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Intra-state economic disparity in Uttar Pradesh

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Abstract

The paper investigates the pattern of inequality in economic development existing at the district level with the help of selected economic indicators as well as change in their ranking. Using principal component analysis (PCA), a composite score was generated to rank the districts with regard to economic development. The study finds glaring inter-district inequality in economic development as the districts in western region performing reasonably better as compared to the districts in eastern region which continue to lag strategies have been suggested under decentralized multilevel planning process with an emphasis on spatial organization and balanced regional development.

Keywords: *Intra-state disparity, Economic Development Index, Principal Component Analysis.*

Introduction

The debate on disparities or inequality in the process of economic growth and development is not new. Since the days of Adam Smith to the recent times of globalisation and convergence, economists have been trying to explain through varied economic model the dynamics of economic growth and inequality taking cognizance of experience from the developed, developing and emerging economies. In the first half of the twentieth century, especially from 1920s to 1970s, almost all the countries have witnessed sharp decline in income inequality, but the inequality is on the rise globally since then. Although the developed countries have experienced substantial decline in inequality during the last four decades, it is the emerging economies which are witnessing steep rise in inequality as the growth rates are not high enough to counterbalance it (IMF 2017; Alvaredo et. al., 2018). World Inequality Report (2018) also projected the future global inequality, warning of continued increase of within-country inequality. The dynamics of intra-country inequality therefore has attracted scholarly attention in the recent years (Lakner and Milanovic 2016; Liberati, 2015; Atkinson 2015; Piketty 2014; Stiglitz 2012). The issue of increasing inequality has now been acknowledged by the World Bank, International Monetary Fund (IMF) and the Asian Development Bank. Moreover, United Nation (2015) has added an exclusive goal (Goal 10) as part of its Sustainable Development Goals (SDGs) to reduce income-based inequality within countries[1].

1 Target 10.1 is to progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average by 2030.

As one of the fastest growing economies, India is an important player in world development and is home to 17 percent of the world population with the highest number of poor (World Bank, 2013). Until 1980s, the Indian economy grew sluggishly. During the first three decades (from 1950s to 1980s), the growth rate in gross domestic product (GDP) was 3.6 percent and it accelerated to 5.6 percent during the 1980s. In 1991, India's revolutionary reform towards deregulation and liberalization has infused structural changes in the economy heralding a phase of spectacular growth trajectory. Between 1991 and 1996 the annual growth rate of GDP was 6.7 percent and further accelerated to 8.7 percent during 2001-07 which made India as the fastest-growing economy in the world. Post 2008 economic crisis, the growth rate has decelerated to 5.6 percent in 2012, but since 2013-14, the economy started recovering despite recent blips[2]. This surge in economic growth is often seen to have been responsible in significant reduction of extreme poverty bringing down the proportion of the poor from 45.3 percent in 1993-94 to 21.9 percent in 2012 (Planning Commission, 2013)[3]. This remarkable achievement however is coupled with steep rise in income inequality, relative poverty and accessibility to basic services (Sen and Himanshu 2004; Himanshu 2007; Himanshu 2015; Sarkar and Mehta 2010; Subramaniam and Jayaraj 2015: Piketty and Chancel 2017; Mazumdar, Sarkar and Mehta 2017). Oxfam report (2018) on inequality placed India at 147 rank out of 157 countries indicating poor commitment towards reduction of inequality. The extent of inequality can be measured from the fact that in 15 years since 2004, the number of billionaires in India increased from only 13 (Himanshu 2018) to 136 in 2020[4].

This alarming rise in inequality has not unduly perturbed the economists and policymakers who believe that during initial stage of high growth, the inequality tends to increase which after reaching a certain threshold is predicted to decline (Kuznets, 1955). However, all do not take Kuznets theory at the face value since the developing countries like India is characterized by extreme heterogeneities— interpersonal, socio-cultural, religion and regional disparity (Dubey, 2009) making it far more complex than what the theory assumes. The World Inequality Report (2018) reported that the income shares of the top one percent of Indian population increased from 6 percent in 1983 to around 23 percent in 2014 in contrast to the share of bottom 50 percent falling from 24 percent to around 16 percent in the same period. This suggests that Indian economy has not transitioned to the next phase of Kuznet's Curve. Indian economic growth trajectory has only perpetuated the inter-sectoral and inter-regional disparity (Papola, 2005). There are evidences of persisting regional inequality which is only widening since independence (Mathur, 1994; Das and Barua, 1996; Chaudhuri, 2000; Dasgupta et. al., 2000; Bhattacharya and Sakthivel, 2004). Even after liberalization, the inter-state disparity is only steadily widening (Kurian, 2000; Sen, A & Himanshu, 2004; Nagaraj et. al. 2000; Ahluwalia, 2002).

2 https://www.indiatoday.in/india/story/india-china-fastest-growing-economies-world-bank-1024813-2017-07-17

3 https://www.niti.gov.in/sites/default/files/2020-05/press-note-poverty-2011-12-23-08-16.pdf. Then planning Commission is now known as NITI Aayog.

