

Gender Equality, Growth and Human Development in India

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This article evaluates gender inequalities in education and employment and examines their impacts on economic growth and human development in 15 major states of India. Although the overall gender gap has declined marginally due to reduced gender gaps in political empowerment and educational attainment, it has remained high due to huge gender gaps in other categories. India has attained gender parity in primary and upper primary education and has been moving towards gender equality in literacy. Gender equality in life expectancy has improved modestly at the cost of increasing gender disparity in infant mortality. Despite the increasing literacy rate and educational levels among women, the female labor force participation rate has been declining with increasing gender gaps in wage and income. Gender equalities in literacy and labor force participation rates have positive impacts on per capita income and human development. The results suggest the need for adopting policies to create conditions, which would allow both women and men to realize their full human potential. They also suggest that increasing investment in infrastructure and the social sector could play an important role.

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INTRODUCTION

Gender discrimination against women takes place in many forms. While this discrimination is generally recognized in the form of differential wage rates in the labor market in developed economies, it takes the form of differential access to education, health and wage employment in developing economies (Collier 1994). The prevailing gender inequalities in well-being related dimensions such as education, health, employment and income in developing economies have many implications. While from the point of view of welfare and equity, such inequalities are considered to be a form of injustice to women as they lower their well-being, these inequalities have serious development outcomes as they reduce economic growth and its associated benefits (Klasen & Lamanna 2009).

The Millennium Development Goals (MDGs), consisting of eight goals set for the year 2015, were intended to increase an individual's human capabilities and advance the means to a productive life. One of the goals was to promote gender equality and empower women. Similarly, one of the Sustainable Development Goals (SDGs),

proposed to be achieved by 2030 replacing the MDGs, is to ‘achieve gender equality and empower all women and girls’. It has been argued that “Gender equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world. Providing women and girls with equal access to education, health care, decent work, and representation in political and economic decision-making processes will fuel sustainable economies and benefit societies and humanity at large¹.” The United Nations advocates for adopting and strengthening “sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.”

Gender inequality is one of the major challenges facing India’s policymakers, who are trying to achieve ‘faster, sustainable, and more inclusive growth’. For growth to be inclusive, the people, irrespective of gender, must have the opportunity to participate productively in the economic growth process. However, despite significant economic progress over the past 25 years, gender inequalities in such critical spheres as education, health, employment and income have been conspicuous. This article evaluates gender inequalities in education and employment and examines their impacts on economic growth and human development in 15 major states of India. The rest of the article is organized as follows. Section 2 reviews the related literature. Section 3 examines the trends in gender inequalities in terms of the gender gap index and some indicators of gender gaps in education, health outcomes, employment, and income. Section 4 examines the impacts of gender inequalities in education and employment on economic growth and human development. Section 5 summarizes the major findings and conclusions.

REVIEW OF LITERATURE

A number of theoretical and empirical studies have examined the relationship between gender inequality and economic growth. Bloom & Williamson (1998), Dollar & Gatti (1999), Galor & Weil (1996), King, Klasen & Porter (2008), Knowles et al (2002), Lagerlof (2003) and World Bank (2001) have suggested an inverse relationship between gender inequality in education and economic growth, largely due to the positive impact of female education on fertility and human capital of the next generation. Gender inequality in education adversely affects economic growth, as it reduces the average quota of human capital in a society by excluding qualified girls and including less qualified boys (Dollar & Gatti 1999). And given the diminishing marginal returns to education, this signifies that by reducing gender inequality in education giving more access to girls would boost economic growth, as the marginal returns to investment in girls’ education is higher than that of boys’ education (Knowles et al, 2002; World Bank 2001). Female education was found to have a positive impact on next generation’s education, and reduces fertility and infant mortality, all of which significantly contribute to economic growth (Galor & Weil 1996; King, Klasen & Porter 2008; Lagerlof 2003; World Bank 2001). A reduced fertility level lowers the dependency ratio and offers a ‘demographic dividend’ with positive impacts on economic growth (Bloom & Williamson 1998).

Gender inequality in employment reduces the pool of talented workers to be hired, which reduces the average quality of the workforce (Esteve-Volart 2004). Such distortion is possible also for the self-employed in agricultural and non-agricultural sectors, which may reduce their average productivity and overall economic growth (Blackden, et al. 2007). Gender inequality in employment is also associated with higher fertility which reduces economic growth (Cavalcanti & Tavares 2007). Women’s employment and earnings increase their bargaining power in the family (Haddad, Hoddinott & Alderman 1997; King, Klasen & Porter 2008; Klasen & Wink 2003; Sen 1990; Thomas 1997; World Bank 2001). This can have beneficial effects not only for the women concerned but also for economic growth through higher savings (Seguino & Floro 2003), more productive investments and use, and repayment of credit (Stotsky 2006). It also helps higher investments in the education and health of their children, promoting future human capital and economic growth (Thomas 1997; World Bank 2001). Thus, wom-

¹ United Nations: *Sustainable Development Goals: 17 Goals to Transform our World*. <http://www.un.org/sustainabledevelopment/gender-equality/>.

en's employment is essential for promoting overall gender equity, as gender equality in livelihoods can contribute to equality in other domains.

At the empirical level, King & Hill (1993), and Knowles et al (2002) demonstrate that gender inequalities in education have a large and statistically significant negative effect on the level of gross domestic product (GDP). Contradicting the results reported by Barro & Lee (1994), Appiah & McMahon (2002), Dollar & Gatti (1999), Forbes (2000), and Klasen (2002) find that gender gaps in education have a negative impact on subsequent economic growth. Blackden & Bhanu (1999) argue that gender inequality could hinder growth by limiting the ability of women to accumulate capital.

Empirical studies on the impact of gender inequalities in employment and wages on economic growth report that increases in female labor force participation and formal-sector employment have been associated with higher growth (Klasen 1999). Seguino (2000a, 2000b) finds that low gender inequalities in education and employment with large gender inequalities in wages have contributed to the growth experience of export oriented, middle-income countries. This is supported by Busse & Spielmann (2006), who find that similar gender gaps in education, employment and wages have helped promote exports in a sample of twenty-three developing countries. Stotsky (2006) argues that improving gender equality and the status of women have helped promote economic growth and macroeconomic stability, especially in developing countries.

Gender equality in workforce participation is a necessary condition for inclusive growth. High female labor force participation can promote economic growth by reducing the effect of a shrinking workforce (Elborgh Woytek, et al. 2013; Rahaman & Islam 2013). Extending opportunities for women can contribute to economic development through increased school enrolment for girls in developing economies (Elborgh Woytek, et al. 2013). Women can play an important role by contributing to the household income and adding to the supply of labor for economic activities (Rahaman & Islam 2013). Gender equality is considered vital for the progress and development of a country. A further review of the literature on gender inequalities and economic growth is available in Klasen (1999, 2002, 2006) which is summarized in Klasen & Lamanna (2009).

