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Growth Without Convergence: Employment, Education, and the Structural Persistence of Regional Poverty in India, 2017–2024

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1. Introduction:

Poverty has continued to remain among the most important problems in the field of development for all nations. Despite the rapid economic growth witnessed by several countries in the past few decades, there is a vast majority population who continue to face the problem of low income and lack of basic requirements. For many families, ensuring availability of adequate food, education, health care services and employment remains a tough task. This clearly indicates that the issue of poverty should not be seen simply in terms of low-income levels rather it involves disparities in opportunities, resource availability and standard of living.

The example of India is quite demonstrative in this respect. The reforms introduced in 1991 led to impressive economic growth of the country and made it one of the leaders in terms of economic development. Indeed, such development has definitely contributed to the overall improvement of the living standards in the country and the reduction of poverty at least at the national level. At the same time, development was not equal throughout the country. Whereas some states were successful in their economic development through education, industry, infrastructure and employment opportunities, there were those states which failed to achieve this goal. As a result, the levels of poverty vary greatly depending on the state. Thus, states like Kerala, Goa and Tamil Nadu have low rates of poverty while other states like Bihar, Uttar Pradesh, Jharkhand and several Northern Eastern states continue experiencing higher levels of poverty.

The way poverty is measured also plays an important role in understanding its nature. Although the concept of poverty has expanded over time to include dimensions such as health, education and living standards, but the monetary measures based on income or consumption remain widely used in empirical research. They provide a clear and consistent basis for comparing poverty across states and over time. The widely accepted approach is the Foster-Greer-Thorbecke (FGT) class of poverty index measures. The FGT measures not only the percentage of individuals living below the poverty line but also the depth and inequality of poverty within the poor population. Therefore, the combination of the HCR, PGI and SPGI provides a more comprehensive measure of poverty than the individual indicators alone.

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Another great feature of these measures is their ability to be decomposed by regions and other socio-economic groups.

Poverty in India has been studied in detail through the years many researchers have pointed out a reduction in poverty in India as a whole. Previous research has shown that education, employment opportunities, demographic characteristics and social disadvantages are closely associated with poverty. However, much of this evidence is based either on National Sample Survey (NSS) data or on multidimensional poverty measures. Comparatively fewer studies have examined recent state-level monetary poverty using the Periodic Labour Force Survey (PLFS). In addition, only a limited number of studies have simultaneously analysed the incidence, depth, and severity of poverty while examining their socio-economic determinants within a panel data framework. This creates an opportunity to provide updated evidence using more recent data.

The current paper aims to analyse regional differences in poverty levels in India from 2017 to 2024. The poverty measures include the Headcount Ratio, Poverty Gap Index, and Squared Poverty Gap Index. The study combines descriptive analysis with panel-data econometric techniques to examine both the patterns of poverty and its determinants. Educational attainment, labour market conditions, household demographic characteristics, social composition and religious composition are considered the major explanatory variables.

1.1 Background and Motivation:

Over the three decades of rapid economic growth and structural transformation India has experienced. Despite that, poverty remains one of the most persistent and multidimensional development problems in the Indian economy. Since the economic liberalisation reforms of 1991, there have been gains in income, infrastructure, educational attainment, and several human development indicators. These gains have played a role in a substantial reduction in aggregate poverty and have improved India's standing as one of the fastest-growing emerging economies. But the benefits of economic growth have not been equally shared across regions. The gaps between states in economic opportunities, labour market outcomes, educational achievement, and access to basic public services are stark. While states like Kerala, Tamil Nadu, Karnataka, Gujarat and Maharashtra have achieved significant reductions in poverty as they have progressed on human capital and structural transformation, states such as Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh, Odisha and Chhattisgarh continue to have high levels of poverty and socioeconomic deprivation. Such diverse development trajectories

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suggest that economic growth alone was insufficient to achieve inclusive development and an equitable reduction in poverty in Indian states.

The persistence of poverty in the region is a manifestation of the complex interplay among economic, demographic, institutional, and social factors. The current developmental literature increasingly recognises that poverty is not only about consumption or income poverty, but also about limited capabilities, restricted access to productive employment, poor educational outcomes, social exclusion and unequal access to economic opportunities. The monetary poverty index remains central to development policy. Regardless of the fact that multidimensional poverty frameworks have considerably enriched our understanding of deprivation. It directly measures households' ability to meet their consumption needs and remains the primary basis for the design and implementation of poverty reduction programmes in India. Thus, there is still a need to analyse the incidence, depth, and severity of monetary poverty to assess the efficacy of development policies and monitor India's progress towards Sustainable Development Goal (SDG) 1, which aims to end poverty in all its forms.

An equally important issue is the proper measurement of poverty. The official poverty estimates in India have undergone major changes following the recommendations of the Lakdawala, Tendulkar, and Rangarajan Committees. Each of these committees is based on different normative assumptions about minimum consumption requirements and standards of living. These methodological changes have sparked considerable debate, as alternative poverty lines often yield markedly different estimates of poverty incidence and regional disparities. So the analysis of poverty requires not only an assessment of its extent but also a close examination of the methodological framework used to estimate it.

The measurement of poverty in this study is based on the Foster-Greer-Thorbecke class of poverty indices: Headcount Ratio (HCR), Poverty Gap Index (PGI), and Squared Poverty Gap Index (SPGI). These measures provide a more complete measure of poverty by simultaneously capturing its incidence, depth, and severity, and thus offer richer insights into regional deprivation than conventional headcount measures alone.

Another important dimension of poverty reduction is the performance of the labour market. Most Indian households depend on employment for their main livelihood. However, labour market outcomes vary widely across States, reflecting differences in industrial development, educational attainment, labour force participation, quality of employment and economic structure. Despite continued economic growth, the Indian labour market continues to be

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marred by extensive informality, underemployment and persistent gender and social inequalities. Consequently, a large number of economically active households remain poor because of the concentration of employment in low-productivity and low-paying occupations. These structural characteristics suggest that increasing labour force participation alone is unlikely to reduce poverty without a concomitant increase in productivity, better employment opportunities and improvements in human capital. Therefore, an integrated analysis of poverty and labour market dynamics is important in understanding the structural determinants of regional poverty.

The availability of the Periodic Labour Force Survey (PLFS) has provided important opportunities to advance empirical research on poverty in India. Unlike earlier household surveys undertaken at relatively long intervals, the PLFS provides annual nationally representative data on employment, labour force participation, educational attainment, demographic characteristics, social composition and household consumption. These data allow us to construct a panel data set at the state level that reflects changes in poverty and labour market conditions over time. The 2017-2024 period is especially relevant because it includes the pre-pandemic years, the economic turmoil caused by the COVID-19 pandemic, and the subsequent recovery period. The impact of the pandemic on employment, migration, household income and consumption is profound and has the potential to alter the trajectories of regional poverty across Indian states. Thus, the analysis of poverty in this period provides valuable evidence about resilience in regional labour markets and the effectiveness of public policies that were implemented to mitigate the socio-economic shocks.

There is a huge literature on poverty in India, but many important gaps remain. Much of the existing literature still uses older National Sample Survey (NSS) data and therefore does not adequately capture the recent changes in poverty observed during the PLFS period. In addition, prior studies have mainly employed cross-sectional methods, which limit the study of the dynamic changes of poverty across states. Similarly, existing research has tended to analyse education, labour market conditions, demographic characteristics and social disadvantage separately, with relatively few studies combining these dimensions within a unified state-level panel framework. The empirical evidence on the structural mechanisms through which human capital, labour market performance and social characteristics jointly influence regional poverty disparities in India is thus limited.

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The present study is motivated by the need to develop a thorough comprehension of regional poverty dynamics by combining poverty measurement with labour market performance and socio-economic characteristics in a unified analytical framework. The study uses state level panel data from Periodic Labour Force Survey (PLFS) for the period 2017-2024 to examine the role of educational attainment, labour market conditions, demographic characteristics and social structure on the incidence, depth and severity of poverty across the Indian states. The paper combines the Foster-Greer-Thorbecke (FGT) poverty measures with advanced panel econometric techniques to identify the structural determinants of regional poverty, controlling for unobserved state-specific heterogeneity. The findings are expected to help in academic research and policy-making by providing strong evidence to support the design of more effective region-specific poverty reduction strategies to promote inclusive growth, reduce interstate inequalities and advance sustainable development in India.

2. Literature Review:

The study of poverty in India has evolved significantly over time, moving from a focus on income deprivation toward a broader, multidimensional understanding of well-being. This shift reflects both conceptual advancements in development economics and empirical recognition of the complex, regionally differentiated nature of poverty

2.1 Conceptualising Poverty:

Early poverty analysis was largely welfarist, defining poverty as a lack of income or consumption compared to a given threshold. This approach has a huge impact on the official poverty estimates in India, especially thru consumption-based household surveys. However, scholars have questioned the effectiveness of this measure in capturing deprivation fully. Amartya Sen (1981) has argued the case for seeing poverty as a deprivation of capabilities, such as health, education and social inclusion.

In response, the multidimensional poverty measurement approach was introduced, with the Alkire–Foster method providing a way to combine multiple deprivations into a single index. This methodology has caught on globally and in India, effectively highlighting disparities in education, health and living standards. Though the reduction of poverty has been one of the most important goals of India's economic planning since Independence, the debate on the definition and measurement of poverty in development economics remains unsettled. Different

methodologies produce different estimates of poverty which in turn shape perceptions of economic reforms and social welfare programs.

The initial poverty estimates in India were based on minimum consumption needs, using the calorie norms prescribed by the Planning Commission. Critics saw the neglect of nutritional needs and welfare issues such as healthcare and education. The Lakdawala Committee (1993) improved the methodology by updating the poverty lines, but retained the calorie baselines. With changes in consumption patterns, the Tendulkar Committee (2009) adopted a broader approach that included basic non-food expenses, leading to higher estimates of urban poverty and reflecting the multidimensionality of poverty. The Tendulkar approach was criticised for low poverty lines despite these advances, and the Rangarajan Committee (2014) recommended higher poverty lines by increasing estimates of food and non-food expenditures.

Economists Deaton and Drèze questioned poverty measurement techniques, citing inconsistencies in household consumption data and methodological errors that distort estimates. Their work highlights the need for continual methodological refinements. Recent work by Himanshu (2022) shows that changes in the poverty line can have a substantial effect on estimates, thereby calling into question comparisons of the effectiveness of monetary and multidimensional poverty measures. Consumption measures frequently report declines in poverty, but analyses across multiple dimensions reveal persistent deprivation in education and health.

This challenge in measuring poverty is reflected in the advice of international bodies such as the World Bank (2022) and NITI Aayog (2023) that national estimates should conform to global standards while allowing for regional variations. Critics argue that the choice of dimensions and indicators for multidimensional measurement involves subjective judgements that may produce inconsistent estimates of poverty, thus raising questions about their comparability and policy implications. Thus, multidimensional approaches do not solve measurement disputes but rather demonstrate the normative and constructed nature of poverty measurement.

2.3 Regional Disparities and Spatial Inequality:

Regional disparities significantly impact India's development, revealing uneven benefits from the economic growth since the 1991 reforms. Variations in income, employment, education, and access to public services contribute to differing poverty levels across states. The New Economic Geography (NEG), as proposed by Krugman (2005), highlights the geographical

clustering of economic activities, favoring regions with better conditions and perpetuating poverty in less advantaged areas. Research by Kanbur and Venables indicates that spatial inequality arises from unequal regional development, demonstrating that poverty is shaped by geographical contexts rather than solely individual productivity.

Western and southern states like Maharashtra and Tamil Nadu have shown improvements in economic indicators, while northern states like Bihar and Uttar Pradesh continue experiencing high poverty rates. Studies by Das et al. (2021) and Tripathi and Yenneti (2020) provide empirical evidence of persistent interstate variations in multidimensional poverty despite household income levels. Soumyabrata et al. (2023) reveal that poverty clusters spatially, emphasizing the necessity for regional policies that take inter-state dynamics into account.

Investment in human capital, particularly in education and healthcare, is vital; states like Kerala, which prioritize these sectors, report lower poverty rates. In contrast, states lagging in such investments limit economic mobility. Additionally, labour market structures influence poverty outcomes, with diversified economies providing better job opportunities than regions dependent on subsistence agriculture.

Governance quality and institutional strength are critical for effective poverty alleviation; states with robust institutions deliver services more efficiently, whereas weak governance obstructs poverty reduction initiatives. Demographic elements also intertwine with regional inequalities, where socially excluded communities face intensified disadvantages, underscoring the need for a holistic approach to understanding poverty that integrates both regional and social dimensions.

2.4 Labour Markets, Informality, and Poverty:

In developing economies, labour market outcomes are a key determinant of living standards as employment is the main source of income for most households. But the link between employment and poverty is neither automatic nor uniform. While productive and remunerative employment provides a way out of poverty at the household level, low-productivity, insecure and informal employment often keeps people trapped in deprivation even when they are economically active. Labour market conditions continue to be central to understanding the persistence of poverty and regional inequalities in India, where close to 90 per cent of the

workforce is employed in the informal sector. Thus, the poverty analysis that ignores labour market dynamics presents a partial explanation of household welfare

Understanding poverty in India with reference to PLFS data: Role played by labour market dynamics. Informal employment is a defining feature of the Indian economy with important implications for income security and poverty reduction. Loayza and Rigolini (2011) contend that informality can be both a safety net and a drag on productivity and growth.

High levels of informality are associated with persistent poverty, particularly in rural and less developed states, according to empirical evidence. Fields (2011) argues that the translation of economic growth into poverty alleviation is constrained by labour market segmentation. This is echoed in India by the combination of high economic growth with relatively slow improvements in employment quality." Gender is also an important factor. Mehrotra and Parida (2017) describe the decline in female labour force participation in India and its implications for household income and poverty dynamics. These labour market constraints are not equally distributed across regions, leading to differences in poverty outcomes across states.

2.5 Growth, Structural Transformation, and Poverty Reduction:

The interplay between economic development and the diminishment of poverty is a fundamental topic in academic research. According to Datt and Ravallion (2011), economic growth has helped reduce poverty in India; however, its influence has fluctuated across states and over time. Development has shown more success in diminishing poverty in locales characterised by enhanced infrastructure and skilled human resources. According to Bao (2024), the alleviation of multidimensional poverty is significantly correlated with improvements in education and health, demonstrating that structural change is essential to understanding poverty dynamics. Yet the varying pace of structural modifications across states has produced distinct poverty pathways. Srivastava et al. (2026) reveal that different poverty standards can significantly affect poverty estimates in India. Likewise, Chakrabartty (2024) points out anomalies in the methods used for measuring poverty.

2.8 Research Gap:

Despite the considerable progress, there are still several gaps in the literature. Poverty measurement and regional disparities have been studied as separate issues, not as part of a single integrated framework. Many existing studies focus on a single measure of poverty and do not consider the implications of measurement sensitivity. PlFS data are widely used for

studying labour dynamics and other aspects, but are of limited use in analysing state-level disparities in poverty.