4 https://www.financialexpress.com/industry/number-of-billionaires-in-india-stands-at-136-in-fy21/2308013/

Table 1: Inter-regional variation in GSDP in Uttar Pradesh, 2012-13 (GDDP at 2004-05 constant prices)

Regions	Primary	Secondary	Tertiary	Total	Per Capita Income (Rs.)
Western	23.72	25.21	51.06	100	28,324
Central	19.54	20.79	59.67	100	22,632
Bundelkhand	31.48	14.2	54.31	100	26,805
Eastern	23.21	17.72	59.07	100	16,522
Uttar Pradesh	23.26	21.54	55.2	100	22,459

Source: Mamgain et.al. (2017)

While the extent of inter-state disparity in India has been studied in great detail by scholars, the intra-state disparity existing at lower aggregate level has received much less attention despite its importance at sub-regional level largely on account of limited data at the lowest administrative unit (Dubey and Gangopadhyay, 1998; Borooah and Dubey, 2007; Raychaudhuri and Halder, 2009; Chakraborty, 2009). The present study attempts at filling this gap to understand the nature and quality of disparity at sub-provincial level by taking the case of Uttar Pradesh-one of the most important states of India from demographic, social and economic point of view.

Uttar Pradesh is the most populous state in India with 199.8 million people accounting for about 17 percent population of the country (Census, 2011) and has the dubious distinction of being the most backward state after Bihar in terms of per capita income (Economic Survey 2020-21, Ministry of Finance, GoI). Since 1991, the growth in Gross State Domestic Product (GSDP) of Uttar Pradesh has however accelerated significantly. During 2004-05 – 2014-15, the annual average growth was 6.5 percent. Nevertheless, even with this surge in economic growth, Uttar Pradesh continued to occupy one of the bottom positions in many economic, social, cultural well-being indicator in the country (Mathew et al., 2016). In fact, since 2000, state's growth rate of GSDP is constantly lower than the national average with the sole exception in 2008-09. This continued gap in growth rate resulted in decreasing the share of Uttar Pradesh in India's GDP from about 9 percent in 2000 to 7.83 percent in 2016-17 (Maurya, 2019). The per capita income of the state is Rs. 70,419 in 2019-20 which is almost half of the national average of Rs. 1,34, 226 (Economic Survey, 2020-21). This indicates that the poor economic performance is likely to widen the gap between Uttar Pradesh and the national average. The sectoral composition shows that one third of the GSDP of the state comes from agriculture and allied sector while service sector contributed almost half of the GSDP. The stagnant growth of manufacturing is one of the major concerns, which contributed to GSDP at around 20 percent in 2014-15.

Striking and persistent inter-regional disparity in Uttar Pradesh in many economic indicators too is (GoUP, DES, 2013) a major concern. The state is divided into four administrative divisions- Western, Eastern, Central, and Bundelkhand region displaying revealing glaring disparities in most economic indicators (Table 1). The per capita

income of Western region for example is Rs. 28,324, in contrast to Eastern region which is much lower at Rs. 16,522 (Mamgain et.al, 2017). Several studies (Kumari, 2014; 2016; Diwakar, 2009; Singh et. al, 2013; Saravanan and Durai, 2012; Debroy and Bhandari 2003; Debapriya and Mohanty 2008; Ahmad and Shamim 1998; Chakravorty 2009; Bhattacharya 2009) have noted persisting inter-district disparity in various sectoral indicators. Most of studies (Pandey 2014; Chhipa and Sagar 1981; Krishnaji, 1993) have examined inequality in specific indicators such as per capita income, agriculture, industry, services, education, health, social development and while others (Ahluwalia, 2001; Kundu & Varghese, 2010; Kurian, 2000; Singh, Kendali, Jain, & Chander, 2014) have explored the existing spatial disparities in overall development. The present study is an extension of these studies by incorporating a few more important indicators not included in the previous studies. Specifically, the paper investigates the district level pattern in movement of inequality in selected economic indicators as well as the changes in their ranks in economic development.

Data base and Methodology

Inter-district economic disparity in this study has been presented on the strength of nine indicators aggregated as an index using principal component analysis (Table 2). The Economic Development Index (EDI) across 70 districts in Uttar Pradesh has been measured with the help of the selected indicators.

Selection of these indicators however poses problems due largely to the constraint of non-availability of reliable and desirable data for the analysis. Initially, the analysis began with 15 indicators related to industrial and other development sectors. But, while running factor analysis, six indicators' communalities show value less than 0.5, which means these indicators do not play much role in overall economic development. Therefore, finally, nine indicators have been identified for the present study, whose contribution is 50 percent or more. The study gathered information on selected indicators for 2000-2001 and 2010-2011 for analysing the disparities in the levels of development. Total industrial workers and number of non-agriculture workers show the proportion of workers in activities other than agriculture in particular and the primary sector in general. Female work participation is a positive indicator as it is generally perceived to empower women with economic independence and social security. Work participation rate is important as it shows the extent to which the working age group is finding work. The percentage of primary sector, secondary sector and tertiary sector in the distribution of net domestic product (at current price) show the type and level of economic development. But the data related to these sectors of the economy was not available for the period of 2000-01 so, 2003-04 data have been used. Per capita income and level of urbanization are important factors that affect the level of social and economic development. It is important to note that since it is a comparative study, therefore, the study has tried to use same reference period of data collection year for all selected indicators. However, it is observed that the information was not available for all indicators in reference year, therefore, nearest data collection year was considered as reference year. In case of per capita income, data was not available for 2001 (base reference year), hence 2004 data are used for the purpose of analysis. Urbanization is

