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ARTICLE

Private Investment in Education and Linkage to Future Employment in India: Will the Pandemic Take its Toll?

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Abstract
Pandemic and online learning have added to barriers to education. Lack of digital access, difficulty in communication with teachers and lack of peer support create major hurdles in learning for a large proportion of the student population. New entry barriers to better jobs, level and quality of higher education, will add to existing social barriers of gender, caste and nepotism. This will perpetuate a vicious cycle of low education and low incomes. In this paper, we investigate whether there is a threshold of level of education for better jobs in India? We find that higher secondary education is a threshold required for entry into good jobs. We observe increasing returns to private investments in higher levels of education and higher returns to education in the formal sector jobs compared to the informal sector. Will deficits in education during the pandemic reduce investments in education? We study these issues mainly using secondary data from the National Sample Office (NSO). The purpose of this short paper is to build research hypotheses regarding the relation between investment in education and employment, which we highlight in the conclusion.

Keywords Human capital · Labour · Education · Pandemic · Gender · Employment

1 Introduction

Pandemic and online learning have added to entry barriers to education, particularly for the children and youth in poor households in India. Lack of digital access, difficulty in communication with teachers to clear doubts and lack of peer support would create major hurdles in learning for a large proportion of the student population. The year or two of education that they may have missed out due to shut down of schools/colleges or lack of digital access could have long-term consequences on their prospects for employment. Pandemic will raise the entry barriers to better jobs, such

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as the level and quality of higher education, for the majority. This will add to the already existing social barriers to employment, other than education, such as gender, caste and nepotism. All this will perpetuate a vicious cycle of low education and low incomes.

There is a vast literature on the impact of the pandemic on employment, incomes and domestic violence, but few studies focus on possible impact on education and its linkage with future employment prospects. This article focuses on this issue of linkages between education and employment as an aftermath of the pandemic in India.

In this paper, we investigate whether there is a threshold of level of education for better jobs? We find that higher secondary education is a threshold required to cross entry barriers for good jobs. We analyse returns to private investments in education and found increasing returns to education in India. Higher returns to education exist in formal sector jobs compared to the informal sector. Then, what prevents people from investing in higher levels of education? Will the deficits in education during the pandemic further affect investments in education? We study these issues using secondary data from the National Sample Office (NSO). We also present some results from a primary survey on returns to education. The purpose of this short paper is to build research hypotheses regarding the relation between investment in education and employment, which we highlight in the conclusion, for future study.

2 Brief Review of Literature

United Nations (2021) warns of the adverse impact of the pandemic lockdowns on education and health. 'Lockdowns and income losses have made healthcare and education less accessible and affordable, especially for the poor and vulnerable, including women and girls'. (United Nations 2021, p. 2). According to UNESCO, 'one year into the COVID-19 pandemic, close to half the world's students are still affected by partial or full school closures, and over 100 million additional children will fall below the minimum proficiency level in reading as a result of the health crisis.[1]' UNESCO estimated that some 6.7 million additional pupils in primary and secondary schools in the Asia–Pacific region are at risk of dropping out, with secondary school pupils accounting for the bulk of potential dropouts (4.2 million) (United Nations 2021, p.5). United Nations also predicted that the social impact of COVID-19 pandemic would trigger the first decline in human development in 30 years. It would lead to an increase in income poverty and multidimensional poverty (United Nations 2021).

Digital transformation is good but creates risk of widening economic, educational and social inequalities. It could increase the already existing digital divide in the country. The increased use of digital technologies will lead to the exclusion of the poor and marginalized. The Internet penetration rate in Asia–Pacific stood at 48 per cent in 2019, compared with 46 per cent globally (United Nations 2021). 'Despite

[1] UNESCO website, https://en.unesco.org/covid19/educationresponse. Accessed July 1, 2021.

rapid advances in technology and digital platforms, large segments of the population remain left behind. The pandemic cast a spotlight on the digital divide in many aspects including remote work and distance learning during lockdowns and school closures.' (ADB 2021). Sustainable Development Goal 4[2] refers to quality education. The disruptions in education along with the digital divide in the less developed countries and countries with large social and economic inequalities will impede this goal of provision of quality education.

On the links between education and employment in the COVID-19 pandemic, Kesar et al. (2021) noted that persons with lower levels of education registered greater employment loss compared to better educated persons. This is understandable as the better educated undertake the core activities in the enterprises, are better paid and more likely to be permanent employees. The low skilled workers, more often women, are seen as dispensable in a crisis situation. A large proportion of workers in India earned less than a National Minimum Wage of ₹ 375 per day in 2017–18 (Shekar & Mansoor 2021). The majority of these workers have very low levels of education including some regular salaried workers.

