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Socio-Economic Determinants of Educated Unemployment in India

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SOCIO-ECONOMIC DETERMINANTS OF EDUCATED UNEMPLOYMENT IN INDIA

Indrajit Bairagya∗

Abstract

Despite the presence of a large volume of sub-standard informal employment in India, the economy is not free from a perennial unemployment problem. As per the National Sample Survey Organisation (NSSO) Data, the unemployment rate is more among the educated (secondary and above) persons as compared to those whose education level is lower. This paper, using different rounds of NSSO data, seeks to explore the socio-economic and regional factors responsible for educated unemployment in India. We find that possessing technical education byitself doesn't necessarily guarantee employment which, in fact, questions the rationale behind the present Indian government's initiative to promote technical education on a large scale. Although high-industrialised states account for low educated unemployment rates, these states are also unable to engage all educated people in the production process. Moreover, since the number of unemployed is higher for both the educated and uneducated people among those who are not registered with employment exchanges, search and matching problem may also be an important reason for educated unemployment in India. Besides, differences have been found across social groups, gender, religions, regions and other socio-economic characteristics.

1. Introduction

"*Educated workers enjoy at least three basic advantages over less educated workers in the labor market: higher wages, greater upward mobility in income and occupation, and greater employment stability*" Mincer (1991)

There are a number of other existing studies (e.g., Magnussen, 1979; Sicherman, 1987; Wolbers, 2000; Cairo and Cajner, 2014; Mirica, 2014) which also observed a negative relationship between unemployment and education of the workers. However, the lack of demand for workers, search and matching inadequacy, and mismatch between the aspirations of the well educated and the suitable employment opportunities available may result in employment insecurity and instability among potential job-seekers. Moreover, poor quality of education may also be responsible, to a significant extent, for high levels of educated unemployment and underemployment (Stiglitz, 1975). For instance, at the international level, the unemployment rate is 7.6 percent in 2013 among the U.S. graduates mainly due to the lack of job opportunities and inadequacy of applicants in terms of possessing the required skills as may be desired by employers (Lawrence, 2013; Ludden, 2012). Thus, such mismatches in demand and supply among different segments in the economy can lead to educated unemployment.

At the individual level, though education provides a certain level of employment security, it entails investment in terms of money and time. More importantly, the opportunity cost of investing in education as a measure of the loss of economic productivity can, sometimes, make the pursuit of education less valuable and efficient than other productive economic activities. In fact, the phenomenon of educated unemployment can influence policy makers into claiming that the share of the budget going

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into educating the workforce could be better utilised in creation and sustenance of job-creating productive programmes. It must also be taken into account that besides the direct economic cost in terms of loss of productivity for the respective nation, long periods of educated unemployment related to structural faults of the economy can have far reaching social costs.

Earlier, in most of the OECD countries, the levels of education and unemployment rate were inversely related, while high unemployment and underemployment amongst the educated characterised most of the developing countries (O'Higgins, 2001). However, probably as a fallout of the 2008 global economic crisis, educated unemployment and underemployment has become increasingly more visible, affecting both the developed and developing world, albeit the latter, more severely. While part of the problem lies in over-education due to faulty assumptions of the labour market, socio-economic factors also play a significant role in the mismatch between demand for and supply of educated labour.

Like other developing nations, despite the presence of a large volume of sub-standard informal employment, the Indian economy continues to face a perennial unemployment problem. For instance, as per the National Sample Survey Organisation (NSSO) (2009-10; 2011-12), in both the rural and urban areas in India, not only is the unemployment rate among the educated (secondary and above) higher than that among those whose educational level is lower than secondary, but also this rate has increased with higher levels of education. This could be due to different macroeconomic reasons, the mismatch between demand and supply across different segments of the economy and also because of different socio-economic and region-specific features of the individuals and households. The later cause, however, has not received much attention in the existing literature. This study, therefore, focuses on the problem of educated unemployment in India in terms of identifying the socio-economic factors underlying educated unemployment, using a large and nationally-representative sample of individual (unit level) data provided by National Sample Survey Organisation for the period 1983 to 2011-12. This study also examines whether the determinants of educated unemployment vary with the levels of development across regions.

The rest of the paper is organised as follows: Section-2 presents a descriptive analysis of the nature and pattern of variations in educated unemployment both at the national and international levels. Details of methodology and variables of the determinants of educated unemployment in India are outlined in section-3. In section-4, estimated results of the determinants of educated unemployment in India for 2011-12 are discussed, followed by conclusion in Section-5.

2. Nature and Pattern of Variations in Educated Unemployment

An International Perspective

This section describes the severity of India's educated unemployment in comparison with other countries. Education at a Glance (OECD, 2013) compiles the population and educational attainment figures from OECD, Eurostat databases and databases provided by UNESCO Institute of Statistics and creates attainment profiles considering the percentage of the population (aged 25 to 64) with a successful completion of a particular level of education. The employment rate, according to OECD, is defined as the number of employed persons as a percentage of the working-age population (i.e., the number of employed people divided by the number of all working-age people), whereas, the

unemployment rate is defined as the number of unemployed persons as a percentage of the labour force. The percentage of unemployed by different educational attainments across different countries is presented in table 1.