Table 2: List of Indicators

	Indicators	Description
X1	Household Industrial workers	% of household industrial workers to total workers
X2	Non-agricultural workers	% of non-agricultural workers to total workers
X3	Female work participation rate	% of total female workers to total population
X4	Total Work participation rate	% of total workers to total population
X5	Contribution of primary sector	% of primary sector distribution of net domestic product (at current price)
X6	Contribution of secondary sector	% of secondary sector distribution of net domestic product (at current price)
X7	Contribution of tertiary sector	% of tertiary sector distribution of net domestic product (at current price)
X8	Per capita income	per capita net income (at constant price)/ real GDP
X9	Urbanization	% of total population residing in the urban areas

widely believed to usher economic growth as it leads to employment in service, trade, manufacturing and allied sectors. Data has been collected from Statistical Abstracts of various districts and Uttar Pradesh Statistical Bulletin, published by the Directorate of Economics and Statistics, Lucknow, Uttar Pradesh for the period of 2001 and 2011. The nine selected indicators are heterogeneous in nature; and have been reduced to a manageable scale. Z-score normalization method has been used in the study. The values are standardized using the given formula.

Z-Score Method (Zj)

$$Zj = (Xj - Xi)/_{SDx}$$

Where, Xj = Raw value of the indicator, Xi = Mean value, SDx = Standard Deviation

Principal Component Analysis (PCA)

In order to rank the districts with regard to their performance in the selected indicators, a composite score was computed using principal components that are orthogonal to each other. In order to interpret the large datasets, methods are required to reduce their dimensionality in an interpretable form so that most of the information in the data is preserved. Principal component analysis (PCA) is one of the oldest and the most widely used statistical technique which reduces the dimensionality of the dataset while preserving as much information as possible (Jollife & Cadima, 2016). For the extraction and rotation of the number of factors, 'Kasier Latent Root Criterion' or 'Eigen value greater than one' criterion was used which is suitable particularly for principal component analysis in SPSS. Further, for the rotation, the most widely used Varimax Method was used. This method aims at simplification of columns, i.e. factor loading that tends towards unity or zero, thus facilitating interpretation of the factors (Phull, 2011).

Weight Score Matrix

To calculate the weight score, following steps were adopted for 2001 and 2011 dataset. Initial Eigen values (total) measuring more than one, were extracted by principal component analysis in SPSS. In the present