In the Indian context, there are several studies that have addressed issues related to gender inequality. There are attempts to explain the gender gap in education in India in terms of labour market discrimination against women and parental discrimination against girls. Using household survey data collected in urban Uttar Pradesh, Kingdon (1998) found that due to overall labour market discrimination, girls face poorer economic incentives to invest in schooling than boys because they get lower labour market returns to education than boys. In another study, Kingdon (2002) finds that girls face significantly different treatment in the intra-household allocation of education. Investigating the extent to which education contributes to women's lower labour force participation and earnings than men, and whether any contribution of education to the gender wage differential is explained by the gender differential in educational endowments or by labour market discrimination, Kingdon & Unni (2001) observe that women do suffer high levels of wage discrimination in the Indian urban labour market. However, education contributes little to this discrimination, and the returns to education rise with the level of education for both men and women. Esteve-Volart (2004) found that the ratio of female-to-male managers and the ratio of female-to-male workers are positively and significantly related to per capita output in 16 major states of India. Arora (2012) reported that, by and large, per capita income is inversely associated with gender inequality in education and health at the sub-national level in India. Ukhova (2015) examined how gender inequality has contributed to, and been affected by, growing economic inequality, and suggests policies to simultaneously address the issues of gender inequality and economic inequality in eight emerging economies (Brazil, Russia, India, China, South Africa, Mexico, Indonesia, and Turkey). Evaluating the role of socio-economic and cultural factors in influencing gender differentials in schooling with district-level data from India, Rammohan & Vu (2018) found that economic development is an important factor in narrowing gender gaps in education, with richer districts more likely to educate girls than poorer districts. Most of the studies in the Indian context are primarily concerned with explaining gender inequalities in various dimensions prevalent in the society. These are mostly carried out from a sociological perspective. However, studies dealing with gender inequalities from an economic

perspective are relatively few and far between, and the impact of gender inequalities on economic growth and development has not received adequate attention.

Although there are several studies investigating the relationship between gender inequalities and growth/development in the context of developed economies, there are few studies available in the scholarly literature examining this aspect of gender inequality in India. This study contributes significantly to existing literature by comprehensively evaluating the trends in the magnitude of gender inequalities in education, health outcomes, political participation, and employment and income, using a large data set. We are motivated to explore these trends on the ground as an economy cannot fully develop when women, representing almost half (48.46 percent) of the country's population, remain deprived and discriminated against amidst gender inequalities. This study further contributes to the existing literature by examining the impacts of gender inequalities in education and employment on economic growth and human development applying simple econometric techniques and utilizing up-to-date cross-sectional data covering 15 major states in India at various time points during a longitudinal period between 1981 and 2016. While some studies exist that interrogate the impact of gender inequalities on economic growth, there are only a few studies that address the effect of these inequalities on human development. This study makes an attempt to fill this gap in an Indian context. Moreover, the approach employed here in analyzing gender inequalities and their impacts on economic growth and development is different from those used in the studies performed earlier. The analysis was done using both descriptive statistics (tables and figures) and econometric techniques. This study also offers useful results in helping to guide development policy.

TRENDS IN GENDER INEQUALITY

Gender inequality can arise due to gaps in economic participation and opportunities, educational attainment, health and survival, and political empowerment. These are induced by unequal access to education, legal systems, the labor market and finances, which may result in gender gaps in outcomes, such as low female labor force participation, low wages, and reduced political power (Hakura, et al. 2016). This section evaluates gender inequalities in terms of the Global Gender Gap Index and some indicators of gender gaps in education, health, employment and income at the national and sub-national levels in India. We focus on 15 major states (Andhra Pradesh (AP), Assam, Bihar, Haryana, Gujarat, Karnataka, Kerala, Madhya Pradesh (MP), Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh (UP) and West Bengal) for which data was consistently available across the time period being observed in the dataset.

Gender Gap Index

The Global Gender Gap Index (GGGI) is designed by the World Economic Forum (WEF) to measure gender-based gaps in access to resources and opportunities such as health, education, economic participation and political empowerment. The GGGI measures the gap between women and men in four fundamental categories (i) economic participation and opportunity, (ii) educational attainment, (iii) health and survival, and (iv) political empowerment. These domains are interrelated; progress in one domain can bring about change in another; progress in any one domain without progress in the others is not enough to achieve the overall objective of gender equality. The GGGI is a composite measure of gender inequality combining the gender gaps in the four categories with 14 different indicators that compose them. The economic participation and opportunity index consists of (a) the participation gap (measured in terms of the difference between women and men in labor force participation rates), (b) the remuneration gap (measured in terms of the ratio of estimated female-to-male earned income, and a qualitative indicator measuring wage equality for similar work), and (c) the advancement gap (captured by the ratio of women-to-men among legislators, senior officials and managers, and the ratio of women-to-men in technical and professional workers). The educational attainment index measures the gap between women and men in education in terms of the female-to-male ratio in the literacy rate, and primary, secondary and tertiary education. The health and survival gap index is constructed using two indicators, sex-ratio

at birth as a measure of the phenomenon of “missing women” due to a strong son preference in many countries, and the ratio of women-to-men in life expectancy. The political empowerment gap index is constructed using the ratios of women-to-men in minister-level and parliamentary positions [for details, see World Economic Forum (various years)].

Table 1 presents the estimated scores of the gender gap index for India and some Asian countries along with the best performing country in the world in various years. While Sweden was the best performer in achieving gender equality in 2006, Iceland was the best performing country in the world in the remaining years. Though all the countries except Sri Lanka were able to reduce gender gaps, their relative position has changed over the years. Despite being a lower-middle-income country, the Philippines performed consistently well in achieving gender equality, maintaining her position among the top six to ten countries in the world and occupies the top position among Asian countries across the years. Pakistan was the worst performer in all years examined, followed by Nepal in most years. While Bangladesh was able to improve her relative position remarkably over the years, and the Philippines, Singapore and Nepal maintained their relative positions, the remaining Asian countries, particularly Sri Lanka, experienced a sharp deterioration in their relative positions. Gender inequality thus appears to be functioning independently from economic prosperity in these countries. In most countries examined here, their score on the index has not increased nominally thus, their relative positions have deteriorated sharply over the years despite often remarkable economic growth. Notably, gender inequality has stayed stubbornly high in Japan and South Korea even though they belong to the group of high-income countries.

As a lower-middle-income country, India ranked 98th in 2006, 87th in 2016 and 108th in 2017. Gender inequality was very high in all years during 2006–2017 due to huge gender gaps in all categories except political empowerment. While relatively, in terms of economic participation and opportunity, educational attainment, and health and survival, India’s position has deteriorated significantly over the years, political empowerment, however, has improved greatly (Table 2). Overall, gender inequality has declined to an extent due to these factors (Figure 1). The estimates of the GGGI as a composite measure of gender inequality in reproductive health, empowerment, and the labor market placed India at 125th position among 188 countries in 2015. India’s position was well below some sub-Saharan African countries like Rwanda, Uganda and Ethiopia (UNDP 2016). Similarly, the Gender Development Index, measured as a ratio of female-to-male Human Development Index (HDI), was estimated at

