Asia-Pacific Research and Training Network on Trade
Working Paper Series, No. 105, September 2011

The rich keep getting richer in India! Says who?

by

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Executive summary

In India, the popular perception is that economic reforms have benefited the rich more than the poor, leading to unequal income distribution as in Quah's twin peaks hypothesis. If economic reforms are pro-rich then we would see the emergence of twin peaks in the underlying income distribution function – clustering of rich people and clustering of poor people. On the other hand, a uniform growth process at a pan-India level will lead to the disappearance of any such clusters. Considering district-level per capita income data from the Planning Commission of India, in 1999/2000 and 2004/05, we find that income distribution has not changed; thus, the perception about economic reforms having benefitted only the rich is not supported by the data. The results suggest that between 1999/2000 and 2004/05 there was no statistically significant difference in the median-adjusted income distribution functions. In fact, the income density function for 2004/05 became more platykurtic (with fewer extreme values) than it was during 1999/2000, suggesting that there has been a reduction in inter-district per-capita income disparity.

Introduction

The present buzzword for India's development strategy is inclusive growth, which growth emphasizes a more equitable distribution of income as well as building capabilities for attaining better health and education. If popular press articles are any indication to go by, then most of the recently published articles on inclusive growth are about the effectiveness of government development programmes in reducing poverty ("Poverty rate drops, rural wages up during six years of UPA rule", *Economic Times, 2011b*) and whether pursuing economic reforms has any negative fall-out, such as an increase in income inequality ("Talk of inclusive growth, rich getting richer, faster: Report," Economic Times, 2011b).

It should be noted that the perception regarding economic reforms only benefitting the rich might have been one of the factors responsible for the ouster of the National Democratic Alliance (NDA) government, and paving the way for the election of the United Progressive Alliance (UPA) to government initially during 2004, and subsequent re-election in 2009. The slogan about "India Shining" completely backfired for the NDA. To address this perception about increased inequity – with the rich getting more opportunities to participate in the market than the poor – the UPA Government, started market intervention. Schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme, under which the poor are guaranteed 100 days of employment, is a classic example of labour market intervention. There has also been a plethora of other schemes by the UPA Government such as mid-day meal schemes, Indira Awas Yojana (housing), Pradhan Mantri Gram Sadak Yojana (rural roads) among others. Capital market intervention such as micro-financing has also emerged in a big way.

How true is this perception about increased income inequality and a fall in poverty? In fact, a number of studies have indicated that India is spatially heterogeneous in terms of opportunities to earn income. For example, Tendulkar (2010) admitted that during the eleventh Five-Year Plan (2007-2012) there had been a rise in summary measures of relative inequality (Gini coefficients), especially in the urban areas. On the basis of the 1991 census by the Government of India), Kurian (2000) found evidence of widening regional disparities in India when measured in terms of sex ratio (females per 1,000 males), female literacy, infant mortality and the level of infrastructure development. He found that the forward group of States (Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, Maharashtra, Punjab and Tamil Nadu), with higher per-capita income, had moved ahead in terms of performance of the aforementioned parameters relative to the backward group of States (Assam, Bihar, Rajasthan, Uttar Pradesh and West Bengal), i.e., the States with lower per capita income. On the basis of data obtained from Planning Commission in 2000, Mehta (2003) found that spatial inequalities existed at all level of disaggregation – a given State may perform extremely well on all indicators but there may be districts within that State that are among the most deprived in the country, or a State may have very high levels of attainment for certain specific development indicator(s) but not all of them.

In order to examine whether indeed the poor are left behind, this working paper considers the dynamics of income distributional pattern in India. If reforms are pro-rich

then we would see emergence of twin peaks in the underlying income distribution function, i.e., clustering of the rich people, and clustering of the poor people. On the other hand, a uniform growth process at a pan-India level will lead to the disappearance of any such clusters. Considering district-level per capita income data from the Planning Commission, between 1999/2000 and 2004/05 income distribution did not change; thus, the perception of economic reforms having benefitted only the rich is not supported by the data. The results suggest that between 1999/2000 and 2004/05 there was no statistically significant difference in the median-adjusted income distribution functions. In fact, the income density function for 2004/05 became more platykurtic (with fewer extreme values) than it was during 1999/2000, suggesting that there had been a reduction in inter-district per capita income disparity.