Table 1: Unemployment Percentage among 25-64 Year Olds by Educational Attainments (2011) Across Countries.

Name of Country	Pre-primary and primary education	Lower secondary education	Upper secondary education (ISCED 3A)	Post-secondary non-tertiary education	Tertiary education – Type A and advanced research programmes	All levels of education
Developed Economies						
Australia	8.2	5.3	4.1	4.3	2.7	3.8
Austria		7.6	4.4	2.3	2.9	3.5
Belgium	15.0	10.5	5.7	3.5r	4.0	6.1
Canada	14.6	10.9	7.1	6.6	4.7	6.3
Czech Republic		21.4	4.2		2.6	5.9
Denmark		9.0	6.3		4.7	6.2
Estonia		25.5	11.8	9.4	7.3	11.6
Finland	10.0	11.9	7.0		4.1	6.2
France	14.1	12.4	6.9	6.7	5.3	7.8
Germany	17.8	12.9	7.4	3.9	2.6	5.7
Greece	16.6	17.9	16.4	19.6	11.4	16.0
Hungary	50.0	22.1	7.7	8.8	3.8	9.9
Iceland	7.8		7.6		4.9	5.6
Ireland	23.4	21.0	13.4	17.7	6.1	12.9
Italy	12.4	8.8	5.9	9.2	5.1	7.0
Japan			5.3		3.0	4.4
Luxembourg	6.5	6.3	3.7		3.9	4.1
Netherlands	5.0	4.2	3.0	0.0	2.7	3.2
New Zealand		7.5	3.4	3.3	2.7	4.5
Norway		5.0	3.5		1.5	2.3
Poland		16.9	7.7	8.0	4.5	8.1
Portugal	13.0	13.9	10.9		8.0	11.8
Slovak Republic	2.5	38.5	8.4		5.2	11.8
Slovenia	25.8r	11.9	7.5		4.7	7.6
Spain	30.6	24.5	19.3		10.4	19.5
Sweden	18.7	8.2	5.1	5.4	3.5	5.3
Switzerland	8.2	7.5	4.9	2.6	3.0	3.5
United Kingdom		14.6	4.6		3.9	6.0
United States	13.2	17.9	10.2		4.4	8.3
Economies in Transition						
Russian Federation		14.0	8.5		2.9	5.5
Developing Economies						
Brazil	4.2	5.5	6.1		2.9	4.8
Chile	4.3	4.5	5.0		5.9	5.0
Israel	8.0	6.7	5.7		3.7	5.0
Korea	2.2	3.0	3.4		2.6	3.1
Mexico	3.9	4.1	4.8		4.9	4.3
Turkey	8.1	9.8	9.6		7.6	8.4
OECD Average	13.6	12.6	7.1	6.9	4.7	7.1
EU21 Average	17.4	15.2	8.0	7.9	5.1	8.4

Source: OECD (2013).

Table 1 shows that higher the education level, the lesser is the likelihood of unemployment in the developed countries. However, in the context of developing countries, such as, Chile, Brazil and Mexico, once the level of education goes up, the unemployment rate also increases. This could be due to a demand or skill mismatch or low absorption capacity of the labour markets in the developing countries vis-à-vis the developed countries. It is also important to examine whether the situation of similar trend (higher education-increased unemployment) exists in the Indian context as well.

The Indian Context

In India, NSSO provides the definitional distinction between the proportion unemployed and unemployment rate. According to them, the proportion unemployed is defined as the number of persons/person-days unemployed per 1000 persons/person-days, whereas unemployment rate (UR) is defined as the number of persons/person-days unemployed per 1000 persons/person-days in the labour force. Moreover, the labour force includes those who were either 'working' (or employed) or 'seeking or available for work' (or unemployed) during the reference period. Again, NSSO defines the category of 'not in labour force' as those who were neither 'working' nor 'seeking or available for work' for various reasons during the reference period. Persons under the 'not in labour force' category include students, those engaged in domestic duties, rentiers, pensioners, recipients of remittances, those living on alms, infirm or disabled persons, too young persons, prostitutes and casual labourers not engaged in work due to sickness.

Table 2: Unemployment Rates (per 1000) in India by Education Categories Over Time (Based on Usual Principal Status Category)

Education Level	1983	1993-94	2004-05	2011-12
Not Literate	6	4	7	6
Literate & up to Primary	22	12	18	14
Middle	71	43	37	25
Secondary	114*	79	61	33
Higher Secondary	--	109	81	56
Diploma/ Certificate Course	--	--	133	97
Graduate & Above	110	110	100	84
Secondary & Above	113	96	82	58

Note: *For 1983 data, there is no separate information for the higher secondary category. Secondary and higher sector is merged together.