Private returns to education have been computed using the human capital theory over the last few decades. A recent review of the literature showed that the private average global rate of return to increase in one year of schooling was about 9 per cent a year (Psacharopoulos & Patrinos 2018). An early study of two states in India found returns to women's education at 9 per cent per year and lower for men at 7 per cent per year. They also noted rising returns to higher levels of education, secondary schooling and graduate education (Kingdon and Unni 2001).

Social inequalities have been there historically in India, and its impact on education is lower enrolments in higher education among lower caste and class groups (Madan 2020). India has adopted quota-based reservation in higher education for the socially backward classes as affirmative action policies. While this may have raised enrolments in higher education, Basant and Sen (2020) show that it is more effective in regions where such affirmative action did not exist previously such as the Eastern region of India. Such social inequalities in higher education will further increase after the pandemic as these communities would not have easy access to digital devices and internet connectivity.

3 Is there a Threshold Level of Education to Ensure Better Employment Outcomes?

Work force participation by the level of education showed a gradual U-shaped curve similar for men and women aged 15 years and above in 2018–19 in the Periodic Labour Force Survey (PLFS), NSO (Fig. 1). The absolute levels of work participation rate for men and women, of course, differ drastically across all levels of education. Work participation is the highest at the top most level of education for both men and women. The work participation of illiterate persons is also high, more so

[2] SDG Goal 4: https://www.globalgoals.org/4-quality-education.

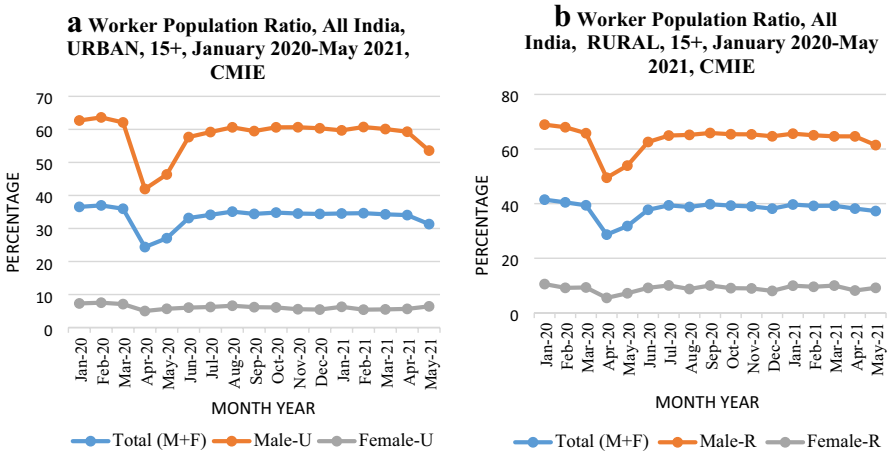


Fig. 1 WPR by Education Level, by Gender, Urban, 15 +, PLFS 2018–19. *Source*: Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, June 2020, National StatisticalOffice, New Delhi: Government of India

for men than women. The illiterate women belong to the poorer households and participate mainly in casual work in the informal sector. The declining participation of women with lower levels of education reflect an income effect wherein the norms of society are more stringently enforced restricting their entry into the workforce. However, with rising levels of education, the opportunity cost of staying at home goes up for women and the substitution effect takes over (Klassen & Pieters 2015). The point to note and keep in mind is that the threshold for rising work participation is the higher secondary level of education for both men and women.

The unemployment rate by level of education showed the opposite, inverted U shape, for men and women in 2018–19 (Fig. 2). The youth, 15–29 years, had higher unemployment rates in 2018–19 than the 15 years and above population. Women in both cohorts had higher unemployment rates than men. The threshold for rising unemployment rate was secondary school education. Possible reason is that persons with higher levels of education, secondary school and above in this case, belong to better-off households. They have a higher reservation wage and greater staying capacity to remain unemployed for longer periods of time.