Table 1. Gender gaps in the best performing and select Asian countries

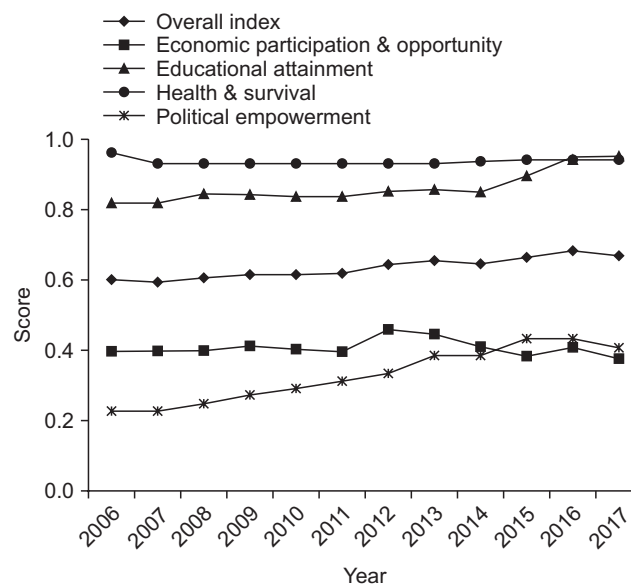
Country	2006 (115)	2010 (134)	2012 (135)	2014 (142)	2016 (144)	2017 (144)
Best Performer	0.8133 (1) (Sweden)	0.8496 (1) (Iceland)	0.8640 (1) (Iceland)	0.8594 (1) (Iceland)	0.874 (1) (Iceland)	0.878 (1) (Iceland)
Philippines	0.7516 (6)	0.7654 (9)	0.7757 (8)	0.7814 (9)	0.786 (7)	0.790 (10)
Sri Lanka	0.7199 (13)	0.7458 (16)	0.7122 (39)	0.6903 (79)	0.673 (100)	0.669 (109)
Thailand	0.6832 (40)	0.6910 (57)	0.6893 (65)	0.7027 (61)	0.699 (71)	0.694 (75)
China	0.6560 (63)	0.6881 (61)	0.6853 (69)	0.6830 (87)	0.676 (99)	0.674 (100)
Singapore	0.6550 (65)	0.6914 (56)	0.6989 (55)	0.7046 (59)	0.712 (55)	0.702 (65)
Malaysia	0.6550 (65)	0.6479 (98)	0.6539 (100)	0.6520 (107)	0.666 (106)	0.670 (104)
Japan	0.6447 (79)	0.6524 (94)	0.6530 (101)	0.6584 (104)	0.660 (111)	0.657 (114)
Bangladesh	0.6269 (91)	0.6702 (82)	0.6684 (86)	0.6973 (68)	0.698 (72)	0.719 (47)
South Korea	0.6157 (92)	0.6342 (104)	0.6356 (108)	0.6403 (117)	0.649 (116)	0.650 (118)
India	0.6010 (98)	0.6155 (112)	0.6442 (105)	0.6455 (114)	0.683 (87)	0.669 (108)
Nepal	0.5477 (111)	0.6084 (115)	0.6026 (123)	0.6458 (112)	0.661 (110)	0.664 (111)
Pakistan	0.5433 (112)	0.5465 (132)	0.5478 (134)	0.5522 (141)	0.556 (143)	0.546 (143)

Notes: Figures in parentheses beside the years are total number of countries. Figures in parentheses beside the score of the gender gap index are the rank of the countries. The gender gap index with a score equal to 1 means perfect equality, and 0 means perfect inequality.

Table 2. GGGI and its components in India

Year	Gender Gap Index (Overall)		Economic Participation & Opportunity		Educational Attainment		Health & Survival		Political Empowerment	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
2006 (115)	98	0.601	110	0.397	102	0.819	103	0.962	20	0.227
2007 (128)	114	0.594	122	0.398	116	0.819	126	0.931	21	0.227
2008 (130)	113	0.606	125	0.399	116	0.845	128	0.931	25	0.248
2009 (134)	114	0.615	127	0.412	121	0.843	134	0.931	24	0.273
2010 (134)	112	0.615	128	0.403	120	0.837	132	0.931	23	0.291
2011 (135)	113	0.619	131	0.396	121	0.837	134	0.931	19	0.312
2012 (135)	105	0.644	123	0.459	121	0.852	134	0.931	17	0.334
2013 (136)	101	0.655	124	0.446	120	0.857	135	0.931	9	0.385
2014 (142)	114	0.646	134	0.410	126	0.850	141	0.937	15	0.385
2015 (145)	108	0.664	139	0.383	125	0.896	143	0.942	9	0.433
2016 (144)	87	0.683	136	0.408	113	0.950	142	0.942	9	0.433
2017 (144)	108	0.669	139	0.376	112	0.952	141	0.942	15	0.407

Note: Figures in parentheses beside the years are total number of countries. *Sources:* World Economic Forum (various years).

**Fig. 1.** Global gender gap index trend India (2006 - 2017). *Source:* Table 2.

0.819 for the year 2015, placing India at 131st position in the world. The female HDI was 0.549 against the male HDI of 0.671 (UNDP 2016).

Gender Inequality in Education, Health and Employment

Gender inequality is persistent and takes on many forms in India, rooted in socio-economic-cultural practices. As a result, women are disproportionately under-represented in economic and other activities (Batra & Reio Jr. 2016). A predominantly patriarchal environment governs women's lives from birth to death (Chadda & Deb 2013; Razvi & Roth 2004). They face discrimination in terms of social, political, educational, and economic opportunities, resulting in continued dominance of patriarchal practices in society (Batra & Reio Jr. 2016). These practices have profound economic consequences because they do not permit society to fully utilize the talent

inherent in women, representing 48.46 percent of India's population of 1.22 billion (2011 Census) (Menon-Sen & Shiva Kumar 2001; Sivakumar 2008). Evidence shows that women lag far behind men in labor force participation and in most measures of human development such as the HDI, literacy and infant mortality. Rathi (2014) argues that low education levels, and social and cultural norms are the two main factors for keeping women at home. This results in gender disparities of income and opportunities (Smith et al 2014). Although India has made significant economic progress, the level of human development (e.g., access to educational opportunities, access to resources for good health, and a decent standard of living) has been appallingly low in most regions (Arora 2012). An economy cannot fully develop when almost half of the country's population remains deprived and discriminated against amidst gender inequalities (Madhok 2014).

Gender inequality in India exists in terms of access to health, education, and employment. Gender discrimination takes place from the very birth of a child. The female child receives less nurturing, care, and parental attention than males, making them far more susceptible than boys to disease and infections, leading to poor health and a shorter life span (Chand & Mehrotra 2012). Census data reveals that men outnumbered women in India. In 1981, there were 934 women for every 1,000 men; the sex-ratio slightly increased to 943 women for every 1,000 men in 2011 (Table 3). While ideally the sex-ratio should be 1000 women for every 1000 men, the number was below 1000 in all states except Kerala between 1981 and 2011. It was low in some developed states such as Haryana and Punjab, and declined in many states (e.g., Bihar, Gujarat, Maharashtra and Odisha) over the census years. Inter-state variation has increased over the years, as reflected in the increasing coefficient of variation (CV) in the sex-ratio. These findings confirm the phenomenon of 'missing women' due to a strong son preference. The preferential treatment for males pervades all social and economic classes in India, which sets the gender inequality standard for females all through their life span (Batra & Reio Jr. 2016).

