEx to changes in various categories of receipts and contrast the impact of receipts in between HSS and LSS, we estimate a panel random effect model for HSS as well as LSS. We find that receipt as a whole significantly impact spending on the HPS. To be precise, 1unit increment of receipt increases 0.10unit HPSEx for HSS and 0.03unit for LSS. While we disaggregate receipts into various components, we observe that, revenue receipt has no significant impact in increasing HPSEx while capital receipts increase HPSEx substantially (table 5.15). Further disaggregation of revenue receipts into non-tax and tax receipts reveals that revenue generated from non-tax sources significantly increase the spending in HPSEx. For instance, 1unit increase in non-tax receipt will significantly increase HPSEx by 4.01units for HSS and 2.91units for LSS. While revenue receipts are categorized into states' own revenue and share in central revenue, the latter, reveals strong influence in increasing HPSEx, to be accurate, 1unit increase in share in central revenue increases spending in the HPS by 5.44units for HSS and 1.54units in LSS. So, we recognize that the two prominent sources of revenue generation to increase HPSEx is non-tax receipts and states' share in central revenue (table 5.15). But, when we contrast the coefficients of HSS and LSS, we find that

receipts have higher impact on HPSEx of HSS compared to LSS. Moreover, for HSS it can be noticed that share in central revenue has higher contribution in increasing HPSEx compared to others, whereas for LSS non-tax revenue receipts has the strongest influence in increasing HPSEx (table 5.16). Furthermore, we find that demographic as well as political variables have no significant influence on HPSEx in HSS but for LSS the population size positively impacts HPSEx, i.e., with increase in population size, governments in LSS significantly increase HPSEx (table 5.15).

Table 5.15: Responsiveness of HPS expenditure to several types of receipts

High Spending States				
Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Receipt	0.10***	*Na*	*Na*	*Na*
Revenue Receipt	*Na*	0.99	*Na*	*Na*
Capital Receipt	*Na*	0.11***	0.14***	0.11***
Tax Receipt	*Na*	*Na*	-0.55	*Na*
Non-Tax receipt	*Na*	*Na*	4.01***	*Na*
States' revenue	*Na*	*Na*	*Na*	-0.02
Share in Central Revenue	*Na*	*Na*	*Na*	5.44***
Population Size	-0.29	-0.26	-0.12	-0.19
Dependent Population	-3.05	-3.06	0.10	-2.41
Political Ideology (2)	-1.66	-1.54	-1.02	-0.21
3	-0.82	-0.66	-0.44	0.08
5	-5.32	-5.24	-4.28	-3.77
Election Year	1.59	1.50	1.27	1.16
Constant	2.51	3.39	5.01	2.02
Model	Yes	Yes	Yes	Yes
Low Spending States				
Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Receipt	0.03**	*Na*	*Na*	*Na*
Revenue Receipt	*Na*	0.94	*Na*	*Na*
Capital Receipt	*Na*	0.04*	0.04**	0.03*
Tax Receipt	*Na*	*Na*	-0.39	*Na*
Non-Tax receipt	*Na*	*Na*	2.91***	*Na*
States' revenue	*Na*	*Na*	*Na*	-0.48
Share in Central Revenue	*Na*	*Na*	*Na*	1.54*
Population Size	64.98***	56.76**	56.55**	59.42**
Dependent Population	-358.89	-277.26	-371.72	-333.91
Political Ideology (2)	1.33	1.33	1.51	1.47
3	-3.34	-3.46	-3.74	-3.54
4	-1.64	-1.70	-1.72	-1.76
5	-0.26	-0.38	-0.11	-0.32
Election Year	-2.27	-2.25	-1.72	-2.13
Constant	-0.32	0.76	-0.76	0.13
Model	Yes	Yes	Yes	Yes

Source: Author's calculation using RBI bulletin
*Note: HPS denotes human priority sectors. The model specifications are given in Appendix 5A. ****
*$p<0.01$, ** $p<0.05$, * $p>0.05$ &p <0.10*

Table 5.16: Comparison between High and Low Spending States

Various Sources of Receipt	HSS	LSS
Receipt	0.10***	0.03**
Revenue Receipt	0.99	0.94
Capital Receipt	0.11***	0.04*
Tax Receipt	-0.55	-0.39
Non-Tax receipt	4.01***	2.91***
States' revenue	-0.02	-0.48
Share in Central Revenue	5.44***	1.54*

Source: Author's compilation from table 5.15
Note: HSS and LSS represents high spending states and low spending states. *** p<0.01, ** p<0.05,
* p>0.05 &p <0.10

5.3.7 Public Borrowing and Human Priority Sector Spending

As mentioned earlier, in this section we will further explore the issue by studying the borrowing pattern of states and analysing the influence of such borrowing on HPS spending. While examining the borrowing pattern, we find that public debt as a percentage of GSDP is almost double for LSS compared to HSS. However, differences between the two categories of states were higher in the early 2000 compared to latter half of the decade. We notice a substantial reduction of the gap between the two categories of states over the time period signalling catching up of the two groups. Overall, the states have gradually reduced their public debt to GSDP percentage from 2002-04 to 2018-19 perhaps due to the enactment of FRBMA which was introduced during the span 2003-10 across the states. And during the last phases, the average percentage of public debt to GSDP ratio is observed to be 27-28% for HSS and 32-33% for LSS (figure 5.6).

Figure 5.6: Percentage of Public Debt to Gross State Domestic Product of High and Low Spending states
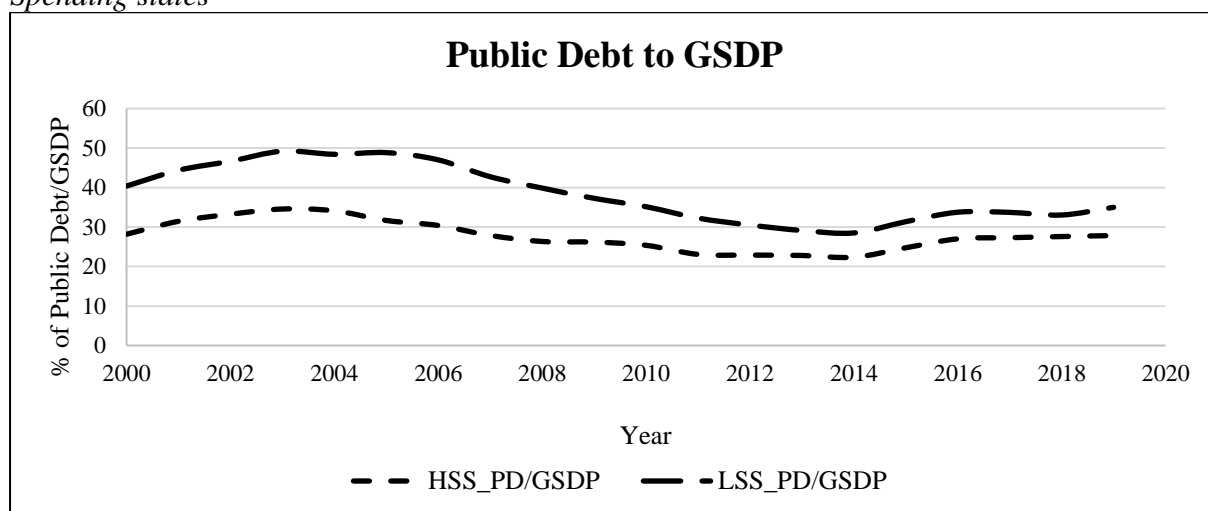
Source: Author's calculation using RBI bulletin
Note: HSS_PD/GSDP and LSS_PD/GSDP represents public debt as a percentage of gross state domestic product with regard to high spending states and low spending states respectively

Table 5.17: Responsiveness of HPS expenditure to Borrowing

High Spending States				
Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Receipt	0.07**	*Na*	*Na*	*Na*
Revenue Receipt	*Na*	2.07***	*Na*	*Na*
Public Debt	*Na*	-73.20**	-36.95	-72.68***
Tax Receipt	*Na*	*Na*	0.40	*Na*
Non-Tax receipt	*Na*	*Na*	3.64***	*Na*
States' revenue	*Na*	*Na*	*Na*	0.57
Share in Central Revenue	*Na*	*Na*	*Na*	6.63***
Population Size	-0.16	-0.30	-0.28	-0.26
Dependent Population	6.00	4.35	7.29	3.84
Political Ideology (2)	0.97	-1.42	-0.83	-1.28
3	-0.70	-0.77	-0.72	-0.24
5	-5.04	-5.30 *	-4.73	-3.55
Election Year	1.96	2.14	2.06	1.81
Centre State Political Relation	1.29	1.58	1.46	1.34
FRBMA	5.15**	4.48*	5.09**	4.24*
Constant	-6.64	-0.44	-6.57	-5.94
Model	Yes	Yes	Yes	Yes
Low Spending States				
Independent Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Receipt	0.02	*Na*	*Na*	*Na*
Revenue Receipt	*Na*	1.13	*Na*	*Na*
Public Debt	*Na*	-25.36	-13.48	-29.10
Tax Receipt	*Na*	*Na*	-0.16	*Na*
Non-Tax receipt	*Na*	*Na*	2.85***	*Na*
States' revenue	*Na*	*Na*	*Na*	-0.08
Share in Central Revenue	*Na*	*Na*	*Na*	1.67**
Population Size	61.63**	56.09**	59.09**	58.74**
Dependent Population	-340.27	-211.48	-304.20	-268.73
Political Ideology (2)	0.47	-0.23	0.09	-0.13
3	-3.07	-2.93	-3.17	-3.06
4	-1.95	-2.23	-2.05	-2.27
5	2.45	3.04	3.35	2.72
Election Year	-2.15	-2.07	-1.53	-2.04
Centre State Political Relation	-2.01	-1.54	-1.28	-1.57
FRBMA	3.59	4.84*	5.18**	4.28
Constant	-1.17	0.96	-0.52	0.77
Model	Yes	Yes	Yes	Yes

Source: Author's calculation using RBI bulletin
Note: Model specification 1 to 4 is given in Appendix 5A. HPS and FRBMA denotes human priority sector and fiscal responsibility and budget management act. *** p<0.01, ** p<0.05, * p>0.05 &p <0.10

While analysing the influence of public debt on HPSEx we notice the interesting fact that public debt significantly reduces expenditure of HSS but has no significant effect for LSS. It is indicative of the fact that even if LSS are having higher public debt to GSDP ratio in contrast to HSS it doesn't utilize the borrowing to finance spending on the HPS whereas for HSS with

increase of such outstanding liabilities it reduces HPSEx. To be precise, 1% increase in public debt can reduce the HPSEx by 0.73%. However, enactment of the FRBMA didn't reduce spending on the HPS rather HPSEx increased at a rate of 4-5% after the introduction of the act (table 5.17). As mentioned earlier, the FRBMA has majorly reduced capital expenditure whereas revenue expenditure has increased after the introduction of the act (Kumar and Saumya, 2011). Given, HPSEx comprises of capital expenditure, revenue expenditure as well as loans and advances, the increase of other two components might have surpassed the reduction of capital expenditure or perhaps overall expenditure for the HPS was not comprised to comply with the fiscal discipline. The other control variable i.e., centre state political relationship capturing the favouritism of the centre towards state due to same political affiliation turned out to be insignificant indicating that even if the centre and state has similar political party or allies' party in rule, it has no influence on states' HPSEx in particular.

5.4 Conclusion and Discussion

To understand the preparedness of Indian states to achieve the SDGs by 2030 this chapter discusses states' spending pattern on the HPS during 2001-19. We discovered that water and sanitation and family welfare are the most neglected subsectors in the human priority sectors which need much attention. During the study period these sectors received only 3% of HPSEx on an average. There are huge inter-state disparities in HPSEx. The highest disparity is in nutrition and disparity is increasing for family welfare. Among all the major Indian states Bihar has the lowest spending and also accounts for the lowest growth rates of expenditures. Bihar supposedly being the most vulnerable state needs to address the issue of prioritising social sector expenditure urgently to catch up with the other states and meet the SDG targets on time. While analysing inter-state disparities, we find Bihar and Uttar Pradesh are spending the lowest on account of the HPS whereas Kerala and Haryana represent the high spending states on the same.