We look at the status of workers by education level in Fig. 3a and b. Very clearly the regular and salaried workers benefit the most from higher education, the share of such employment rise dramatically for both men and women for higher secondary education and above. The point to note here is that the threshold level of education for the rise in proportion of regular salaried employment is higher secondary schooling. The threshold is the same as for the overall work force participation rate (Fig. 1). The opposite is seen for the persons who are out of the labour force (OLF) (Fig. 3a and b), that is, OLF starts to fall at higher secondary schooling for men and women. Clearly, a much larger proportion of women remain out of the labour force, nearly 80 percent upto the higher secondary level of education. At the higher secondary level of education, the opportunity cost of staying at home rises, women

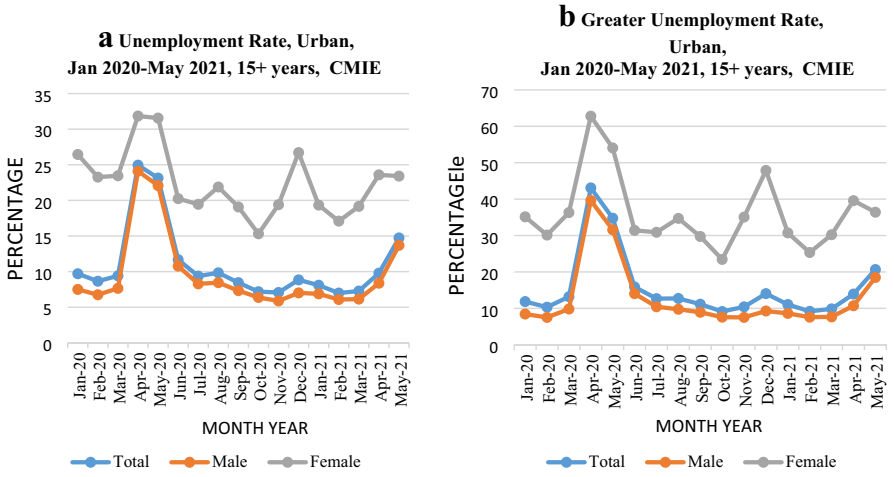


Fig. 2 Unemployment Rate by Gender, 15–29 and 15 + years, Urban, 2018–19. *Source*: Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, June 2020, National Statistical Office, New Delhi: Government of India

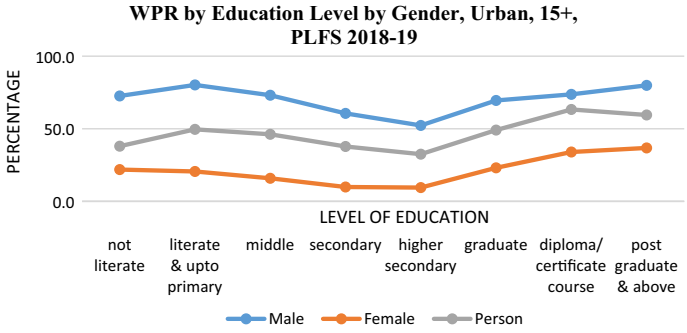


Fig. 3 **a** Status of Work & OLF by Education Level, Urban, Male 15 + , 2018–19. **b** Status of Work & OLF by Education Level, Urban, Female 15 + , 2018–19. *Source*: Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, June 2020, National Statistical Office, New Delhi: Government of India

offer themselves for work and the proportion out of the labour force declines rapidly to 55 per cent for those with post-graduate degree or with skill enhancing diploma or certificate (Fig. 3b).

A similar pattern is seen if we look at the number of years of formal education by status of work (Fig. 4a and b). The proportion of regular salaried workers rises sharply at 11–12 years of formal education for men and women. The threshold level for entry into regular salaried employment is 11–12 years of education that is again the higher secondary level.

Shekar and Mansoor (2021) estimated that 84 per cent of casual workers and 53 per cent of regular workers did not earn more than the national minimum wage of

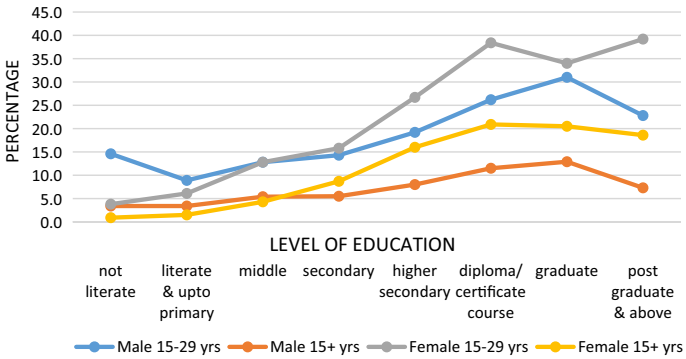


Fig. 4 **a** Years of Formal Education by Status, Male 15+, Urban. **b** Years of Formal Education by Status, Female 15+, Urban. *Source*: Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, June 2020, National Statistical Office, New Delhi: Government of India

₹ 375 per day in 2017–18. Among regular salaried workers, the 53 per cent not earning minimum wages are likely to be those with below higher secondary education. That is, only about 47 per cent of regular salaried workers are likely to be in highly educated and, as we shall see in the next section, benefit from higher returns to education in either the formal sector or the upper echelons of the informal sector.