Source: Author's estimation based on NSS0 data (different rounds).

It is important to note that NSSO measures employment and unemployment rates by three ways: Usual Status (US), Current Weekly Status (CWS) and Current Daily Status (CDS). US measure the magnitude of persons unemployed for a relatively longer period during the reference period of 365 days. In this context, it is imperative to keep in view that those persons treated as unemployed under US approach might be engaged in some subsidiary work. Thus, NSSO also estimates the number of

unemployed excluding those employed in a subsidiary capacity during the reference period and this is termed as US-adjusted. CWS and CDS provide the number of unemployed on the basis of average weekly picture and average level of unemployment on a day, respectively. However, throughout the paper, for measuring the unemployment rate, US(principal) and US-adjusted categories are considered. Changes in the unemployment rate over time in India by different educational categories are depicted in table 2.

Table 2 shows the unemployment rates across different educational categories over time based on US (adjusted) method. Though the unemployment rate has decreased across categories over time, it shows an increasing trend with an increase in the educational level over all in the survey rounds and diploma/ certificate course holders account for highest unemployment rate. More importantly, the unemployment rate among the graduates and above is much higher as compared to secondary and above categories over the survey rounds mentioned above. Unemployment rates across different educational categories over time by rural-urban are given the table 3.

Table-3: Unemployment Rates (per 1000) Across Different Educational Categories Over Time by Rural-Urban in India (Based on Usual Principal Status Category)

Education Level	1983		1993-94		2004-05		2011-12	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Not Literate	5	15	3	9	6	10	5	9
Literate & up to Primary	15	43	8	27	16	26	12	21
Middle	59	94	33	66	30	57	24	26
Secondary	123*	105	79	79	59	64	34	29
Higher Secondary	--	--	114	104	89	70	55	57
Diploma/ Certificate Course	--	--	--	--	154	116	126	70
Graduate & Above	150	94	152	89	117	90	108	71
Secondary & Above	128	101	103	89	84	80	59	56

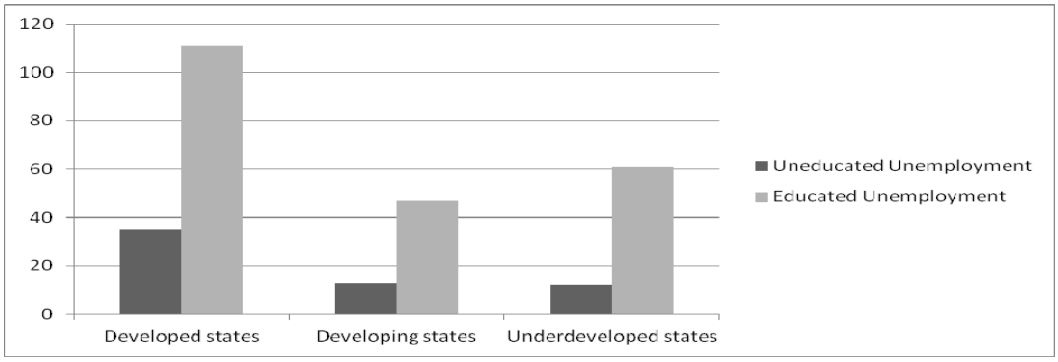
Note: *For 1983 data, there is no separate information for the higher secondary category. Secondary and higher sector is merged together.

Source: Same as table 2.

From table 3, it is clear that the rate of unemployment in urban India is lower than that of the rural across at higher levels of educational categories (secondary and above) and also for all the study periods. However, it is higher in the case of urban India than rural at lower levels of educational categories (less than secondary). The possible reason could be that though highly educated people are in a better position in urban areas in terms of finding jobs than the rural people, less educated people generally find themselves unable to find sufficient job opportunities in the urban areas. It is important to note here that the rate of educated unemployed has increased corresponding to an increase in the education levels both in respect of rural and urban areas. And also, the unemployment rate among the graduates and above is much higher than those with secondary and above education both in rural and urban areas.

Further, as the nature and extent of educated unemployment varies across developed and developing nations, it may also vary across different regions within a country. We, therefore, have classified all states/ Union Territories in India into three categories: developed regions, developing regions and underdeveloped regions. We have classified developed regions as those with a Human Development Indices (HDI) of 0.701 and above. Chandigarh, Goa, Kerala, Delhi, Pondicherry, A&N Islands and Manipur come under the developed regions. While developing regions are classified as those with a HDI between 0.601 and 0.700. Nagaland, Daman & Diu, Lakshadweep, Maharashtra, Mizoram, Dadra & Nagar Haveli, Punjab, Himachal Pradesh, Tamil Nadu, Sikkim, Tripura, Uttarakhand, Arunachal Pradesh, Haryana, West Bengal, Gujarat, Meghalaya and Karnataka come under the developing regions. Underdeveloped regions considered with a HDI below 0.600 include Assam, Jammu & Kashmir, Andhra Pradesh, Jharkhand, Chhattisgarh, Rajasthan, Orissa, Madhya Pradesh, Uttar Pradesh and Bihar. However, a detailed discussion about the level of development across states is given in table 1A in appendices, while a comparative picture of educated and uneducated unemployment across developed, developing and underdeveloped regions is given in figure-1.