Towards understanding the financing of such expenditure, we investigate pattern of revenue generation of the states. While analysing the pattern, we find among all sources of revenue generation, capital receipts and tax revenue receipts are the two major contributors of total state receipts. However, the revenue generation significantly varies across states and the rate of increment of receipts differ quite substantially. With MDS measure, we identify the cluster of outliers comprising of Assam, Bihar, Jharkhand and Punjab in terms of receipts, where Bihar

and Jharkhand are outlier states owing to their low receipts, Assam and Punjab are outlier states due to their high receipts.

Given the high inter-state disparities in HPS spending we form two groups as high spending states and low spending states based on their average per capita spending. We find that HSS has spent almost double the amount LSS spent over the years and divergence of HSS and LSS in terms of HPSEx is increasing in the recent years.

In an attempt to find the association between HPSEx and the sources of revenue, we discover that although there is a strong positive correlation of HPSEx with revenue receipts and tax revenue receipts, but they have no significant influence in enhancing HPS expenditure. Further investigation shows that the spending pattern is inelastic to receipts as a whole but highly elastic to share of central revenue and non-tax receipts. The findings are reaffirmed by the results of panel random effect model. We detect that revenue sources such as capital receipts, non-tax receipts and share in central taxes have a significant positive bearing on spending pattern in priority sectors, whereas tax receipts and states' own revenue have no significant effect. While contrasting the coefficients of the revenue sources between HSS and LSS, we find that all the significant contributors of HPSEx have substantially higher impact in case of HSS compared to LSS, i.e., 1% increment in revenue generation increases HPSEx far higher in case of HSS where it has very marginal impact on HPSEx among LSS. Particularly for HSS, revenue sources such as share of central revenue have the highest impact on HPSEx followed by non-tax revenue receipts and capital receipts. On the contrary among LSS, non-tax revenue receipts have the highest impact followed by share of central revenue and capital receipts. Given the differences in the intensity of influence of several revenue sources in increasing expenditure in the HPS, it can be noted that the financing pattern differs significantly across states and every state adopts differential strategy to fund HPS spending. Apart from analysing the financing pattern of the HPS, we also verified the possible role of state borrowing in HPSEx funding. We find that public debt negatively influences spending on the HPS for HSS but has no significant impact on spending pattern of LSS. Further we find that even after introducing the FRBMA, HPS spending has significantly increased rather than decreased. However, we find no apparent favouritism of the centre towards states based on their sharing similar political affiliation in terms of HPS spending.

In the era of the SDGs and India's commitment to achieve the goals on time, there is a pressing need to increase spending in the priority sectors substantially to improve the development

indicators at large. Acknowledging the positive impact of states' revenue to enhance public spending, examining the financing of HPSEx becomes one of the major concerns, especially when there is a growing difference in HPSEx across states defining HSS and LSS, which calls for identifying the differences in financing HPSEx between HSS and LSS in particular. In this context, our analysis unfolds the differences of HPSEx arising from the differences in receipts as we observe the strong association of revenue receipts with spending pattern. LSS are not only disadvantaged due to low receipts but also lower utilisation of revenue resources to fund HPSEx. In fact, we observe that LSS despite receiving higher share of central revenue compared to HSS have utilised the resources far less compared to HSS. Even with non-tax receipts too, there is greater under-utilization in LSS as against HSS. Thus, this exercise affirms the coexistence of lower utilization of available resources of LSS in funding HPSEx along with lower generation of revenue. Hence, in case of LSS, diverting larger share of revenue resources to fund HPSEx perhaps will increase HPSEx consequently reducing inter-state disparities in HPSEx. In addition, there is a definite need for external assistance by increasing states' share of central revenue and large amount of fund transfer to LSS in particular so that they can use the funding to boost HPSEx and spend at par with HSS. These observations call for immediate policy response as less of disparities of HPSEx across states is expected to result in lower development disparities thus aiding the achievement of the SDGs.

However, increasing the priority sector expenditure alone may not be adequate to realise inclusive development and enhance development parameters, rather it needs to be complemented with right set of public policies and strategies to improve outcomes qualifying inclusive criterion. Such motive and policy framework are majorly driven by the political environment of state particularly guided by the political ideology of the ruling party since most of the public policies are the manifestation of party ideology which also effects the administration of such policies. Thus, in the next chapter we investigate the interrelation between the political environment of state and its development.

CHAPTER 6

POLITICAL ENVIRONMENT AND DEVELOPMENT OF THE INDIAN STATES

6.1 Introduction

Implementation of public policies as a manifestation of political ideology plays a crucial role in explaining economic progress (Kohli, 2006) and human development trajectories (Joshi and McGrath, 2015). Political environment is vital in shaping government policies (Dash and Raja, 2013) thus influencing human development (Dash and Mukherjee, 2015). It has served as the primary influence in public policy formulation. Ideological differences across parties give rise to disagreements over issues ranging from economic reforms to public assistance programmes (Ganguly and Mukherji, 2011). For example, left wing parties encourage socialism, adopting a more egalitarian development strategy while right-wing parties advocate for neoliberal capitalism (Noël and Thérien 2008; Joshi and O'Dell 2013). Left parties prioritise achieving a high degree of equality by improving human development such as increasing education and health whereas the political right argues in favour of improving human capacities and social achievements through material incentives and technological innovations.

The relationship between political determinants and human development become complex in case of governance by several ideologically differentiated parties wherein there cannot be an explicit connect between the two rather than being context-specific and system-specific. Political differentiation is a usual phenomenon in a large federalist country which gives rise to a diverse array of ideologies and public policies. For instance, India the largest democracy in the world, is politically fragmented at the state level by distinct ideologies of regional and national political parties. India having a multi-party electoral system, governments at state level are formed by different national and regional parties having their own unique political ideologies. Since the first democratic election in 1951, centre ideology party Indian National Congress (INC) had won most of the elections at the state level until 1967. But since 1967, India has embraced the emergence of several regional parties challenging the rule of the INC and increasing political competition at the state level. Since then, India has been continuously experiencing political differentiation based on ideologies. Thus, at the state level political ideologies differ significantly in accordance with the party in power. For example, leftist political parties have prominent presence in Kerala's politics in contrast with the western state of Gujarat under the influence of right-wing parties.

Ideologies are a basis of competitions over providing plans for public policies (Freeden, 2003). It is a comprehensive belief system embraced by significant groups in society (Steger 2008). Political parties defined by such belief systems influence public policies at large. Such distinctly defined public policies driven by ideologies can be assumed to generate dissimilar levels of human development across states. Besides, in a democratically elected political system, the ruling party at the state level enjoys considerable power to guide the development path of the state and its subjects. Ideological differences may be a key source of divergence of development across states. We, thus, attempt to examine the relationship between political ideology and human development across Indian states. We employ panel data estimation to our data set of human development indicators across 15 states to investigate the effect of political ideology on development across states.

The chapter is structured as follows: in section 2, we provide the details of the methodology, in section 3 we analyse the empirical results of the study, we begin with the discussion of the political profile of Indian states, followed by linking the development of state with the political ideology of the ruling party. Finally, section 4 discusses the findings of the study and concludes.

6.2 Methodology

The relationship between political ideology and state development during 1991-2020, is considered for the four interrelated sectors of education, health, family welfare and nutrition. The details of the indicators considered under each sector along with their data sources are mentioned in table 1.1 in chapter 1. For the purpose of our study, the time period 1991-2020[62] is divided into 6 parts, 1991–1995, 1995–2000, 2000–2005, and 2005–2010, 2010-2015 and 2015-2020 and the analysis is performed for the mid-year of each sub period, 1993, 1998, 2003, 2008, 2013 and 2018. All parties are codified following the ideology codification of the Dash and Raja (2013) paper. Details of ideological codes of the Indian political parties are mentioned in table 1.2 in chapter 1.

Apart from political ideology, other political factors, such as strength of the government, government stability, and political experience of the leaders, could influence the deliverance

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[62] We restrict our data into six time points given the limited availability of information regarding the development indicators. Moreover, the nature of influence of the independent variables on the development of the state is also not immediate. We have combined the information of NFHS and DLHS for certain selected indicators.

of governance towards holistic development. For strength of the government, we differentiate between a single-party government and a coalition government wherein a single-party government is considered to be decisive compared to a coalition government since well-supported governments are involved in sustainable decision-making, and weigh the future costs of their decisions compared to coalition governments (Grilli et al. 1991). Government stability is also considered in two ways i.e., in terms of the number of years the elected party retains power and second, the number of years the Chief Minister stays in power. A re-elected government supposedly continues with similar public policies, whereas change in government leads to alteration in public policies. So, if the party remains in power for longer years, continuation of a stable set of public policies is likely to facilitate better development of the state (Dash and Mukherjee, 2015). Lastly, we capture the political experience of the leader by number of years the Chief Minister is in active politics[63]. Political experience is assumed to positively influence holistic development as experienced politicians have better knowledge and understanding of the implementation of public policies and the intricacies related to public administration. We collect the data on government strength and stability from Election Reports on States released by the Election Commission of India.

Apart from political determinants we consider a set of control variables which include per capita gross state domestic product (GSDP), per capita development expenditure[64] and poverty level of the state. We use per capita GSDP growth rate as a state growing at a higher rate will have a significant difference in its development trajectories compared to a state growing at a lower rate[65]. The role of public expenditure[66] on development sectors in enhancing development is also widely documented in the literature (Mukherjee & Chakraborty, 2011). However, increased level of poverty seems to slow down development, as poverty has a negative impact on health and educational outcomes. Higher poverty also relates to greater inequality and social instability. Data related to GSDP and state spending on education, health,

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[63] The starting point in the political career is being considered when the leader is publicly recognized for any active political participation or has won any election at national, state or local level. We used newspaper and online sources to gather information regarding the same.

[64] For each development indicator we use the state expenditure that is targeted particularly to the specific development sector, for example, for education indicators we use per capita education expenditure, whereas for family welfare indicators we use family welfare expenditure and so on.

[65] A five-year average growth rate is being used for each round of development indicators

[66] Since most of the outcomes need continuous government spending over the years to improve and don't have immediate improvement, thus, we have used the average per capita expenditure of the periods 1991–1995, 1995–2000, 2000–2005, and 2005–2010, 2010-2015 and 2015-2020 for the years, 1993, 1998, 2003, 2008, 2013 and 2018 respectively.

family welfare and nutrition are collected from the RBI Bulletin for the year 1991-2020. Information on state level poverty is collected from the Planning Commission Estimates released by the Government of India. Information on state population to calculate per capita expenditure and per capita GSDP is from the Census of India.

We begin the exercise by discussing the political profile of states and categorize[67] the states according to their political profiles. We consider two specific categories of states situated at political extremes. For instance, the extremes are states ruled by right wing and right-centric parties and states ruled by centre, left-centric and left-wing parties. Similarly with regard to government strength, the states at the extremes are the ones which were ruled by coalition governments and the states which experienced fewer years of coalition government. Likewise, we have the poles apart states for government stability[68] as well as political experience of the state leader. We contrast development indicators of these extremes to examine whether there is any significant[69] difference between the two groups. Correlation coefficient is also used to understand the linkages between political variables and development indicators.

To investigate the relationship further we use panel data estimation using the empirical model specification as $DI_{it}=\alpha +\beta P_{it}+\gamma X_{it}+\theta_i+ \eta_t +\varepsilon_{it}$; i=1…N, and t=1,..,T where DI_{it} is the measure of development indicators considered under each sector, P_{it} is the vector of political determinants, X_{it} is a set of control variables that are expected to affect the development of states, whereas, θ_i represents unobservable state-specific effects, η_t will capture common time-specific effects for all states, and ε_{it} is the error term. Vector P_{it} represents the political factors[70], such as political ideology, which is a categorical variable ranging between point 1 to 5[71], government stability which is a continuous variable, measured by the ruling party's years in power and the CM's years in power and, government strength is a binary variable which takes 0 if the state is ruled by a single party government and takes 1 if it is ruled by coalition government for each year under consideration. Lastly, political experience of the CM is a continuous variable measured in terms of years the leader is publicly recognized for his/her political participation. X_{it} signifies control variables which are all continuous in nature, such as per capita gross state

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[67] A detailed explanation of the state categorization according to political characteristics is given in Appendix 6A. table no. 6A.1. The states are grouped according to certain lower and upper limit unique to each political variable.
[68] The two extremes are the states which repeatedly elected the same government and states which never elected the same government consecutively for two terms.
[69] We apply t-test to find the significant difference.
[70] Under political variable Centre State Political relation was not included as an independent variable given its insignificant impact on the states expenditure in the development sector in the previous chapter.
[71] The details of the political ideology coding and its formation are discussed in chapter 1.

domestic product (GSDP) growth rate, log of per capita state expenditure and poverty rate. During 1991-2020, three new states were created from – Bihar, Madhya Pradesh, and Uttar Pradesh in 2000 and one from Andhra Pradesh in 2014, all the bifurcated states are considered as divided states from the base year and indicators are adjusted for population. We account for unobserved state-specific effects and time-specific effects by including state-specific dummies, θ_i and time-specific dummies, η_t respectively. Given the presence of autocorrelation[72] in our regression equation, we use Panel Correcting Standard Errors (PCSE) model to estimate the results which corrects the standard errors for first ordered autocorrelation and calculates unbiased coefficient parameters.