The present study fills this gap by focusing on monetary measures of poverty and explicitly accounting for measurement sensitivity in the empirical analysis. In so doing, it contributes to a deeper understanding of poverty in India as a structural and measurement-dependent phenomenon.

The literature clearly shows that poverty in India is multidimensional, unevenly distributed across regions, and highly dependent on methodological choices. There have been great advances in measurement and analysis, but there is little integration of these dimensions. The study seeks to augment theoretical understanding and empirical evidence on poverty in India by bringing together the debates on measurement and analysis of regional inequality.

2.9 Objectives: (Research Gap and Research Questions)

The principal aim of this study is to explore the nature and determinants of regional poverty dynamics across Indian states during 2017-2024 using the Foster-Greer-Thorbecke (FGT) poverty measures. The study, in particular, looks at the spatial and temporal dynamics of poverty by examining interstate and regional variations in its incidence, depth and severity. Furthermore, it aims to identify the key socio-economic determinants of poverty with particular emphasis on educational attainment, labour market conditions, demographic characteristics and social factors. The study aims to offer an integrated understanding of the structural factors driving regional disparities in poverty and to generate evidence to inform the design of more effective and inclusive poverty reduction policies in India by incorporating these dimensions into a state-level panel data framework.

2.10. Research Questions

To achieve the above objectives, the study addresses three interrelated research questions. First, it delves into the spatial and temporal patterns and trends of poverty across Indian states between 2017 and 2024, to understand the evolution of the incidence, depth, and severity of poverty over time. Second, it examines the extent of regional disparities by studying states and regions with consistently high and low poverty levels. Finally, the study analyses the main economic and social factors influencing regional differences in poverty, with particular attention to employment market conditions, levels of education, demographic characteristics, and other socio-economic factors. Taken together, these questions constitute the analytical

framework for comprehending the dynamics of regional poverty and the structural factors behind interstate disparities in India.

2.11. Hypotheses of the study

Based on the theoretical framework and empirical literature reviewed in this study, two null hypotheses are formulated to examine the relationship between key socio-economic factors and regional poverty in India. The first null hypothesis (H_{01}) is that there is no significant association between higher levels of educational attainment and lower levels of poverty in the Indian states. The second null hypothesis (H_{02}) is that there is no significant association between better labour market conditions, as reflected in indicators such as labour force participation, employment and labour market outcomes, and lower poverty levels. The role of human capital and labour market dynamics in explaining regional disparities in poverty is empirically tested using state-level panel data from the Periodic Labour Force Survey (PLFS) for the period 2017–2024.

3. Methodology:

This section presents the methodological framework adopted for examining regional disparities in poverty across Indian states. The chapter covers the research design, data sources, the study area, the construction of the poverty line, the measurement of poverty, variable selection, data preparation, and the econometric approach used in the analysis. The methodology combines descriptive and econometric methods to analyse trends in poverty and the socio-economic factors that affect it.

3.1Research Design:

The present study employs a quantitative research design using secondary data. The analysis is both descriptive and explanatory. Descriptive techniques are employed to examine temporal variations in poverty across Indian states, while econometric models are used to analyse the relationship between poverty and selected socio-economic variables. The study constructs an unbalanced panel dataset consisting of annual observations for Indian states over the period 2017–2024. Both rural and urban populations are included to obtain a comprehensive picture of poverty across regions.

3.2 Data Source:

The study is based entirely on secondary data; the primary source is the Periodic Labour Force Survey (PLFS). This survey is conducted annually by the National Sample Survey Organisation within the Ministry of Statistics and Program Implementation, which is part of the Government of India. The Periodical Labour Force Survey has been conducted eight times between 2017-18 and 2024-25, which we have considered.

The Periodic Labour Force Surveys include monthly per capita consumption expenditure (MPCE), demographics, education, employment, labour force participation, worker population ratio, social category, religion, and household composition. These variables are used to estimate poverty measures and to serve as explanatory variables in the econometric analysis.

Consumer Price Index (CPI) data from MoSPI are used to periodically update the poverty lines. The poverty line estimated by the Rangarajan committee forms the base poverty line, updated for inflation separately for rural and urban areas.

3.3 Study Area:

The study covers major Indian states for which consistent data are available throughout the study period. The analysis includes both rural and urban sectors, allowing comparison of poverty across geographical regions and sectors. Although the original PLFS data are collected at the household level, they are aggregated to obtain state-level annual indicators, separately for rural and urban areas. The final dataset consists of state-sector-year-wise observations, which constitute the panel used for econometric estimation.

3.4 Construction of Poverty Line:

Poverty measurement in India has evolved substantially over the past five decades, with successive expert committees redefining minimum consumption requirements and the underlying concept of deprivation. The Lakdawala Committee (1993), Tendulkar Committee (2009), and Rangarajan Committee (2014) mark key stages in this evolution, but each embodies progressively more realistic assumptions about living standards a trajectory that culminates in the Rangarajan methodology adopted in this study for its superior capacity to capture the true extent of deprivation in present-day India.

The Rangarajan Committee's central advantage lies in its ability to directly address these two limitations. First, unlike Lakdawala's calorie-centric model, Rangarajan constructs distinct

normative consumption baskets for rural and urban households that explicitly incorporate clothing, housing, education, healthcare, transportation, and fuel expenditures that dominate modern household budgets but were marginal to earlier frameworks. Second, unlike Tendulkar's comparatively conservative thresholds, the Rangarajan poverty lines capture a larger and more realistic share of economically vulnerable households, avoiding the underestimation bias for which Tendulkar was criticised. This broader conceptualisation also aligns more closely with Sen's Capability Approach, treating poverty as a deficit in essential capabilities rather than mere subsistence a conceptual advance neither predecessor methodology achieved.

These advantages make Rangarajan particularly well suited to the present study's focus on regional poverty disparities during 2017–2024, a period defined by rapid structural transformation, rising living costs, and pandemic-induced disruption — conditions under which a narrower poverty line would risk substantially understating both the incidence and depth of deprivation. Nonetheless, recognising the persistent methodological debate and the sensitivity of poverty estimates to line selection, the study also conducts a robustness check using the Tendulkar poverty line to confirm the consistency of its findings across methodologies.

Empirically, household consumption is measured using Monthly Per Capita Consumption Expenditure (MPCE) from the Periodic Labour Force Survey (PLFS). The Rangarajan Committee's base-year (2011–12) poverty lines serve as benchmark thresholds, updated annually for each state from 2017–18 to 2023–24 using the Consumer Price Index for Agricultural Labourers (CPI–AL) for rural areas and the Consumer Price Index for Industrial Workers (CPI–IW) for urban areas — ensuring the poverty lines remain sensitive to interstate variation in inflation and cost-of-living changes over time.

For each year, the state-specific poverty line is constructed by inflating the 2011-12 Rangarajan poverty line by the ratio of the current year's CPI to the base-year CPI for the respective state and sector. More formally, the adjusted poverty line is computed as:

$$PL_{st} = PL_{2011-12} \times \frac{CPI_{st}}{CPI_{2011-12}}$$

Where, PL_{st} is the poverty line for s'th state & sector and t'th year, $PL_{2011-12}$ is the base year poverty line for s'th state & sector, proposed by Rangarajan Committee, CPI_{st} is the

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Consumer Price Index for s'th state & sector and t'th year, $CPI_{2011-12}$ is the base year Consumer Price Index for the i'th state & sector. *CPIst* refers to the relevant Consumer Price Index (CPI–AL for rural areas and CPI–IW for urban areas). This approach ensures that the poverty line captures both temporal inflation and regional price variation. State-specific poverty lines are constructed each year to identify poor households. Households will be classified as poor if their MPCE is below the corresponding rural or urban poverty line for the state and survey year, and non-poor otherwise. Then the poverty classifications are used to estimate the Foster-Greer-Thorbecke (FGT) framework.

3.5 The Baseline Model:

For analysing the socio-economic and economic factors that affect poverty, this paper uses panel regression models with three different measures of poverty, which are the Headcount Ratio (HCR), the Poverty Gap Index (PGI), and Squared Poverty Gap Index (SPGI). The general econometric model can be written as follows:

$$\begin{aligned} Y_{it} = \alpha_0 &+ \beta_1(Primary\ Education)_{it} + \beta_2(Secondary\ Education)_{it} \\ &+ \beta_3(Higher\ Secondary\ Education)_{it} + \beta_4(Higher\ Education)_{it} \\ &+ \beta_5(OBC)_{it} + \beta_6(SC)_{it} + \beta_7(ST)_{it} + \beta_8(Muslim)_{it} + \beta_9(Christrian)_{it} \\ &+ \beta_{10}(Other\ Religion)_{it} + \beta_{11}(Dependency\ Ratio)_{it} \\ &+ \beta_{12}(Labour\ Force\ Participation\ Ratio)_{it} \\ &+ \beta_{13}(Work\ Population\ Ratio)_{it} + \beta_{14}(Female)_{it} + \varepsilon_{it} \end{aligned}$$

Where the dependent variable Y_{it} represents HCR, PGI and SPGI alternatively for i'th state and t'th year and the explanatory variables represent the educational, social, religious, household demographic and employment characteristics.

3.6 Variable Description:

Poverty

The empirical analysis uses three poverty indicators as dependent variables: the Headcount Ratio (HCR), the Poverty Gap Index (PGI) and the Squared Poverty Gap Index (SPGI) based on the Foster-Greer-Thorbecke (FGT) poverty measures. These indicators are measures of the incidence, depth and severity of poverty respectively and hence, they give a comprehensive assessment of the extent of poverty across the Indian states. The explanatory variables are socioeconomic, demographic, educational and labour market characteristics, selected in accordance with existing theoretical frameworks and empirical evidence about the

determinants of poverty. The Table (appendix) summarises the variables, their definitions, measurement and expected relationship with poverty.

Schooling:

Educational level is measured by the share of population that has completed primary, secondary, higher secondary and higher education. According to Human Capital Theory, education improves skills, labour productivity, employability and earning potential which leads to the welfare of households and reduces the probability of poverty. Higher levels of education also facilitate access to formal employment and higher-paid occupations, while strengthening individuals' capacity to adapt to structural changes in the labour market. Hence, it is expected that all education variables will be negatively related to poverty indicators such that increases in educational attainment will be related to lower levels of poverty.

Social level:

Social characteristics are indicated by the population shares of SCs, STs and OBCs. These variables are included to explore whether historical and social disadvantage are contributing to persistent regional differences in poverty. These communities have historically had unequal access to education, productive assets, formal employment and public services, which can limit income-generating opportunities and perpetuate poverty. Higher concentrations of SC, ST and OBC populations are thus generally expected to be associated with higher levels of poverty, but the magnitude and statistical significance of these relationships may differ across social groups and regions.

Religion:

The religious composition is given by the population shares of Muslims, Christians and other religious communities, the latter including Sikhs, Buddhists, Jains and other minority groups. These are included to control for regional differences in socioeconomic conditions related to religious composition. The cross-religious and cross-state variation in educational attainment, employment opportunities, and economic conditions is large enough that no clear a priori expectation can be imposed on the direction of these relationships. We therefore treat the effect of religious composition on poverty as an empirical question that can be resolved with econometric analysis.

Characteristics of the Household:

Household Size:

Household demographic characteristics include average household size, dependency ratio and proportion of female population. Household size is a measure of the average number of people living in a household. Larger households typically have higher consumption expenditure and may experience more financial strain if the household income does not increase proportionally. Thus, household size is expected to be positively related to poverty.

Dependency ratio:

The dependency ratio represents the ratio of household members of working age to those economically dependent and indicates the economic burden on income earners. Higher dependency ratios are expected to reduce household saving and increase the risk of poverty, implying that they are positively related to the poverty measures. The female population share is included to account for the gender composition of the population. While the potential for increased female participation in education and employment to improve household welfare and reduce poverty is recognised, the expected relationship is ambiguous, depending on the regional labour market opportunities, gender wage differentials and prevailing social norms that affect women's economic participation.

Share for women:

The variable captures the **gender composition of the state population** rather than female labour-force participation. It should therefore be distinguished from **FLFPR** or the female WPR.

A higher female population share may have an **ambiguous relationship with poverty**. On the one hand, a larger female population may be associated with higher dependency and poverty where women face restricted access to paid employment, lower wages, occupational segregation, or limited control over household resources. On the other hand, a higher female share does not inherently imply greater poverty; in states where women have higher educational attainment, labour-force participation, and access to productive employment, a larger female population may be associated with improved household welfare. The expected coefficient should therefore be treated as **empirically indeterminate** rather than imposing a priori a positive or negative sign.

Labour Market:

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The conditions of the labour market are measured by the Labour Force Participation Rate (LFPR) and the Worker Population Ratio (WPR). The Labour Force Participation Rate is an indicator of economic participation and measures the proportion of the working-age population either employed or actively seeking employment. Higher labour force participation generally translates into higher participation in productive economic activities and is therefore expected to contribute to poverty reduction. Thus, it is hypothesised that LFPR is inversely related to poverty. The Worker Population Ratio is also a measure of the share of the total population which is employed and gives an indication of labour market absorption. Higher employment levels boost household income, enhance economic security and raise living standards, thus decreasing the incidence and severity of poverty. The Worker Population Ratio is therefore expected to have a negative association with the three poverty indicators.

The selected explanatory variables capture the determinants of multidimensional poverty discussed in the theoretical and empirical literature. This study attempts to explain the causes of regional variation in poverty across Indian states during 2017–2024 by incorporating educational attainment, social and religious composition, demographic characteristics, and labour market indicators into an integrated empirical framework. The detailed specification enables us to study the effect of a variety of factors, such as human capital, labour market performance and socio-economic characteristics, on the incidence, depth and severity of poverty, within a state-level panel data framework.

4. Results:

4.1.1 The dynamics of national and rural–urban poverty:

This section analyses the evolution of monetary poverty in India from 2017 to 2024 based on three complementary FGT measures: incidence, depth, and severity. This allows us to track the effects of the COVID-19 pandemic, the speed of recovery, and enduring rural–urban disparities in household welfare.

The poverty trajectory of India between 2017 and 2024, as measured by the Headcount Ratio (HCR), Poverty Gap Index (PGI) and Squared Poverty Gap Index (SPGI), had three distinct phases, with these FGT measures together capturing not just the number of poor people but the depth and inequality of that poverty (Foster et al., 1984). All three indices declined gradually between 2017 and 2019, reflecting steady macroeconomic growth and an expansion

of social protection programs. But the rate of improvement was modest, implying that growth by itself cannot do away with structural poverty, unless its benefits are distributed equitably across households and regions (Ravallion, 2001; Bourguignon, 2003). Education, access to employment and regional development remained persistently unequal, so the decline was gradual, not transformative.

2020 was a sharp structural break, all three indices jumped up after the COVID-19 onset. Significantly, SPGI rose more than PGI, implying that the poorest of the poor experienced disproportionately greater welfare losses, rather than simply more individuals falling below the poverty line. This pattern points to the vulnerability of informal-sector workers with no contracts, no savings buffers or social insurance to cushion income shocks. This is consistent with ILO (2023) and World Bank (2022) reports on the uneven impact of the pandemic.