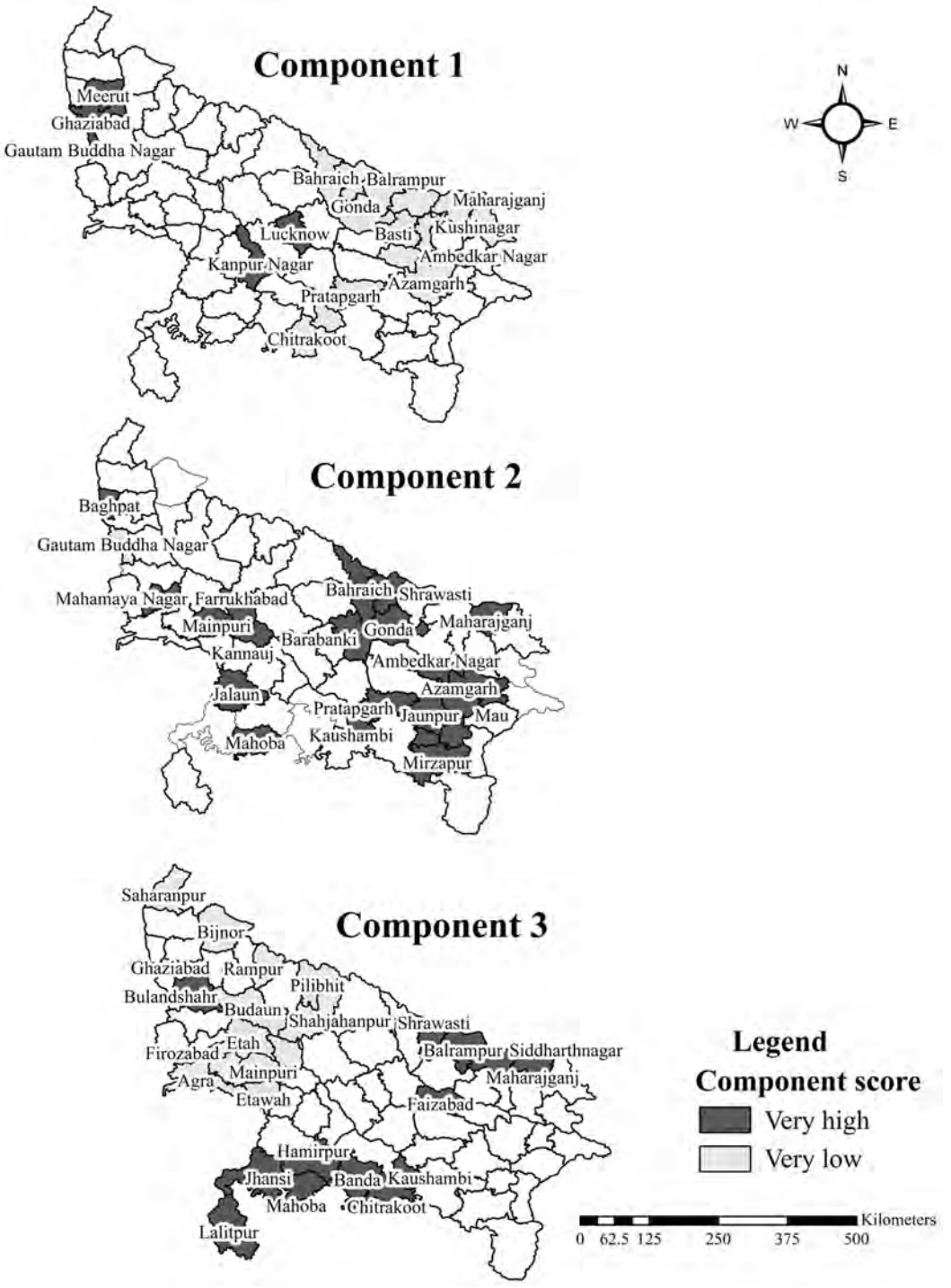

Fig. 1: Component score across districts in Uttar Pradesh, 2001

study, three eigen values (Table 3 and 4) were found which are 4.395, 1.805 and 1.27. Number of Eigen values above 1 varies from data set to dataset. According to the number of Eigen values above 1, the same number of the components have been calculated for each indicator in principal component analysis as shown in Rotated Component Matrix Table 3. To calculate the weight score, eigen values were multiplied with their respective component scores. for example, first eigen value 4.395 were multiplied with 1st extracted component column (0.058, 0.815, -0.282, -0.141, -0.58, 0.788, 0.063, 0.892, and 0.846) and 2nd Eigen value with 2nd Component column and likewise 3rd Eigen value with 3rd column value. It has been calculated in the following manner.

Weight Score Matrix (W_{ji}) = E_{1i}. F_{1j} + E_{2i}. F_{2j}+ E_{3i}. F_{3j} or

W_{2001} = (4.395) F_{1j} + (1.805) F_{2j} + (1.271) F_{3j}

W_{2011} = (4.027) F_{1j} + (1.938) F_{2j} + (1.518) F_{3j}

Where, W_{ji} = the weight score of the component vector of j^{th} indicators of the i^{th} districts during 2001 and 2011

F_{ji} = factor loadings of the principal component vector relating to j^{th} indicators of the i^{th} districts

E_i = Eigen value of the components.

While calculating the weight score matrix only absolute values have been considered irrespective of sign, negative values are treated as positive. Each indicator has some score in each component extracted by principal component analysis (Table 3 and 4). By summing up the component score obtained in each case like for the first indicator, 0.058, 0.674 and -0.245 is the sum obtained is 1.78345. This total value (1.78345) is treated as the weight score for the first indicator. Likewise, the weight scores of remaining indicators have been calculated for 2001 and 2011 data set.

Economic Development Index (EDI)

The mutually interdependent indicators in combination affect the overall economic development. Hence, it is not appropriate to take one of the indicators and analyze the level of development. There is a need to compute 'Composite Economic Development Index' by integrating various components in a suitable manner. The following formula is used to determine the index.

EDI = W_1 (X_1) + W_2 (X_2) + W_3 (X_3) .....+ W_{ij} (X_{ij})/ W_{ij}

W= Weight of Component score coefficients of the –indicators in j^{th} time,

X = standardized observed indicators for the i-th state in j-th time point.

Mathematically it can be expressed in the following form.

EDI_{2001} = (1.78) X_1 + (4.71) X_2 + (2.53) X_3 + (2.12) X_4 + (3.98) X_5 + (4.28) X_6 + (2.03) X_7+ (4.60) X_8 + (4.28) X_9/30.31

EDI_{2011} = (2.00) X_1 + (4.46) X_2 + (2.48) X_3 + (1.75) X_4 + (4.05) X_5 + (3.88) X_6 + (2.09) X_7+ (4.16) X_8 + (4.14) X_9/29.03

Where EDI_{2001} and EDI_{2011} are composite index for economic development for the year 2000-01 and 2010-11 respectively and X_1, X_2…. X_9 are the values in standardized form and the figures in parentheses are weight score from rotated component matrix.

For convenient and purposeful analysis districts have been classified into very high,

Table 3: Rotated Component Matrix (RCM), 2001

Indicators	Component loadings			Weight Score
	1	2	3	
Industrial workers	0.058	0.674	0.245	1.783
Non-agricultural workers	0.815	0.411	0.306	4.710
Female work participation rate	0.282	0.07	0.921	2.533
Total work participation rate	0.141	0.158	0.948	2.108
Contribution of primary sector	0.58	0.775	0.028	3.982
Contribution of secondary sector	0.788	0.332	0.169	4.279
Contribution of tertiary sector	0.063	0.872	0.141	2.027
Per capita income	0.892	0.276	0.138	4.595
Urbanization	0.846	0.2	0.161	4.281
Eigen value	4.395	1.805	1.271	Total weight
% of variance explain	48.828	20.056	14.126	30.303
Cumulative variance	48.828	68.884	83.01	
Kaiser-Meyer-Olkin Test (h^2)				0.543

Source: Computed by the author based on factor analysis
Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations

Table 4: Rotated Component Matrix (RCM), 2011

Indicators	Component loadings			Weight Score
	1	2	3	
Industrial workers	0.085	0.761	0.162	2.079
Non-agricultural workers	0.818	0.408	0.259	4.480
Female work participation rate	0.221	0.119	0.922	2.498
Total work participation rate	0.022	0.091	0.951	1.689
Contribution of primary sector	0.617	0.701	0.164	4.104
Contribution of secondary sector	0.824	0.278	0.016	3.887
Contribution of tertiary sector	0.057	0.853	0.130	2.100
Per capita income	0.901	0.267	0.010	4.162
Urbanization	0.898	0.155	0.149	4.139
Eigen value	4.022	1.966	1.492	Total weight
% of variance explain	44.694	21.846	16.582	29.142
Cumulative variance	44. 694	66.540	83.122	
Kaiser-Meyer-Olkin Test (h^2)	0.617			0.543

Source: Computed by author based on factor analysis
Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations

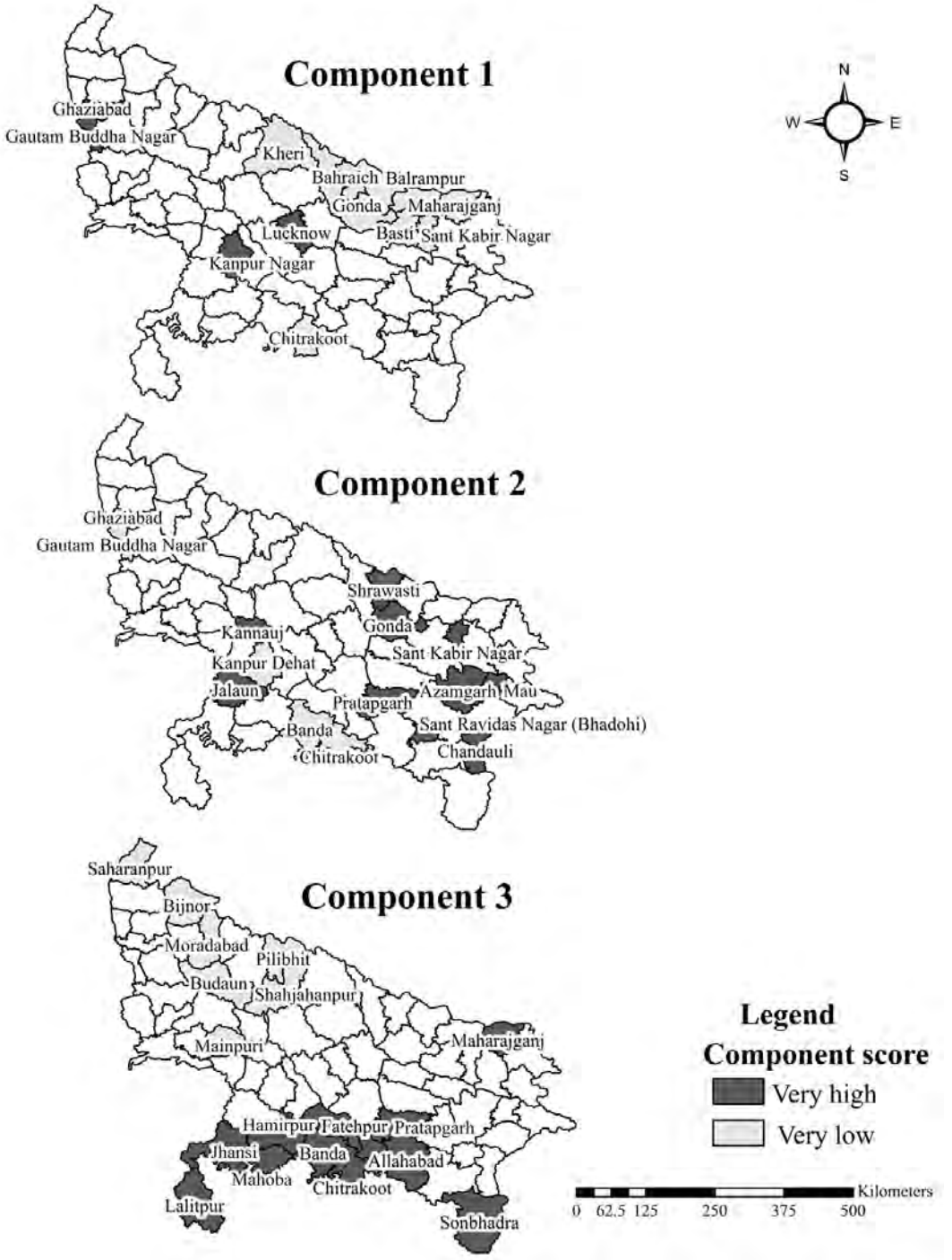

Fig. 2: Component Score, 2011

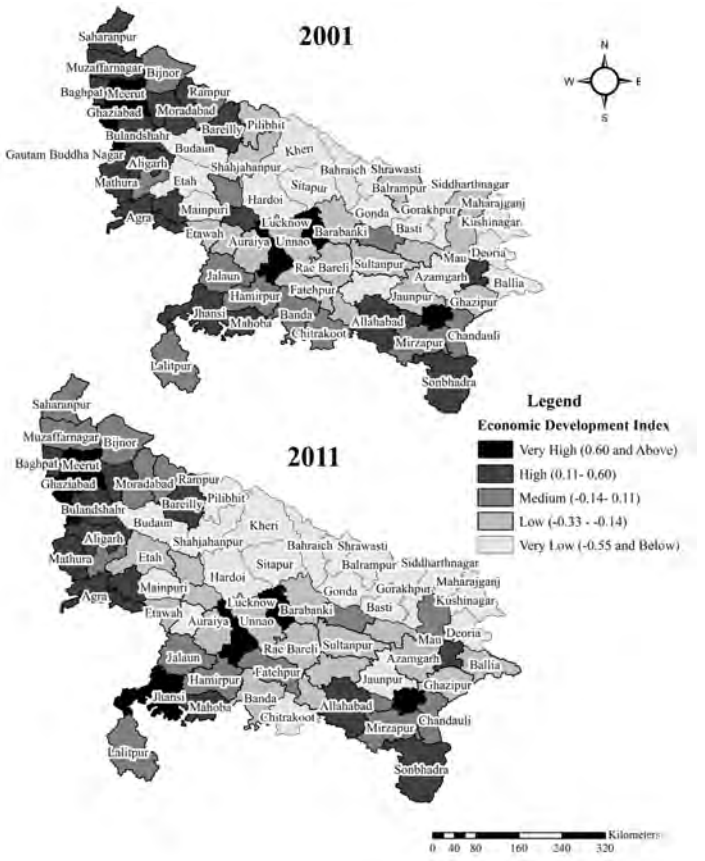

Fig. 3: Economic Development Index (EDI)

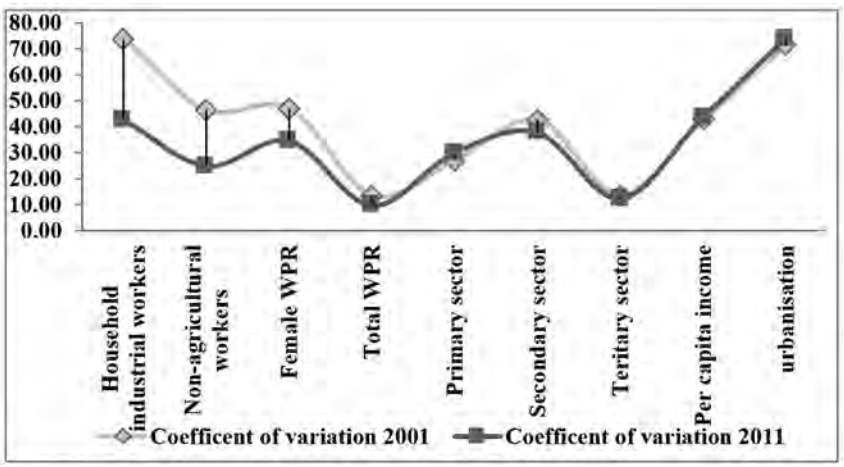

Fig. 4: Nature of Disparity (coefficient of variation)

Table 5: Economic Development Index, Uttar Pradesh, 2001-11