Gender Inequality in Education

Education in India is gender discriminatory, with males obtaining more access to education than females. Due to patriarchal perceptions, girls are brought up primarily for marriage, after which they belong to their in-

Table 3. Sex-ratio in Indian states (*females per thousand males*)

State	1981	1991	2001	2011
Andhra Pradesh	975	972	978	993
Assam	910	923	935	958
Bihar	948	907	919	918
Gujarat	942	934	920	919
Haryana	870	865	861	879
Karnataka	963	960	965	973
Kerala	1032	1036	1059	1084
Madhya Pradesh	921	912	919	931
Maharashtra	937	934	922	929
Odisha	981	971	972	979
Punjab	879	882	876	895
Rajasthan	919	910	921	928
Tamil Nadu	977	974	987	996
Uttar Pradesh	882	876	898	912
West Bengal	911	917	934	950
India	934	927	933	943
CV (%)	4.75	4.84	5.22	5.35

Source: Reserve bank of India (2017).

laws. Education is not essential for them and the return on investment on their education is low compared to the education of boys (Chadda & Deb 2013; Roy & Vecchio 1998). For low-income families, the education of girls is unaffordable. As patriarchal views dominate in Indian households, girls often do not gain access to educational opportunities, and are effectively kept engaged in household chores (Batra & Reio Jr. 2016). The female literacy rate has been lower than men's; it was 29.76 percent against the male literacy rate of 56.38 percent in 1981, and 65.46 percent against the male literacy rate of 82.14 percent in 2011.

This section reviews the trend in gender inequality in literacy rate as a broad measure of educational achievement. It also examines gender differences in gross enrolment ratio in the elementary (primary and upper primary) education. Table 4 reports data on the female-to-male (F/M) literacy rate ratio. The F/M literacy rate ratio increased from 52.3 percent in 1981 to 79.7 percent in 2011. Although the ratio increased in all major states over the years, there were large inter-state variations in it; Kerala had the highest ratio across the years; Rajasthan had the lowest in 1981, 1991 and 2011 followed by Bihar, and Bihar had the lowest ratio followed by Rajasthan in 2001. However, the states have converged in the F/M literacy rate ratio, as the coefficient of variations, measuring the relative dispersion in the F/M literacy rate across states, declined over the years. The number of states with F/M literacy ratios of 80 percent and above increased from one (Kerala) in 1981 to eight out of the fifteen major states in 2011, and overall, the country has been moving toward gender equality in literacy.

This is also true for gender parity in gross enrolment in school education at the elementary level. Figure 2 exhibits trends in the gender parity index (female-to-male ratio in gross enrolment in elementary education (class I-VIII), including primary (class I-V) and upper primary (class VI-VIII) levels. The F/M ratio at all levels of education improved significantly during the period from 1990-91 to 2014-15; it increased from 71 percent in 1990-91 to 100 percent in 2011-12, and above 100 percent thereafter in elementary education; from 75 percent in 1990-91 to 100 percent in 2009-10 and more than 100 percent afterwards at the primary level, and from 61 percent in 1990-91 to 99 percent in 2011-12, and thereafter exceeded 100 percent at the upper primary level. The gender parity index (GPI) at the upper primary level, starting from below the gender parity indices at the primary and elementary levels, surpassed the latter two indices after 2011-12.

Table 4. Gender parity index (female/male ratio) in literacy rate

State	1981	1991	2001	2011
Andhra Pradesh	0.516	0.594	0.722	0.791
Assam	0.797	0.695	0.779	0.854
Bihar	0.355	0.436	0.557	0.727
Gujarat	0.590	0.665	0.727	0.811
Haryana	0.460	0.586	0.711	0.782
Karnataka	0.565	0.659	0.753	0.822
Kerala	0.862	0.920	0.933	0.958
Madhya Pradesh	0.495	0.494	0.661	0.745
Maharashtra	0.589	0.683	0.783	0.840
Odisha	0.445	0.550	0.671	0.781
Punjab	0.715	0.768	0.840	0.876
Rajasthan	0.313	0.372	0.580	0.654
Tamil Nadu	0.594	0.696	0.784	0.851
Uttar Pradesh	0.362	0.454	0.612	0.748
West Bengal	0.602	0.687	0.776	0.861
India	0.523	0.613	0.722	0.797
CV (%)	28.57	22.95	13.73	9.04

Source: Created using data from Indiastat.

States have performed well in attaining gender equality in enrolment in the elementary education. Table 5 reveals that the number of states that have achieved or are close to gender parity in enrolment in the primary and upper primary education (with F/M ratios equal to or clustering around 1) increased remarkably over the years. While in 1991, no state could achieve gender parity either at the primary or upper primary level, as many as 10 states were able to achieve gender parity in school enrolment at the primary level and 13 states at the upper primary level in 2015-16. Inter-state variation in gender parity index has declined significantly over the years at

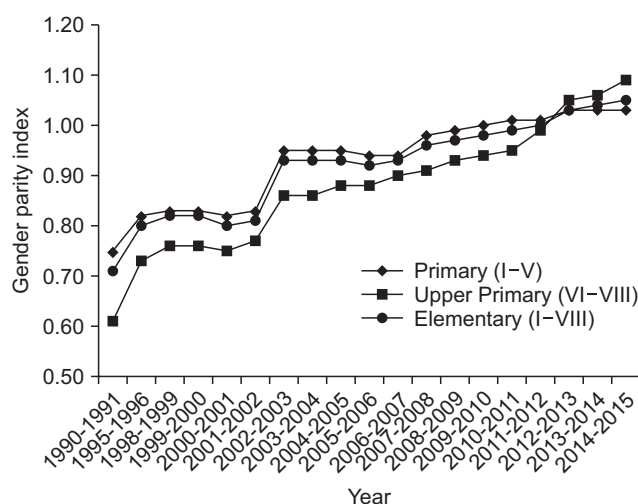


Fig. 2. Gender parity index in elementary education in India. *Source:* Created using data from Indiatat.

Table 5. Gender parity index (female/male ratio) in gross enrolment in elementary education

States	Classes I-V (6-11 years) (Primary)				Classes VI-VIII (11-14 years) (Upper Primary)			
	1991	2000-01	2010-11	2015-16	1991	2000-01	2010-11	2015-16
Andhra Pradesh	0.789	0.978	1.00	0.990	0.684	0.828	1.00	1.005
Assam	0.876	0.849	1.03	1.028	0.865	0.796	1.02	1.127
Bihar	0.626	0.616	0.94	1.067	0.591	0.509	0.88	1.216
Gujarat	0.850	0.824	1.02	1.036	0.784	0.814	0.91	1.024
Haryana	0.833	1.022	1.11	1.036	0.756	0.914	1.03	1.135
Karnataka	0.859	0.947	0.99	1.001	0.765	0.902	0.97	1.021
Kerala	0.998	0.987	1.00	1.000	0.994	0.949	0.95	1.018
Madhya Pradesh	0.764	0.846	1.06	0.981	0.639	0.657	1.02	1.084
Maharashtra	0.893	0.956	0.98	0.997	0.835	0.898	0.94	1.040
Orissa	0.792	0.729	1.01	0.977	0.693	0.657	0.97	0.987
Punjab	0.925	1.008	0.99	1.041	0.874	1.011	0.96	1.083
Rajasthan	0.523	0.603	0.99	0.982	0.423	0.461	0.80	0.997
Tamil Nadu	0.937	0.997	1.01	1.010	0.841	0.979	0.99	1.023
Uttar Pradesh	0.659	0.630	1.05	1.085	0.588	0.525	0.90	1.223
West Bengal	0.862	0.932	1.03	1.011	0.829	0.743	1.04	1.151
India	0.802	0.819	1.01	1.029	0.734	0.749	0.95	1.100
CV (%)	15.61	17.95	4.03	3.27	19.32	23.79	6.64	7.26

Sources: Created using data from government of India (2002) and Indiatat.

the primary as well as at upper primary levels. On the whole, gender inequality in primary and upper primary school enrolment has not only been declining, but the country has been moving towards regional convergence with an increasing number of states converging towards or beyond gender parity. The trends in educational attainment in recent years indicate gender reversals in many states, with women's educational attainment exceeding men's.