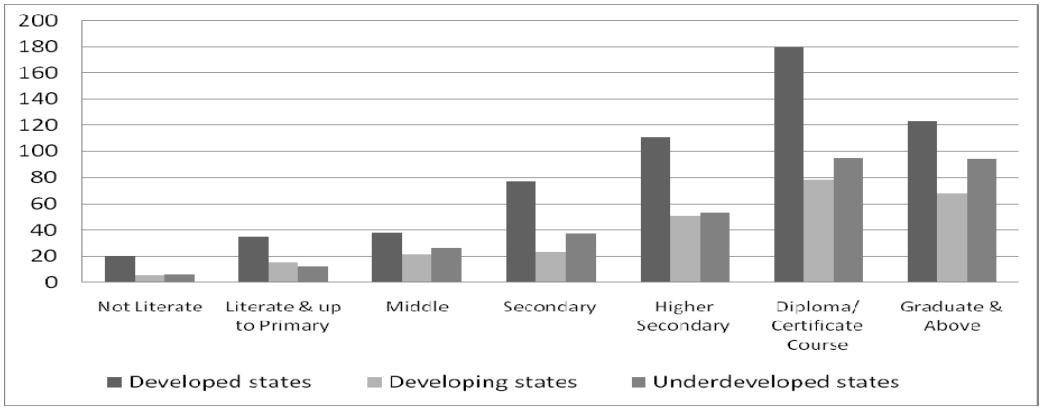
Figure 1: A Comparative Picture of Educated and Uneducated Unemployment Across Developed, Developing and Underdeveloped Regions.



Source: Author's estimation based on NSS0 unit level data for 2011-12.

The above figure reveals that the unemployment rate among educated is much higher than for uneducated people in all the regions in India irrespective of their levels of development. Although Table 1 shows that the unemployment rate among educated is lower in the developed nations as compared to the developing nations at the international level, it is evident that the developed states within India account for higher rates of educated unemployment than the developing and underdeveloped states. This may be due to the fact that the developed states account for higher number of educated people than the developing and underdeveloped regions, and as such, a convex relationship is well expected between the unemployment rate and the number of educated people. In this context, it is important to see whether the developed states account for higher unemployment rates across all the educational categories in the developing and underdeveloped regions in India, as depicted in figure 2.

Figure 2: Unemployment Rates in the Developed, Developing and Underdeveloped States in India Across Different Educational Categories.

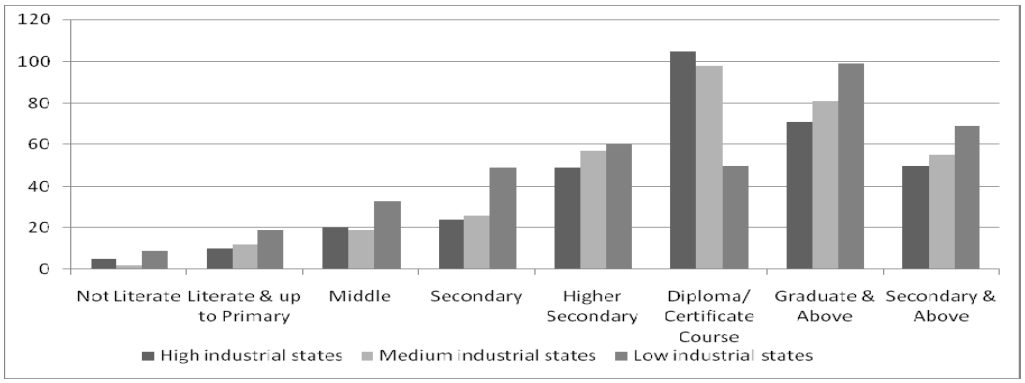


Source: Same as figure-1.

Figure 2 also shows a higher unemployment rate in developed states as compared to the developing and underdeveloped states against all the educational categories. More importantly, the unemployment rate has increased with an increase in the educational levels of all the three types of states and is highest for those with a diploma or certificate course. This could be due to the lack of demand for educated labour at higher wage rates in the developed states.

At the international level, for developed countries, development also implies higher rate of industrialisation etc with higher labour demand. However, one may argue that within India, the classification of states based on HDI may not reflect demand for jobs; it may rather reflect higher supply of educated labour. Thus, we have again classified the states into three categories based on per capita private capital across states. These categories are high industrialised states, medium industrialised states and low industrialised states. The details of the classification are given in table-2A in the appendices and unemployment rates across these three categories of states are presented in figure-3.