This idea is embedded in the work done by Quah (1993 and 1996), and Jones (1997), who introduced the notion of twin peaks in cross-country income distribution. Quah (1993 and 1996) found evidence about persistence and stratification of income density functions. Jones (1997) observed that clustering could be a temporary phenomenon, as might happen with high frequency growth miracles data. Here the conclusions are little less stark. The emergence of twin peaks implies polarization of cross-country income distribution into a rich and a poor convergence club.

A. Heterogeneity and inequality

India is a heterogeneous country. Policy makers should be held accountable when heterogeneity leads to inequity in opportunities to earn income. In this context it is worth mentioning that equality of income distribution might not always lead to equity. Equality is a positive concept that describes a state of distribution but without indicating whether this distribution is "good", or "bad". On the other hand, equity is a value judgment made on distributive mechanisms and outcomes, using the principle of justice. Thus, a "fair" income distribution usually refers to an income distribution that conforms to a commonly accepted principle of justice. From the policy perspective, one should worry about existence of market imperfection leading to inequity, as opposed to inequality.

Inequality (in terms of income earned) can primarily be due to circumstantial reasons or policy failure.[1] Circumstantial reasons are exogenous and cannot be controlled by policy measures. Examples of circumstance-led poverty are because of (a) caste, (b) natural disasters, (c) gender and (d) wars. For example, people born in some lower caste in India (scheduled tribes or scheduled castes) are most likely to start with limited opportunities to participate in the market, and hence have a lower steady state level of income (i.e., poor). Backwardness in certain areas in Gujarat, Madhya Pradesh, Bihar and Orissa, are explained by the preponderance of lower-caste people living in those areas.

Inequality can also persist because of policy failures. It happens primarily because of a lack of access to education and basic healthcare, unequal distribution of productive assets (land, livestock etc.), a lack of legal empowerment among the vulnerable section of

[1] For a detailed discussion about inequality in India and elsewhere in Asia see Banik, 2009.

the population, and corruption. In addition, inefficient and corrupt bureaucracies raise transactions costs in the asset market that is important for the poor, in addition to reducing interregional mobility.[2] These factors are particularly true not only for India but also for other countries. In a cross-country study, Mauro (1995) suggested that corruption was more prevalent in low-income countries, and that reducing corruption would have a positive influence on investment rates (an increase of around 5 per cent) as well as the overall gross domestic product growth of a region.

Interestingly for India, these circumstantial reasons as well as policy failures leading to poverty are spatially concentrated. For example, in India, the services and industry sectors contribute some 80 per cent of the total national income. However, most of the industry and services sectors are located in the States of Gujarat, Maharashtra and Tamil Nadu. Together, these three States contribute some 40 per cent of the total national income originating from the industry and services sectors. On the other hand, output from the agriculture sector, which contributes some 20 per cent of the national income, is mostly produced in the northern and central States of Uttar Pradesh, Madhya Pradesh, Rajasthan and Bihar (around 50 per cent of total agricultural production in India). Heterogeneity also exists within a State. For 2005/2006, the district of Gautam Budh Nagar in Uttar Pradesh had a per capita income of Rs. 60,082, a figure that is around nine times higher than that of Shravasti, the poorest district in Uttar Pradesh (Planning Commission, 2010).

Thus, there is a broad consensus about India being heterogeneous and unequal in terms of opportunities to earn income. However, what is debatable is whether this notion of heterogeneity has changed over time. In particular, it is interesting to examine the factors responsible for changing or not changing the underlying income distribution functions. This aspect is analysed below.

B. Data

The data on district per capita income are from the Planning Commission. The authors considered the period between 1999/2000 and 2004/05. Data for the years after 2004/05 are not available for all the districts, resulting in a significant drop in the number of observations. Also many districts are newly formed and information about per capita income in those districts is not available for earlier years.[3] Therefore, to maintain uniformity, and to achieve a more robust result, the authors considered the aforementioned

[2] For example, the controversy surrounding India's "First Family" being accused of land grabbing is a testimony of how land records are poorly maintained and the fact that officials who have the authority to certify ownership might be corrupt. In a similar vein, incidents – reflecting the emergence of regionalism (thanks, to Shiv Sena a regional political party) in the State of Maharashtra – show what can happen to a vibrant democracy if property or legal rights are not properly enforced. A search on Google generated more than 1,000,000 hits on these two issues alone.