In what industries are persons with level of higher secondary education and above likely to be concentrated? In urban areas, workers with average years of formal education of 12 years (higher secondary) and above were mainly in service industries like information and communication, financial/insurance services, real estate, professional/scientific and technical activities, public administration, education and health (Table 1). The only secondary sector industry with formal education of 12 years and above was electricity and gas. Higher secondary education may be working as a minimum threshold level for entry into better jobs in these industries. A large proportion of the workers in these industries having higher average years of education are likely to be in the formal sector. We turn to estimates of returns to education in the next section.

4 Returns to Education

A standard method of computing returns to education is the Mincerian Earning Functions (Mincer 1958). This computes the increase in private returns to investment for one extra year of education. The returns are generally higher for women than for men and rise with the level of education for both men and women in developing countries (Kingdon & Unni 2001).

Table 1 Years in Formal Education among Workers by Industry, Urban, 2018–19

Industry sections of NIC 2008*	Average number of years in formal education for workers (ps + ss) with age		
	15–29 years	15–59 years	15 years & above
A Agriculture, forestry and fishing	9.5	8.9	8.9
B Mining and quarrying	10.8	11.0	10.9
C Manufacturing	9.9	9.9	9.8
D Electricity, gas, steam and air conditioning supply	12.9	12.7	12.7
E Water supply; sewerage, waste management and remediation activities	9.9	9.8	9.9
F Construction	8.9	8.9	8.8
G Wholesale and retail trade; repair of motor vehicles and motorcycles	11.0	10.7	10.6
H Transportation and storage	9.9	9.8	9.8
I Accommodation and food service activities	10.3	9.4	9.3
J Information and communication	15.3	15.1	15.1
K Financial and insurance activities	15.1	14.6	14.5
L Real estate activities	13.1	12.6	12.6
M Professional, scientific and technical activities	14.1	14.8	14.8
N Administrative and support service activities	11.8	11.6	11.5
O Public administration and defence; compulsory social security	13.5	13.0	13.0
P Education	15.4	15.4	15.3
Q Human health and social work activities	13.7	13.3	13.3
R Arts, entertainment and recreation	10.3	10.6	10.6
S Other service activities	10.7	10.3	10.2
T Activities of households as employers; Undifferentiated goods and services producing activities of households for own use	8.9	7.8	7.8
U Activities of extraterritorial organizations and bodies	0.0	0.0	0.0
Total	11.2	11.0	10.9

ps + ss: Principal and Subsidiary worker in usual status of work

Source: Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, Appendix Table 11, June 2020, National Statistical Office, New Delhi: Government of India

Table 2 Returns to Education by Quantiles of Wage Distribution in Formal and Informal Sector, City Estimates, 2010

	Q10	Q25	Q50	Q75	Q90
Formal sector	0.062***	0.089***	0.102***	0.105***	0.097***
Informal sector	0.020***	0.030***	0.041***	0.068***	0.080***

Q; Quantile. ***Significant at 1% level. Dependent Variable: Log hourly wage earnings

Source: Unni & Sarkar 2013, Indian Journal of Labour Economics, Vol. 56, No. 4

4.1 Urban City Estimates

We computed returns to education to log hourly wages for sample of 4126 men and women workers, aged 14–60 years, in urban Delhi and city of Ranchi, 2010 (Unni & Sarkar 2013). The overall returns to education were 8 per cent.

4.1.1 By Levels of Education

When we looked at returns to education using splines for levels of education we noted that there is a threshold before returns rise. This threshold was at the level of secondary/higher secondary/diploma-certificate skill courses. Using a Heckman selectivity correction earnings function with middle school as the reference category, we found that the returns rose to 30 per cent at higher secondary/diploma level (Unni & Sarkar 2013). Clearly, education above the threshold level gives far higher returns. Using simple graphs (Figs. 3a, b and 4a, b), we noted that the threshold for rising participation in regular salaried employment was at higher secondary level.