The improvement in gender parity in school enrolment at the elementary level may be attributed partly to government policies and programs emphasizing universal elementary education. National Education Policy 1968, Operation Blackboard 1986, Total Literacy Campaigns 1988, District Primary Education Program 1994, the Sarva Siksha Abhiyan 2001, and the Right to Free and Compulsory Education 2009, are some of the government policies and programs, which have focused on improving school enrolment, reducing drop outs and ensuring retention of students, with a special emphasis on gender equality. While these policies and programs have contributed towards achieving the goal of universal elementary education along with gender equity, there are considerable concerns over the quality of education.

Gender Inequality in Health Outcomes

Gender inequality in health outcomes is evaluated in terms of gender disparity in the infant mortality rate (IMR) and expectation of life at birth (ELB). Figure 3 provides trends in gender disparity index (F/M ratio) in IMR in rural, urban and all of India. Gender disparity indices at the rural and all-India levels follow closely and remained above unity most of the time, signifying that the infant mortality at birth among girls was higher than that among boys. Gender disparity index for urban India had fluctuated widely and remained above unity in most of the years during 1982-2013. Overall, there has been an increasing trend in gender disparity in infant mortality during the entire period. All the major states experienced an increasing trend in gender disparity in infant mortality during the period between 1981 and 2016. The data reported in Table 6 reveals that the F/M ratio in infant mortality increased consistently over the years in most states. The number of states with F/M ratio exceeding unity increased from five in 1981 to 15 in 2011 and 13 in 2016. Inter-state variation in gender disparity in IMR has, however, declined over the years, indicating that states are closer to converging with increasing gender disparity in infant mortality.

Table 7 provides data on gender equality in the expectation of live at birth (ELB) in India and its major states. The F/M ratio in ELB was above unity in all observed periods in India. The ratio was above unity in all states except Bihar, MP, Odisha and UP during 1993-1997; it was greater than unity in all states except Bihar during 2001-2005; the ratio was greater than unity in all states during 2007-2011 and 2010-2014, implying that all the major states have achieved gender parity in ELB.

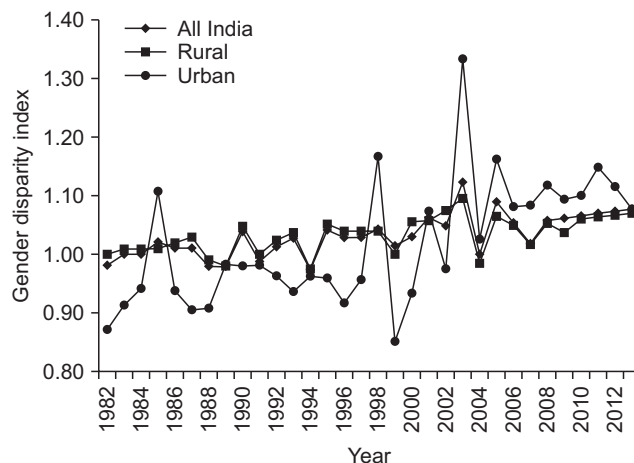


Fig. 3. Gender disparity index (female/male ratio) in IMR in India. *Source:* Author's estimate using data from Indiastat.

Table 6. Gender disparity index (female/male ratio) in IMR in major states

State	1981	2001	2011	2016
Andhra Pradesh	0.761	1.046	1.150	1.061
Assam	0.906	1.159	1.018	1.047
Bihar	1.435	1.193	1.023	1.484
Gujarat	1.108	0.984	1.077	0.968
Haryana	0.947	1.111	1.171	1.129
Karnataka	0.973	0.983	1.029	1.227
Kerala	0.911	0.643	1.182	1.222
Madhya Pradesh	1.038	1.072	1.088	0.898
Maharashtra	1.056	1.116	1.042	1.056
Odisha	0.860	1.033	1.055	1.000
Punjab	0.654	1.465	1.179	1.050
Rajasthan	0.840	1.051	1.060	1.128
Tamil Nadu	0.927	1.200	1.095	0.944
Uttar Pradesh	1.061	1.024	1.073	1.098
West Bengal	0.680	0.925	1.133	1.083
India	1.068	1.063	1.070	1.091
CV (%)	20.26	16.29	5.28	12.96

Source: Created using data from Indiatat.

Table 7. Gender equality in expectation of life at birth (female/male ratio)

State	1993-1997	2001-2005	2007-2011	2010-2014
Andhra Pradesh	1.038	1.075	1.072	1.068
Assam	1.009	1.033	1.039	1.045
Bihar	0.967	0.998	1.014	1.009
Gujarat	1.033	1.064	1.067	1.066
Haryana	1.014	1.049	1.074	1.075
Karnataka	1.054	1.072	1.074	1.058
Kerala	1.078	1.088	1.081	1.081
Madhya Pradesh	0.993	1.027	1.052	1.056
Maharashtra	1.039	1.051	1.060	1.053
Odisha	0.998	1.042	1.025	1.037
Punjab	1.031	1.040	1.066	1.059
Rajasthan	1.017	1.048	1.057	1.072
Tamil Nadu	1.030	1.000	1.056	1.060
Uttar Pradesh	0.979	1.017	1.037	1.040
West Bengal	1.023	1.049	1.052	1.039
India	1.023	1.040	1.051	1.048
CV (%)	2.80	2.48	1.82	1.74

Source: Created using data from Indiatat.

Gender Inequality in Employment and Income

Several studies (e.g., Kabeer, et al. 2013; Ridgeway 2011; Seguino 2007) argue that women's employment is essential for promoting gender equity and that gender inequality in livelihoods can contribute to inequality in

other domains (Collins, et al. 1993; Seguino 2013). Women's lower incomes and limited access to other resources such as land, credit and assets, required to secure a livelihood, reduce their bargaining power within households. Besides access to employment, the relative quality of jobs also matters for economic empowerment of women. As an example, labor force participation rate (LFPR) measures the proportion of working-age population that is active in the productive activities of the economy, either by working or looking for work. Despite increasing literacy rates and educational levels among women, the female labor force participation rate has been declining in India. It is argued that a lack of decent quality jobs in the formal sector discourages female participation in the labor market. More than 80 percent of the workforce is employed in the informal sector, and among those who are employed in the formal sector, females constitute only 19 to 20 percent. Rigidities in the labor market have often been considered the main reasons for this huge informality (Khera 2016).