[3] In 2011, there were 627 districts in India, while in 2000 there were 585 districts. Many of these districts are newly formed, and for some of them information about the income variable is unavailable. A case in point is Delhi. The census of 2001 contains information about many variables related to north, north-east, north-west, south, south-west, west, east and central Delhi. However, with regard to per capita income during 2001, information is available only for Delhi as a whole and not its constituent districts (Planning Commission, http://districts.nic.in/dstats.aspx, accessed 2 April 2011).

period. For 1999/2000, an important omission in the Planning Commission data is district-level income for the State of Gujarat as well as Delhi. During 1999/2000, there are 508 data points (out of 585 districts) in India. For the latter fiscal years (2001/02, and 2004/05), the data points cover 536 districts. This increase in the number of observations is due to the inclusion of per capita district income data from Gujarat State and Delhi, which are unavailable for 1999/2000. The per capita district income data for Gujarat State and Delhi are taken from Indicus Analytics, Delhi.[4]

C. Results

The analysis provides some interesting results. No evidence is found to support twin peaks, i.e., clustering of high-income districts and low-income districts across India. A uniform increase has occurred in income among all the districts.

Table 1. Per capita income summary statistics (in 1999 rupees)

	1999/00	2001/02	2004/05
Mean	15 512.3	16 882.7	19 600.8
Median	14 029.5	15 154.5	17 084.5
Standard deviation	7 660.9	9 126.5	12 093.4
Skewness	1.5	2.0	3.0
Kurtosis	7.3	12.1	23.3

Table 1 shows an increase in the mean and in the median per capita district income. There are also increases in standard deviation, skewness and kurtosis measures of income. In fact, as kurtosis became very high during the latter period, i.e., 2004/05, the assumption of normality might not be valid. So the non-parametric sign test was used to test for the increase in income across different periods. The results in table 2 show that there was a significant increase in the mean and median per capita district-level income between 1999/2000 and 2004/05 as well as between 2001/02 and 2004/05. Since the income distribution is skewed as well as having a high kurtosis (table 1), the authors performed the same set of tests for the log per capita income, which provided similar results. This indicated an overall increase in the level of income.

Table 2. Tests for significance in mean and variance of income

	1999/00 and 2004/05 (without Gujarat and Delhi)	2001/02 and 2004/05
T-test of mean difference: Income	19.41 (0.00)*	16.08 (0.00)
T-test of mean difference: Log income	23.22 (0.00)	22.11 (0.00)
Z-Value of sign test of median: Income	6.87 (0.00)	4.98 (0.00)
Z-Value of sign test of median: Log income	6.78 (0.00)	4.99 (0.00)

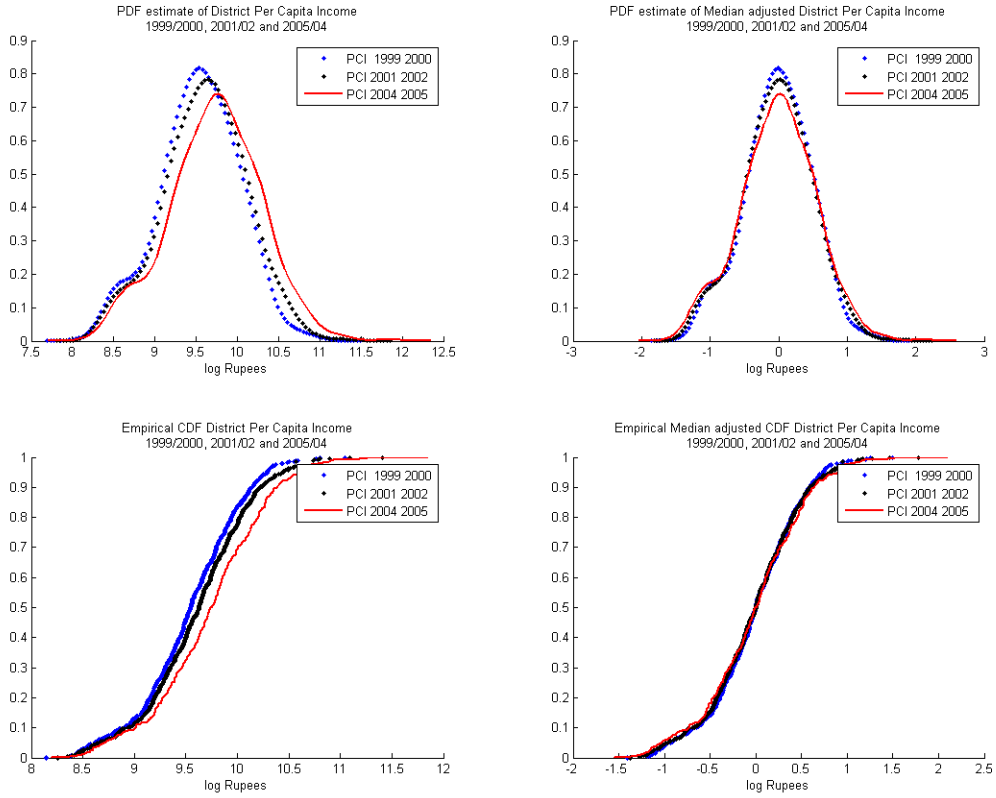
* *P*-values are given in parenthesis.