Measures of poverty declined from 2021 to 2024, but did not return to pre-pandemic levels. HCR recovered faster than PGI and SPGI, suggesting that households near the poverty line exited it while those further down remained trapped in deep deprivation, a sign of chronic poverty and slow recovery among households with low human capital and productive assets (Barrett & Carter, 2013).

All three phases are marked by a persistent rural-urban divide. Rural areas consistently had higher poverty in all indicators, reflecting lower agricultural productivity, weaker infrastructure and informal, seasonal employment, in line with Lewis's (1954) dual-sector model. Rural areas were hit harder and recovered more slowly while urban areas proved more resilient with diversified labour markets. More generally, COVID-19 has revealed these structural fault lines rather than created them, and it is obvious that sustained poverty reduction requires integrated investment in education, quality of employment and social protection (Sen, 1999), particularly for rural and chronically poor populations.

4.1.2 Spatial Distribution of Poverty Depth and Severity:

This section maps the depth (PGI) and severity (SPGI) of poverty across Indian states, identifies enduring regional hotspots and examines how the geography of deprivation is shaped by structural factors such as human capital, industrialisation and governance.

There are wide and persistent regional variations in the spatial distribution of the Poverty Gap Index (PGI) and Squared Poverty Gap Index (SPGI) across Indian states. SPGI, with its higher weight on extreme deprivation, brings out inequality among poor that is hidden by PGI alone

(Foster et al., 1984). In 2017, Kerala, Tamil Nadu, Andhra Pradesh, Telangana, Punjab, Himachal Pradesh and Goa in the southern and north-western states had low PGI and SPGI, helped by better education and health systems, diversified industries and labour productivity. This is consistent with the Human Capital Theory where investments in education and health increase earnings and decrease poverty (Becker, 1964) and with Sen's (1999) Capability Approach where access to public services increases the ability of people to escape deprivation.

Conversely, central, eastern, and northern states meaningfully lagged behind with consistently high poverty depth and severity, reflective of chronic, multidimensional deprivation associated with low industrialisation, dependence on agriculture, poor infrastructure, and informal labour market conditions that perpetuate poverty traps (Barrett & Carter, 2013).

Geographic concentration of poverty in 2024 was higher than 2017 and post-pandemic years. UP, Bihar, Chhattisgarh and Nagaland have emerged as important hotspots. Kerala, Tamil Nadu, Andhra Pradesh, Goa, Punjab and West Bengal continue to have low levels of poverty due to strong institutional and economic resilience in the recovery period. This uneven recovery is showing up a marked geographical clustering – a belt of poverty thru central, eastern and northern India, with less poverty in the south and west. The spatial clustering reflects regional spillovers with neighbouring states following similar structural and institutional trajectories, as we would expect from cumulative-advantage theories of regional development (Myrdal, 1957; Krugman, 1991).

Most importantly, high scores on both indices by states indicate not only widespread poverty but also a stark inequality among the poor population, implying that policies based on income growth alone are not sufficient. Acute poverty calls for specific measures in health, nutrition and human capital, as opposed to a one-size-fits-all approach. The persistence of regional disparities in the national growth context suggests that structural gaps in education, industrialisation and governance, rather than mere income growth, are responsible for the uneven outcomes of poverty and justify use of state level panel econometric analysis to capture unobserved regional heterogeneity.

4.1.3: Convergence and Interstate Poverty Ranking:

This section ranks Indian states by poverty levels in 2024 and tests whether historically poorer states are catching up with better performing states, providing insight into whether India's growth process has been regionally inclusive or has reinforced long-standing disparities.

Figures 5 and 8 investigate the spatial persistence of poverty across Indian states and whether poor states converged toward better-performing ones in 2017–24. The interstate ranking shows a stark heterogeneity with Bihar, Uttar Pradesh, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan and Odisha consistently topping the poverty charts and Kerala, Goa, Tamil Nadu, Punjab, Himachal Pradesh and Sikkim remaining at the bottom. This implies that the benefits of growth have not been equitably shared and that the effect of poverty has been more dependent on governance and institutional capacity at the state level than on overall growth (World Bank, 2022; NITI Aayog, 2023; UNDP, 2024).

Persistent poverty in central and eastern India reflects structural rather than cyclical constraints low educational attainment, agricultural dependence, weak infrastructure, and informal employment. This is explained by Human Capital Theory in terms of lower productivity and earnings from under-investment in education (Becker, 1964) and by Labour Market Segmentation Theory in terms of limited mobility and wage growth for workers stuck in informal, low-productivity jobs (Doeringer & Piore, 1971). Thus poverty is not due to lack of employment, but because employment does not often generate enough income, a trend amplified by the growth of informality (ILO, 2024).

However, Kerala, Goa, Tamil Nadu, Himachal Pradesh and Punjab show that persistent investment in health, education and governance improves welfare at moderate growth rates in line with Sen's Capability Approach (1999) and recent multidimensional poverty results (UNDP, 2024; NITI Aayog, 2023).

Figure 8 tests the convergence hypothesis that poorer states should grow faster because they have more room to improve (Barro & Sala-i-Martin, 1992). The evidence is poor. There is a slight negative slope but the high dispersion indicates that poorer states have not been systematically catching up. This implies that state-specific structural factors dominate outcomes. This path dependence is consistent with New Economic Geography where infrastructure, skilled labour and institutions create cumulative regional advantages (Krugman, 1991).

The pandemic further hampered convergence, to the detriment of countries with weaker institutions and economies with a greater reliance on informality, as also found by the World Bank (2022) and ILO (2024). Overall, the weak convergence suggests that national growth is not enough to tackle regional poverty, and that sustainable poverty reduction requires targeted investment in human capital, formal employment, infrastructure and institutional

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strengthening in lagging states. These results provide the motivation for the panel econometric analysis of the structural determinants of poverty that follows.

4.1.4:Labour Market Outcomes and Poverty :

This section examines developments in the labour force participation, employment and unemployment, and poverty outcomes to assess whether the post-pandemic labour market recovery resulted in genuine gains in welfare or just an increase in informal and low quality jobs.

Figure 6 looks at labour market trends in labour force participation rate (LFPR), worker population ratio (WPR) and unemployment along with poverty over the period 2017–2024. Clearly, the poverty-reducing effect of employment is related to job quality and security, not just availability (ILO, 2024; World Bank, 2024).

LFPR and WPR also increased gradually with a sharper uptick post pandemic.Urban India always lagged behind rural India in participation rates due to continued dependence on agriculture and informal jobs. But the rural rise after the pandemic is probably a case of distress-driven labour supply of households sending more members to work to compensate for income losses rather than real improvement. PLFS data ascribe the increase mostly to self-employment and unpaid family labour, not productive wage jobs.

Despite a steady recovery in WPR since the contraction in 2020, poverty indices have fallen only modestly, indicating that employment growth has not led to a proportional reduction in poverty. The gap is explained by the fact that new jobs are concentrated in informal, low productivity work – nearly nine out of ten Indian workers are informally employed, often without contracts or social security, so we are not seeing the welfare gains that would come from rising employment.

Unemployment fell from its pandemic peak, but remained alongside high levels of poverty, indicating unemployment is an imperfect measure of the labour market. In economies dominated by informality, workers cannot afford to remain unemployed for long and accept precarious work instead, so falling unemployment may mask rising underemployment – a pattern evidenced by the India Employment Report (2024), which links recent job growth to informalisation and weak wage growth.

This is supported by the rural–urban comparison: participation was higher, but poverty was higher in rural areas relative to urban areas, meaning the quality of employment matters more than quantity. Rural jobs remain seasonal, low productivity and informal. Urban labour markets are more formal, diversified and protected, enabling a faster urban recovery.

This is consistent with the Labour Market Segmentation Theory of primary (secure) and secondary (precarious) labour markets (Doeringer & Piore, 1971) and the Capability Approach of Sen focusing on the need for stable dignified work rather than simple participation to reduce poverty (Sen, 1999). Recent evidence also suggests that "decent work" (including fair pay and social protection) is a better predictor of poverty reduction than employment status alone (Moktan & Chakrabarti, 2024).

Overall, Figure 6 shows that labour markets remain central to poverty dynamics, but informality has constrained employment-led poverty reduction. The use of LFPR, WPR and unemployment as key variables in the subsequent econometric analysis is justified by the need to focus on productivity, formalisation, skill development and social protection to sustain progress.

4.1.5 Educational Attainment and Poverty:

This section considers the association between improvements in educational attainment and poverty reduction, and asks the question of whether increasing levels of schooling have translated into real gains in welfare or whether they are limited by the quality of learning and weak labour market absorption of educated workers.

Figure 7 shows the change in education attainment between 2017-2024 and its association with poverty. It is based on the Human Capital Theory's argument that education increases productivity, employability and earnings (Becker, 1964), but recent research has pointed out that learning quality and labour market absorption as much as years of schooling (Hanushek & Woessmann, 2021; World Bank, 2024).

The data shows a steady increase in secondary, higher secondary and tertiary education and a declining share of those with only primary or no schooling – improvements attributed to the Samagra Shiksha and the National Education Policy (NEP) 2020. But higher education continues to be constrained, particularly in less advantaged states, and gaps in learning and digital access persist, limiting the productivity impact of education.

These gains notwithstanding, poverty declined more slowly than education improved. This divergence indicates that education is not enough to reduce poverty in states with weak industrialisation and high levels of informality. There is not enough demand for skilled labour, and educated people still experience unemployment, underemployment, or work below their qualifications. PLFS-based evidence confirms that graduate unemployment and education-occupation mismatch continue to exist and are especially severe among youth and women weakening the private returns to education.

Regional patterns support this: Kerala, Tamil Nadu, Himachal Pradesh, Goa and Punjab combine high education with low poverty, thanks to industrial diversification and stronger service sectors, while Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh and Chhattisgarh show the reverse low attainment and high poverty. It implies that the poverty-reducing potential of education depends on complementary infrastructure, institutions and labour demand as consistent with global evidence linking the impact of education to structural transformation.

An important distinction is between schooling and learning. Hanushek and Woessmann (2021) argue that cognitive skills, not years of schooling, drive growth and poverty reduction, while the World Bank's Learning Poverty Brief (2024) finds that many Indian children still face learning deficits despite rising enrolment, suggesting that quality remains a binding constraint.

There are also strong complementarities between human capital and labour markets: states with stronger labour markets have greater poverty-reducing returns from education, while informal-dominated states have weaker returns, reinforcing the need for skill-matching and industrial diversification alongside educational investment.

Figure 7 supports Human Capital Theory and Sen's Capability Approach, but suggests that the role of education in poverty reduction is increasingly contingent on labour market structures. This provides a justification for including educational attainment in the subsequent panel econometric models, as well as its interaction with labour market variables.

4.2 **Panel Regression Results and Robustness Analysis:**

The study uses state level panel data of 72 states for the period 2017-2024 (N=565) to estimate fixed-effects panel regressions for the Headcount Ratio (HCR), Poverty Gap Index (PGI) and Squared Poverty Gap Index (SPGI) to identify the socioeconomic determinants of monetary poverty across the Indian states. The estimator was chosen on the basis of a Hausman

specification test, which rejected the null hypothesis that there was no systematic difference between the fixed-effects and random-effects coefficients ($\chi2(17) = 47.74$, $p = 0.0001$). This suggested that unobserved, time-invariant state-specific characteristics were correlated with the explanatory variables. Therefore, the fixed-effects estimator was chosen as the preferred specification, as it is the standard practice in studies of regional poverty, since the likelihood of structural heterogeneity across states biases random-effects estimates.

Table (appendix) presents the regression results. The results reveal a number of patterns that are consistent across the three poverty measures. The proportion of Scheduled Tribe (ST) population is the strongest predictor of poverty in all specifications. It has a positive and highly significant impact on HCR ($\beta = 0.615$, $p < 0.001$), PGI ($\beta = 0.282$, $p < 0.001$) and SPGI ($\beta = 0.153$, $p = 0.001$). This finding is consistent with a large body of evidence documenting the persistent socioeconomic marginalisation of tribal communities in India, reflecting limited access to education, formal employment and productive assets (Barrett & Carter, 2013). The ratio of the worker population is also positively and significantly associated with all three poverty indices (HCR: $\beta = 1.549$, $p = 0.006$; PGI: $\beta = 0.694$, $p = 0.017$; SPGI: $\beta = 0.350$, $p = 0.043$). This counterintuitive finding of an association between higher employment and deeper and more severe poverty supports the descriptive evidence presented in Section 4.4 and suggests that employment expansion in India has taken place in low-productivity, informal, and poorly paid activities, providing low welfare gains (ILO, 2024; Doeringer & Piore, 1971). As expected from dependency-burden effects, the poverty incidence is positively associated with household size ($\beta = 0.060$, $p = 0.009$). There are positive but generally weak or statistically insignificant effects for variables for educational attainment (primary, secondary and higher secondary schooling), lending support to the argument developed in Section 4.5 that educational expansion alone is not enough to reduce poverty in the absence of adequate labour market demand for skilled workers (Hanushek & Woessmann, 2021).

4.2.2 Robustness Tests:

A number of diagnostic tests were used to test the reliability of the baseline estimates. The modified Wald test rejected the null hypothesis of groupwise homoskedasticity (χ 2 (72) = 3234.30, $p < 0.001$). The Wooldridge test indicated the presence of first-order serial correlation ($F(1,71) = 42.70$, $p < 0.001$). These two results are not surprising considering the type of data used in this study and all reported specifications make use of heteroskedasticity- and autocorrelation-robust standard errors. Diagnostics of multicollinearity using Variance

Inflation Factors (mean VIF = 2.27; maximum VIF = 4.56) showed that while regressors are correlated, including across education categories, the coefficient estimates are not materially biased.

To further examine the dynamic persistence of poverty and to account for the potential endogeneity arising from the reverse causality and unobserved state-specific shocks, the baseline model was re-estimated using the two-step system Generalised Method of Moments (GMM) estimator (Blundell & Bond, 1998) in the implementation of the xtabond2 command. The coefficient on lagged HCR was positive, large in magnitude and highly significant ($\beta = 0.804$, $p < 0.001$), offering strong evidence of state-level poverty persistence consistent with the path-dependence findings reported in Section 4.3. The Arellano–Bond test confirmed the expected existence of first-order autocorrelation in the differenced residuals ($z = -4.46$, $p < 0.001$) and rejected the existence of second-order autocorrelation ($z = 1.23$, $p = 0.219$), thus confirming the validity of the underlying moment conditions of the model. The Hansen test of overidentifying restrictions did not reject instrument validity ($\chi^2(152) = 58.41$, $p = 1.000$), but this result is interpreted cautiously given the relatively large number of instruments relative to the number of groups, in line with well-known concerns about instrument proliferation in dynamic panel estimation (Roodman, 2009).

Overall, the static fixed-effects and dynamic GMM specifications provide similar conclusions: poverty in India is highly dependent on structural and demographic factors, in particular the tribal population share and the quality of employment (not its quantity), and exhibits large persistence over time. The robustness of these findings across alternative estimators strengthens confidence that the observed relationships reflect genuine structural determinants of regional poverty rather than artefacts of the estimator. They empirically support the central argument of this study that inclusive poverty reduction in India requires policies that go beyond aggregate employment and educational expansion to address employment quality, social protection, and structural marginalisation.