Table 8 provides data on LFPR, estimated earned income of women and men, and gender inequality in wages for the period 2006-2017. Female LFPR declined steadily from 34 percent in 2006 to 28.5 percent in 2017. There were wide gaps in LFPR between women and men, the F/M ratio in LFPR being very low. Moreover, while the LFPR for females has declined significantly, the same for males varies between 82 to 85 percent during this period. Naturally, gender gaps in employment have widened, as the F/M ratio in LFPR has declined, and gradually moved away from gender parity in employment; the F/M ratio in LFPR declined from 0.41 in 2006 to 0.35 in 2017 (Table 8). A similar trend in gender inequality in LFPR is observed in the major states of India during the period between 1993-94 and 2011-12. Table 9 reveals that gender inequality in employment exists across states in India. The F/M ratio in LFPR was below 0.61 in 1993-94 and below 0.53 in 2011-12 in all states. The number of states with F/M ratio above 0.50 declined considerably during the period; whereas seven states had F/M ratios above 0.50 in 1993-94, only one state (Andhra Pradesh) had this ratio in 2011-12. The ratio declined considerably in all the states except Punjab during this period. At the all-India level, it declined from 0.448 in 1993-94 to 0.366 in 2011-12. Moreover, states have diverged in terms of gender inequality in employment, as the coefficient of variations in the F/M ratio in LFPR increased from 29.53 percent in 1993-94 to 33.22 percent in 2011-12 (Table 9). Women's participation in the labor force according to levels of education has followed a U-shape curve – relatively high participation of illiterate women (primarily from rural area), but lower participation of women with low and intermediate education, and an upward trend in the participation of women with graduate/postgraduate degrees (Klasen & Pieters 2013).

Table 8. Gender inequality in employment and income in India

Year	Labour Force Participation Rate			Wage Inequality for Similar Work (survey)			Estimated Earned Income (PPP US\$)		
	Female (%)	Male (%)	F/M	Female	Male	F/M	Female	Male	F/M
2006	34	82	0.41	NA	NA	0.62	1569	4130	0.38
2007	36	84	0.43	NA	NA	0.67	1471	4723	0.31
2008	36	84	0.43	NA	NA	0.67	1620	5194	0.31
2009	36	85	0.42	NA	NA	0.66	1185	3698	0.32
2010	35	85	0.42	NA	NA	0.63	1304	4102	0.32
2011	35	85	0.42	NA	NA	0.62	1518	4960	0.31
2012	35	85	0.42	NA	NA	0.62	1530	5635	0.27
2013	30	83	0.36	NA	NA	0.62	1628	5974	0.27
2014	30	84	0.36	NA	NA	0.56	1980	8087	0.24
2015	29	83	0.35	NA	NA	0.51	2257	9175	0.25
2016	28	82	0.34	NA	NA	0.57	2103	9045	0.23
2017	28.5	82	0.35	NA	NA	0.62	2424	10428	0.23

Note: NA = Not available, Sources: World economic forum (various years).

Gender inequality in the labor market also exists in wage and income, apart from LFPR. The F/M ratios in LFPR, wage and earned income (presented in Figure 4) demonstrate wide gender gaps in all three, the ratios lying far below unity. Gender inequality was the highest in earned income followed by wage and LFPR. Indian women get 51 to 67 percent of what men receive wages for doing similar work, implying that women in paid work get 33 to 49 percent less in wages than their male counterparts. Overall, there has been an increasing trend in gender inequality in wages.

The F/M ratios in wage for similar work followed a declining trend during 2006-2017 (Table 8 and Figure 4). Gender inequality in earned income was higher than that in wages and increased steadily during 2006-2017. Women earned 23 to 38 percent of what their male counterparts earned, suggesting that they earned 62 to 77 percent less income relative to men. The steadily increasing trend in gender inequality in earned income is re-

Table 9. Gender inequality (female/male ratio) in labor force participation rate in major states

State	1993-94	1999-2000	2004-05	2009-10	2011-12
Andhra Pradesh	0.609	0.581	0.601	0.545	0.529
Assam	0.269	0.269	0.291	0.245	0.199
Bihar	0.251	0.264	0.212	0.128	0.121
Gujarat	0.481	0.486	0.490	0.404	0.342
Haryana	0.428	0.303	0.436	0.351	0.249
Karnataka	0.534	0.488	0.538	0.451	0.379
Kerala	0.440	0.447	0.531	0.430	0.417
Madhya Pradesh	0.520	0.495	0.479	0.390	0.326
Maharashtra	0.592	0.528	0.583	0.481	0.491
Odisha	0.427	0.423	0.478	0.316	0.338
Punjab	0.286	0.370	0.426	0.331	0.324
Rajasthan	0.597	0.529	0.573	0.468	0.490
Tamil Nadu	0.600	0.553	0.593	0.512	0.495
Uttar Pradesh	0.314	0.299	0.347	0.251	0.276
West Bengal	0.308	0.253	0.290	0.251	0.308
India	0.448	0.415	0.454	0.369	0.366
CV (%)	29.53	27.66	26.83	31.60	33.22

Source: Government of India (2017).

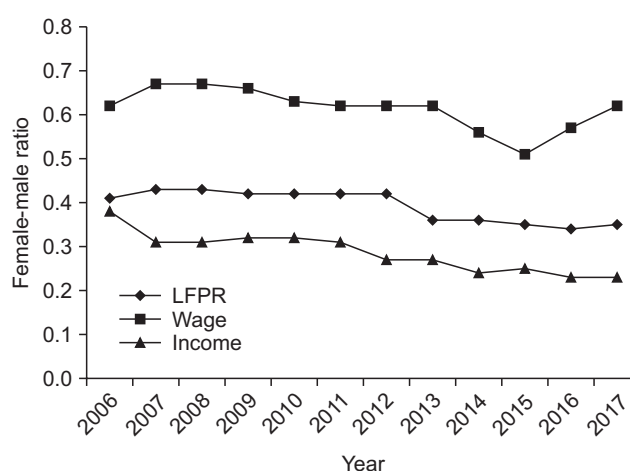


Fig. 4. Female-Male Ratio in LFPR, Wage and Income. Source: Table 8.

flected in the steadily decreasing F/M ratio in it (Figure 4).

GENDER INEQUALITY–DEVELOPMENT NEXUS

Methodology and Data

Drawing inferences from economic theories and the existing literature (Section 2), we have selected the following variables to examine the impact of gender inequalities in education and employment on economic growth and human development in India. The average level of per capita income (AVPCI) has been explained in terms of the following variables: (i) per capita capital expenditure (PCCE), (ii) gender parity index in literacy rate (GPILR), (iii) gender inequality in labor force participation rate (GILFPR), and (iv) the physical infrastructure development index (PIDI). In order to explain the variations in growth of per capita income (GRPCI), we have considered initial levels of per capita income (PCI)₀ in addition to the above four variables. This enables us to see if there is any conditional convergence of per capita income across the states. The physical infrastructure development index was constructed by combining: (i) the proportion of households with access to electricity, safe drinking water and toilets (EWT); (ii) the proportion of households with pucca (concrete structure) houses (HPH); and (iii) the index of road connectivity (IRC) estimated as a product of (a) the proportion of surfaced roads to total roads, and (b) the increase in road coverage per 100 sq. km relative to the national average. The PIDI is given by: $PIDI = \{Exp[0.4\ln(EWT) + 0.3\ln(HPH) + 0.3\ln(IRC)]\} / 100$ (see Malhotra 2014, for details).