6.3 Results
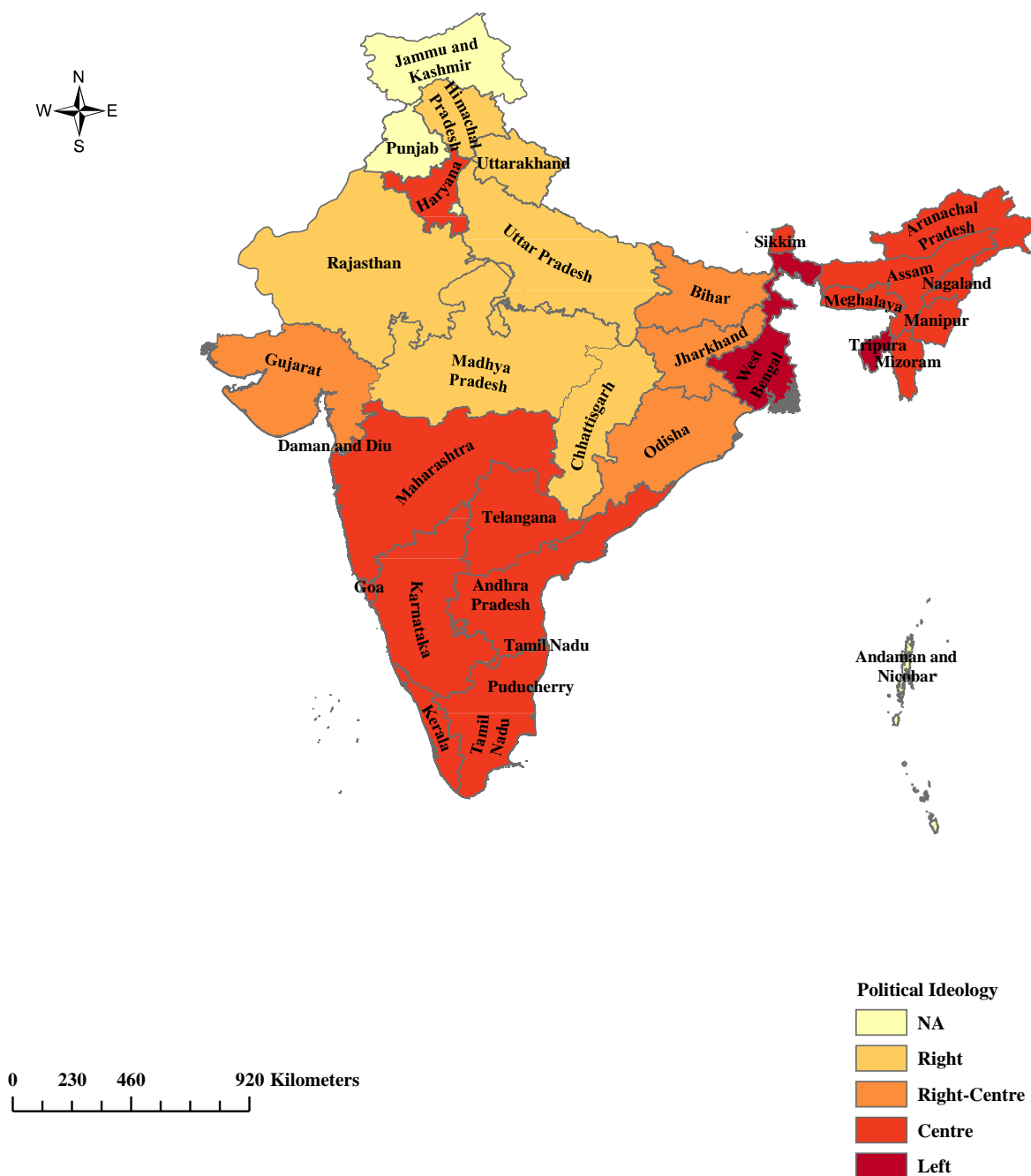
6.3.1 Political profile of the Indian states

Provincial governments in India are formed based on democratic elections where voters directly elect their political representatives. Party which wins a simple majority forms the government otherwise parties arrange for coalition to attain the required majority to form the government. The elected party remains in power for a tenure of five years term, provided it enjoys the simple majority in the house.

Given India's election history, from 1967, although several regional parties emerged and challenged the rule of the INC, number of national parties representing in the parliament has largely been the same. However, several regional parties with different political ideology emerged as ruling party at state level. And during the last two decades, we witness a slow shift of ideological leaning towards right ideology from centric ideology with a steady increase in vote share of the Bharatiya Janata Party (BJP) and its rise to political dominance at the national and state level. A demonstration of such ideological shift across various regions between 1991 and 2019 is shown in figure 6.1 and figure 6.2. It is apparent that during 1991, centric-ideology parties used to rule a majority of the states in India whereas in 2019, majority of the states are ruled by the parties subscribing to a right ideology. We also notice a peculiar pattern. Parties with a similar ideology ruled in certain geographical areas in 1991. For instance, the centric and left ideology parties ruled mostly southern and eastern states as against right and right centric ideology parties having dominant presence in northern and western states. However, in

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[72] We have tested for autocorrelation using Wooldridge tests. The test statistics are significant indicating the presence of 1st order autocorrelation.

2019, the geographical concentration of party ideology has substantially changed and the pattern has become more scattered compared to 1991. The right and right-centric parties are currently ruling south-west and north-east states whereas the centre, left-centre and left are ruling north-western and south-eastern states. Overall, we observe the strengthening of right ideology rule and weakening of centre ideology parties over the last two decades.

Figure 6.1:Political Profile of India in 1991

Source: Author's compilation using election reports of India

Figure 6.2: Political Profile of India in 2019

Political Ideology

- NA
- Right
- Right-Centre
- Centre
- Left-Centre
- Left

0   230   460   920 Kilometers
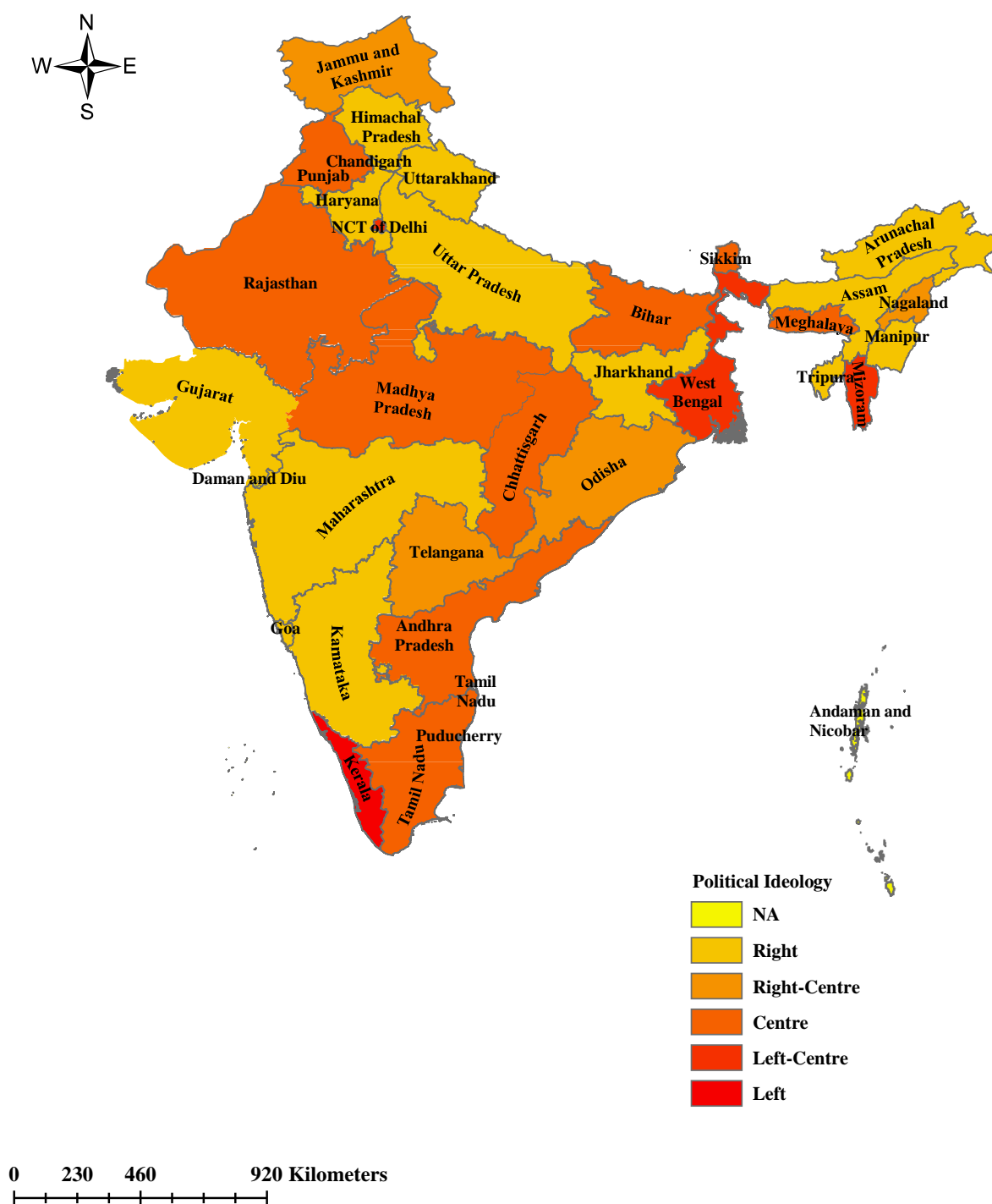
Source: Author's compilation using election reports of India

Table 6.1: Political profile of Indian major states during 1991-2020

State	Political Ideology	Coalition Government	Party Years in Power	CM Years in power	Years of Political recognition
Andhra Pradesh	2.0	0.0	4.7	3.0	28.8
Assam	2.5	15.0	5.4	5.5	31.8
Bihar	2.3	20.0	4.7	4.2	23.6
Chhattisgarh	1.4	0.0	6.6	6.7	31.7
Gujarat	1.2	5.0	11.3	4.1	33.0
Haryana	2.4	10.0	3.7	4.4	36.4
Jharkhand	1.0	19.0	10.0	2.2	18.4
Karnataka	2.4	11.0	6.0	2.1	31.9
Kerala	4.0	30.0	3.0	2.9	52.5
Madhya Pradesh	1.8	2.0	6.1	5.4	34.3
Maharashtra	2.6	30.0	5.2	2.2	24.4
Odisha	2.2	9.0	8.0	7.9	19.7
Punjab	2.5	10.0	3.8	3.6	45.5
Rajasthan	1.8	8.0	3.3	2.8	24.7
Tamil Nadu	3.0	5.0	3.6	3.0	33.0
Telangana	2.0	0.0	3.5	3.5	33.5
Uttar Pradesh	2.2	15.0	4.0	2.2	22.4
West Bengal	4.7	5.0	11.3	9.9	40.0
Total	2.4	194.0	5.8	4.2	31.6

Source: Authors' calculation using Election reports of India
Note: Col 1 refers to the average of the ideology code of the ruling parties. Col 2 refers to the number of years the state is being ruled by coalition government. Col 3 refers to consecutive number of years the same party ruled the state. Col 4. refers to consecutive number of years the same Chief Minister (CM) was in power. Lastly, Col 5 refers to the average of the years of recognition of the all the CM those who were in power

The description of major political features of Indian states during the study period is presented in table 6.1. It suggests that in states such Gujarat, Chhattisgarh, Jharkhand, right-wing parties dominate in contrast to Madhya Pradesh, Rajasthan, Andhra Pradesh, Bihar, Karnataka where right centric parties dominate. In Kerala and West Bengal, leftist political parties have figured prominently during the last three decades. Coalition government is mostly seen in Kerala and Maharashtra whereas Andhra Pradesh, Madhya Pradesh, Gujarat and West Bengal are mainly ruled by a single party government. West Bengal and Gujarat display higher government stability than others i.e., voters in these states have re-elected the same party time and again. Odisha and West Bengal have also retained the same political leader as the Chief Minister (CM) for a longer time than other states. We also observe Kerala, Punjab and West Bengal are ruled by more experienced leaders compared to Uttar Pradesh, Bihar and Jharkhand which have the least experienced political leaders as CM. Such political divergences reflected in diverse public policy design and implementation across states may have triggered inter-state disparities in development. For example, HDI for Kerala is 0.625 while for Bihar it is 0.447 and for Chhattisgarh it is 0.449 (UNDP, 2011 as cited in Suryanarayana, et. al., 2011). In Kerala infant

mortality rate is 10 whereas in Madhya Pradesh it is 47; and almost 43% children are under-weight in Bihar in contrast to 16% in Kerala (NFHS-4 report). So, we categorize[73] the states according to political extremes as discussed earlier and test the differences in their development indicators.