Districts	EDI 2001	Rank 2001	EDI 2011	Rank 2011	Districts	EDI 2001	Rank 2001	EDI 2011	Rank 2011
Agra	0.41	11	0.502	9	Jaunpur	-0.31	51	-0.323	52
Aligarh	0.27	14	0.283	14	Jhansi	0.61	7	0.687	5
Allahabad	0.34	12	0.503	8	Jyotiba phule nagar	0.26	15	0.204	17
Ambedkar nagar	-0.22	43	-0.133	39	Kannauj	0.2	21	-0.139	40
Auraiya	-0.16	38	-0.338	53	Kanpur	0.9	3	0.833	4
Azamgarh	-0.35	56	-0.283	48	Kanpur Dehat	-0.27	48	-0.284	49
Baghpat	0.23	17	0.223	16	Kaushambi	-0.19	42	-0.125	37
Bahraich	-0.55	69	-0.574	70	Kushinagar	-0.43	66	-0.436	63
Ballia	-0.37	59	-0.161	41	Lakhimpur kheri	-0.36	58	-0.476	67
Balrampur	-0.25	46	-0.405	61	Lalitpur	0.02	27	0.033	28
Banda	-0.04	33	-0.257	47	Lucknow	0.87	4	0.96	3
Barabanki	-0.17	40	-0.126	38	Maharajganj	0.19	22	-0.323	51
Bareilly	0.16	24	0.287	13	Mahoba	-0.31	53	0.228	15
basti	-0.39	61	-0.476	66	Mainpuri	-0.46	68	-0.404	59
Bijnor	0.11	25	-0.004	29	Mathura	0.44	9	0.332	12
Budaun	-0.35	57	-0.359	55	Mau	0.24	16	0.405	10
Bulandshahar	0.58	8	0.343	11	Meerut	0.74	6	0.679	7
Chandauli	-0.11	36	-0.008	31	Mirzapur	-0.01	31	0.034	27
Chitrakoot	-0.11	35	-0.492	68	Moradabad	0.22	19	0.126	21
Deoria	-0.44	67	-0.402	58	Muzaffar nagar	0.22	18	0.089	24
Etah	-0.33	54	-0.296	50	Pilibhit	-0.18	41	-0.358	54