4.1.2 By Formal and Informal Sector

Estimates for returns to education in the formal and informal sector showed that returns to education in the formal sector in the city samples were distinctly higher (9.7 per cent) than in the informal sector (5.7 per cent) (Unni & Sarkar 2013).

4.1.3 By Quantiles of Wage Distribution

As all jobs in the formal and informal sector do not provide similar incomes, we computed returns by quantiles of the distribution of wage earnings. Social factors of gender and caste are used as control variables in these regressions. Hence, the returns to education we report here are over and above the influence of these social characteristics. We found a curious difference in returns in the formal and informal sector across the wage distribution (Table 2).

The returns to education along the wage distribution showed that the bottom 10 per cent had lower returns in the formal sector, but after that it rose and there is no difference in the returns which remains at nearly10 per cent till the top 90 per cent

of the incomes (Table 2). Returns to education in the informal sector are lower than those in the formal sector in all the quantiles of the wage distribution. Further, the returns to education rise all along the wage distribution in the informal sector from 2 per cent at the bottom 10 per cent quantile, to 8 per cent at the top 90 per cent quantile. The formal sector may have barriers to entry, where at least a higher secondary education or diploma/certificate is the threshold. But, once a person gains entry into the formal sector, the returns do not vary with rising income, while in the informal sector the higher income segments have higher returns to education. It could be that the persons in the higher wage echelons in the informal sector had higher than threshold levels of education and hence also higher returns. This should definitely encourage private investments in higher education.

4.2 Urban India by Formal and Informal Sector

The results discussed above were for a small sample specific to two cities in India. To get an all India picture, we computed returns to education for urban non-agricultural activities, using unit level records of the NSO, Employment and Unemployment Survey data, 2011–12. We computed the returns to education for a sample of 34,000 individual wage workers in the age group of 25 and 60 years. Using a selectivity corrected Mincerian equation, the estimated returns to education for urban India were lower than in the sample cities. However, the difference in returns by sector was maintained with 4.7 per cent in the formal sector and 2.6 per cent in the informal sector (Unni & Naik 2016). When we included a variable for experience, the returns to education in the formal sector rose to 7.2 per cent, but was not very different in the informal sector, 3.1 per cent. Experience along with education plays a very important role in jobs, more so in the formal sector.

4.2.1 By Quantiles of Wage Distribution

As noted for the city sample earlier, OLS estimates do not provide complete information about the variation at different points across the wage distribution. All-India estimates of returns to education are not uniform across the wage distribution as noted earlier, and the variation is slightly different from what we observed for the cities (Table 2). Rewards are lower at the lower segment of distribution implying these workers have lower skills. The difference we note is that for urban India the gap in returns between formal and informal sector persists across the wage distribution till the 75th quantile. At 75th quantile, the rate of return to education converges at around 3 per cent per additional year of schooling for formal and informal sectors. At the 90th quantile, the returns are actually higher in the informal sector (Table 3).

This is an interesting result and suggests that persons with higher levels of education in the top segments of the wage distribution get similar returns in the formal and informal sector. The incentive to invest in higher education should be high. Then, why do we see low private investment in higher education, that is, lower enrolment in higher secondary and graduate education? Our explanation is that the catch is

Table 3 Quantile Regression: Returns to Education by Sector, Urban India (2011–12)

	All	Formal	Informal
Q10	0.021***	0.036***	0.0070***
	(0.001)	(0.001)	(0.001)
Q25	0.036***	0.056***	0.020***
	(0.001)	(0.001)	(0.002)
Q50	0.058***	0.065***	0.029***
	(0.001)	(0.002)	(0.001)
Q75	0.065***	0.035***	0.037***
	(0.001)	(0.002)	(0.001)
Q90	0.048***	0.018***	0.043***
	(0.001)	(0.001)	(0.001)
N	39,111	16,889	22,222

Standard Errors are in Parenthesis. *$p<0.05$, **$p<0.01$, *** $p<0.001$

Selectivity corrected equations

Source: Computed by the authors using unit level data, NSO, 2011–12

in 'crossing the threshold' level of education in order to obtain higher returns in the formal or informal sector. Children and youth from poor and socially backward households face difficulty in reaching this threshold of higher secondary education. The pandemic has added more barriers. We hypothesis that the difficulty in crossing the threshold will rise with educational disruptions and digital divide after the pandemic. This is likely to further reduce private investments in higher education among a large majority of households in India.