5. Synthesising Descriptive and Econometric Evidence:

The preceding sections presented, in turn, the descriptive trajectory of national and rural–urban poverty (Section 4.1), the spatial distribution of poverty depth and severity (Section 4.2),

interstate poverty rankings and convergence dynamics (Section 4.3), labour market performance (Section 4.4), educational attainment (Section 4.5), and finally the panel econometric results (Section 4.6). Read in isolation, each of these strands offers a partial account of the dynamics of poverty in India between 2017 and 2024. Read together, however, they converge on a single, theoretically coherent narrative: that Indian poverty is increasingly a function of the structural position a household occupies within the labour market, the education system, and the geography of the Indian economy, and less a function of aggregate economic growth.

The national time-series evidence (Section 4.1) documented a pandemic-induced structural break, followed by an incomplete recovery in which poverty incidence (HCR) fell more rapidly than poverty depth and severity (PGI, SPGI). This asymmetry is not merely a statistical curiosity; it is the first empirical signal of a phenomenon that the subsequent sections independently confirm, namely, that the households closest to the poverty line are cyclically sensitive and recover with economic upswings, while a hard core of chronically poor households does not. The regression results in Section 4.6 provide the structural explanation for this asymmetry: poverty is heavily conditioned by ST population share and driven by low-quality informal employment, both of which are largely invariant to short-run macroeconomic recovery. In other words, the pandemic did not create a new poverty problem; it temporarily deepened an existing, structurally determined poverty floor that ordinary economic recovery is poorly equipped to dissolve. This interpretation directly supports Barrett and Carter's (2013) poverty-trap framework over a purely cyclical, growth-driven account of poverty dynamics.

The spatial analysis (Section 4.2) and interstate ranking evidence (Section 4.3) showed that poverty depth and severity are not randomly distributed but cluster in a contiguous belt across central, eastern, and northern India, with weak evidence of interstate convergence over the study period. The panel regressions lend this spatial pattern an econometric foundation: because ST population share is unevenly distributed across states — concentrated precisely in the central-eastern belt identified in Figures 3 and 4 (e.g., Jharkhand, Chhattisgarh, Odisha, Madhya Pradesh) — the structural exclusion mechanism operating at the household level *aggregates* into the observed regional poverty clustering. This is consistent with New Economic Geography's account of cumulative regional advantage (Krugman, 1991): states that begin with weaker human capital, less diversified industrial structures, and larger marginalised populations do not merely have higher poverty today — they possess self-reinforcing disadvantages that the weak convergence coefficient in Figure 8 empirically confirms. The

dynamic GMM estimate of poverty persistence (lagged HCR coefficient ≈ 0.80) formalises this insight: a state's poverty is substantially path-dependent, meaning the spatial inequalities documented descriptively are not a snapshot of temporary disparity but a structural equilibrium that ordinary growth is unlikely to disturb without targeted intervention.

Perhaps the most theoretically significant point of convergence between the descriptive and econometric evidence concerns labour markets. Section 4.4 documented that both LFPR and WPR rose steadily, particularly after the pandemic, yet poverty declined only modestly, a divergence attributed descriptively to distress-induced labour supply and informalisation. The regression results in Section 4.6 translate this descriptive observation into a formal econometric finding: the worker-to-population ratio is *positively* associated with poverty across all three FGT measures. This is a critical result because it inverts the conventional growth-employment-poverty transmission mechanism assumed in much of the development economics literature. Rather than signalling welfare improvement, employment expansion in the Indian context appears to proxy for the *scale of distress absorption* into low-productivity informal work. This finding operationalises the qualitative argument advanced in Section 4.4 that employment quantity and employment quality are analytically distinct, and that only the latter reliably predicts poverty reduction (Moktan & Chakrabarti, 2024) — and demonstrates that standard labour force statistics, taken at face value, can produce systematically misleading inferences about household welfare in economies characterised by extensive informality (ILO, 2024).

Section 4.5 documented rising educational attainment nationally, but noted that poverty declined more slowly than schooling expanded, and that the poverty-reducing effect of education was concentrated in states with diversified, industrialised economies (Kerala, Tamil Nadu, Himachal Pradesh) rather than being uniform nationally. The regression evidence directly corroborates this conditionality: education variables are largely statistically insignificant once labour market and demographic controls are included, indicating that schooling's average effect on poverty, net of these structural factors, is weak. This is not evidence against Human Capital Theory (Becker, 1964) so much as evidence for its *conditionality*: the theory's core prediction that human capital investment raises earnings holds only where labour markets possess sufficient demand-side capacity to absorb skilled workers into productive employment. Where this capacity is absent, as in much of central and eastern India, educational expansion produces credentialed but underemployed or informally employed individuals, consistent with the graduate unemployment and education–occupation

mismatch documented in recent PLFS-based studies. This reframes the education–poverty relationship from a simple supply-side story to one requiring joint consideration of human capital formation *and* structural transformation (Hanushek & Woessmann, 2021).

The panel regression results provide econometric confirmation of the structural narrative that emerged from the descriptive analysis, while simultaneously complicating conventional assumptions about the growth–employment–poverty nexus in India. Three findings merit particular theoretical scrutiny: the robust poverty-increasing effect of tribal population share, the counterintuitive positive association between the worker population ratio and poverty, and the weak explanatory power of educational attainment. Read together, these results suggest that poverty in India is not primarily a function of labour market *participation* or years of *schooling*, but of the *quality* and *terms* on which marginalised populations are incorporated into economic activity.

The consistently strong and statistically robust coefficient on ST population share is significant across HCR, PGI, and SPGI, and stable across both static fixed-effects and dynamic GMM specifications, and cannot be adequately explained within a neoclassical framework that treats poverty as a transitory outcome of insufficient factor endowments. Rather, the persistence of this effect across all three FGT measures, including the inequality-sensitive SPGI, indicates that tribal populations are not merely poorer on average but disproportionately represented among the *poorest of the poor*. This is consistent with dual and segmented labour market theory (Doeringer & Piore, 1971), wherein certain groups are structurally confined to a secondary labour market segment characterised by low productivity, geographic isolation, and limited access to formal credit, land titling, and public infrastructure. From the standpoint of Sen's Capability Approach (1999), the finding implies that tribal poverty reflects a deficit not merely in income but in the underlying *capabilities*, such as education, mobility, and institutional recognition, required to convert available resources into functional well-being. Because this effect persists even after controlling for education, employment, and demographic composition, it points toward a poverty trap rooted in social and spatial exclusion rather than one that market-led growth alone can resolve (Barrett & Carter, 2013).

The positive and significant relationship between the worker population ratio and poverty indices is, at first glance, a puzzling result that appears to contradict the standard growth-employment-poverty transmission mechanism central to development economics. However, this finding is fully consistent with and indeed provides formal econometric validation of the

descriptive labour market evidence discussed in Section 4.4. In a dualistic economy where employment expansion occurs predominantly through informal, low-productivity, and casual work rather than the growth of the formal wage sector, a rise in the employment rate does not necessarily signal an improvement in household welfare; it may instead reflect **distress-driven labour supply**, whereby additional household members often women and youth enter low-return informal activities to compensate for inadequate primary earnings (ILO, 2024; Moktan & Chakrabarti, 2024). This interpretation reframes the employment variable not as a measure of labour market *success* but as a proxy for the *intensity of informal absorption*. It has an important corollary: standard labour force indicators such as LFPR, WPR, and unemployment are conceptually inadequate measures of welfare in economies with extensive informality, because they do not capture the productivity, security, or earnings adequacy of the jobs being created. This finding lends strong empirical support to the "decent work" framework, which argues that the *quality* of employment, rather than employment status per se, is the operative determinant of poverty transitions (Moktan & Chakrabarti, 2024; Sen, 1999).

The insignificance of the coefficients for primary, secondary, and higher secondary education in most specifications further challenges a pure Human Capital Theory interpretation of poverty reduction (Becker, 1964). Under conventional human capital logic, rising educational attainment should translate directly into higher productivity, higher wages, and reduced poverty risk. The absence of this relationship in the Indian state-panel context suggests that the *private returns* to education are being suppressed by demand-side labour market constraints, specifically the limited capacity of state economies to generate formal, skill-intensive employment capable of absorbing an increasingly educated workforce. This is consistent with Hanushek and Woessmann's (2021) argument that cognitive skill formation and labour market absorption, rather than years of schooling, are the binding constraints linking education to growth. It also echoes the qualitative regional evidence from Section 4.5: states such as Kerala and Tamil Nadu translate educational investment into poverty reduction only because they possess complementary industrial diversification and service-sector depth, whereas states with comparable schooling gains but weaker structural transformation see negligible poverty dividends. The implication is that education functions as a *necessary but insufficient* condition for poverty reduction; its efficacy is conditional on structural transformation, a finding with direct relevance to India's contemporary skilling and employment-generation policy debates.

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The dynamic GMM estimates reinforce and extend these static findings. The strongly significant lagged-HCR coefficient ($\beta \approx 0.80$) indicates a high degree of poverty persistence at the state level, implying that a state's current poverty status is substantially determined by its historical poverty trajectory rather than by contemporaneous shocks or policy interventions alone. This result is consistent with New Economic Geography's emphasis on cumulative regional advantage (Krugman, 1991) and with the weak convergence evidence presented in Figure 8: poorer states are not systematically catching up, because poverty itself generates self-reinforcing constraints — lower tax bases, weaker public investment capacity, and diminished human capital accumulation — that perpetuate the very structural conditions producing poverty in the first place. This path-dependent character of Indian regional poverty has an important policy implication: interventions calibrated to produce short-run, marginal improvements in employment or schooling are unlikely to alter the poverty trajectories of structurally disadvantaged states durably; only sustained, multi-generational investment in institutional capacity, infrastructure, and formal-sector job creation is likely to shift the underlying growth path.

Collectively, these results support a revised interpretation of the growth–poverty relationship in India, one in which aggregate indicators of economic activity (employment rates, schooling years) are poor proxies for welfare-relevant structural change. The econometric evidence instead points toward a model of poverty determined jointly by (i) social and spatial exclusion, particularly affecting tribal populations; (ii) the informalisation of employment growth, which decouples job creation from income adequacy; and (iii) a persistent mismatch between educational expansion and the productive absorption capacity of regional labour markets. This synthesis extends existing theoretical frameworks Human Capital Theory, Labour Market Segmentation Theory, and the Capability Approach by demonstrating empirically that their explanatory power in the Indian context is conditional on structural transformation, and that policies targeting any single dimension (education, employment quantity, or income transfers) in isolation are unlikely to generate durable, inclusive poverty reduction.

Taken as a whole, the study's descriptive and econometric findings jointly support an integrated theoretical account of Indian poverty that draws on and extends three established frameworks. Human Capital Theory correctly identifies education as poverty-relevant, but the data show its effect is conditional on labour market absorption. Labour Market Segmentation Theory (Doeringer & Piore, 1971) correctly predicts that workers confined to informal, secondary-sector employment remain poor despite being employed, and the positive worker-

population-ratio coefficient provides direct econometric confirmation of this segmentation at the state level. Sen's Capability Approach (1999) correctly frames poverty as a deficit in capabilities rather than income alone, which explains why ST population share, a marker of social and institutional exclusion rather than mere income deficiency, remains the single most robust predictor of poverty across every specification and every poverty measure estimated in this study.

The policy implication that follows from this synthesis is that India's growth process, while reducing poverty incidence over the medium run, has not been structurally transformative in the sense required to close deep and severe poverty gaps. Durable poverty reduction will require moving beyond employment-generation and school-enrolment targets toward policies that address the *quality* of jobs created, the *productive absorption* of educated labour, and the *social and institutional inclusion* of structurally marginalised groups, particularly tribal populations, within regional development processes. Absent such structural interventions, the persistence parameters estimated in this study suggest that current regional and social disparities in poverty are likely to remain a durable feature of the Indian development landscape rather than a transitional phase to be resolved by aggregate growth alone.

6. Conclusion:

This study set out to examine the dynamics, spatial distribution, and structural determinants of monetary poverty in India between 2017 and 2024, combining descriptive analysis of Foster–Greer–Thorbecke (FGT) poverty measures with panel econometric estimation across 72 Indian states. The findings, taken together, offer a comprehensive empirical account of how poverty in India has evolved amid a pandemic-induced shock and an uneven recovery, and why aggregate improvements in growth, employment, and education have failed to translate into a commensurately inclusive reduction in poverty.

The descriptive evidence established three foundational facts. First, national poverty followed a three-phase trajectory: gradual pre-pandemic decline, a sharp pandemic-induced deterioration in 2020, and an incomplete post-pandemic recovery in which poverty incidence fell faster than poverty depth and severity. Second, poverty in India remains profoundly spatial, concentrated within a persistent belt spanning central, eastern, and parts of northern India, with limited evidence of interstate convergence over the study period. Third, and most consequential, rising labour force participation and educational attainment did not generate a

proportionate reduction in poverty, indicating a weakening rather than a strengthening of the conventional growth-employment-education-poverty transmission mechanism.

The panel regression analysis provided formal econometric confirmation of these patterns while revealing their underlying structural logic. The fixed-effects estimates, validated against random-effects specifications via the Hausman test and robust to heteroskedasticity, serial correlation, and multicollinearity, identified the scheduled tribe population share and the worker population ratio as the most consistent and statistically robust predictors of poverty across all three FGT measures. The positive association between employment and poverty — corroborated by the dynamic system-GMM specification and its strongly significant lagged dependent variable indicates that employment growth in India has been substantially absorbed into low-productivity, informal activity rather than translating into welfare-enhancing formal employment. Educational attainment, by contrast, exerted only a weak and largely conditional effect on poverty outcomes, suggesting that human capital investment yields meaningful returns only where complementary labour market demand exists to absorb skilled workers productively.

These findings collectively challenge a growth-centric interpretation of Indian poverty reduction and instead support a structurally conditioned account in which poverty is determined less by aggregate economic expansion than by the terms of inclusion — the quality of employment, the productive absorption of education, and the social and institutional position of marginalised groups, particularly tribal populations, within regional economies. Theoretically, the study extends Human Capital Theory, Labour Market Segmentation Theory, and Sen's Capability Approach by demonstrating, through rigorous panel evidence, that their explanatory power in the Indian context is conditional upon structural transformation rather than operating independently of it. The high degree of estimated poverty persistence further situates these findings within a path-dependence framework, indicating that regional poverty disparities in India are self-reinforcing rather than transitional, consistent with cumulative-advantage theories of regional development.

From a policy perspective, the study's findings suggest that continued reliance on aggregate growth, employment generation, and school enrolment targets is unlikely to yield durable reductions in the depth and severity of poverty unless accompanied by more fundamental structural interventions. Priority should be given to improving the quality of employment through formalisation, wage growth, and employment-linked social protection; strengthening

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the labour market absorption capacity of economically lagging states through industrial diversification and skill-employment matching; and addressing the social, institutional, and spatial exclusion of tribal and other structurally disadvantaged populations through targeted, place-based development strategies. Given the evidence of strong poverty persistence and weak interstate convergence, such interventions are likely to require sustained, long-horizon commitment rather than short-term stimulus, particularly in the historically disadvantaged states of central and eastern India.