Districts	EDI 2001	Rank 2001	EDI 2011	Rank 2011	Districts	EDI 2001	Rank 2001	EDI 2011	Rank 2011
Etawah	-0.25	45	-0.183	43	Pratapgarh	-0.43	65	-0.18	42
Faizabad	-0.03	32	-0.043	33	Raebareli	-0.29	49	-0.25	44
Farrukhabad	-0.07	34	-0.113	35	Rampur	-0.01	29	-0.006	30
Fatehpur	-0.17	39	-0.018	32	Saharanpur	0.18	23	0.075	25
Firozabad	0.21	20	0.204	18	Sant kabir nagar	-0.42	64	-0.451	65
Gautam budh nagar	1.54	1	1.776	1	Sant ravidas nagar	0.42	10	0.161	20
Ghaziabad	0.99	2	1.029	2	Shahjahanpur	-0.26	47	-0.405	60
Ghazipur	-0.3	50	-0.25	45	Shravasti	-0.38	60	-0.559	69
Gonda	-0.56	70	-0.408	62	Siddharth nagar	-0.42	63	-0.378	56
Gorakhpur	-0.14	37	-0.05	34	Sitapur	-0.35	55	-0.385	57
Hamirpur	-0.01	28	0.11	22	Sonebhadra	0.29	13	0.194	19
Hardoi	-0.39	62	-0.439	64	Sultanpur	-0.31	52	-0.253	46
Hathras	0.07	26	0.059	26	Unnao	-0.23	44	-0.121	36
Jalaun	-0.01	30	0.102	23	Varanasi	0.79	5	0.682	6

Source: Calculated by the author

high, medium, low and very low categories of development in terms of their Z-score value and constructed on the basis of a composite index of development. Natural Jerk method was used in Arc GIS to classify districts into 5 categories. Districts in the composite index of development are arranged in alphabetical order with their values and rank (Table 5)

Co-efficient of Variation (CV)

The coefficient of variation technique has been used to measure the degree of variation between the selected indicators from 2001 to 2011. In case of perfect equality that is no disparity at all and the CV will be zero which means there is no variation in the series of observation. Higher the calculated value of coefficient of variation, greater is the degree of variation. To measure the level of variation among the indicators the following formula is used (Nachimuthu, 2009).

Where,

$$CV = \left[\sqrt{\frac{\sum_{j=1}^{m} (X_j - \bar{X})2}{\sum_{j=1}^{m} N_j}} / \bar{X} \right] \times 100$$

Xj are the indicators of economic development and $\overline{X}$ are the mean.

Result and discussion

Factor analysis of economic development indicators, 2001

Table 3 shows that the Rotate Component Matrix (RCM) in 2000-01 has retained three components which together explain 83 percent of the total variance. The communalities (h^2), which is the proportion of the variance for each indicator, with a score of 0.543 reveals that each indicator taken for the analysis was significantly correlated with each other. The spatial pattern of development (Fig. 1) is clearly brought out when the districts were classified into two categories i.e. those with higher level of development (above the state average) and those with lower level of development (lower than the state average). First component explained 48.8 percent of the total variance by incorporating non-agricultural workers, share of secondary sector, per capita income and urbanization as major indicators. Component 1 gives highest value (0.892) to per capita income followed by urbanization (0.846) and non-agricultural workers (0.815). On analyzing the results (Figure 1, component 1) G.B. Nagar occupied the top position in respect of the first component followed by Ghaziabad, Kanpur Nagar, Lucknow, Meerut among others, which are the few developed districts, whereas Balrampur, Bahraich, Maharajganj, Gonda and Shravasti are the districts which fall under the very low developed category.

The second component of economic development explained 68.8 percent of the cumulative variance giving highest score to the tertiary sector (0.872) followed by industrial workers and share of primary sector. It has 1.80 eigen value which explains the contribution made by nine selected indicators in second component loading. Spatial analysis of this factor is shown in figure 1, component 2, which reveals that Kannauj, Mau, Pratapgarh, Varanasi are the few districts which occupied the top position. On the other hand, districts like Allahabad, Gorakhpur, Kanpur Nagar, Ghaziabad and G.B. Nagar are at the bottom. The third component in 2000-01 explained 83 percent of cumulative variance and provide highest loading to the total work participation rate (0.948) and female work participation rate (0.921). There are regional variations in work participation rate and female work participation rate is shown in figure 1,

component 3. Among the districts in Uttar Pradesh, Chitrakoot, Lalitpur, Mahoba and Balrampur are the few districts that registered high work participation rate. The districts with lower participation rates were mainly from the western region of Uttar Pradesh including Ghaziabad, Bijnor, Etah and Shahjahanpur.

Factor Analysis of Economic Development Indicators, 2011

The principal component analysis of nine indicators related to economic development for the year of 2010-11 has yielded three major components which together accounts for 83.1 percent of the total variance in economic development in Uttar Pradesh (Table 4 and Fig. 2). The first factor explained of the cumulative variance as high as 44.69 percent with eigen value of 4.022, second factor explained 66.54 percent and third factor explained 83.12 percent of the total cumulative variance (Table 4). The first factor explained the variation mainly due to per capita income (0.901) followed by urbanization (0.898), share of secondary sector (0.824) and percentage of non-agricultural workers (-0.818). Spatial analysis shows that Gautam Budhha Nagar, Ghaziabad, Lucknow, Kanpur Nagar, Meerut and Varanasi are the few districts that achieved a very high level of development during 2011. Districts like Maharajganj, Basti, Chitrakoot, Bahraich and Shravasti mainly from eastern region of Uttar Pradesh show very low level of development (Figure 1, component 1). The second component is an economic indicator and explains 66.56 percent of the total variance. Three indicators of economic nature showed highest factor coefficient value during 2011. These indicators are: share of the tertiary sector (0.853), percentage of industrial workers (0.761) and share of the primary sector (-0.701). The third component gives highest loading to the total work participation rate (0.951) and female work participation rate (0.922).