5 Employment Impact of COVID-19

The impact of the shock of the COVID 19 lockdown on employment as reported by national official level statistics, the PLFS of the NSO and estimates by the private agency Center for Monitoring the Indian Economy (CMIE) are analysed here.

5.1 Employment Impact in First Wave of Pandemic Lockdown

The PLFS data provide quarterly estimates of employment in urban areas only. There is a large dip in work participation during the first stringent lock down in April–June 2020 in urban areas compared to the same period in 2019 and 2018 (Table 4). The dip in female worker population ratio (WPR) is lower than that of male workers. Unemployment rate rises dramatically for men in April–June 2020, but falls for women (Table 5). This is a very interesting result and probably points to the discouraged worker effect for women, who are forced to drop out of the labour force due to a sharp declining in jobs opportunities. Men continue to search for work. We will explore this further.

Table 4 Worker Population Ratio, April–June, 2018, 2019 and 2020, Urban India, 15 + years

Gender	April–June 2018	April–June 2019	April–June 2020
Male	67.0	67.3	56.9
Female	16.4	16.9	15.5

Source: Annual Reports, Periodic Labour Force Survey (PLFS), July 17–June 2018, July 2018-June 2019, and July 2019–June 2020, National Statistical Office, New Delhi: Government of India

PLFS Quarterly Bulletins, NSO, 2020

Table 5 Unemployment Rate, April–June, 2018, 2019 and 2020, Urban, 15 + years

Gender	April–June 2018	April–June 2019	April–June 2020
Male	8.9	8.2	20.7
Female	12.7	11.3	10.6

Source: Annual Reports, Periodic Labour Force Survey (PLFS), July 17–June 2018, July 2018–June 2019, and July 2019–June 2020, National Statistical Office, New Delhi: Government of India

5.2 Center for Monitoring the Indian Economy

We present data on employment and unemployment from January 2020, before the pandemic, to May 2021, a period of 17 months. A similar sharp dip in employment during the first wave of the pandemic, April–May 2020, as we noted in the PLFS data, is seen in the CMIE, Consumer Household Pyramids Survey (CHPS) data. However, during the second wave of the pandemic, April–May 2021, the decline in employment rate is mild. It appears that the impact on employment has been muted so far during the second wave of the pandemic. One of the reasons for this as given by the RBI was as the second wave lockdowns were localized, there was better adaptation to work from home protocols and increase in online delivery, ecommerce and digital payments (Express News Service, May 18, 2021[3]). In the second wave, the decline in work participation was steepest for male workers in urban areas (Fig. 5a and b).

5.3 Employment by Status of Work (NSO)

The workers in current weekly status are classified into three broad categories according to their status in employment: self-employed, regular salaried, and casual worker. The self-employed consist of two sub-categories (Table 6), own account worker and employer combined together and unpaid helper in household enterprises. In urban India, PLFS collected data for four quarters from April 2019 to June 2020.

Overall, for both male and female workers, share of regular salaried workers rose but that of casual workers fell drastically during April–June 2020, when the

[3] Express News Service, https://indianexpress.com/article/business/covid-second-wave-indian-economy-rbi-7319301/.