Figure 3: Unemployment Rates in the High, Medium and Low Industrialised States in India Across Different Educational Categories

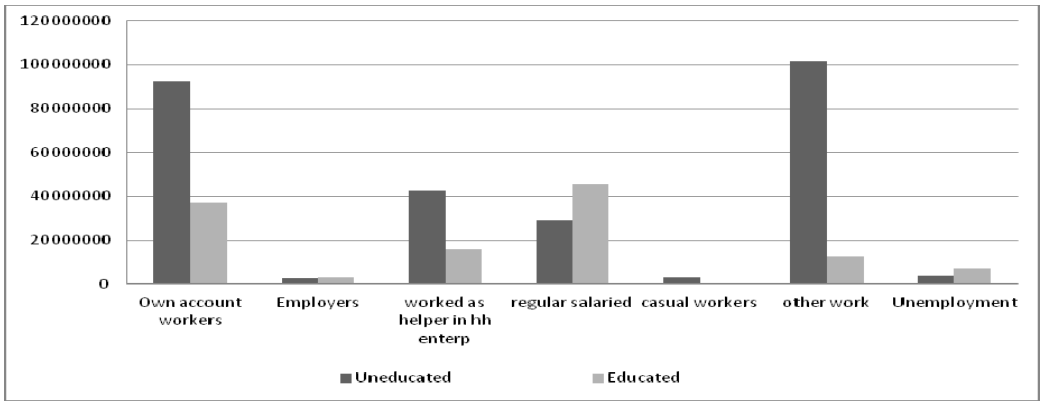


Source: Same as figure 1.

Figure 3 portrays that although unemployment rate increases with the increase of the level of education in all the states irrespective of their status of industrialisation, high-industrialised states account for low unemployment rates across higher educational categories than medium and low industrialised states. The possible reason could be that high-industrialised states are able to create more jobs for educated people compared to other states. However, high-industrialised states are also unable to engage all educated people in the production process, which clearly shows the deficiency in demand for educated workforce in India.

Since the above discussion brings to the fore the fact that the unemployment rate is higher for educated people than for uneducated across all the regions in India, it is important to examine as to why the unemployment rate is lower for uneducated people than for educated people and the occupation categories where the uneducated people are employed. Figure 4 presents a comparative picture of educated and uneducated people by different types of occupation.

Figure 4: A Comparative Picture of Educated and Uneducated People by Types of Occupation for 2011-12

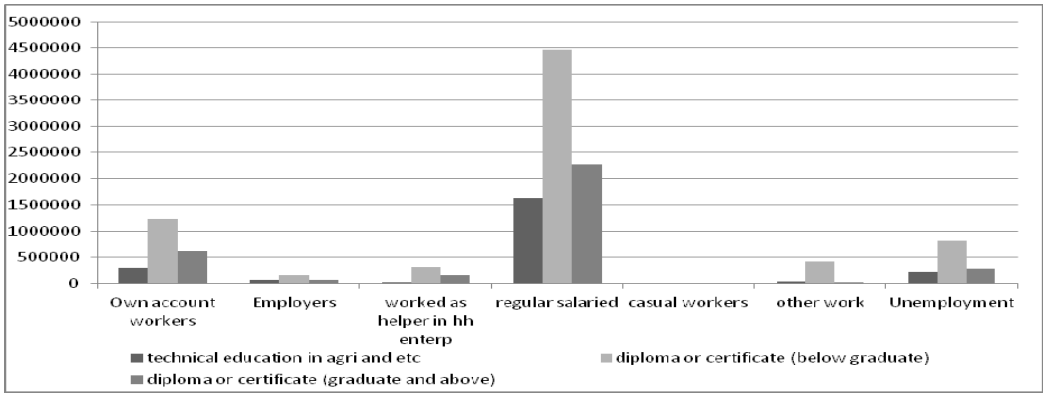


Source: Same as figure 1.

Figure 4 shows that the uneployment rate among the uneducated people is lower since they are mostly own account workers (i.e, self-employed) and engaged in other work. A substantial number of them are also engaged as helpers in household enterprises on an unpaid basis. However, the educated people are mostly engaged in regular salaried jobs. Thus, one of the reasons for high unemployment among educated people as against uneducated is that the educated people are not fit for sub-standard informal jobs like own account work, helper in household enterprises etc., and at the same time, sufficient regular salaried jobs are also not available to absorb all the educated labour force.

More importantly, considering the present focus of the Indian government on solving the unemployment problem through promoting technical education and vocational training, it would be interesting to take a look at the present situation of different types of jobs held by technically-educated and vocationally-trained people which are presented in figures 5 and 6.