The study is not without limitations. The reliance on state-level aggregated panel data, while enabling robust identification of structural determinants, precludes analysis of intra-state and household-level heterogeneity that may further illuminate the mechanisms underlying observed poverty persistence. Additionally, while the dynamic GMM specification addresses concerns about endogeneity and reverse causality, the relatively large number of instruments relative to the number of cross-sectional units warrants caution when interpreting the associated overidentification tests. Future research would benefit from incorporating district- or household-level panel data, exploring nonlinear and threshold effects in the education–employment poverty relationship, and examining the differential impacts of specific policy interventions such as employment guarantee schemes, skill development programmes, and targeted tribal welfare initiatives on the structural determinants identified in this study. Such extensions would further strengthen the evidence base needed to design genuinely inclusive poverty reduction strategies in India.

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Appendix

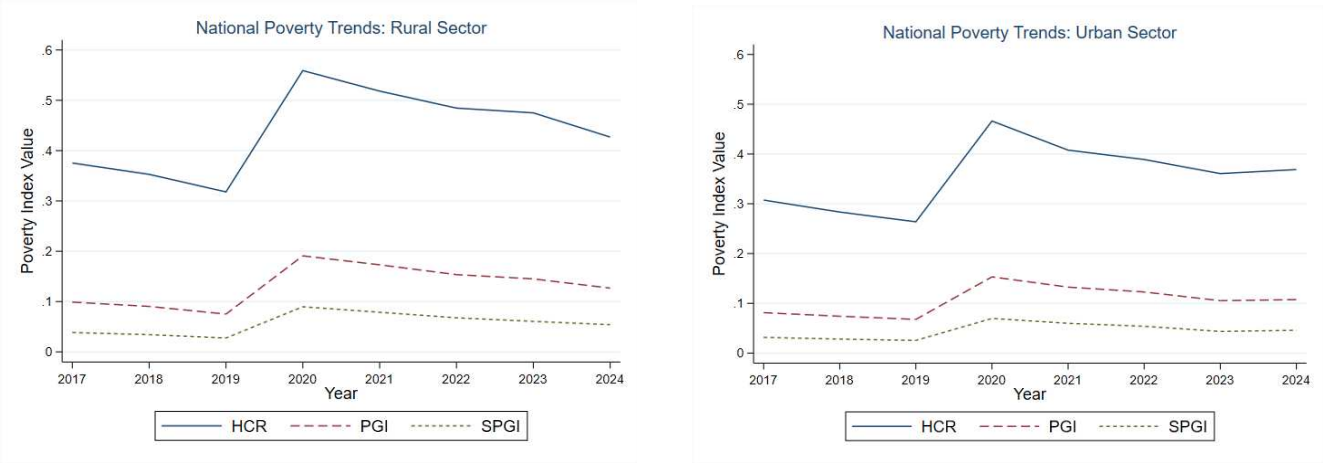


Figure 1: Rural Poverty Trends in North India

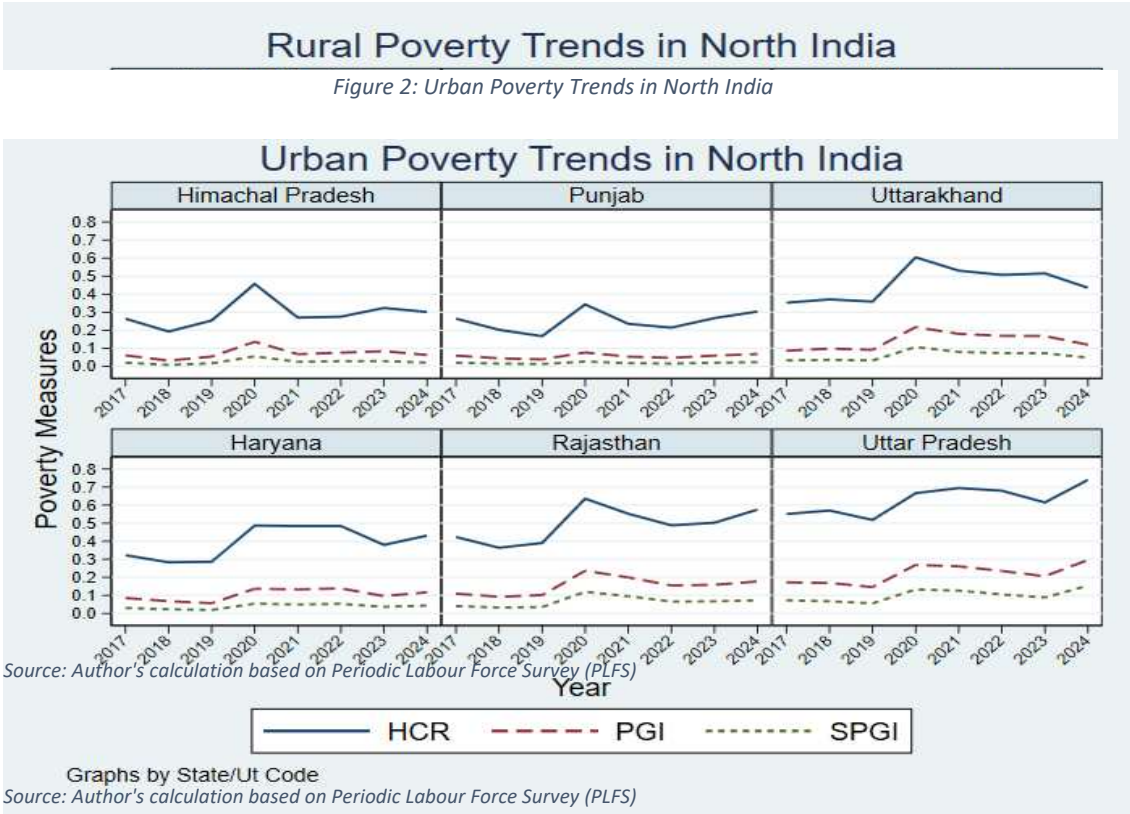


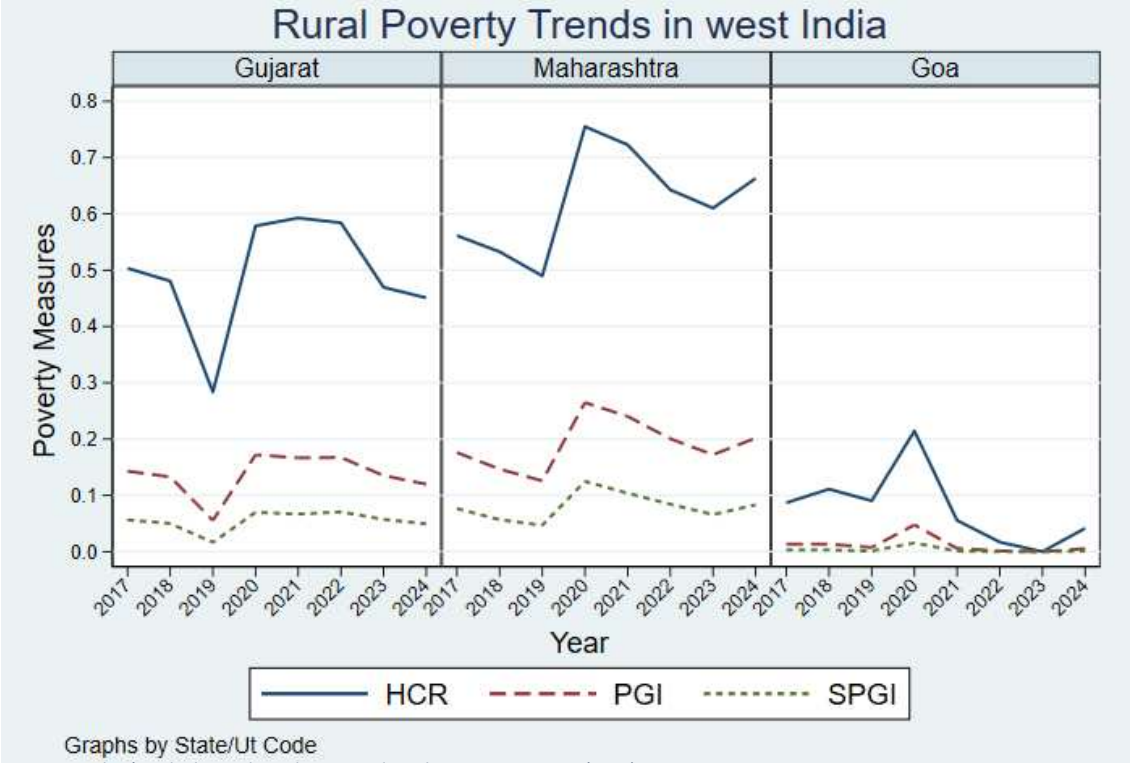
Figure 2: Urban Poverty Trends in North India

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

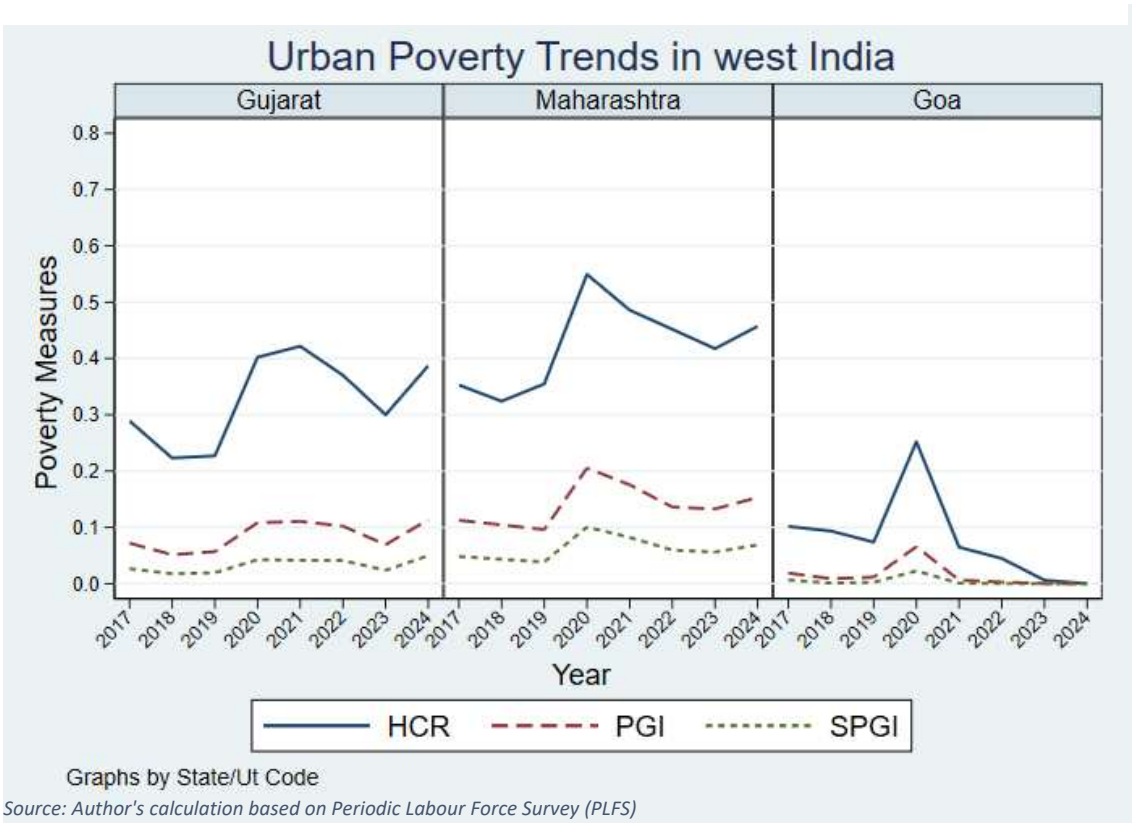
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Figure 3: Rural Poverty Trends in West India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

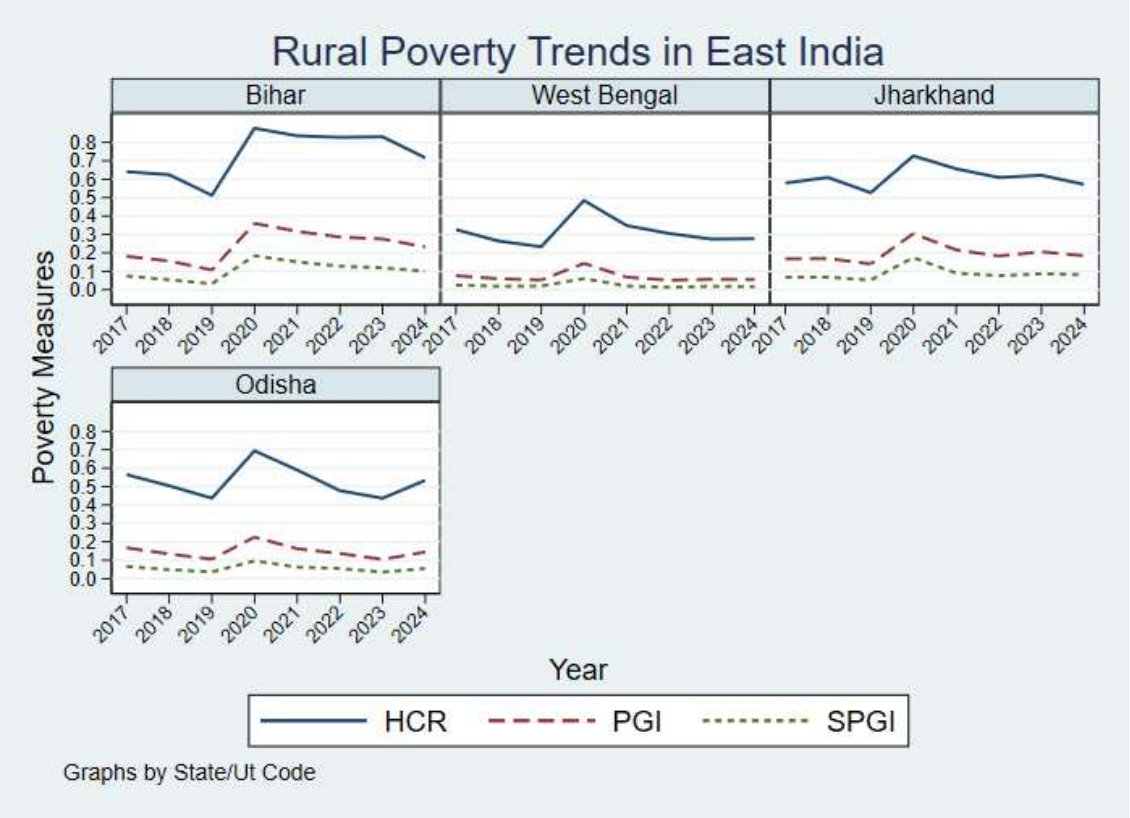
Figure 4: Urban Poverty Trends in West India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