6.3.2 Political environment and development of state

Figures in table 6.2 exhibit that states ruled by political centre, left-centric and left parties[74] have fared significantly better in all development indicators and have spent much more on the social sectors compared to states ruled by right wing parties. But the other political characteristics have a mixed effect on development performance. For instance, states with single party government have fared better in most of the indicators for education and family welfare sectors but have poor performance in child nutrition compared to the states ruled by a coalition government. When it comes to party stability also, we find significant differences in development indicators. Generally, the same party being elected several times seems to hinder the improvement in child health and community education. Lastly, development across states is starkly influenced by the political experience[75] of the CM. States ruled by highly experienced political leaders perform significantly better in all development indicators compared to states ruled by less experienced CM. Overall, state development can be unambiguously contrasted by political characteristics (table 6.2).

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[73] Details of state categorization according to the political characteristics during 1991-2020 is mentioned in table 6A.1 in Appendix 6A. We have taken an upper limit and lower limit for each political characteristic and grouped the states accordingly.

[74] The states with average of ideology score more than 3 are clubbed together and states with average ideology score less than 2 are clubbed together to capture the extremes, the states having score between 2-3 is not included in the comparative analysis

[75] States ruled by CM with more than 40 years are clubbed in highly experienced group whereas states with CM political experience less than 25 is being clubbed in the less experience group

Table 6.2: Comparison of Holistic Development between states of political extremities

Indicators	Right Centric	Left Centric	Difference	Single party Gov	Coalition Gov	Difference	Lower Party stability	Higher Party stability	Difference	Lower CM stability	Higher CM stability	Difference	Less Exp CM	Highly Exp CM	Difference
LR	61.3	77.9	-11.0***	58.8	72.1	-13.3***	70.6	68.3	6.0***	64.5	66.2	0.3	59.4	76.8	-12.1***
GER(I-XII)	81.2	83.7	0.2	78.6	76.1	2.4	78.8	74.9	4.4**	77.0	79.1	-1.1	74	75.2	-0.6***
GER(HE)	13.1	18.9	-6.3***	17.1	16.2	0.9	18.9	12.8	4.2***	16.5	12.6	2.6**	13.8	15.5	-3.1***
AM	48.5	61.0	-12.4***	57.2	51.2	5.9	57.4	53.8	1.7	48.3	54.1	-7.0**	43.1	65.0	-20.9***
AMM	45.0	51.6	-8.8**	55.6	47.3	8.4*	52.1	44.1	3.6	44.3	42.9	-1.8	38.5	53.2	-16.5***
TFR	3.3	2.0	1.2***	2.4	2.7	-0.4**	2.5	2.6	-0.1	3.0	2.9	0.2**	3.4	2.1	1.2***
ANC	44.5	81.8	-36.7***	67.5	60.5	6.9	65.8	54.1	4.9	49.6	48.8	-4.7	36.8	73.9	-38.5***
ID	43.7	75.4	-28.1***	54.8	61.5	-6.7	61.4	49.7	8.5	49.4	39.8	5.7	39.3	64.7	-24.6***
IMR	61.3	31.7	23.8***	54.2	36.2	18.1***	43.1	47.3	-6.2**	51.6	65.2	-11.8***	60.6	32.9	22.2***
IMN	39.9	68.6	-25.0***	53.8	55.3	-1.5	62.4	48.2	12.7**	46.9	44.6	0.7	40.0	66.8	-23.5***
CS	48.7	32.6	14.6***	42.3	40.2	2.1	37.6	46.9	-7.5**	46.9	44.5	3.2	48.4	35.0	12.5***
CW	24.4	17.7	7.5***	18.4	20.4	-2.1	16.7	23.3	-4.6**	23.2	21.6	2.7	23.2	15.1	8.2***
CU	45.9	31.4	13.7***	38.2	36.4	1.8	30.6	44.8	-11.5***	43.5	41.5	3.2	44.9	30.2	13.6***
EExp	321.2	416.0	-92.7***	331.9	411.6	-79.6**	406.2	314.1	68.1***	337.5	326.6	-2.9	312.5	407.0	-94.7***
HExp	82.5	110.9	-29.3***	91.5	95.2	-3.7	105.8	83.4	14.3**	79.7	79.9	-6.1	72.2	111.9	-40.4***
FWExp	12.6	15.9	-6.0***	18.0	10.5	7.5***	16.2	11.1	1.0	11.5	8.7	-0.3	12.2	11.2	-2.9**
NEXp	24.3	22.2	-11.4***	61.2	12.3	48.8***	21.3	23.3	-16.5***	16.7	14.5	-8.7**	15.1	4.4	-7.2**

Source: Author's calculations using state level reports and election reports

Notes: LR, GER(I-XII), GER(HE), DOR(I-X), AM, AMM, TFR, ANC, ID, IMR, IMN, CS, CW, CU, DW, NLF, EExp, HExp, FWExp, NExp, WSExp refers to Literacy rate in percent, Gross enrolment ratio (I-XII), Gross enrolment ratio in higher education, drop out ratio in I-X, % of any method in contraceptive usage, % of any modern method in contraceptive usage, total fertility rate, % of antenatal care, % of institutional delivery, infant mortality rate, % of immunization, % of child stunted, % of child wasted, % of child undernutrition, % of safe drinking water facilities, % people having no latrine facilities, per capita education expenditure, per capita health expenditure, per capita family welfare expenditure, per capita nutrition expenditure and per capita water and sanitation expenditure respectively. All expenditures are adjusted for inflation using 1991 base year. Col named 'Difference' refers to difference in the values of the previous two columns i.e., $Col_{(n-1)} - Col_{(n)}$. *** $p<0.01$, ** $p<0.5$, * $p<0.1$.

Table 6.3: Correlation coefficient between Political Characteristics and Holistic development

Indicators	Political Ideology	Coalition Government	Party Years in Power	CM Years in power	Years of Political recognition
LR	0.41***	0.28***	0.13**	0.11*	0.53***
GER(I-XII)	-0.06	-0.08	0.04	-0.06	0.30***
GER(HE)	0.03	-0.03	-0.05	0.01	0.24***
AM	0.07	-0.13	-0.02	0.04	0.34**
AMM	0.26**	-0.09	0.05	0.27**	0.46***
TFR	-0.29***	-0.03	-0.14***	-0.12**	-0.41***
ANC	0.35**	-0.04	0.02	0.02	0.34**
ID	0.13	0.06	0.1	0.06	0.37***
IMR	-0.22***	-0.23***	-0.14***	-0.06	-0.41***
IMN	0.25**	0	0.08	0.09	0.46***
CS	-0.18	-0.13	0.10	-0.06	-0.38***
CW	-0.32**	-0.1	0.20	-0.14	-0.24*
CU	-0.23*	-0.17	0.24*	0	-0.41***
DW	-0.17	-0.30**	0.09	0.04	-0.02
HExp	0.02	0	0.14***	0.12**	0.35***
FWExp	-0.04	-0.19***	0	-0.07	0.09**
NExp	-0.19***	-0.21***	0.12**	-0.03	0

Source: Author's calculations using state level reports and election reports
Note: LR, GER(I-XII), GER(HE), DOR(I-X), AM, AMM, TFR, ANC, ID, IMR, IMN, CS, CW, CU, DW, NLF, EExp, HExp, FWExp, NExp, WSExp refers to Literacy rate in percent, Gross enrolment ratio (I-XII), Gross enrolment ratio in higher education, drop out ratio in I-X, % of any method in contraceptive usage, % of any modern method in contraceptive usage, total fertility rate, % of antenatal care, % of institutional delivery, infant mortality rate, % of immunization, % of child stunted, % of child wasted, % of child undernutrition, % of safe drinking water facilities, % people having no latrine facilities, per capita education expenditure, per capita health expenditure, per capita family welfare expenditure, per capita nutrition expenditure and per capita water and sanitation expenditure respectively. All expenditures are adjusted for inflation using 1991 base year. *** p<0.01, ** p<0.5, * p<0.1

While analysing the correlation between political environment and states' development we find the political variables have a significant association with development. From table 6.3 it can be noted that literacy rate, fertility rate, infant mortality rate, immunization and child nutrition show a stronger association with ideology compared to other indicators, it hints that these indicators improve with increase in ideology scale i.e., as the political ideology stand shifts from right wing to left wing, there is a steady and significant increase in the development indicators. Furthermore, government strength in terms of government formation is significantly related to better literacy rate and infant mortality rate. And states ruled by coalition governments are found to spend significantly less on family welfare and nutrition, though the negative association is very weak. Government stability has little relation to development indicators, and the relation is mainly insignificant. However, party stability exhibits greater association with development indicators compared to CM stability. Nevertheless, political

experience turned out to be highly associated with development performance, having a significant correlation coefficient. Higher experience in political career exhibits greater positive association with improvement of the overall development of states.

In keeping with the previous observation, we witness similar pattern for the human development index (HDI) as well. Progress in HDI for right and right-centric ideology states has been slower and lower compared to the centre, left-centre and leftist states during the study period. Although the states started from a similar level of HDI during the early 1990s but non-right ideology states advanced faster in HDI in contrast to right and right-centric ideology[76] states (figure 6.3). The pattern of HDI in terms of other political characteristics are also in line with the previous results (see figure 6A.1-6A.4 in Appendix 6A).