The human development related variables such as the human development index (HDI), gross enrolment rate (GER), expectation of life at birth (ELB), and the infant mortality rate (IMR) are explained in terms of (i) per capita social sector expenditure (PCSSE), (ii) gender parity index in literacy rate (GPILR), (iii) gender inequality in labor force participation rate (GILFPR) and (iv) the physical infrastructure index (PIDI). Social sector expenditure includes spending on education, medical and public health, family welfare, water supply and sanitation, labour and employment, social security and welfare, nutrition, sports and youth services, arts and culture, housing, urban development, welfare of SC, ST and OBC, natural calamities, other social services, etc.

The relationships were examined by estimating the following log-linear regressions by the ordinary least squares (OLS) method, using pooled cross-sectional data for 15 major states corresponding to four time points. We did not need to use fixed effect or random effect panel data method because of the following reasons. (i) The data set relates to a cross-section of 15 major states corresponding to four time points only. This method could have been used if data for more time points for all the states were consistently available; (ii) The state (group) effect may not be a serious problem in view of the fact that the states have converged, following a common steady-state path of per capita income; (iii) As we shall see, the OLS estimates are quite acceptable and convincing. All the equations are well specified, as the explanatory power of the equations (R²) is reasonably good and the coefficients of the explanatory variables are of expected sign most of which are statistically significant; (iv) The OLS estimates with pooled data are intuitively plausible and quite consistent with the underlying economic theory and the empirics in the existing literature; (v) Thus, the results are useful for policy prescriptions.

$$\ln(AVPCI) = \alpha_0 + \beta_1 \ln(PCCE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \varepsilon \quad (1)$$

$$(GRPCI) = \alpha_0 + \beta_1 \ln(PCCE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \beta_5 \ln(PCI)_0 + \varepsilon \quad (2)$$

$$\ln(HDI) = \alpha_0 + \beta_1 \ln(PCSSE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \varepsilon \quad (3)$$

$$\ln(GER) = \alpha_0 + \beta_1 \ln(PCSSE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \varepsilon \quad (4)$$

$$\ln(ELB) = \alpha_0 + \beta_1 \ln(PCSSE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \varepsilon \quad (5)$$

$$\ln(IMR) = \alpha_0 + \beta_1 \ln(PCSSE) + \beta_2 \ln(GPILR) + \beta_3 \ln(GILFPR) + \beta_4 \ln(PIDI) + \varepsilon \quad (4)$$

Equation (2) is a conditional β -convergence type equation and this convergence holds if the coefficient of the initial level of per capita income is negative and statistically significant. The impacts of gender gaps in education and employment and the other selected variables on growth and human development were evaluated by

estimating the regression equations, using pooled cross-sectional data for 15 major states corresponding to four time periods. In this context, there is a possibility of encountering an endogeneity problem. While gender gaps in education (literacy rate) and employment (measured in terms of LFPR) could plausibly influence the level and growth of per capita income, it is also likely that high growth draws women into the labor force and higher per capita income help improve literacy, enabling higher spending on education. This problem was taken care of by using the average level and annual growth of per capita income data for the succeeding periods corresponding to each year's data for the explanatory variables. For example, corresponding to four discrete years 1980-81, 1990-91, 2000-01 and 2010-11 for the explanatory variables such as PCCE, GPILR, GILFPR, PIDI and (PCI)₀, we have used AVPCI and GRPCI data of the four succeeding periods (1982-1990, 1992-2000, 2002-2010, and 2011-2015). Appropriate leads and lags were considered while using data for the other variables. The endogeneity problem is largely resolved, as the data for the explanatory variables used in estimating the equations relate to the periods preceding the periods for those of the dependent variables.

Results and Discussion

The estimated regression results are reported in Table 10. The equations are well-specified, as the explanatory power of the equations appears to be reasonably good (as reflected in the high values of R^2), and all the coefficients of the explanatory variables are of expected sign, most of which are statistically significant. Consistent with the properties of the neoclassical production function, per capita capital expenditure is found to have a significant positive impact on the average level and annual growth rate of per capita income, the coefficient of PCCE being positive and statistically significant in equations (1) and (2). The regression results also establish the importance of infrastructure in economic growth and development. Infrastructure accelerates economic growth by raising productivity and lowering production costs. It was reported that infrastructures have played an important role in enhancing economic growth in India, and the states with better infrastructure facilities are more attractive for domestic and foreign private investment and perform better in terms of economic growth. Dispari-

Table 10. Results of log-linear regressions between gender inequality and development

Independent Variables	Dependent Variables						
	ln AVPCI (Eq. 1)	GRPCI (Eq. 2)	ln HDI (Eq. 3)	ln GER(Pri) (Eq. 4a)	ln GER(UPri) (Eq. 4b)	ln ELB (Eq. 5)	ln IMR (Eq. 6)
Constant	10.264 (25.44)*	14.633 (1.68)***	-0.227 (-3.19)*	3.832 (9.69)*	4.275 (13.29)*	4.242 (46.73)*	4.892 (7.86)*
ln (PCCE)	0.081 (1.70)***	0.366 (1.69)***	--	--	--	--	--
ln (PCSSE)	--	--	0.034 (2.81)*	0.139 (3.58)*	0.047 (2.37)*	0.117 (2.93)*	-0.192 (-3.15)*
ln (GPILR)	0.902 (6.11)**	1.692 (1.73)***	0.661 (8.31)*	0.673 (4.48)*	0.606 (4.95)*	0.210 (6.08)*	-0.853 (-3.60)*
ln (GILFPR)	0.256 (3.42)*	1.078 (2.02)**	0.132 (3.56)*	0.116 (1.69)***	0.121 (2.13)**	0.025 (1.72)***	-0.121 (-1.10)
ln (PIDI)	1.032 (7.06)*	2.644 (2.06)**	0.276 (3.76)*	0.072 (1.75)***	0.055 (1.78)***	0.082 (2.52)**	-0.041 (-1.79)***
ln (PCI) ₀	--	-0.915 (-1.78)***	--	--	--	--	--
R^2	0.861	0.321	0.813	0.771	0.682	0.772	0.685
$\bar{R}^2$	0.851	0.258	0.799	0.752	0.663	0.751	0.673
F-statistics	85.19 ^a	5.11a	59.57 ^a	30.47 ^a	32.80 ^a	41.90 ^a	26.39 ^a
N	60	60	60	60	60	60	60

Notes: Figures in parentheses are t-statistics. *, **, *** indicate significance at 1, 5 and 10% levels, respectively. ^adenotes significance of the F-statistic at the 1% level. AVPCI = Average per capita income (measured in terms of per capita net state domestic product (NSDP) at constant (1993-94) prices; GRPCI = Annual growth rate of per capita income; HDI = Human development index; GER(Pri) = Gross enrolment ratio (Girls/Boys) at the primary (class I-V) level; GER(UPri) = Gross enrolment ratio (Girls/Boys) at the upper primary (class VI-VIII) level; ELB = Expectation of life at birth; IMR = Infant mortality rate; PCCE = Per capita capital expenditure; PCSSE = Per capita social sector expenditure; GPILR = Gender parity index (Females/Males) in literacy rate; GILFPR = Gender inequality (Females/Males) in labor force participation rate; PIDI = Physical infrastructure development index; (PCI)₀ = Initial level of per capita income; ln = Natural logarithm; N = Number of observations. *Source:* Author's estimate.

ties in per capita income across states have often been attributed to inter-state disparities in infrastructure. It is also argued that infrastructure such as roads, electricity, tele-communications, safe drinking water, sanitation etc., are crucially important for economic development, poverty alleviation, and human well-being in terms of education and health. The estimated regression results reveal that physical infrastructure has positive and significant effects on the level and growth of per capita income, the coefficient of PIDI being positive and significant in equations (1) and (2). Physical infrastructure has also significantly improved human development (HDI) by raising life expectancy at birth and gross enrolment at the primary and upper primary levels of education, and by reducing the infant mortality rate (Table 10).