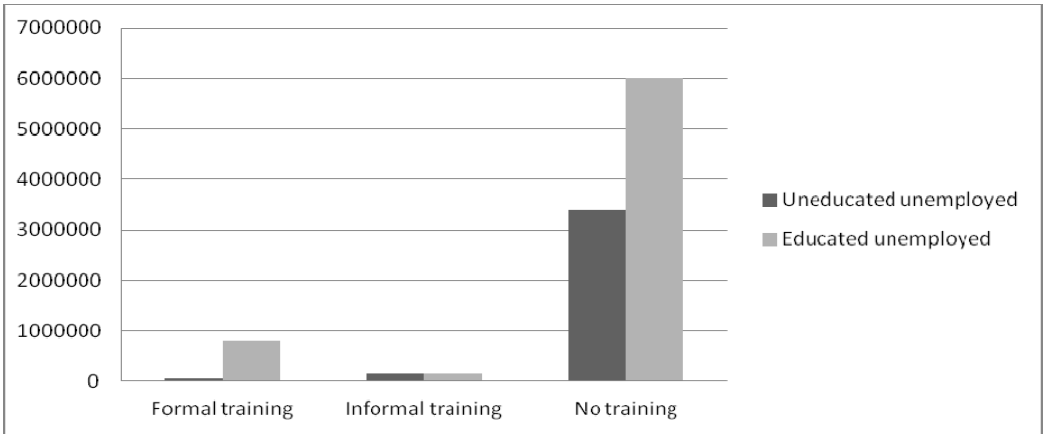
Figure 5: Different Types of Jobs Held by Technically Educated People for 2011-12



Source: Same as figure 1.

Figure 5 clearly shows that technically-educated people across all the three categories (technically educated in agriculture and etc, diploma or certificate below graduate and diploma or certificate above graduate) are engaged in regular salaried jobs. However, it has to be noted that possessing technical education byitself doesn't necessarily guarantee employment. In fact, a large number of technically-educated people coming under all the three categories are also unemployed. Thus, besides promoting technical education, the government needs to focus more on the creation of jobs and demand for workers since industries are unable to create sifficient job opportunities for all the technically educated people. As the number of technically educated people increases due to several special intiatives being undertaken by the present Indian government, the creation of jobs for engaging these people should, at the same time, expand at a more repid rate. Otherwise, it could increase the volume of technically-educated unemployment, leading to a huge loss of human capital investment.

Figure 6: Magnitude of Educated and Uneducated Unemployment (in Absolute Numbers) with Formal, Informal and Without Vocational Training.

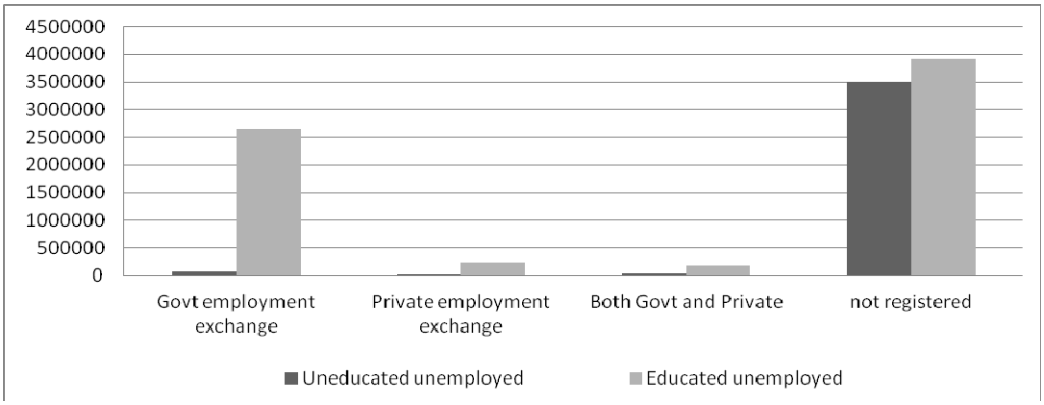


Source: Same as figure 1.

Although the number of both educated and uneducated unemployment is higher for people without vocational training, a substantial number of people are unemployed even with formal and informal vocational training. This clearly indicates that possessing vocational training byitself doesn't guarantee employment. Thus, the creation of employment opportunities is very important along with the promotion of vocational education.

Further, studies argue that 'information asymetry' and 'search and matching' problem can also result in unemployment, to a large extent. In this respect though, employment exchanges, to some extent, try to solve such problems by way of maintaining a register of bio-data details of the people registered with them and informing them, from time to time, of the availability of suitable vacancies. Thus, an analysis of the educated and uneducated unemployment of people registered with different employment exchanges can be very useful in understanding whether 'search and matching' is a crucial factor in determining educated unemployment in India.

Figure 7: A Comparative Picture of Educated and Uneducated Unemployed Based on Registration with Different Employment Exchanges.