Figure 6.3: Pattern of HDI according to the political ideology
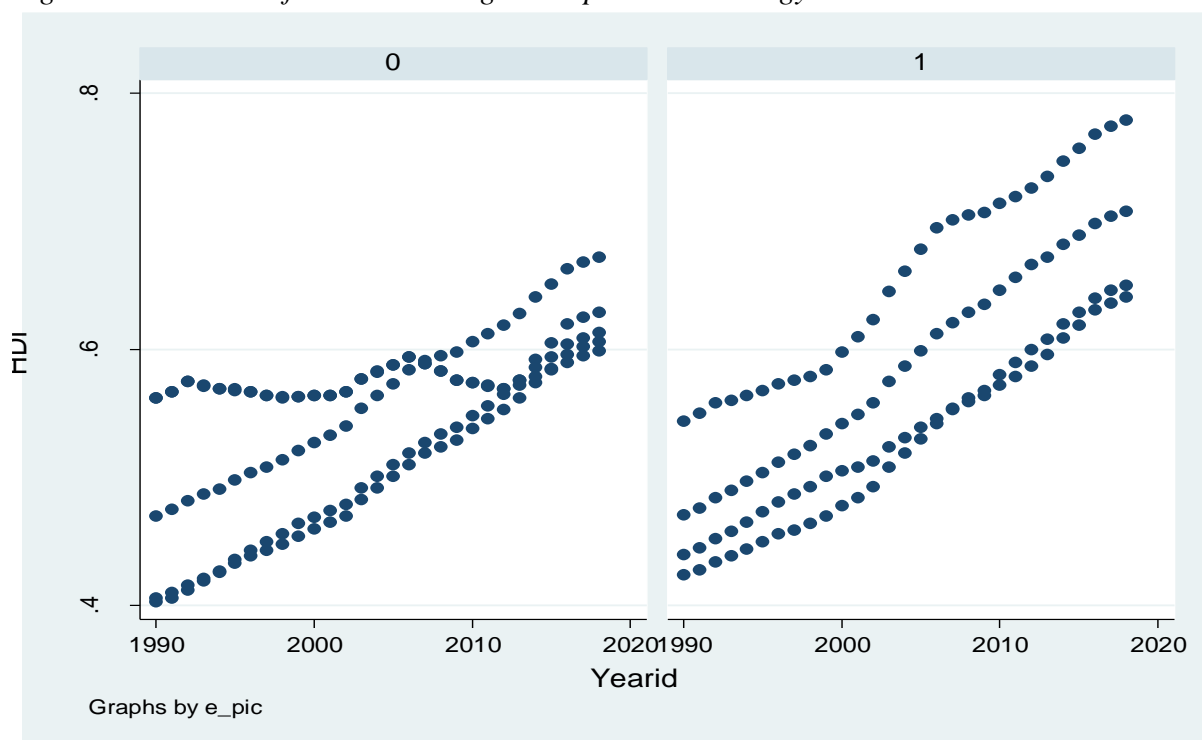
Source: Author's calculations using UNDP reports and election reports
Note: 0 represents right ideology states whereas 1 represents left ideology states and HDI refers to Human development Index

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[76] We reported the pattern of HDI in terms of political ideology only since measuring the influence of the political ideology on the holistic development of the Indian states holds the centre stage of this chapter. HDI pattern in terms of other political variables are given in Appendix 6A, figure 6A.1-6A.4, and the pattern is also in line with the previous findings.

6.3.3 Regression Results

The panel data estimation results on the interrelationship between political ideology and overall development of state are presented in table 6.4. The first column for each development indicator displays results when only political variables are used, whereas results estimated using the complete model specification are displayed in the second column. Irrespective of model specification, the results show that political ideology has a significant influence on the development performance of Indian states.

To be precise, if the state ideology is centre and left-centre the indicators are estimated to perform better compared to right ideology states. For instance, immunization will increase 6.32 times, usage of contraceptive methods will increase 3.39 times and usage of antenatal care will increase 5.93 times if ruled by a centre ideology party compared to a right ideology party. While, immunization will increase 9.17 times and usage of antenatal care will increase 13.21 times if ruled by a left-centre party compared to a right-wing party. However, political ideology has no significant influence on child nutrition[77]. Coalition government has a significant positive impact on antenatal care (3.52) and significant negative impact on child undernutrition (-0.83). The other political variable that came out to be an important determinant of development is government stability, i.e., if the same party is re-elected, it significantly increases immunization (.50), usage of contraceptive methods (.16), antenatal care (.27) and reduces the percentages of stunting (-0.19), wasting (-0.31) and underweight children (-0.39). Again, if the same leader stays as the CM for a relatively longer time it increases immunization (0.42) and antenatal care (0.59) but reduces usage of modern contraceptive methods (-0.34).

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[77] We only report the results of the indicators whose overall model turned out to be significant. To keep the parity of comparison indicator's specific explanatory variables are not included even though overall model became insignificant.

Table 6.4: Political determinants of development in major Indian states

	IMN	IMN	AMM	AMM	ANC	ANC	CS	CS	CW	CW	CU	CU
Right-Centre (2)	2.62	2.6	2.67	2.59*	2.62	2.27	-0.93***	-0.88	-0.39	-0.43	-0.44	-0.29
Centre (3)	5.63**	6.32***	2.83**	3.39***	5.06**	5.93***	1.52*	1.55*	-1.73	-2.07	2.09	1.76
Left-Centre (4)	11.49**	9.17*	5.94	3.98	14.45***	13.21***	1.47	1.10	1.36	1.64	1.38	0.64
Left (5)	1	1.84	-0.25	1.15	-0.18	0.75	3.26**	3.76*	-1.08	-0.48	4.82*	5.51
Coalition Govt	3.01	2.33	2.04	1.34	4.33**	3.52**	0.02	0	0.13	0.6	-0.83*	-0.95
Party Stability	0.55**	0.50**	0.20***	0.16***	0.34***	0.27**	-0.19*	-0.19***	-0.28***	-0.31***	-0.39**	-0.39***
CM Stability	0.46***	0.42**	-0.25*	-0.34***	0.60*	0.59***	0.05	0.05	-0.13	-0.19**	0.04	0.04
Political Experience	-0.03	-0.03	0.04	0.04	-0.02	-0.02	0.06***	0.05***	0.02	0.03	-0.01	-0.01
State Exp		-2.50		-0.23		-0.81		-1.26		4.83		-4.37*
GSDP		0.64***		0.64***		0.63***		0.07		-0.07		0.02
Poverty		-0.05		-0.11***		-0.07		-0.03		-0.04		-0.09***
State-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Source: Author's calculations using state level reports and election reports

Note: GSDP refers to gross state domestic product. IMN, AMM, ANC, CS, CW, CU refers to % of immunization, % of usage of modern contraceptive methods, % of antenatal care, % of child stunted, % of child wasted, % of child undernutrition respectively. All expenditures and GSDP are adjusted for inflation using 1991 base year. *** p<0.01, ** p<0.5, * p<0.1.

Apart from political determinants, growth rate of per capita GSDP has a positive and significant effect on immunization, usage of contraceptive methods and antenatal care but has no significant impact on child nutrition. To be specific, 1% increase in growth of PCGSDP will increase 0.64% of immunization, usage of contraceptive methods will go up by 0.64% and antenatal care 0.63%. However, sector specific per capita state expenditure has no significant impact on the development indicators reaffirming the results of the previous chapters. Besides, poverty has no significant impact on the development indicators except for contraceptive usage (-0.11) and child undernutrition (-0.09). We also observe the significant presence of state - specific and time-specific effects.

6.4 Conclusion and Discussion

We investigate the relationship between political ideology and development of state with respect to some selected indicators. While contrasting the two political extremes in terms of ideology, we find the states ruled by centre, left-centre and left ideology have fared significantly better than right and right-centred ideology states. We also observe a strong association between ideological leaning and development indicators which hints at the same. The result from the regression estimates, that political centre and left-centre ruling result in better development when compared with right-wing ideologies is not surprising as public policies are manifestations of ideological stances.

Political centre, and left-centric parties advocating social democratic ideologies are more likely to realise an egalitarian pattern of development that generates substantial progress in basic development indicators compared to right-wing parties which preach neoliberal capitalism (Kohli, 1987). Although both ideologies emphasise economic growth, social democratic parties orient their policies towards universal provisioning of public goods and avoid clientelism (Sandbrook et al. 2007). On the contrary, right ideologies overlook the distributional features of development outcomes and opportunities across class, gender and race (Steger 2009). As Harvey (2005) rightly argues, accepting neoliberalism actually hinders development by limiting state protections and provisioning for the underprivileged classes. Thus, political parties with a leaning towards egalitarian ideology allocate more towards provisioning of public goods and services leading to better development of a state and implement such polices more effectively. For instance, Tamil Nadu ruled by more egalitarian party ideology adopted an inclusive development strategy which fetched greater gains in

human development than Gujarat despite having similar economic growth. The government in Tamil Nadu has invested more in the human development of underprivileged sections of society following its inclusive ideology (Joshi and McGrath, 2015). Similarly, Kerala, known for its relatively more egalitarian development ideology has gained high levels of human development over the years (Heller 2000; Devika 2010; Singh 2011). And according to NITI Ayog, 2019 report Kerala can be compared with high-income and middle-income countries in the world in terms of health and development.

Apart from ideology party stability also relates to the development of a state but it has a mixed bearing on the improvement in development indicators. For instance, while contrasting the states with extreme party stability in the descriptive analysis (section 6.3.2), we find that states with relatively much longer ruling by the same party i.e., more than 10 years have fared worse than the states ruled by the same party around 4 years. In contrast, as revealed by the regression results (section 6.3.3), we find that the states ruled by the same party for long have better outcomes than the states electing different parties in its consecutive election. This contradiction in the results indicates that the relationship between party stability and development is not linear rather it hints the presence of the non-linear relationship between the two. Given, the two contrasting results it perhaps indicates that same government ruling for a long time improves the development compared to single term government, but if the same government rules for a very long period it worsens development. For instance, same government ruling for a long time can have sufficient time at hand to implement the existing policies more effectively which eventually improves the development of states (Dash and Mukherjee, 2015). Because public policies targeted to impact the development indicators do not have an immediate bearing on the development outcome. So, implementation of policies over a period is necessary for improving the development indicators. But if the same party is in power for a very long time it will worsen the development of a state because if some party is re-elected for several terms, it decreases the political competition thus leading to less effective public administration and governance. Since, politically-competitive governments perform well in development as pointed out by Dash and Mukherjee (2015). Such contrasting results indicate that there is certain optimum number of years a political party must enjoy power because beyond that or below that, it does not serve the development process as expected[78].

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[78] Given the scope and objective of this chapter we limited our analysis to linear association between party stability and development of a state. The estimation of non-linear relation between the two and identifying the optimum

Although we find a significant contrast between states ruled by a more experienced leader and a less experienced leader and a strong positive association between years of political experience and development outcomes, political experience per se does not manifest a significant bearing on development indictors as revealed by the regression estimates. This could be because of the fact that the significant contrast was between the two extreme state groups which loses its significance when all the states are analysed together. Apart from political variables, increase in growth rate of per capita state domestic product contributes to the process of development of states. The notable growth rate India experienced in the last two decades seems to have had a positive effect on the development of states which confirms the trickle-down effect of growth on development. But increasing public spending on specific social sectors does not seem to have much positive effect on development outcome of states. Since improvement of the development outcomes largely depend on the composition and efficacy of the public spending (Filmer and Pritchett, 1999), the expenditure-outcome association could be weak on account of the fact that states are spending ineffectively and inefficiently with poor targeting.

Overall, the analysis suggests the strong influence of political environment on the development of states and reveals how important political ideology is in shaping state development. So, along with promoting inclusive development by increasing public spending, political leaders also need to emphasize on framing policies with the motivation of inclusive development and administer the policies accordingly.

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number of years of political powers to improve development can be an area of future research for the interested researchers.

CHAPTER 7

CONCLUSION

The thesis examines the disparities and progress of the education and the health sector across Indian states using certain selected indicators obtained from state level reports. It also traces the development trajectories over the period and assesses the odds of the states in realization of the SDGs. Further, it investigates the responsiveness of development parameters and imbalances towards state spending in case of large Indian states, accompanied with a case study of Kerala and Bihar in particular. While analyzing such responsiveness we use the concept of targeted per capita expenditure along with conventional per capita expenditure. In this regard we verify whether state government spending is in accordance with the direct beneficiaries of various social sector spending. In addition, we examine states' spending pattern on the HPS and identify the financing pattern of HPSEx by investigating the level of impact of various kind of receipts on HPSEx. Lastly, we examine the influence of the political environment on development of a state to recognize the motive and framework of policies towards inclusive development.

7.1 Summary of Findings

While analysing the development performance of the states in the education and health sectors in chapter 2, we find poor performance and large inter-state disparities in education as well as health indicators. While states exhibit a tendency of convergence with regard to most of the health and education indicators, the significantly small magnitude of the coefficients of convergence suggest the speed of the convergence to be alarmingly low. Despite the overall slow convergence there is an increase in inter-state disparities for certain indicators such as gross enrolment ratio in higher education, infant mortality rates and stunting among children. Furthermore, the slow progress of the states implies that proposed targets will not be accomplished especially in raising the gross enrolment ratio in higher education, and improving antenatal care and child nutrition. This slow progress, if continued, also implies a low likelihood of the states achieving the SDGs.