[4] Indicus Analytics collect data from the Central Statistical Organization (CSO), Ministry of Statistics and Programme Implementation. CSO collates data from respective State governments. The Planning Commission database also uses the CSO database. Therefore, introducing per capita district-level income data for Gujarat State and Delhi for 2001/02 and 2004/05 does not affect (bias) the results given in this paper.

Since there has been an increase in the mean and the median per-capita income, does this indicate that districts with high per capita income have become well-off relative to the districts with low per capita income? In other words, is there any evidence in favour of clustering, or divergence of income, between the richer and the poorer districts? To analyse this aspect, income density function for 1999/2000, 2001/2002 and 2004/05 is plotted in figure 1.

It can be seen that in considering district income data there is definitely no evidence of an emergence of twin peaks in any of these periods. There is, however, a shift in the per capita income density function during these same periods. This is due to a significant increase in the mean and the median per capita income from 1999/2000 to 2004/05.

Figure 1. Median adjusted densities and distribution of district-level log-income in 1999/2000, 2001/02 and 2004/05.



The income distribution functions also show evidence about first-order stochastic dominance. The income distribution function for 2004/05 everywhere lies below (that is, to the right of) income distribution drawn for 2001/02. An income distribution function stochastically dominates another if the percentage of people below any given income change amount is smaller in the first than in the second. The income distribution function that stochastically dominates the other also has less poverty than the other.

Table 3. Extent of poverty in India

	1993/94* Fiftieth round of National Sample Survey	2004/05* Sixty-first round of National Sample Survey	1993/94 (Head count ratio)	2004/05 (Head count ratio)
Rural	2 440.3	2 209.2	50.1	41.8
Urban	763.4	808.0	31.8	25.7

Sources: Planning Commission, 2010, and Tendulkar, 2009.
* Numbers in 100,000s.

Similarly, income distribution for 2001/02 lies to the right of income distribution drawn for 1999/2000. This implies that between 1999/2000 and 2004/05, poverty had fallen. This is also evident from the Planning Commission data showing that on the basis of fiftieth and sixty-first rounds of the National Sample Survey, conducted by Ministry of Statistics and Programme Implementation, there was a fall in the absolute number of people living below the poverty line (table 3).

This result is not surprising. It has been widely documented that when economic growth occurs, absolute poverty falls.[5] What is more interesting is to examine whether there is any significant change among districts in the median-adjusted per capita income distribution function between 1999/2000 and 2004/05, and between 2001/02 and 2004/05. This is especially relevant because the income density function for 2004/05 becomes more platykurtic (with fewer extreme values) than during 1999/2000.