Economic Development Index (EDI)

The composite index of economic development for the year 2001- 11 is, in fact, an aggregate of weight scores of the three components which have been discussed above. Table 5 shows that Gautam Budh nagar has occupied top rank in terms of economic development during 2001-11 (Fig. 3). The district has a weight score value of 1.776 followed by Ghaziabad (1.029) during 2011. Both the districts are adjacent to each other and fall under very high factor score in non-agricultural workers, contribution of primary and secondary sector, per capita income and rate of urbanization. Western districts like Meerut, Ghaziabad, Baghpat and Gautum Buddha Nagar have a locational significance. The well-developed city NOIDA is located in Gautum Buddha Nagar is a part of Export Processing Zone (EPZ) as well as the Special Economic Zone (SEZ). The pace of development is also high along the axis of Yumuna Express Highway. Table 5 shows that Lucknow, Kanpur, Jhansi, Varanasi, and Meerut are the developed districts during 2011 with ranks varying from third to seventh. Districts with large cities such as Lucknow (the capital of Uttar Pradesh), Kanpur (the largest city of Uttar Pradesh and the main commercial and industrial centre), and Varanasi (a religious, spiritual and educational centre) do show higher development. Besides, horticulture (betel leaves and mangoes) and household industry (silk weaving) also contribute to higher development largely on account of employment offered by these occupations and a degree of specialization by which the product is known. These cities also offer opportunities of tourism and tourist related activities. Meerut ranked second in financial

penetration index, which measures the presence of ATMs and bank branches (Sahni, 2011).

There are six districts namely Sant Kabir nagar, Basti, Lakhimpur kheri, Chitrakoot, Shravasti and Bahraich characterized by very low level of economic development. The factor scores of this category ranges from -0.451 in Sant Ravidas Nagar to -0.574 in Bahraich (Table 5). With significantly lower per capita income and rate of urbanization, Bahraich emerges as the economically the least developed district in 2011. The economic backwardness of the district is evident from the fact that only 3.3 percent workers in the district were engaged in industrial sector. In this district, employment opportunities in the non- agricultural sector are limited and there is overcrowding in agricultural sector (Garia, 2008).

Regional disparity

Figure 4 clearly shows the diverging and converging trends in the level of economic development. On the basis of coefficient of variation values, the variation in household industrial workers and level of urbanization were found to be the highest whereas lowest values were recorded in total work participation rate during 2001-11. Household industrial workers registered 31.16 percent decline that confirm the converging trends over the period of 2001 to 2011. Coefficient of variation (CV) of non-agricultural workers was 46.45 percent in 2001 which declined to 24.89 percent in 2011 that indicates declining rate of disparity. Regional disparities in the indicators like female work participation rate and work participation rate across districts declined over time (2001 to 2011). The share of the primary sector in the level of development decreased during aforesaid period and disparities among the districts widened marginally. Indicators like share of secondary sector and tertiary sector show convergence during the aforesaid period that indicates the narrowing trend of disparities among the districts. On the other hand, per capita income and level of urbanization marked slight increase in terms of disparities during 2001 to 2011.

Conclusion

The present study examined the pattern of inequality in economic development existing at the district level with the help of selected economic indicators as well as change in their ranking. Findings suggest that economic disparity existed across the districts for both the reference year of 2001 and 2011. It is evident that although the ranking (performance) in terms of economic development of the districts has changed between 2001 and 2011, there was no immediate sign of decline. Only two most developed districts such as Gautam Buddha Nagar and Ghaziabad remain in the first and second rank in economic development. This is due to the prevalence of high per capita income, high rate of urbanization and good share of non- agricultural workers and secondary sector. This is corroborating with the factor analysis results showing the contribution of each indicator to overall development. The results indicate that per capita income, urbanization and share of non-agricultural workers are contributed most for the balanced economic development. Indicators like industrial workers and share of primary sector show a little improvement in their weight score while the share of secondary sector and total work participation rate display noticeable decline between 2001 and 2011. The highest increase of disparity found in the indicators of share of primary sector followed by urbanization and per capita income. As stated earlier that income and

urbanization are the important indicators of development, but these indicators also show the rising disparity among the districts which leads unbalanced economic development in the state. This result is not surprising as many previous studies concluded the same (Bhattacharya and Sakthivel, 2004, Sarkar and Mehta 2010, Raychaudhuri & Haldar, 2009). The remaining indicators show a converging path in terms of economic disparity, the highest reduction in economic disparity recorded by the share of industrial workers. Furthermore, the findings of the study point to an imperative need for a speedy development for the three least developed districts namely Bahraich (-0.574), Shravasti (-0.559) and Lakhimpur Kheri (-0.476). A similar approach is required for the districts of the Bundelkhand region such as Chitrakoot, Banda, and Lalitpur. The scope of the present study will be more broadened by incorporating indicators related to industrial development (for example, districts wise output of the different manufacturing industries) if the bottleneck of the data availability is removed. For the robust analysis in the future, other multivariate techniques can be used which will widen the horizon of the use of more indicators of economic development and will give a deep insight into overall economic development in Uttar Pradesh.

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