In chapter 3, while analysing the demographic account of public spending, we observe that the states didn't spend in keeping with their population composition of the direct beneficiaries of the expenditures as we find no systematic relation between the change in social expenditure and the change in targeted population across the states. The result exposes the limitation of

considering per capita expenditure as against using expenditure per capita of the targeted population. Conventional per capita expenditure based analysis tends to understate or overstate a problem by providing misleading results. So, we consider both targeted per capita spending and conventional per capita spending to evaluate the responsiveness of the education and health outcomes to state public spending.

While analyzing such responsiveness in chapter 4, we observe a weak association between the development disparities across rural-urban regions and state spending on these sectors. Besides, we don't find any orderly linkages between progress of outcomes and increment of state spending. With regard to comparison between the two-extreme development performers, Bihar and Kerala, we find Bihar having better progress in health and family welfare indicators as against Kerala. Also, Bihar achieved such progress at a relatively lower cost when compared with Kerala. In addition, we observe that the impact of state spending on outcome for both the states is insignificant. Nonetheless, we emphasize that the complexities such as unique production function of development outcome, pattern of preference, efficiency of spending and proper targeting serve towards masking the impact of state spending on development, which endorse a prescription in favor of increasing public spending adequately and efficiently to promote inclusive development in India.

In chapter 5 while exploring the pattern of HPSEx, we find that family welfare and water sanitation, received only 3% of HPSEx and there are visible disparities in expenditure across the states being the largest in nutrition and growing in the component of family welfare. Besides, Bihar is found to be the most vulnerable state with the lowest spending and records lowest growth rates in per capita expenditures. Regarding the examination of financing pattern of HPSEx of HSS and LSS, we find capital receipts, non-tax revenue receipts and states' share of central revenue have significant positive impact on HPSEx. However, the intensity of influence for all the significant revenue sources is larger in case of HSS compared to LSS. Moreover, the primary source of revenue utilized to fund HPSEx differs across the two categories of states. For instance, resources obtained as a share in central revenue has the highest impact on HPS in case of HSS whereas non-tax receipts have the highest impact for LSS. This indicates the unique financing pattern of the two categories of states with regard to HPS spending and explains the low spending on HPS of LSS given the low usage of revenues to fund HPSEx. In addition, the analysis of the relationship between public borrowing and

HPSEx shows that borrowing significantly decreases HPS spending for HSS but has no impact on HPSEx of LSS.

Lastly, in chapter 6, we examine the influence of political environment on the development of a state particularly by investigating the relationship between political ideology and development of states. We find political ideology to have a significant bearing on the development of states. To be specific, states ruled by political centre and left-centric ideology parties significantly outperform states ruled by right ideology party. With regard to other political variables, we find that states benefit in terms of development if the same government rules for a relatively long period compared to a single term. But if the same government rules for a very long period it worsens development outcomes as it faces little competition. The result hints on a possible existence of a certain optimum number of years a political party must enjoy power, because beyond that or below that, it does not serve the development process as expected.

7.2 Discussion and Policy Recommendations

The first and foremost lesson that we derive from this exercise relates to the need for expenditure allocation to be responsive to its target population to realise development goals in general, and the SDGs in particular. Further, through this exercise, we raise the apprehension on achieving the SDGs in the presence of the current resource constraints and available institutional infrastructure for implementation.

To confirm the positive impact of state spending on development outcome given its theoretical underpinning, we advocate increased public spending in the key human development sectors so that spending is adequate to influence the outcomes. We also suggest that public spending needs to be efficient given the scarcity of resources. And to that effect the agents involved in the spending decisions and provisions must consider the underlying production function, pattern of preference and proper targeting. These together with regular assessment of the net impact and usage of public services at the micro level can increase the responsiveness of outcomes to state spending. Further, the differences in the findings of the two states namely Bihar and Kerala provide a cautionary tale against analysing the impact of expenditure on the indicators for all states together that compromises the precision of the results by overshadowing the state level interaction of variables. Thus, such inspection should always be temporal in nature for specific region/state accounting for its specificities rather than across states which dilutes the findings. Moreover, given states' lack of revenue generation capacity and rise in

demand for increasing state HPSEx to attain the SDGs, it is felt that raising states' share in central taxes remains the only alternative to ensure the required increase in HPS spending.

Our investigation further reveals that apart from enhancing efficient spending on the development sector with careful financing, political environment too has its own influence in shaping the development of a state. This endows the political leaders with the responsibility to frame and motivate public policies in keeping with the principle of inclusive development setting aside the ideological differences and administer them judiciously. Such an observation literally conveys that all rests with the voter to decide for their own development by choosing whom to vote for and for how long to keep the government in power as such voting decision would set the pathway for their development in the future. Finally, while public spending remains a necessary pre-requisite to realise development outcomes, it is not sufficient in the absence of efficient institutions and political will that ultimately differentiates good performance from bad performance.

7.3 Contribution to the Literature

In terms of contribution to the existing literature, we introduced the fresh concept of targeted per capita expenditure as a better measure of spending compared to the conventional per capita given that every spending is meant for a certain targeted group of citizens. We also discuss the feasibility of the Indian states to achieve the SDGs using the non-linear progressive pathway of the development indicators in contrast to conventional linear measurement of progress. Besides, we attempt to assess the impact of state spending on development trajectories and imbalances in a holistic framework using a set of 12 indicators explaining comprehensive human development rather than using single indicators as in previous studies. This framework provides a clearer understanding of holistic development compared to conventional single indicator approach especially in the era where states like to celebrate their success by picking and choosing certain indicators where they excel masking the overall development. Lastly, we discuss the intertwined political and development process to conclude that development is not an exclusive economic process rather it is a mixed outcome of spending priorities guided by political commitments.

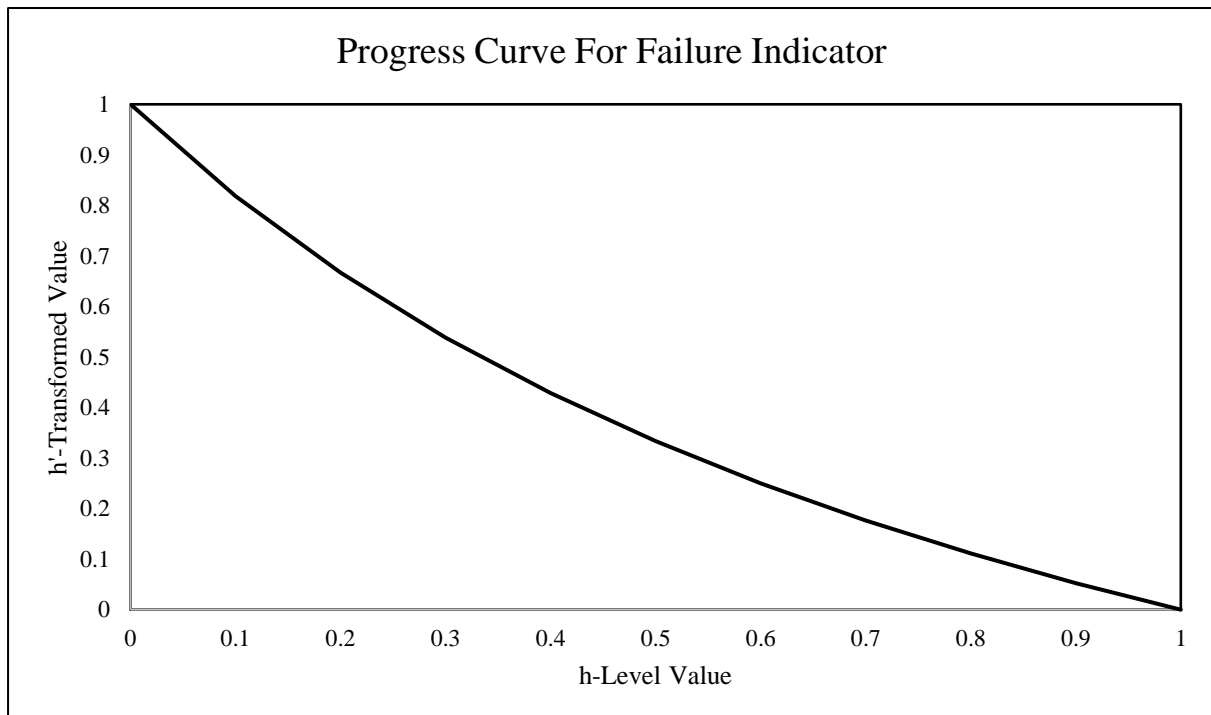**Appendix:**

Chapter 2- Appendix 2A

Figure 2A.1: The non-linear pathway of achievement indicators
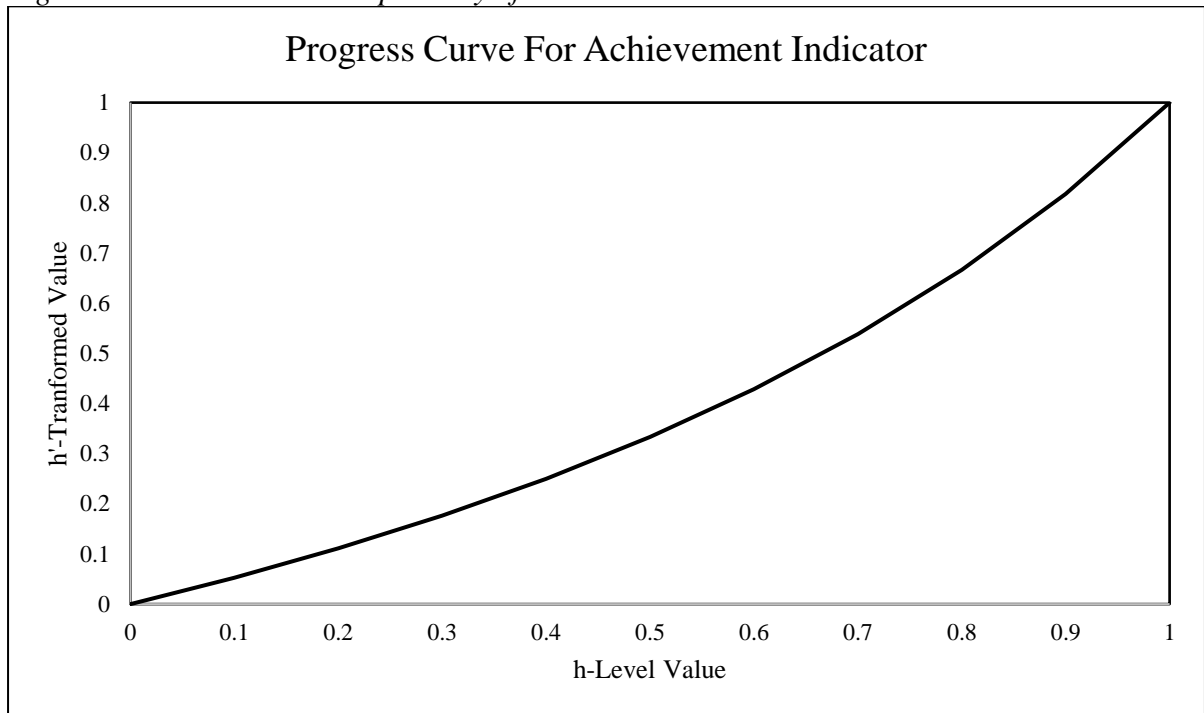
Source: Author's calculation using the non-linear conversion
Note: 'h' represents level value and 'h`' represents transformed level value using h`= h/(2-h)

Figure 2A.2: The non-linear pathway of failure indicators

Source: Author's calculation using the non-linear conversion
Note: 'h' represents level value and 'h`' represents transformed level value using h`= (1-h)/(1+h).