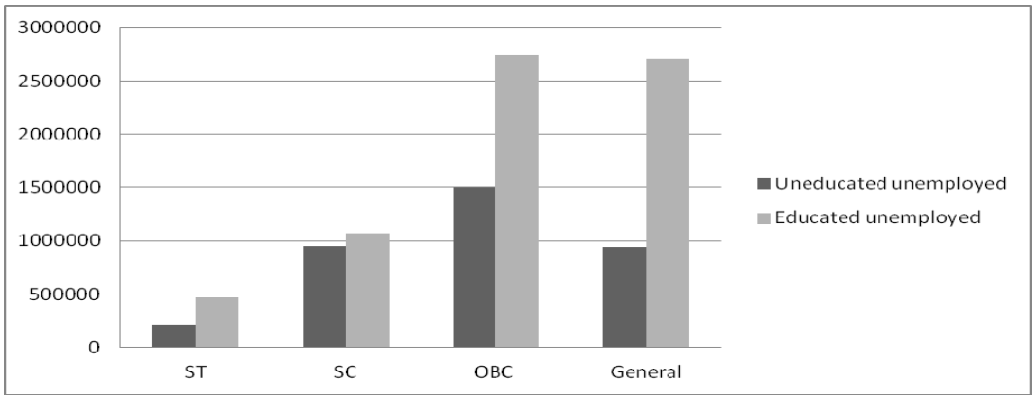


Source: Same as figure 1.

Although a large number of educated are unemployed even after having been registered with government employment exchanges, the number of unemployed is higher for both the educated and uneducated people among those who are not registered with employment exchanges. This clearly indicates that search and matching problem may also be an important reason for educated unemployment in India.

Considering that India exhibits heterogeneity in terms of socio-economic charateristics, such as religion, culture, social groups etc., it is important that we examine educated and uneducated unemployment against different socio-economic characteristics at the individual and household levels. Figure-8 presents a comparative picture of educated and uneducated unemployment by different social groups.

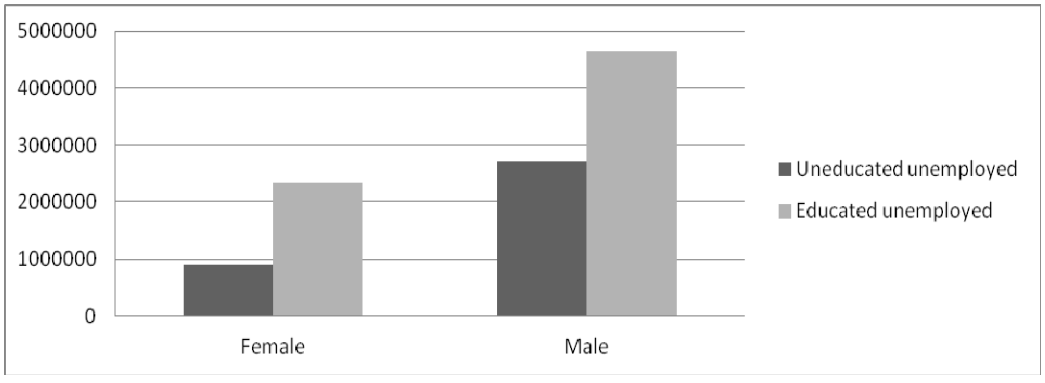
Figure 8: A Comparative Picture of Educated and Uneducated Unemployment by Different Social Groups



Source: Same as figure 1.

The above figure depicts that the unemployment rate is higher for educated people than for uneducated across all the social groups. However, the gap between educated and uneducated unemployment is higher for general and OBC categories as compared to ST and SC. The possible reason could be that the general and OBC categories account for higher numbers of educated people, creating a high degree of competition among them for securing jobs due to the scarcity of jobs on the one hand and on the other, reservations in jobs for other backward social groups. As a result, a substantial number of people remain unemployed in these categories.

Figure 9: A Comparative Picture of Educated and Uneducated Unemployment by Male and Female



Source: Same as figure 1.

The unemployment rate for both the educated and uneducated people is higher for male than for female. The reason for this is the fact that the labour force participation rate (LFPR) in India is much higher for male than for female. However, the unemployment rate is much higher for educated people than for the uneducated in respect of both male and female.

3. Determinants of educated unemployment

The descriptive analysis at the macro level (sector/ economic activities) is not rigorous enough to identify the socio-economic factors responsible for educated unemployment in India. However, with the above macro background of educated unemployment in India, this limitation is overcome by the following results from the econometric approach based on the Probit model, using unit/individual level data.

Methodology

This section estimates the determinants of the probability of being educated unemployed. From the unit level data, we have excluded all uneducated people. Following NSSO, 'educated' is defined here as those who have attained an educational level of secondary and above, including those completed diploma/ certificate courses. Considering the working-age group, our analysis is restricted to the age group 15 and above.