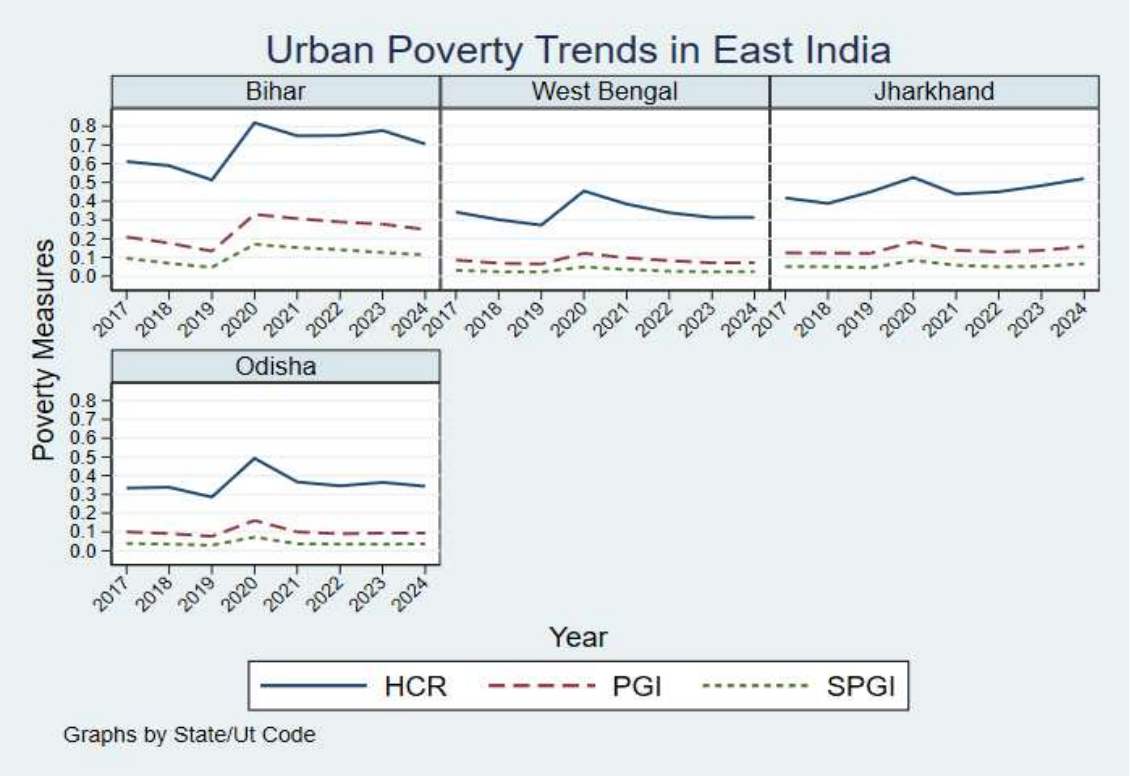
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Figure 5: Rural Poverty Trends in East India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

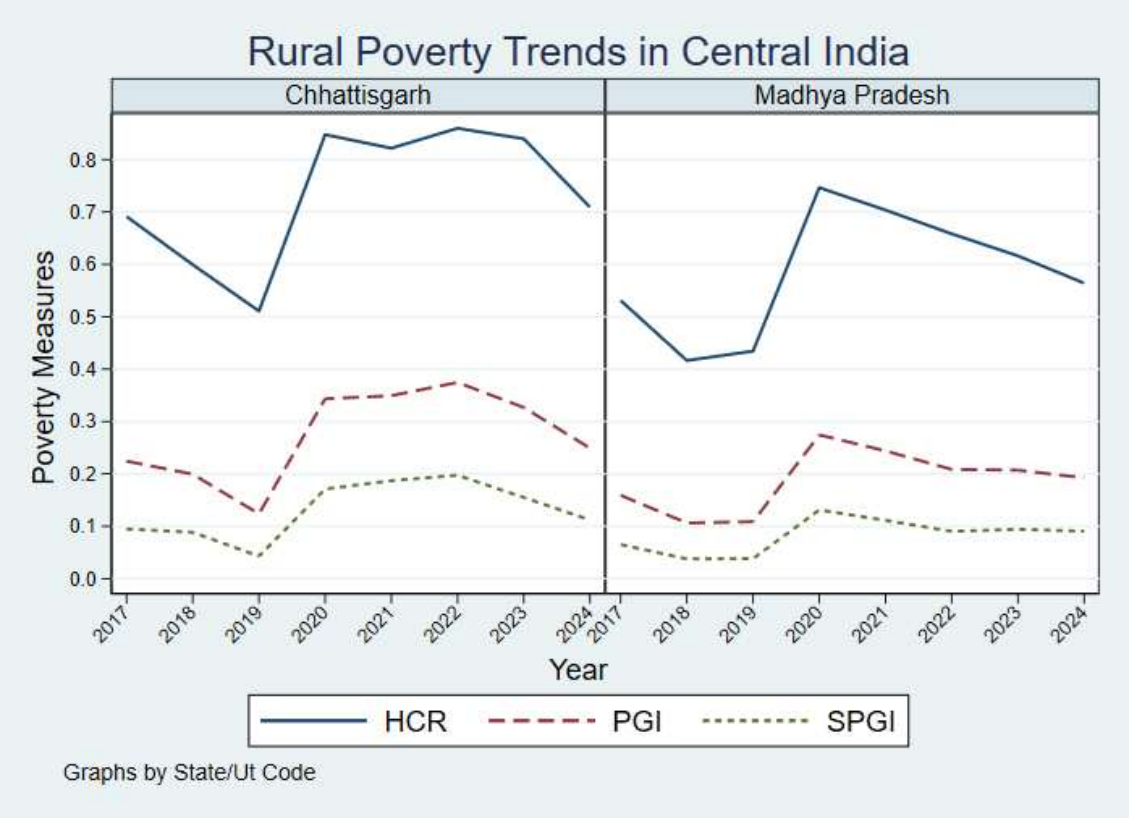
Figure 6: Urban Poverty Trends in East India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

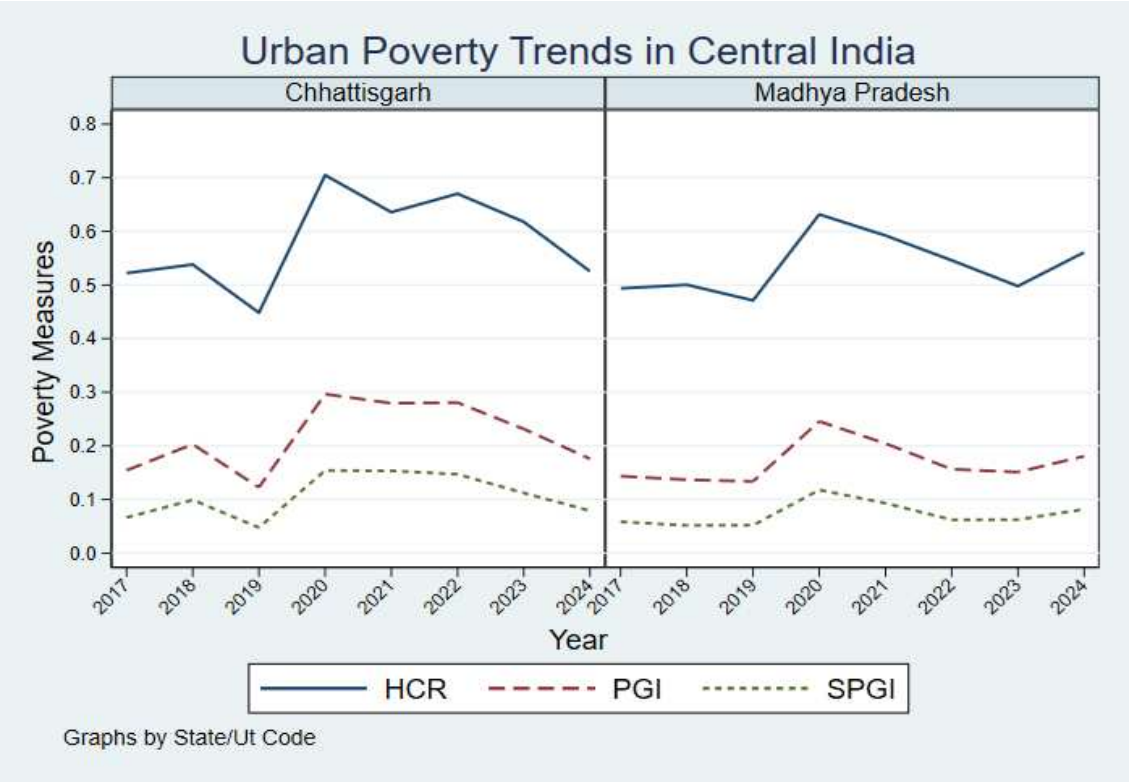
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Figure 7: Rural Poverty Trends in Central India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

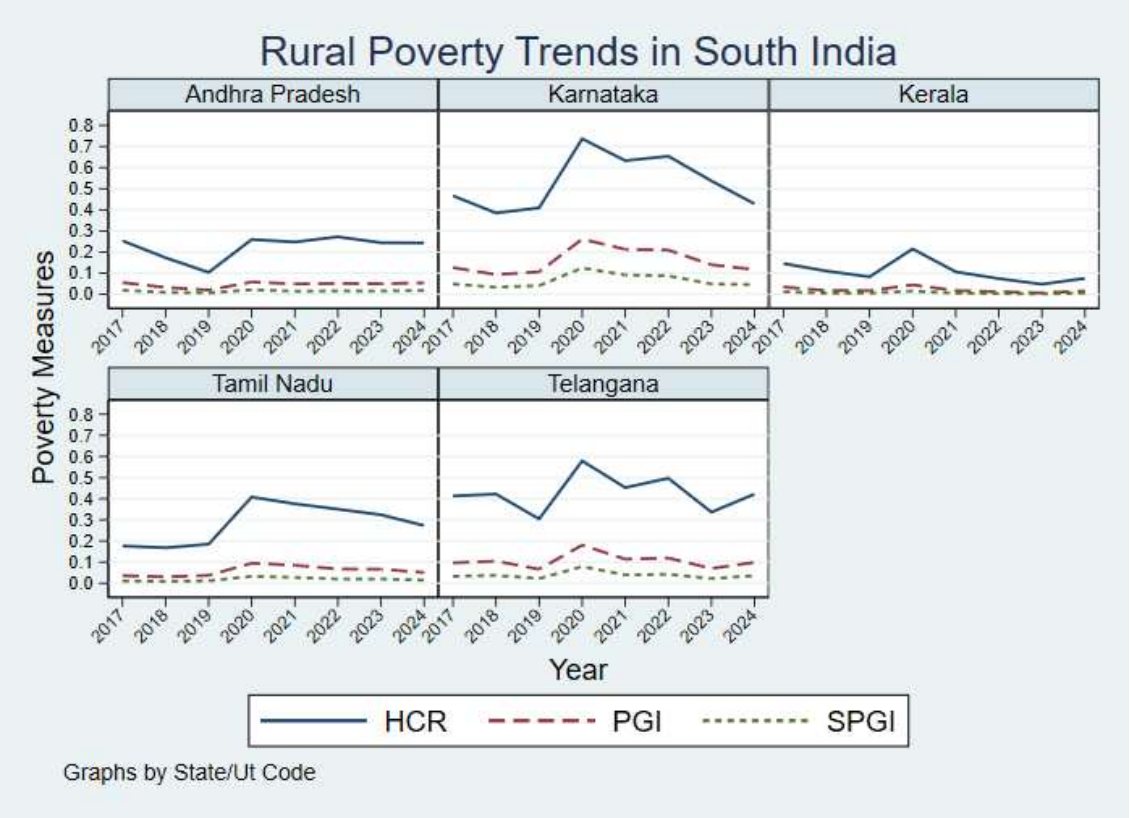
Figure 8: Urban Poverty Trends in Central India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

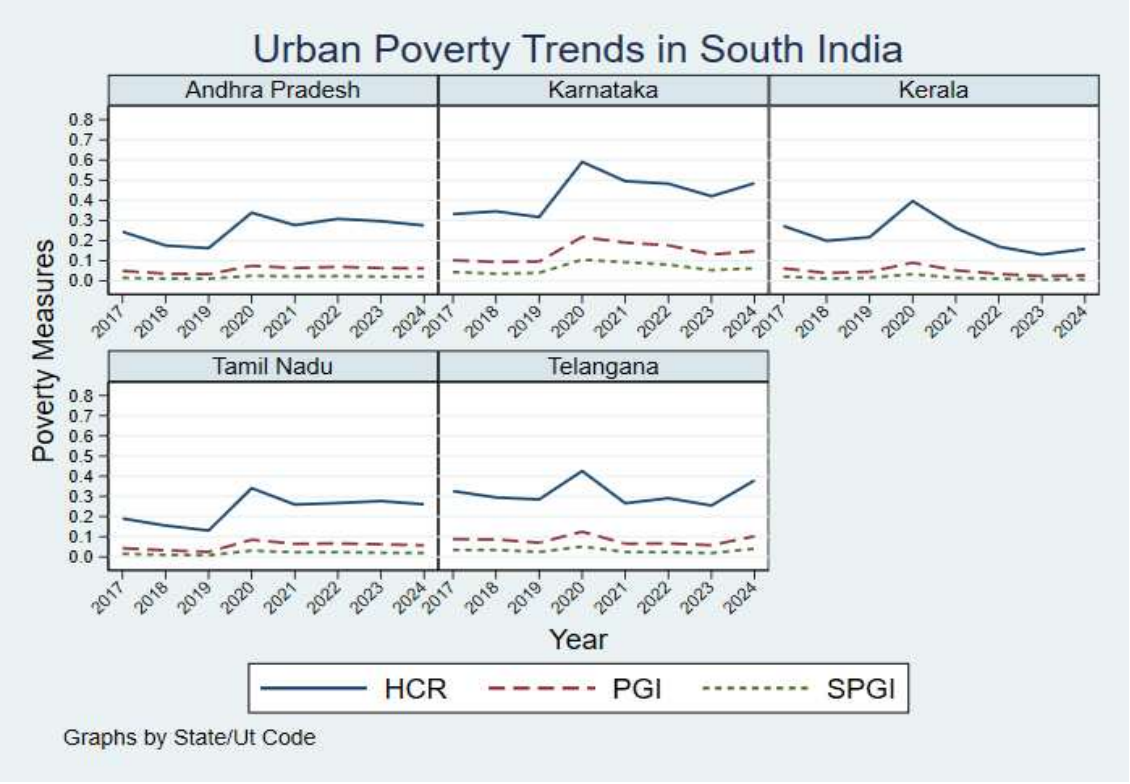
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Figure 9: Rural Poverty Trends in South India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