Chapter 5- Appendix 5A

Model Specifications for table 5.15 and 5.16:

1. HPS expenditure = f (Receipt, Population Size, Dependent Population, Political Ideology, Election Year)

2. HPS expenditure = f (Revenue Receipt, Capital Receipt, Population Size, Dependent Population, Political Ideology, Election Year)

3. HPS expenditure = f (Tax Receipt, Non-Tax receipt, Capital Receipt, Population Size, Dependent Population, Political Ideology, Election Year)

4. HPS expenditure = f (States' Revenue, Share in Central Revenue, Capital Receipt, Population Size, Dependent Population, Political Ideology, Election Year)
   States Revenue=States' own Tax Revenue + States' own Non-Tax Revenue
   Share in Central Revenue=Share in Central Taxes + Grants from Centre

Model Specifications for table 5.17:

1. HPS expenditure = f (Receipt, Population Size, Dependent Population, Political Ideology, Election Year, Centre State Political Relationship, Fiscal Responsibility and Budget Management Act)

2. HPS expenditure = f (Revenue Receipt, Public Debt, Population Size, Dependent Population, Political Ideology, Election Year, Centre State Political Relationship, Fiscal Responsibility and Budget Management Act)

3. HPS expenditure = f (Tax Receipt, Non-Tax receipt, Public Debt, Population Size, Dependent Population, Political Ideology, Election Year, Centre State Political Relationship, Fiscal Responsibility and Budget Management Act)

4. HPS expenditure = f (States' revenue, Share in Central Revenue, Public Debt, Population Size, Dependent Population, Political Ideology, Election Year, Centre State Political Relationship, Fiscal Responsibility and Budget Management Act)
   States Revenue=States' own Tax Revenue + States' own Non-Tax Revenue

   Share in Central Revenue=Share in Central Taxes + Grants from Centre

Under revenue receipt we have tax and non-tax revenue. Under tax revenue, we have states' own tax revenue and share in central taxes, under non-tax revenue we have states' own non-tax revenue and grants from Centre.

Figure 5A.1: Contrasting the growth of targeted per capita expenditure versus population growth in Indian States for Water Sanitation Sector
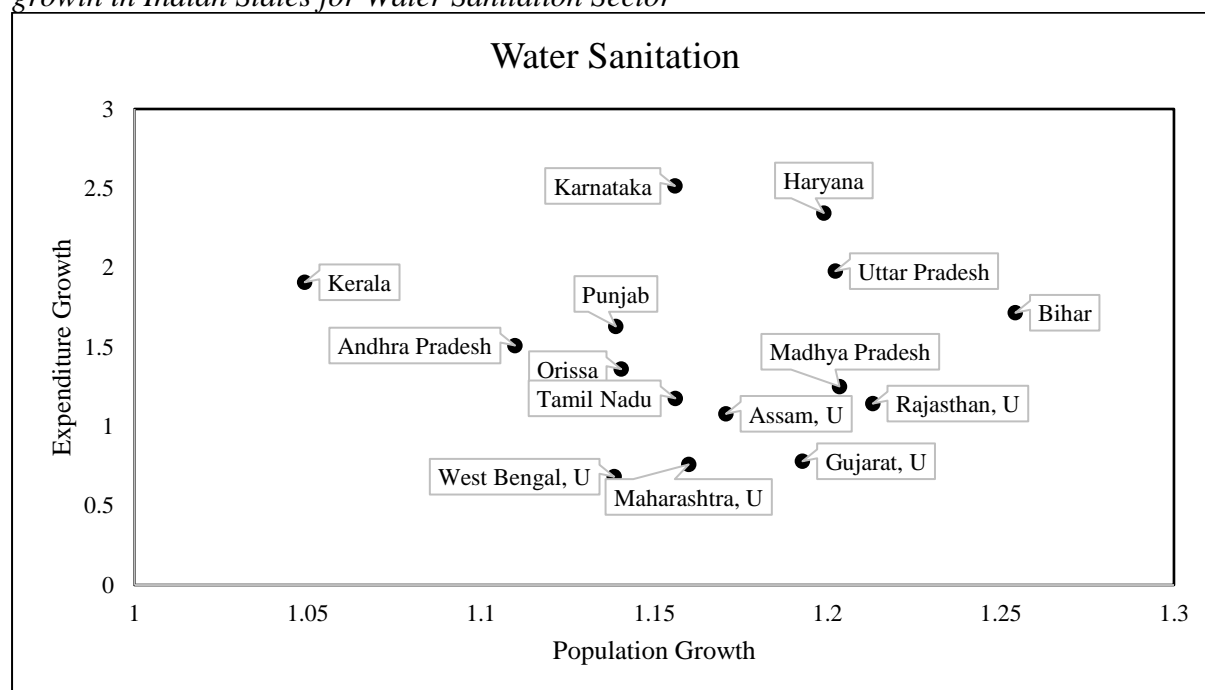
Source: Author's calculation using RBI and Census data
Note: States labelled as (State, U) represent the states whose growth in targeted per-capita fall short of the growth in targeted population

Figure 5A.2: Contrasting the growth of targeted per capita expenditure versus population growth in Indian States for Family Welfare Sector
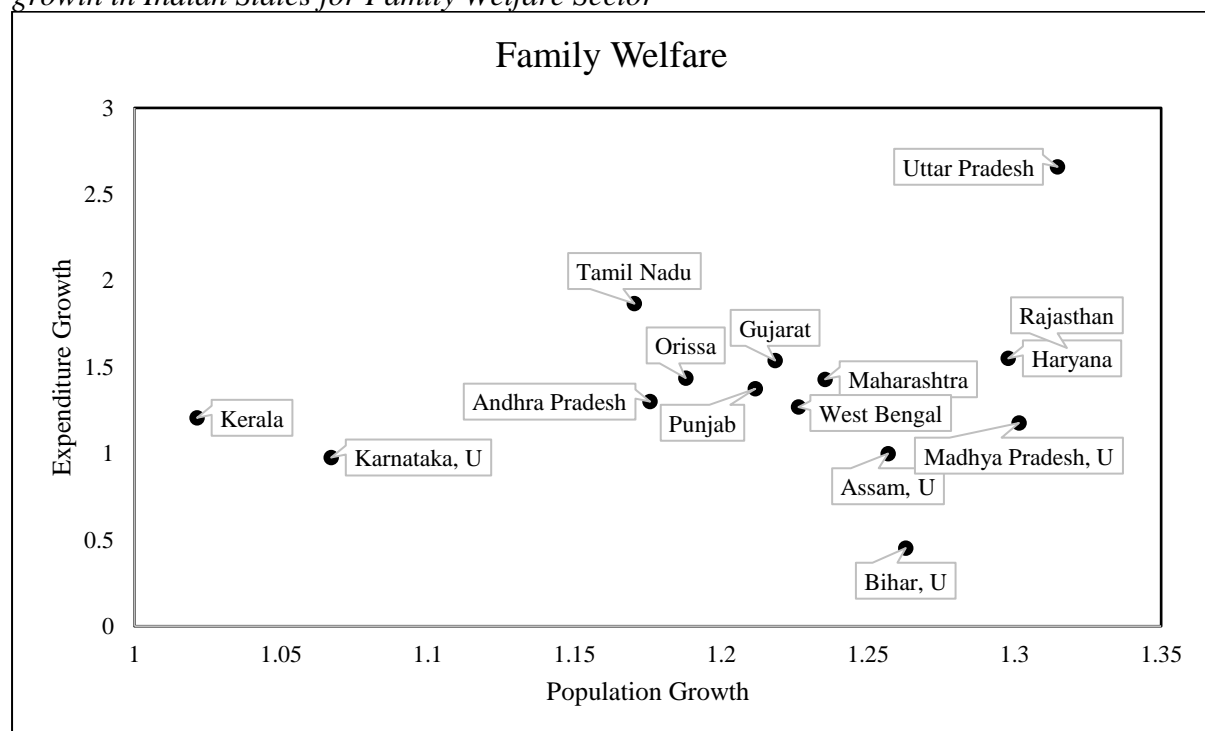
Source: Author's calculation using RBI and Census data
Note: States labelled as (State, U) represent the states whose growth in targeted per-capita fall short of the growth in targeted population

Chapter 6- Appendix 6A

Table 6A.1: State categorization according to the political characteristics during 1991-2020

Political Ideology (Code)	Less than 2	Jharkhand, Gujarat, Chhattisgarh, Madhya Pradesh, Rajasthan
	More than 3	Tamil Nadu, Kerala, West Bengal
Single Party Govt (Years)	Less than 1	Jharkhand, Maharashtra, Kerala
	More than 20	Haryana, Odisha, Rajasthan, Gujarat, Tamil Nadu, West Bengal, Madhya Pradesh, Andhra Pradesh
Coalition Govt (Years)	Less than 1	Telangana, Chhattisgarh, Andhra Pradesh
	More than 20	Bihar, Maharashtra, Kerala
Party Term	Less than 2	Telangana, Bihar, Chhattisgarh, Uttar Pradesh, Jharkhand
	More than 5	Tamil Nadu, Rajasthan, West Bengal, Karnataka, Andhra Pradesh, Maharashtra, Assam, Punjab
No of Years in Party in Power	Less than 4	Kerala, Rajasthan, Telangana, Tamil Nadu, Haryana, Punjab
	More than 10	Jharkhand, West Bengal, Gujarat
CM Term	Less than 2	Karnataka, Telangana, Jharkhand, Maharashtra
	More than 2	Kerala, Odisha, West Bengal, Punjab, Tamil Nadu
No of Years in CM in Power	Less than 2.5	Karnataka, Uttar Pradesh, Jharkhand Maharashtra
	More than 5	Madhya Pradesh, Assam, Chhattisgarh, Odisha, West Bengal
No of Years of experience of CM active Politics	Less than 25	Jharkhand, Odisha, Uttar Pradesh, Bihar, Maharashtra, Rajasthan
	More than 40	West Bengal, Punjab, Kerala