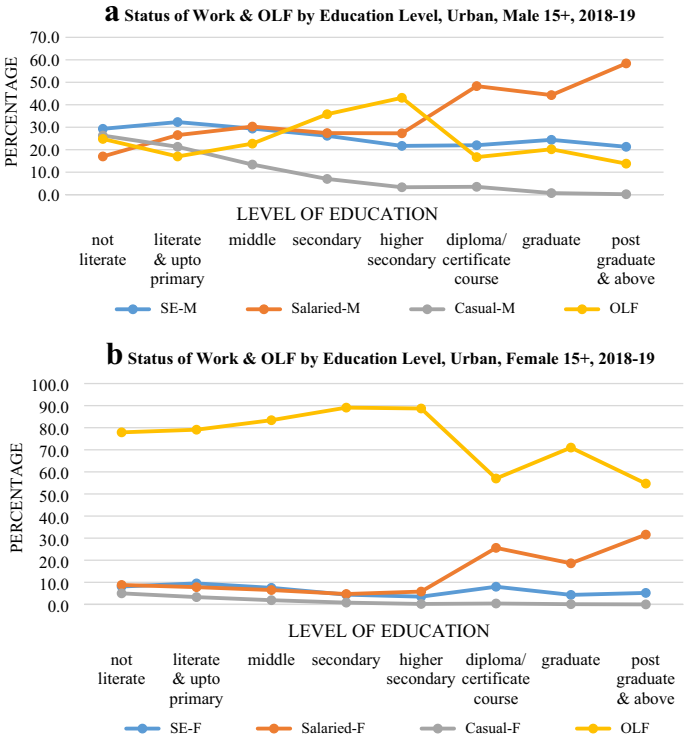


Fig. 5 **a** Worker Population Ratio, All India, URBAN, 15+, January 2020–May 2021, CMIE. **b** Worker Population Ratio, All India, RURAL, 15+, January 2020–May 2021, CMIE. *Source*: CMIE, Consumer Household Pyramids Survey, Computed by the author from unit level data

very stringent lockdown was implemented throughout the country. Regular salaried workers are more likely to be permanent employees with a sizeable proportion of them being in the formal sector. Regular salaried workers are also more likely to have higher levels of education.

There is a large increase in male self-employed (column 4, Table 6) from 39.3 per cent in January–March 2020 to 42.9 per cent in April–June 2020, latter being period of the first wave of pandemic (Table 6). Self-employed among female workers did not change much. This could imply that men who lost jobs were able to move into self-employed activities during the stringent lockdown period. Women did not find any such alternative activities and probably moved out of the workforce. However, if we look at the constituents of self-employed in column 2, own account and employer, and column 3, unpaid helpers, the two together does not add up to column 4, total self-employed, for the period April–June 2020 (period of stringent lockdown). For men, there was a 17.8 percentage point shortfall, and for women, it was about 11.3 percentage points. These workers who reported having a self-employed enterprise (column 4) were found not working during the period of strict lockdown (addition of columns of 2 and 3). In PLFS, current weekly status had two extra

Table 6 Distribution by Status of Employment of Workers (current weekly status) 15 + years, Urban India, 2019–20

Survey period	Employer + own account worker	Helper in household enterprise	Self-employed	Regular salaried worker	Casual worker	All
1	2	3	4	5	6	7
Male						
April–June 2019	34.0	3.9	38.7	48.0	13.3	100.0
July–September 2019	34.3	4.1	39.4	47.5	13.1	100.0
October–December 2019	34.0	4.0	39.0	48.0	13.1	100.0
January–March 2020	32.5	3.8	39.3	48.5	12.2	100.0
April–June 2020	22.3	2.8	42.9	50.4	6.7	100.0
Female						
April–June 2019	23.8	8.9	33.3	58.3	8.4	100.0
July–September 2019	23.9	9.1	34.0	57.4	8.6	100.0
October–December 2019	23.5	9.7	34.4	57.3	8.4	100.0
January–March 2020	22.9	9.8	34.8	57.5	7.7	100.0
April–June 2020	15.4	7.7	34.0	61.2	4.8	100.0

Column 4 are Total self-employed workers who had work in household enterprise. Columns 2 and 3 are self-employed and unpaid helpers who reported so, but those who did not work due to sickness or other reasons are NOT included

Source: Quarterly Bulletins, Periodic Labour Force Survey (PLFS), April to June, 2020, National Statistical Office, New Delhi: Government of India, Statement 3

codes for those who had work in household enterprise but did not work due to: sickness—code 61, or did not work for other reasons—code 62, that allows us to arrive at this conclusion.

Overall, relative to other categories of workers, regular salaried employees were most likely to retain jobs and incomes during the economic shock (Table 6). Salaried employment, which is also relatively more remunerative, requires higher level of education (Figs. 3a, b, and 4a, b). The impact of the pandemic on education could have long-term implication for better remunerative jobs in future.

6 Conclusion: Impact of Pandemic on Education and Employment

Pandemic and lockdowns have led to decline in employment and rise in unemployment. Women tended to fall out of the labour force more than men. Men may have taken up self-employment, but with low demand, a large proportion of them were found not working during the period of stringent lockdown. Regular salaried workers were more likely to retain jobs during and after the pandemic, but such jobs required at least higher secondary education. The employment impact of the economic shock may manifest itself only in the short-run, though some segments of the workers, both wage and self-employed, may feel the negative consequences over a long time. However, the impact on education may have much longer consequences impacting employment outcomes as well in the long run.