The authors ran the Kolmogorov-Smirnov (KS) test to ascertain whether there was any statistically significant difference in the median-adjusted per capita income distribution between different fiscal years, i.e., 1999/2000 to 2004/05, and 2001/02 to 2004/05. For a given cumulative density function, *F(X)*, the KS statistic is given as:
$D_{n,n'} = \sup_x \left| F_{1,n}(x) - F_{2,n'}(x) \right|$, where $\sup_x$ is the supremum of the set of distances given by $D_{n,n'}$. Under the condition when $D_{n,n'}$ converges to zero it implies no significant change in *F(X)* between the periods 1 and 2. Under this condition, there is no change in moment conditions for the cumulative density functions plotted in two different periods. On the other hand, a statistically significant difference in median-adjusted per capita income distribution in two different periods is an indication that among the districts there has been an increase in income disparity. To visually inspect the formation of twin peaks (if any), the authors computed the density estimates using the Epanechnikov kernel with a bandwidth chosen for optimizing normal densities.[6]

[5] For an excellent discussion on this topic see Fields (2001), pp. 102-104.
[6] Compared to other kernels (Gaussian, Uniform, Triangular and Bi-weight), the Epanechnikov kernel minimizes the asymptotic mean integrated square error, and hence was chosen for this analysis.

Table 4. Tests of distributional difference of median-adjusted log income

	1999/00 and 2004/05 (without Gujarat State and Delhi)	2001/02 and 2004/05
Kolmogorov-Smirnov (KS) one-sided test statistics	0.042 (0.38)*	0.036 (0.48)

* *P*-values are in the parenthesis.

The results suggest that between 1999/2000 and 2004/05 there was no statistically significant difference in the median-adjusted income distribution functions. A similar conclusion was reached while comparing the income distribution functions for 2001/2002 and 2004/2005. In fact, a glance at the median-adjusted per capita income densities drawn for 1999/2000, 2000/01 and 2004/05 suggest that these distribution functions are more or less similar (figure 1). The data suggest that both the rich and the poor districts became equally well-off. There was a reduction in income disparity among districts. The authors, however, acknowledge that this analysis of the dynamics of per capita income distribution across districts does not capture intra (within)-district change in income inequality, especially at the household level. To visually compare the effects, the authors divided India into high-, medium- and low-income regions using the thirty-third and sixty-sixth percentiles of the income data from 2001/02 (Rs. 13,484.8, and Rs. 20,897.2, respectively). Figure 2b shows these different income regions for 2001/02. Using the same values, the high-, medium- and low-income regions were obtained for 2004/05 (figure 2a). The most striking observation is that some of the districts from Madhya Pradesh, Orissa and Rajasthan States moved from the low-income category to the middle-income category.

Figure 2a. District per capita income for 2004/05, subdivided into high-, middle- and low-income categories, according to thirty-third and sixty-sixth percentiles (using 2001/02 as base income).

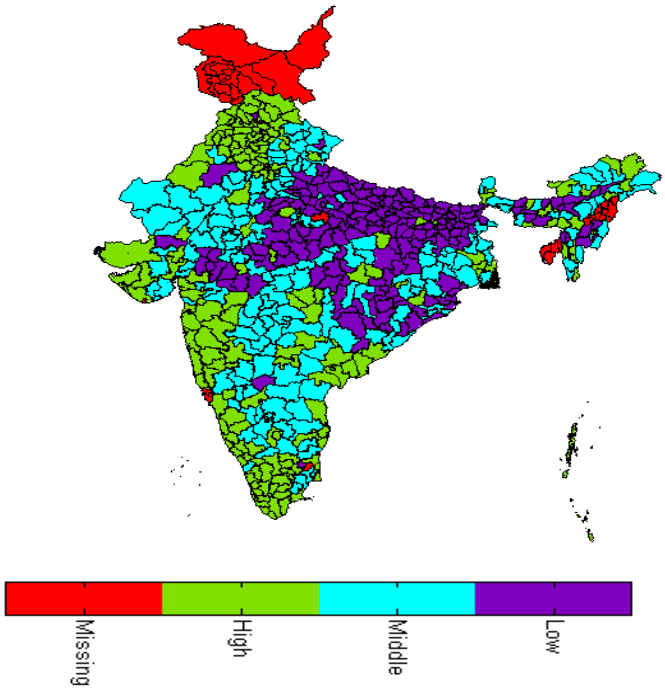
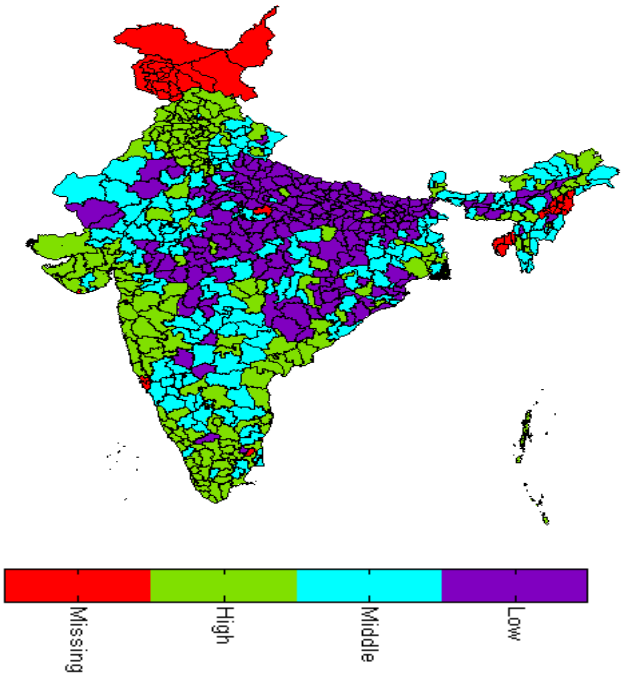