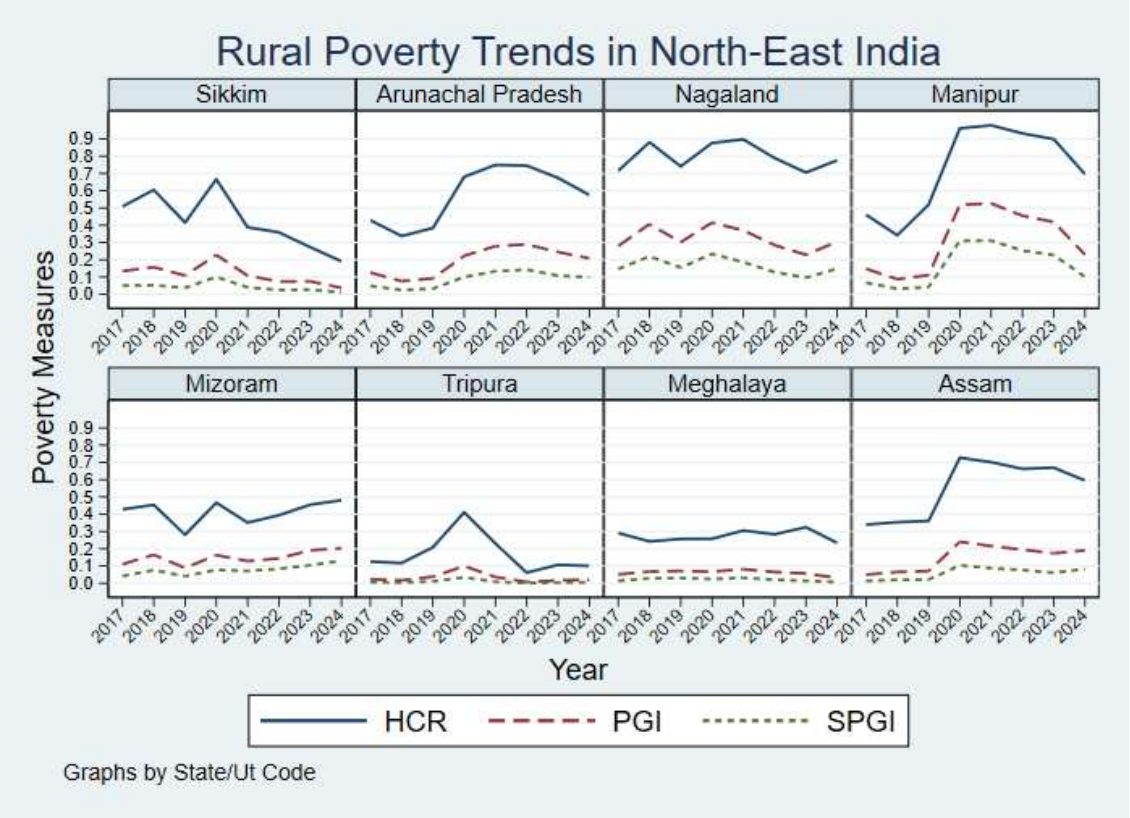
Figure 10: Urban Poverty Trends in South India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

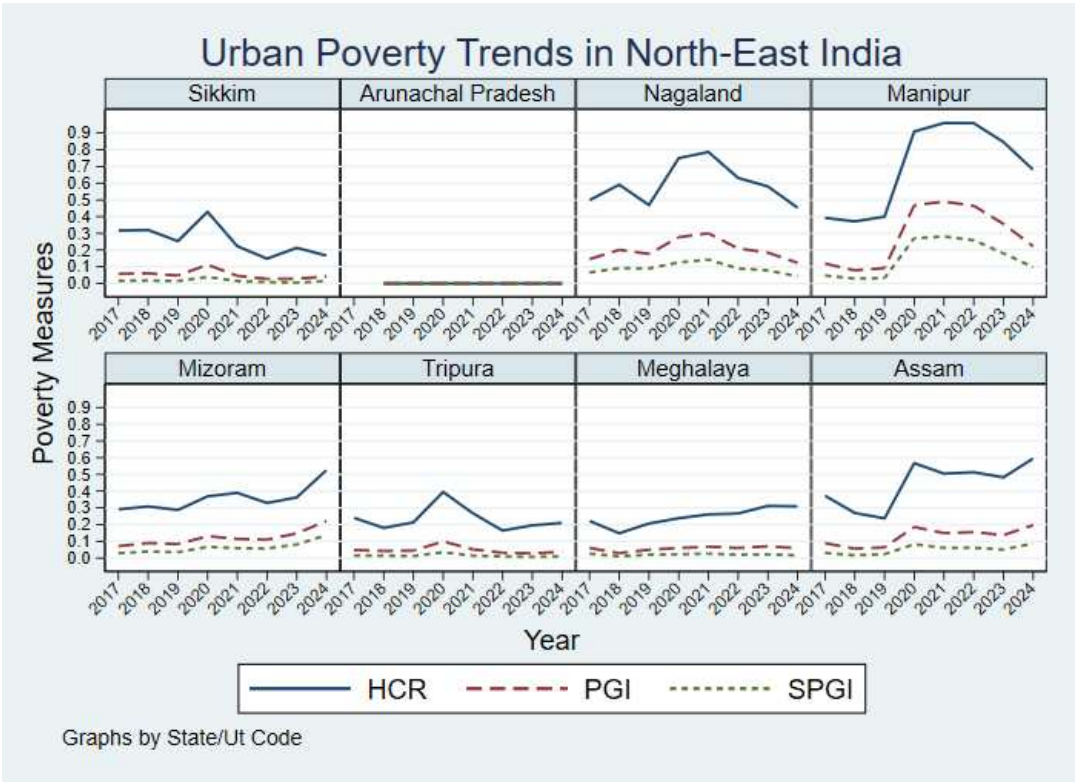
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Figure 11: Rural Poverty Trends in North-East India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

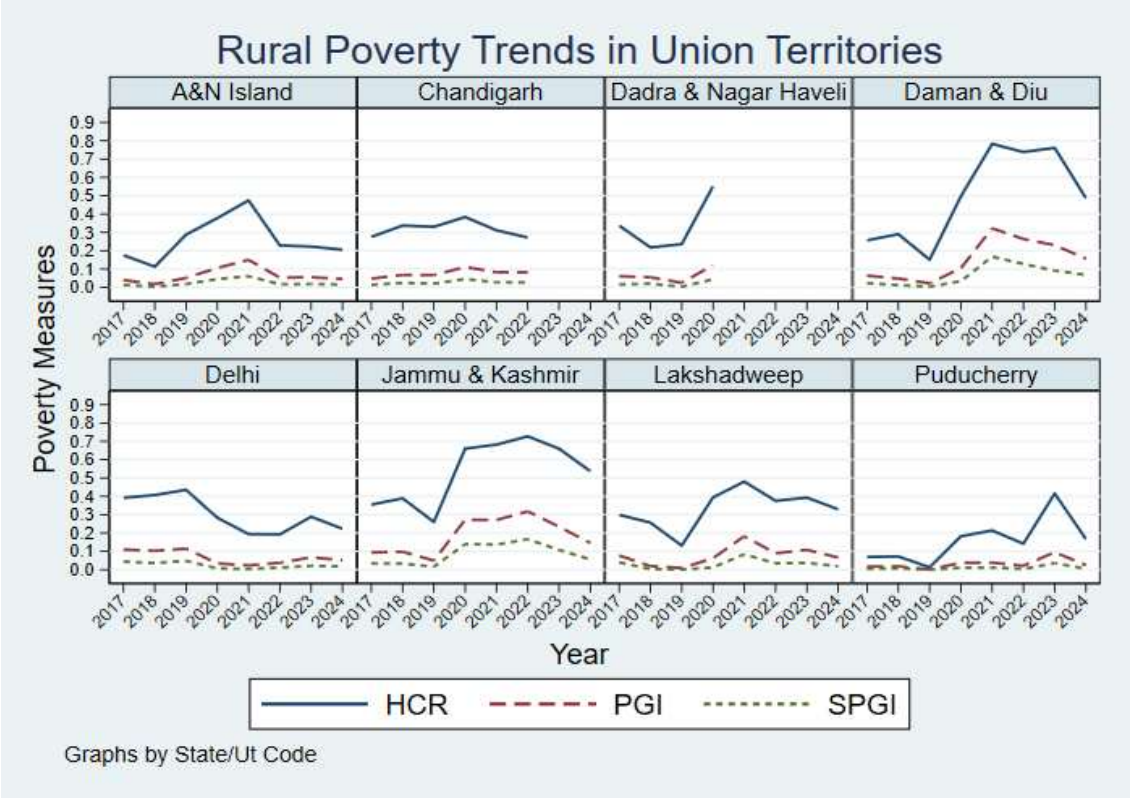
Figure 12: Urban Poverty Trends in North-East India



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

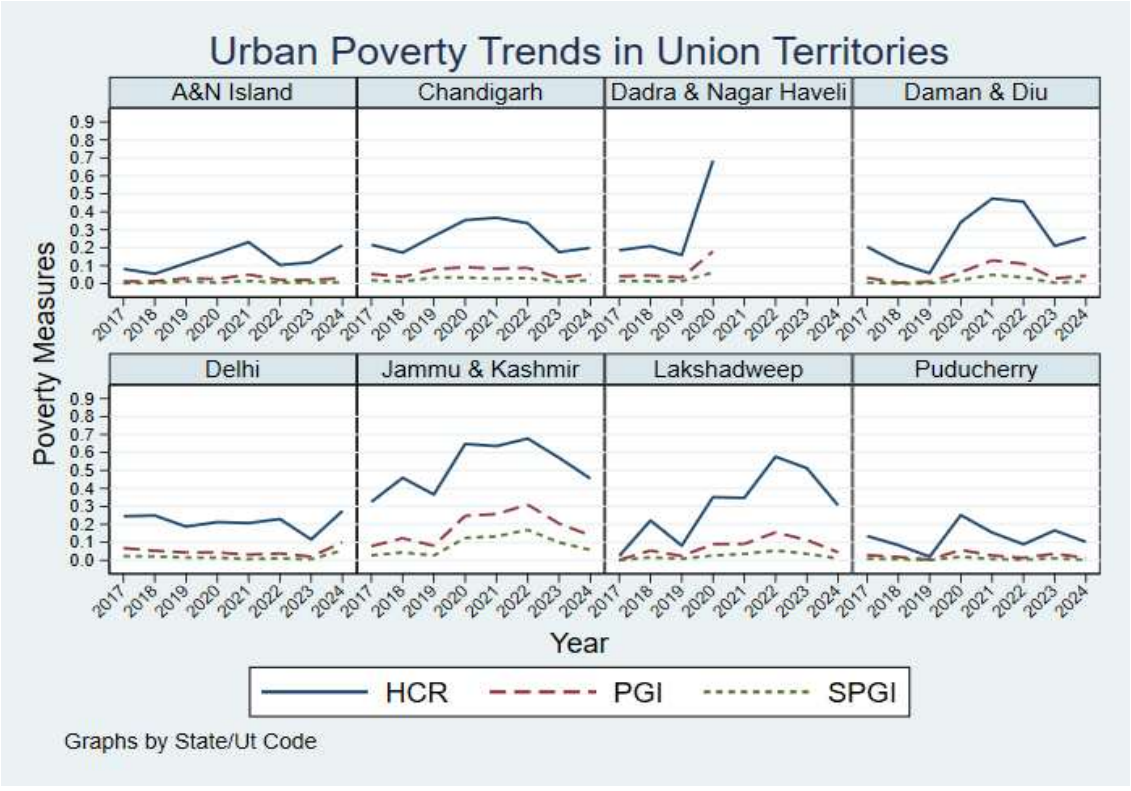
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Figure 13: Rural Poverty Trends in Union Territories



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Figure 14: Urban Poverty Trends in Union Territories



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

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Figure 16: Poverty Map from 2017 and 2024 Based on HCR

Figure 16-A: Poverty Map of 2017 Based on HCR

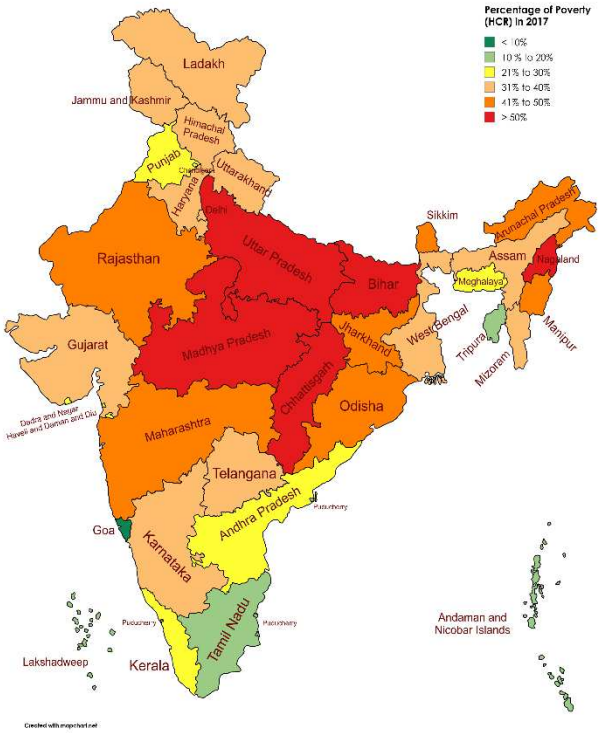
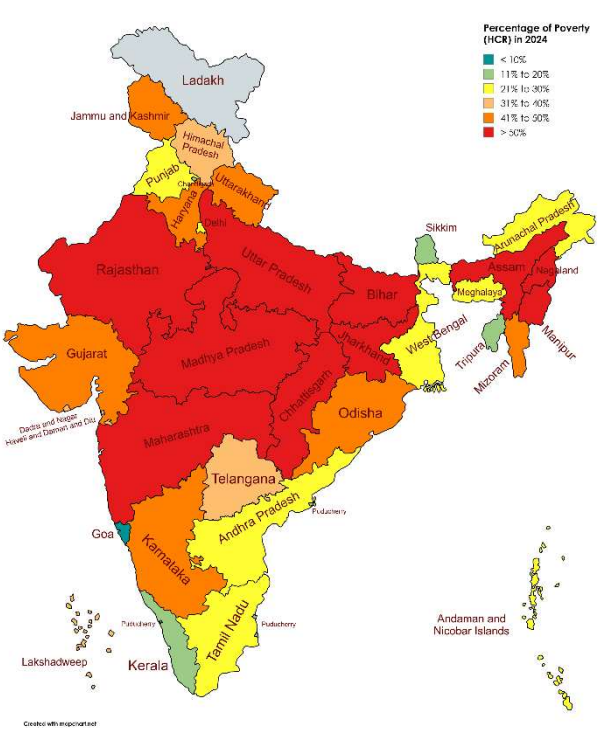


Figure 16-B: Poverty Map of 2024 Based on HCR



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Figure 17: Poverty Map from 2017 and 2024 Based on PGI