We observed increasing returns to education and higher returns in formal sector and upper echelons of the informal sector. What prevents persons from investing in higher levels of education given such increasing returns and prospects of better jobs? In this paper, we found that there is a threshold of higher secondary education for entry into better jobs with higher returns. Regular salaried workers and those in the service sector were more likely to have crossed this threshold of higher secondary education. Workers from poor and socially deprived households face challenges in reaching this threshold level. Therefore, going forward after the pandemic there may be greater impediments to cross the threshold and that would further deter private investment in education for a large majority despite better returns.

As indicated in the introduction, this paper has a limited purpose of posing questions and suggesting hypotheses for further research. Two tentative hypotheses emerge from the analysis in the paper. (1) Employment outcomes associated with returns to education determine private investment in education; (2) There is a threshold level of education for better employment outcomes and the ability to cross this threshold will be impeded by the pandemic. If these hypotheses prove to be true, the economy may run into a vicious cycle of poor education and low incomes in the near future.

To counter this possibility, policy options to keep students in school, provision of digital technology and internet access at low cost are essential. The issue of quality of schooling has been a problem in India. Further deterioration in quality, with poor access to digital technology and other disruptions in education due to the pandemic, can be avoided with proper training of teachers and provision of the required hardware and software and internet connectivity. The double whammy of deficits in quality education and poor employment outcomes for the majority can hit the economy if this is not recognized and steps taken early to offset it.

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Declarations

Conflict of interest There is no conflict of interest in the research undertaken in this paper.

References

ADB. (2021). *Asian Economic Integration Report 2021: Making Digital Platforms Work for Asia and the Pacific*, Manila: Asian Development Bank. https://www.adb.org/publications/asian-economic-integration-report-2021.

Annual Reports, Periodic Labour Force Survey (PLFS), July 2017–June 2018, July 2018–June 2019, and July 2019–June 2020, National Statistical Office, New Delhi: Government of India.

Basant, R., and G. Sen. 2020. Quota-Based Affirmative Action in Higher Education: Impact on Other Backward Classes in India. *Journal of Development Studies* 56 (2): 336–360. https://doi.org/10.1080/00220388.2019.1573987.

Kesar, S., R. Abraham, R. Lahoti, P. Nath, and A. Basole. 2021. Pandemic, Informality, and Vulnerability: Impact of COVID-19 on Livelihoods in India. *Canadian Journal of Development Studies*. https://doi.org/10.1080/02255189.2021.1890003.

Kingdon, G.G., and J. Unni. 2001. Education and Women's Labour Market Outcomes in India. *Education Economics* 9 (2): 173–195.

Klasen, S., and J. Pieters. 2015. What Explains the Stagnation of Female Labor Force Participation in Urban India? *The World Bank Economic Review* 29 (3): 449–478.

Madan, A. 2020. Caste and Class in Higher Education Enrolments Challenges in Conceptualising Social Inequality. *Economic and Political Weekly* 55 (30): 40–47.

Mincer, J. 1958. Investment in Human Capital and Personal Income Distribution. *Journal of Political Economy* 66 (4): 281–302.

Periodic Labour Force Survey (PLFS), 2018–19, Annual Report, June 2020, *National Statistical Office*, New Delhi: Government of India.

Psacharopoulos, G. and H. A. Patrinos. (2018). "Returns to Investment in Education: A Decennial Review of the Global Literature," *Policy Research Working Paper 8402*, Washington DC: World Bank Group, Education Global Practice.

Quarterly Bulletins, Periodic Labour Force Survey (PLFS), April to June, 2020, National Statistical Office, New Delhi: Government of India.

Shekar, C. K. and K. Mansoor. 2021. COVID-19: Lockdown Impact on Informal Sector in India, *University Practice Connect*, Azim Premji University, COVID-19: Lockdown Impact on Informal Sector in India – University Practice Connect (azimpremjiuniversity.edu.in.

United Nations. 2021. United Nations, Asian Development Bank, and United Nations Development Programme. Responding to the COVID-19 Pandemic: Leaving No Country Behind, Bangkok, Thailand: *United Nations.*

Unni, Jeemol and Ravikiran Naik. 2016. "Educational mismatch, and returns from education considering urban formal and informal labour market". Paper presented at technical session on Theme 3: "Education, Employment and Labour Markets", 58th Annual Conference of the Indian Society of Labour Economics 24–26 November 2016, Guwahati, India. https://link.springer.com/article/https://doi.org/10.1007/s41027-017-0090-3#Sec15

Unni, Jeemol, and Sudipa Sarkar. 2013. Wages and Informal Labour Markets in India: Whither Premiums on Human Capital Investments. *Indian Journal of Labour Economics* 56 (4): 625–545.

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