*Source: Author's compilation using the information from election reports*

Figure 6A.1: Pattern of HDI according to the Government strength

Graphs by e_coa
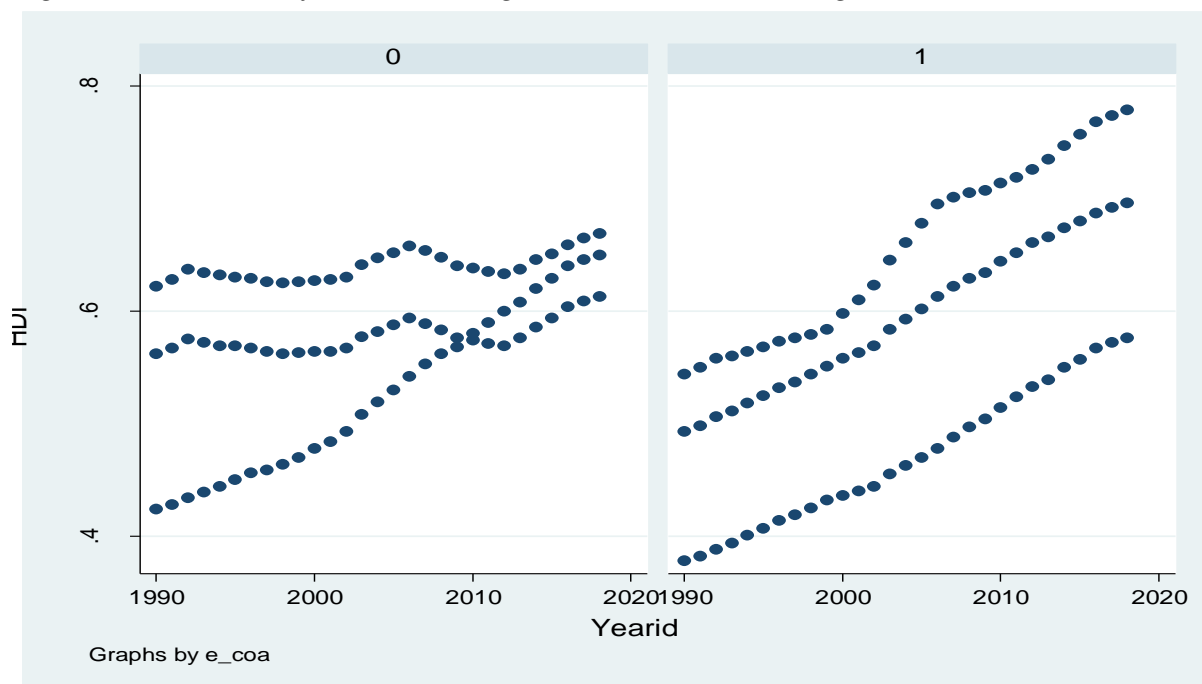
Source: Author's calculations using UNDP reports and election reports
Note: 0 represents single party government whereas 1 represents coalition government. HDI refers to Human Development Index.
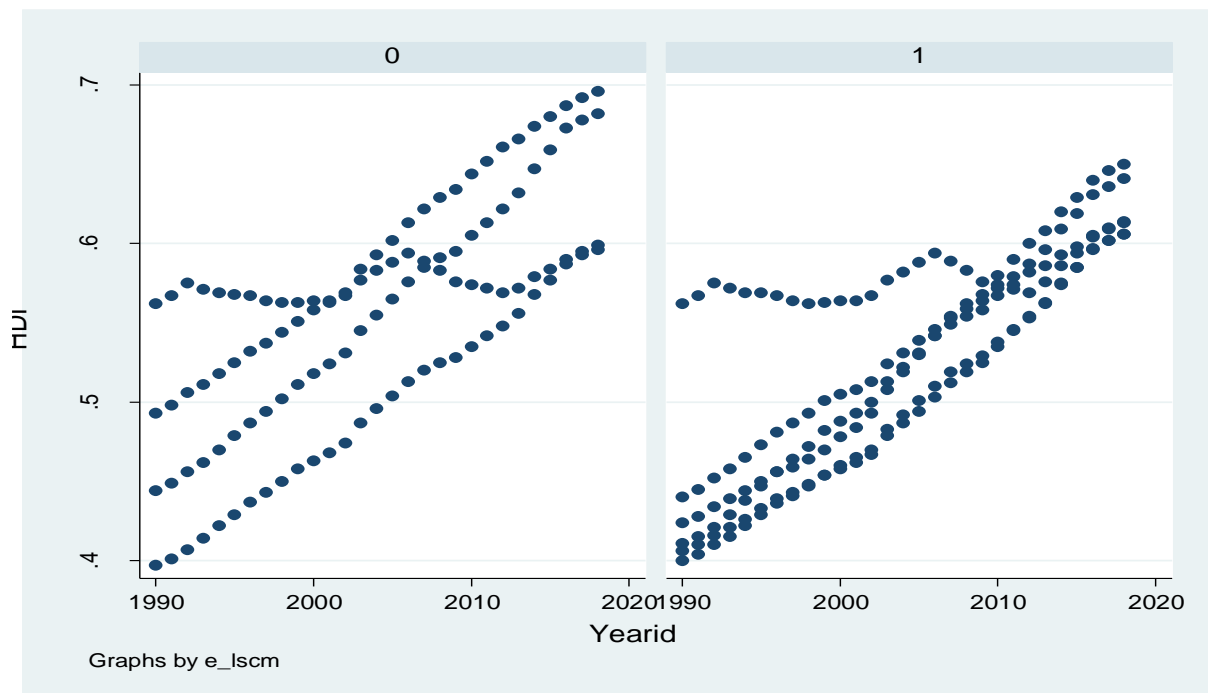
Figure 6A.2: Pattern of HDI according to the party stability
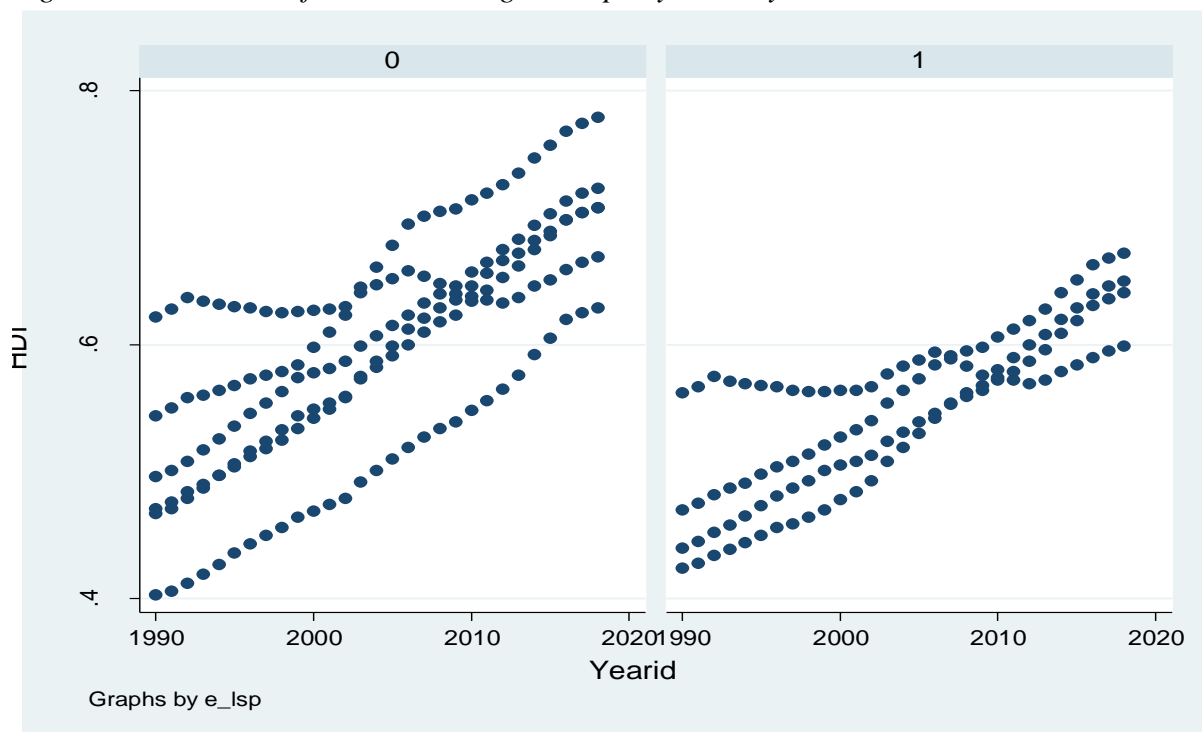
Graphs by e_lsp

Source: Author's calculations using UNDP reports and election reports
Note: 0 represents lower party stability whereas 1 represents higher party stability. HDI refers to Human Development Index.
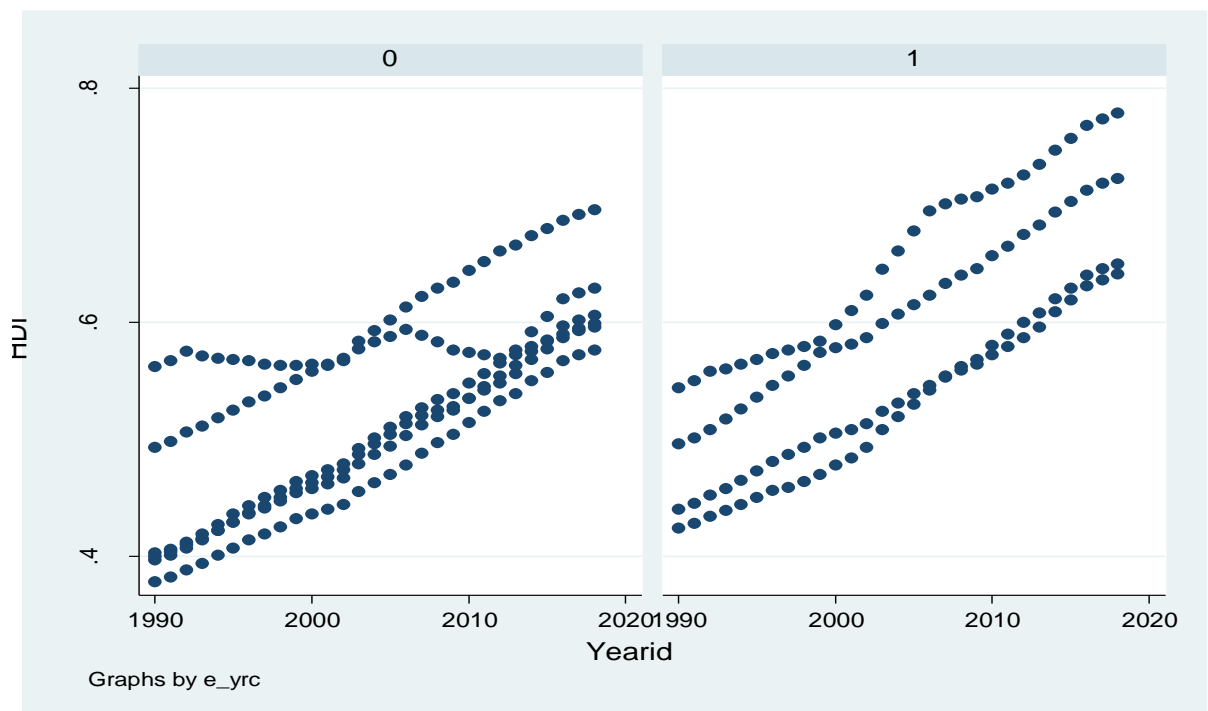
Figure 6A.3: Pattern of HDI according to the CM stability

Graphs by e_lscm

Source: Author's calculations using UNDP reports and election reports
Note: 0 represents lower CM stability whereas 1 represents higher CM stability. HDI refers to Human Development Index.

Figure 6A.4: Pattern of HDI according to the political experience

Graphs by e_yrc

Source: Author's calculations using UNDP reports and election reports
Note: 0 represents CM with less experience whereas 1 represents CM with high experience. HDI refers to Human Development Index.

Definition[79]:

Literacy Rate: The total percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. Here the denominator is the population aged seven years or more.

Gross Enrollment Ratio: Number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. For the tertiary level, the population used is the 5-year age group starting from the official secondary school graduation age. It can be greater than 100 in some cases as it includes students whose age exceeds the official age group (e.g., repeaters). Thus, if there is late enrolment, early enrolment, or repetition, the total enrolment can exceed the population of the age group that officially corresponds to the level of education – leading to ratios greater than 100.

Current use of Contraceptive Methods: Percentage of currently married women who have ever used any contraceptive method or any modern contraceptive methods which includes Pill, IUD (intrauterine device), Condom, Female sterilization, Male sterilization, Any traditional method, Rhythm/ safe period, Withdrawal or any other methods.

Total Fertility Rate: It is the average number of children that would be born to a woman over her lifetime if she was to experience the exact current age-specific fertility rates (ASFRs) through her lifetime and she was to live from birth until the end of her reproductive life.

Antenatal Care: Percentages of mothers who had at least 3-4 antenatal care visits for their last birth (in the previous 3 years of the survey year).

Institutional Delivery: Percentage of women who opted for institutional delivery in public or private facilities. Institutional delivery means giving birth to a child in a medical institution under the overall supervision of trained and competent health personnel. The indicator used in the study is based on the last 2 births in the 3 years before the survey to ever-married women.

Infant Mortality Rate: The infant mortality rate is the number of infant deaths for every 1,000 live births.

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[79] The definitions are collected from various sources such as UNESCO, CENSUS of India, NSSO, NFHS and WHO

Immunization: Percentages of children 12-23 months fully immunized i.e., who have received BCG, measles, and 3 doses each of polio/DPT.

Child Stunting: It refers to low height for age among children. A child is considered to be stunted if the height for age < -2 Standard Deviation (SD) from the median of the World Health Organisation (WHO) Child Growth Standards. It is the consequence of cumulative effects of undernutrition and infections since and even before birth. Such children are at a greater risk of illness and death. The indicator used in the study measures the percentage of children under 5 years who are stunted (height-for-age)

Child Wasting: It refers to low weight for height among children. A child is considered to be wasted if the weight for height < -2 SD from the median of WHO Child Growth Standards. It is a symptom of acute undernutrition and usually results from inadequate intake of food or a high incidence of infectious diseases. The indicator used in the study measures the percentage of children under 5 years who are wasted (weight-for-height).

Child Underweight: It refers to low weight for age among children. A child is considered to be underweight if weight for age < -2 SD from the median of WHO Child Growth Standards. It reflects body mass relative to chronological age. It is influenced by both the height of the child (height-for-age) and his/her weight (weight-for-height). Thus, 'underweight' is a composite indicator that includes stunting as well as wasting and the severely underweight children are expected to face high mortality risk. The indicator used in the study measures the percentage of children under 5 years who are underweight (weight-for-age).

Human Priority Sectors: It includes six sectors namely, education, health, family welfare, nutrition, water sanitation and rural development as defined by Ramakumar, R. (2008) given their externalities and linkages involved in holistic development.

Targeted per capita expenditure: It is defined by the ratio of state expenditure to targeted population. Here, targeted population means the age group of population who can directly benefit from the particular expenditure, for instance expenditure in the education sector has direct benefit to the education age group i.e., 6-21 years.

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