Figure 17-A: Poverty Map of 2017 Based on PGI

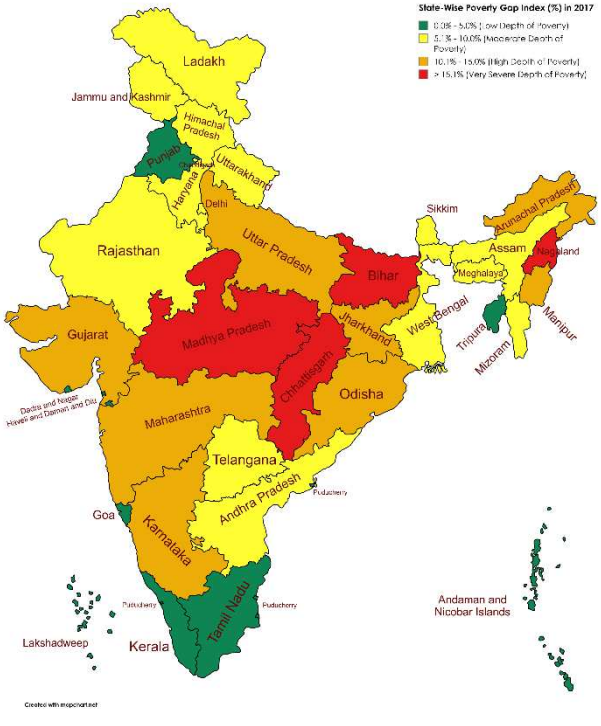
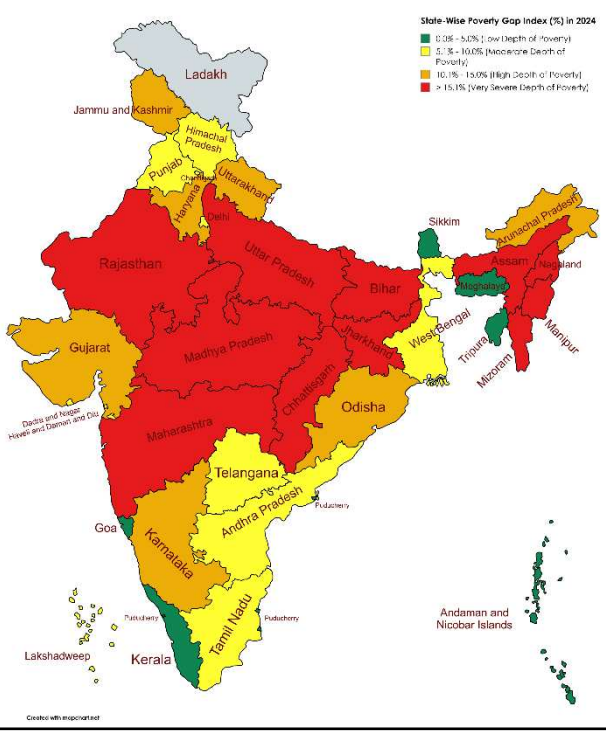


Figure 17-B: Poverty Map of 2024 Based on PGI



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

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Figure 18: Poverty Map from 2017 and 2024 Based on SPGI

Figure 18-A: Poverty Map of 2017 Based on SPGI

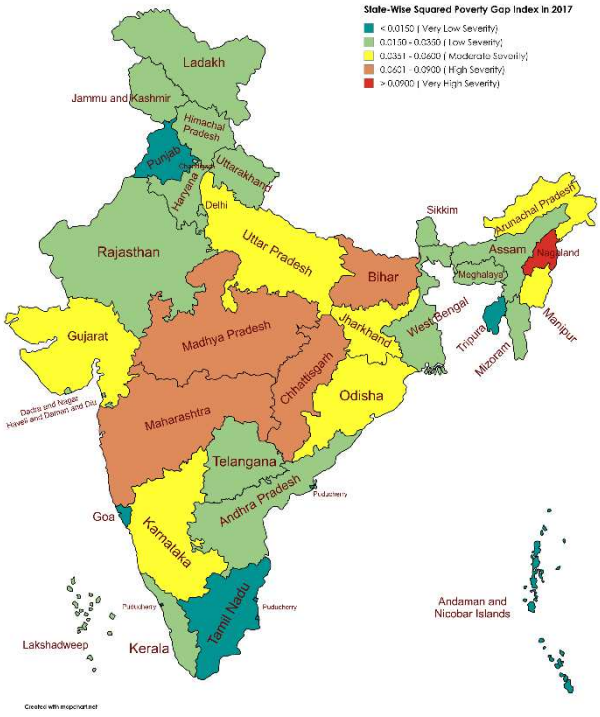
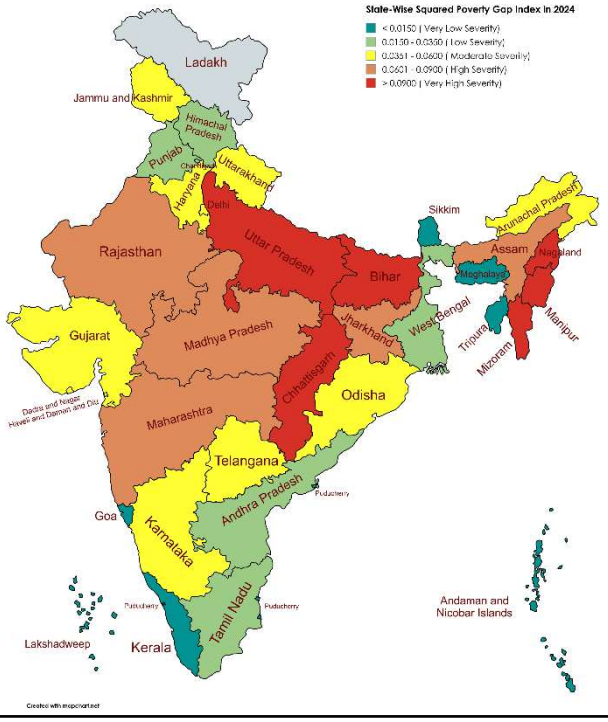


Figure 18-B: Poverty Map of 2024 Based on SPGI



Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 1: Top Ten Poorest and Lowest Ten Poor States by HCR in 2017

Rank	State/UT (Highest Poverty) 2017	HCR (Highest)	State/UT (Lowest Poverty) 2017	HCR (lowest)
1	Bihar	0.63	Goa	0.09
2	Nagaland	0.61	Puducherry	0.10
3	Chhattisgarh	0.61	Andaman & Nicobar Islands	0.13
4	Uttar Pradesh	0.51	Lakshadweep	0.16
5	Madhya Pradesh	0.51	Tripura	0.18
6	Jharkhand	0.50	Tamil Nadu	0.18
7	Maharashtra	0.46	Kerala	0.21
8	Odisha	0.45	Punjab	0.22
9	Arunachal Pradesh	0.43	Daman & Diu	0.23

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10	Manipur	0.43	Chandigarh	0.25

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 2: Top Ten Poorest and Lowest Ten Poor States by HCR in 2024

Rank	State/UT (Highest Poverty) 2024	HCR (Highest)	State/UT (Lowest Poverty)2024	HCR (lowest)
1	Uttar Pradesh	0.72	Goa	0.02
2	Bihar	0.71	Kerala	0.12
3	Manipur	0.69	Puducherry	0.13
4	Chhattisgarh	0.62	Tripura	0.16
5	Nagaland	0.61	Sikkim	0.18
6	Assam	0.60	Chandigarh	0.20
7	Rajasthan	0.58	Andaman & Nicobar Islands	0.21
8	Madhya Pradesh	0.56	Delhi	0.25
9	Maharashtra	0.56	Andhra Pradesh	0.26
10	Jharkhand	0.55	Punjab	0.26

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 3: Top Ten Poorest and Lowest Ten Poor States by PGI in 2017

Rank	State/UT (Highest Poverty Depth) 2017	PGI (Highest)	State/UT (Lowest Poverty Depth) 2017	PGI (lowest)
1	Nagaland	0.212	Goa	0.0161
2	Bihar	0.195	Puducherry	0.0224
3	Chhattisgarh	0.189	Andaman & Nicobar Islands	0.0259
4	Madhya Pradesh	0.151	Tripura	0.0354
5	Uttar Pradesh	0.147	Lakshadweep	0.0394
6	Jharkhand	0.146	Tamil Nadu	0.0395
7	Maharashtra	0.144	Punjab	0.0461
8	Odisha	0.134	Kerala	0.0483
9	Manipur	0.133	Daman & Diu	0.0484
10	Arunachal Pradesh	0.126	Chandigarh	0.0511

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Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 4: Top Ten Poorest and Lowest Ten Poor States by PGI in 2024

Rank	State/UT (Highest Poverty Depth) 2024	PGI (Highest)	State/UT (Lowest Poverty Depth) 2024	PGI (lowest)
1	Uttar Pradesh	0.280	Goa	0.003
2	Bihar	0.240	Puducherry	0.019
3	Manipur	0.226	Kerala	0.022
4	Nagaland	0.214	Tripura	0.029
5	Chhattisgarh	0.212	Andaman & Nicobar Islands	0.038
6	Mizoram	0.212	Sikkim	0.040
7	Assam	0.193	Meghalaya	0.045
8	Madhya Pradesh	0.187	Chandigarh	0.054
9	Rajasthan	0.182	Tamil Nadu	0.054
10	Maharashtra	0.177	Lakshadweep	0.055

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 5: Top Ten Poorest and Lowest Ten Poor States by SPGI in 2017

Rank	State/UT (Highest Inequality among Poor) 2017	SPGI (Highest)	State/UT (Lowest Inequality among poor) 2017	SPGI (lowest)
1	Nagaland	0.106	Goa	0.005
2	Bihar	0.085	Puducherry	0.007
3	Chhattisgarh	0.081	Andaman & Nicobar Islands	0.008
4	Maharashtra	0.062	Tripura	0.011
5	Madhya Pradesh	0.062	Tamil Nadu	0.013
6	Jharkhand	0.059	Punjab	0.015
7	Uttar Pradesh	0.058	Daman & Diu	0.015
8	Manipur	0.057	Dadra & Nagar Haveli	0.016
9	Odisha	0.053	Chandigarh	0.017

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10	Arunachal Pradesh	0.048	Kerala	0.017

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 6: Top Ten Poorest and Lowest Ten Poor States by SPGI in 2024

Rank	State/UT (Highest Inequality among Poor) 2024	SPGI (Highest)	State/UT (Lowest Inequality among poor) 2024	SPGI (lowest)
1	Uttar Pradesh	0.142	Goa	0.000
2	Mizoram	0.134	Puducherry	0.004
3	Bihar	0.107	Kerala	0.007
4	Manipur	0.099	Tripura	0.008
5	Nagaland	0.096	Meghalaya	0.011
6	Chhattisgarh	0.096	Andaman & Nicobar Islands	0.012
7	Madhya Pradesh	0.086	Sikkim	0.013
8	Assam	0.085	Lakshadweep	0.014
9	Maharashtra	0.076	Tamil Nadu	0.017
10	Rajasthan	0.075	Punjab	0.019

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 7: FE and RE estimates for the dependent variable HCR

Variables	Fixed Effects	Random Effects
Primary Education Share	-9.999*** (1.433)	-8.985*** (1.463)
Secondary Education Share	-9.146*** (1.397)	-8.593*** (1.437)
Higher Secondary Education Share	-9.093*** (1.425)	-8.761*** (1.467)
Higher Education Share	-10.820*** (1.662)	-8.792*** (1.640)
OBC Share	0.158 (0.133)	0.129 (0.084)
SC Share	0.145 (0.174)	0.136 (0.139)
ST Share	0.753*** (0.144)	0.268*** (0.087)
Muslim Share	0.011 (0.214)	-0.061 (0.096)
Christian Share	-0.396** (0.190)	-0.019796
Other Religion Share	0.213 (0.217)	-0.156 (0.133)

Household Size	0.019 (0.028)	0.080*** (0.024)
Dependency Ratio	0.295** (0.141)	0.334*** (0.130)
Labour Force Participation Rate	-0.58355	-0.472124
Table 7. (continued)		
Worker Population Ratio	1.545*** (0.520)	1.428*** (0.497)
Female Share	1.034** (0.441)	0.286 (0.410)
Constant	8.747*** (1.386)	8.187*** (1.434)
Note: Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10		

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 8: Hausman Test; for the table 7

Test	Value
Chi-square (15)	58.95
Probability > Chi-square	0.001
Decision	Reject (H_0)
Preferred Model	Fixed Effects

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 9: FE and RE estimates for the dependent variable PGI

Variables	Fixed Effects	Random Effects
Primary Education Share	-4.003*** (0.745)	-3.544*** (0.751)
Secondary Education Share	-3.589*** (0.727)	-3.333*** (0.738)
Higher Secondary Education Share	-3.700*** (0.742)	-3.507*** (0.754)
Higher Education Share	-4.257*** (0.864)	-3.217*** (0.832)
OBC Share	0.086 (0.069)	0.070* (0.039)
SC Share	0.073 (0.091)	0.046 (0.066)
ST Share	0.324*** (0.075)	0.080** (0.040)
Muslim Share	-0.001 (0.111)	-0.007 (0.043)
Christian Share	-0.086 (0.099)	-0.013 (0.047)
Other Religion Share	0.096 (0.113)	-0.062 (0.061)
Household Size	0.001 (0.015)	0.035*** (0.012)
Dependency Ratio	0.137* (0.073)	0.157** (0.064)
Labour Force Participation Rate	-0.433 (0.286)	-0.346 (0.262)

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

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Worker Population Ratio	0.675** (0.271)	0.583** (0.249)
Female Share	0.298 (0.229)	-0.063 (0.203)
Constant	3.463*** (0.721)	3.194*** (0.737)
Note: Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10		

Table 10: Hausman Test; for the table 9

Test	Value
Chi-square (15)	49.09
Probability > Chi-square	0.001
Decision	Reject (H_0)
Preferred Model	Fixed Effects

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 11: FE and RE estimates for the dependent variable SPGI

Variables(SPGI)	Fixed Effects	Random Effects
Primary Education Share	-2.064*** (0.438)	-1.806*** (0.437)
Secondary Education Share	-1.816*** (0.427)	-1.677*** (0.430)
Higher Secondary Education Share	-1.888*** (0.435)	-1.792*** (0.438)
Higher Education Share	-2.166*** (0.507)	-1.579*** (0.480)
OBC Share	0.045 (0.041)	0.039* (0.021)
SC Share	0.033 (0.053)	0.015 (0.037)
ST Share	0.165*** (0.044)	0.032 (0.022)
Muslim Share	-0.014 (0.065)	-0.003 (0.023)
Christian Share	-0.016 (0.058)	0.011 (0.025)
Other Religion Share	0.059 (0.066)	-0.026 (0.033)
Household Size	0.001 (0.009)	0.019*** (0.007)
Dependency Ratio	0.077* (0.043)	0.084** (0.036)
Labour Force Participation Rate	-0.230 (0.168)	-0.178 (0.150)
Worker Population Ratio	0.340** (0.159)	0.286** (0.143)
Female Share	0.130 (0.135)	-0.064 (0.115)

Constant	1.765*** (0.423)	1.616*** (0.429)
Note: Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10		

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)

Table 12: Hausman Test; for the table 10

Test	Value
Chi-square (15)	49.49
Probability > Chi-square	0.001
Decision	Reject (H_0)
Preferred Model	Fixed Effects

Source: Author's calculation based on Periodic Labour Force Survey (PLFS)