An important result that follows from the standard neoclassical growth model is the convergence of per capita output across regions. Based fundamentally on the assumption of diminishing returns to capital, the convergence hypothesis says that the growth rate in the region with lower per capita output should be higher than in the region with higher per capita output. When this happens, then inter-regional differences in per capita output will disappear over time. As covered extensively in the literature review, there exists a huge body of literature examining the issue of regional convergence across Indian states. The empirical studies have offered far from uniform results, and a consensus is yet to emerge on the issue of regional convergence of per capita income. However, some of the studies reported conditional convergence in per capita income across states. Our regression estimate, showing a negative and statistically significant coefficient of the initial level of per capita income (Eq. 2), indicates that the states have conditionally converged in per capita income, after allowing for the variations in the selected factors, besides per capita capital expenditure. The states appear to have followed a common steady-state path of per capita income.

What is more important for our analysis is the effect of gender equality in education and employment on economic growth and human development. Gender equality in education favorably affects economic growth largely through a positive impact of female education on human capital and next generation's education, and a reducing impact on fertility and infant mortality. A reduced fertility level lowers the dependency ratio and offers a 'demographic dividend', making it available higher quantity of human capital with a positive impact on economic growth. Similarly, gender equalities in employment and earnings can have a positive impact on overall economic growth by augmenting the pool of talented workers with higher average productivity, strengthening women's bargaining power in the family with beneficial effects on economic growth through higher savings, more productive investments including on the education and health of their children, promoting thereby future human capital.

The regression estimates, showing a statistically significant positive relation between the female-to-male ratios of literacy rate and labor force participation rate on the one hand and the average level and annual growth rate of per capita income on the other, indicate that gender equalities in education and employment have significant positive impacts on the level and growth rate of per capita income. These results are consistent with the results obtained in the context of developed economies (see, for example, Galor & Weil 1996; King & Hill 1993; King, Klasen & Porter 2008; Klasen 1999; Knowles et al, 2002; Lagerlof 2003; Seguino 2000a, 2000b; World Bank 2001). Since the equations were estimated in log-linear form, the estimated coefficients of the explanatory variables are the estimates of elasticity. Specifically, the estimated coefficients of GPILR and GILFPR indicate that a 10 percent increase in the female-to-male literacy rate and the female-to-male labor force participation rate can raise the level of per capita income by 9.02 percent and 2.56 percent, respectively, and the growth rate of per capita income by 1.69 percent and 10.78 percent.

Gender equalities in education and employment have helped improve various dimensions of human development. The coefficients of GPILR and GILFPR in all the equations for the human development related variables (HDI, GER(Pri), GER(UPri), ELB, and IMR) are of expected sign and statistically significant in all the equations, with the exception that the coefficient of GILFPR in equation (6) is of an expected sign but not statistically significant. Thus, higher female-to-male literacy rate and female-to-male participation rate in the labor force have helped improve human development by improving life expectancy and gross enrolment in the elementary (pri-

mary and upper primary) education, and by lowering the infant mortality rate.

Spending on the social sector (including education, health, family welfare, water supply and sanitation, labour and employment, social security and welfare, nutrition, etc.) is critical, since it tends to benefit the under-privileged section of the population relatively more than others, and enhances human well-being and human capital, producing direct growth effects and indirect spill-over effects for the rest of the economy. The regression results, showing a positive and significant coefficient of PCSSE in equations (3) to (5) and a negative and significant coefficient of the same in equation (6), indicate that per capita expenditure on the social sector has played a significant role in improving human development, life expectancy, and gross enrolment, and lowering infant mortality.

SUMMARY AND CONCLUSIONS

We have evaluated gender inequalities in education and employment and examined their impacts on economic growth and human development at the national and sub-national levels in India using an economics approach. Gender inequalities have arisen due to gaps in economic participation and opportunities, educational attainment, health services, and political empowerment. Overall gender inequality has declined to some extent due to reduced gender gaps in political empowerment and educational attainment.

Our analysis shows that per capita capital expenditure, physical infrastructure, and gender equality in education and employment have significant positive impacts on the level and growth of per capita income. The states surveyed appear to have conditionally converged in per capita income, following a common steady-state path. Gender equalities in education and employment have helped improve human development by improving life expectancy and gross enrolment and by lowering the infant mortality rate. Per capita social sector expenditure and physical infrastructures have positive and significant effects on human development through their positive impacts on life expectancy and gross enrolment, and reducing effects on the infant mortality rate.

The results suggest the need for adopting policies to create conditions, which would allow both women and men to realize their full human potential and ensure gender parity in human well-being. As gender equality in livelihoods can contribute to equality in other domains, women's employment is essential for promoting overall gender equity. Hence, special policies and programs have to be adopted so that more women can participate in the labor force. Job quotas for women could be an effective policy to achieve this goal. Our findings suggest that an implementation of appropriate wage policies could help reduce gender gaps in wage and income.

It was observed that progress in gender equality has been slow in all structures of power and types of decision-making, with power still remaining firmly in men's hands; Indian women represent only 11.8 percent (64 MPs) of the 542-member *Lok Sabha* (Lower house of the Parliament), 11 percent (27 MPs) of the 245-member *Rajya Sabha* (Upper house) and 18.5 percent (five ministers) in cabinet. The figures fall far below the proposed 33 percent quota desired in all power structures for women, an attempt to legislate this in India has failed in the past. However, this study and others like it show an imperative for the government to pass a bill that would reserve this spaces for women in order to reduce gender inequality in political participation. A predominantly patriarchal environment governs women's lives from birth to death in India, and women face discrimination in terms of social, political, educational and economic opportunities, resulting in continued dominance of the patriarchal practices. There is now an urgent need for a change of these practices so as to allow women to participate productively in the growth process and permit society to fully utilize the talent inherent in women. Our analysis demonstrates that persisting gaps in gender equality are inhibiting economic growth in India as well as reducing human development.

Given the importance of infrastructure and social sector expenditure in growth and human development, it is imperative for states to prioritize investment in infrastructure and invest in the social sector. States altogether spend about 6 to 7 percent of GDP on its social sector whereas the central government spends between 1 to 2 percent only (Kumar et al. 2017). Clearly there is a need for increased spending on the social sector from both the state and central governments in order to improve human well-being. In an environment of tight public

spending, states could prioritize expenditure on the social sector depending on the status of social indicators like literacy rate, enrolment ratio, life expectancy, infant mortality rate, child sex ratio, availability of health infrastructure etc. Higher levels of per capita income and human development can also be achieved by undertaking additional investments in infrastructure. Evidence shows that relatively poor states received proportionately larger amount of funds from the central government under the provisions for inter-governmental transfers. Efficient utilization of these funds by the states in infrastructure development could improve their growth prospects and human development. Thus, one final possible recommendation to conclude, states could improve their economic position by undertaking investment in infrastructures and liberalizing investment and infrastructure policies.

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