Figure 2b. District per capita income for 2001/02, subdivided into high-, middle- and low-income categories, according to thirty-third and sixty-sixth percentiles (using 2001/02 as base income).



It is evident from figures 2a and 2b that for 2004/05 there were more districts in the middle- and the high-income categories than during 2001/02. These mini-district economies interacted with each other, and managed to grow together. The authors argue that as inter-income disparity fell among districts between 2001/02 and 2004/2005, looking ahead there is a likelihood of this income disparity even falling further. This is because active labour and capital market intervention only started after 2005 when, in addition to MGNREGA, the Government of India introduced other schemes such as mid-day meal schemes for primary school children, Indira Awas Yojana (building houses for the poor), Pradhan Mantri Gram Sadak Yojana (scheme for building rural roads), and other micro-financing activities. Hence, if there was a fall in inter-district per capita income disparity for the period before these schemes were started, there is a likelihood that the process of income generation will be more uniform once these schemes are in place.

D. Conclusion

The growth process has been uniform across India. Working with district-level data for the period between 1999/2000 and 2004/05, results suggest no divergence in income across districts in India. The income dynamics provide no evidence in support of the twin peaks hypothesis – clustering of the high-income districts and the low-income districts at a pan-India level. In fact, there has been a reduction in poverty during the post-reform period. As active labour and capital market intervention were only started after 2005, the authors argue that in looking forward, this inter-district income disparity is likely to fall further in comparison to what is observed to have occurred between 1999/2000 and

2004/2005. Although it might, perhaps, seem slightly presumptuous, but the authors believe the private sector (without depending too much on the Government) is taking the lead in moving capital and labour to areas with lesser input costs (that is, investing more in backward districts, or second- and third-tier cities), thus contributing to uniform growth across India. The fact that median income is increasing in India shows that both the rich and the poor are benefiting from the reforms process.

However, as the data in this paper show, the authors recognize that pockets of deprivation exist in India, and that there is a necessity for a focused government intervention in such regions. This analysis about dynamics of per capita income distribution across districts does not capture intra-district change in income inequality, especially at the household-level. Therefore, the element of deprivation that is seen to exist may indicate that in certain districts income inequality has increased. However, between districts, income inequality has fallen. The ongoing reform process cannot be blamed entirely for this occurrence. Reforms encourage more active market participation, and hence will not guarantee equal returns to all. While returns to skilled labour are going to increase (due to the scarcity in number), unskilled labour will be left out unless necessary skills are developed by that group. Since the Indian economy is predominantly service-driven, one approach would be to train such workers through vocational education. The growth experience of some South-East Asian economies suggests that one of the reasons why these economies are doing so well (in terms of income distribution) is because the governments of those countries have emphasized vocational education. Growth in those economies is primarily driven by increased workforce participation.

India can imitate this South-East Asian experience. People in India, by and large, are street-smart. Given a little training, they can find employment in some types of manufacturing (e.g., operating machinery) or service-related activities (such as nursing and health care). However, training without developing the necessary infrastructure is going to be of little use. Industries and multinationals will not be willing to invest in the absence of good roads and railway networks (physical infrastructure) as well as proper legal systems and property right regimes (social infrastructure). So infrastructure, whether it is physical or social, is a key component of the existing reform process. Only then will it be possible to say that “India is shining”.

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