The response variable is binary in nature where 1 indicates that a person is educated unemployed and 0 if a person is educated and employed. To estimate the determinants of the educated unemployment, a Probit regression analysis is used. Following Maddala (1989), Probit regression model can be written as follows:

$$y_i^* = \beta_0 + \sum_{j=1}^{K} \beta_j X_{ij} + u_i \qquad (3.1)$$

Where y_i^* is the latent variable. A vector of explanatory variables X is assumed to influence the response variable y_i. Specifically, the model takes on the following form

$$P_i = \text{Prob}(y_i = 1) = \text{Prob}\left[u_i > -\left(\beta_0 + \sum_{j=1}^{K} \beta_j X_{ij}\right)\right]$$

$$= 1 - F\left[-\left(\beta_0 + \sum_{j=1}^{K} \beta_j X_{ij}\right)\right] \qquad (3.2)$$

Where F is the cumulative distribution of u.

If the distribution of u is symmetric, we can write

$$P_i = F\left[\left(\beta_0 + \sum_{j=1}^{K} \beta_j X_{ij}\right)\right] \qquad (3.3)$$

In the Probit model, the inverse of the normal cumulative distribution function is a standardised variable, or a 'Z' score. Thus,

$$P_i = \Phi\left[\left(\beta_0 + \sum_{j=1}^{K} \beta_j X_{ij}\right)\right] \qquad (3.4)$$

Where the general form of the cumulative distribution function, F, is replaced by the standard normal cumulative distribution function, Φ.

Variable descriptions, expected sign and economic interpretation

A similar set of explanatory variables is used to test the hypothesis that the sign and magnitude of the coefficients of the determinants of educated unemployment are the same or different for developed, developing and underdeveloped states, and to test which category of states has a major impact at the national level. NSSO 2011-12 unit level data on Employment and Unemployment is used for accomplishing the objective. The explanatory variables considered for estimation are described in table 4.

Table 4: Variable description for identifying the determinants of educated unemployment

Variables	Description	Expected sign	Economic interpretation
Supply-side factors			
1) Age (years)		Negative	Probability of a young age person (over 14) getting a job is higher.
2) Age-squared		Positive	Probability of an old age person getting a job is lower because of the age restrictions to entry into the job market.
3) Household size	Number of members in a household	Negative	People belonging to a large household (if some other members are earning) can afford being unemployed for a certain time period to search for a better job.
4) Religion	D1 = 1, Hindu = 0, otherwise	Negative	Minority religious people may get less exposure and less information about the job market.
5) Social group	D2 = 1, ST =0, otherwise D3 = 1, SC =0, otherwise D4 = 1, OBC =0, otherwise	Positive Positive Positive	Socially disadvantaged castes (ST, SC and OBC) have a relatively less exposure to finding a job.
5) Gender	D5 = 1, male =0, otherwise	Negative	Male gets a greater exposure to finding jobs. Female have other household-based activities.
6) Registered in employment exchanges	D6 = 1, govt employment exchanges =0, otherwise D7 = 1, private placement agencies = 0, otherwise D8 = 1, both in govt and private = 0, otherwise	Negative Negative Negative	Registration with employment exchanges creates more job opportunities due to the more availability of information about vacancies.
7) Vocational Training	D9 = 1, formal vocational training =0, otherwise D10 = 1, informal vocational training =0, otherwise	Negative Negative	Enhancement of skill Vocational training raises the probability of finding jobs.

8) Rural	D11 = 1, rural =0, otherwise	Positive	People belonging to rural areas have a relatively less exposure of job opportunities.
9) Technical Education	D12 = 1, Technical education in agriculture/ engineering/ technology/ medicine, etc. =0, otherwise D13 = 1, Diploma or certificate (below graduate level) =0, otherwise D14 = 1, Diploma or certificate (graduate and above level) =0, otherwise	Negative	People with technical education possess high probability to find a job.
Demand-side factors			
10. Industrialization of the states	D15 =1, high industrialised states =0, otherwise D16 =1, medium industrialised states =0, otherwise	Negative Negative	High industrialised states creates more demand for educated workers

4. Estimation Results

Determinants of educated unemployment at the national level

The estimation results of the Probit model at the national level are presented in Table-5.

Table 5: Determinants of Educated Unemployment in India: Probit Model Estimates.

Variable	Coefficients	Marginal effects
Age (years)	-0.15*** (0.008)	-0.007*** (0.0006)
Age-squared	0.001*** (0.0001)	0.00006*** (0.000008)
Household size	0.01*** (0.003)	0.0005*** (0.0002)
Religion	-0.106*** (0.022)	-0.005*** (0.001)
ST	-0.042 (0.029)	-0.002 (0.001)
SC	-0.03 (0.031)	-0.001 (0.001)
OBC	-0.104*** (0.022)	-0.005*** (0.001)
Male	-0.476*** (0.02)	-0.032*** (0.002)
Registered with government employment exchanges only	0.771*** (0.019)	0.065*** (0.003)
Registered with private placement agencies only	0.833*** (0.066)	0.089*** (0.013)

Registered with both government and private placement agencies	0.352*** (0.064)	0.024*** (0.006)
Formal vocational training	0.001 (0.034)	0.00006 (0.002)
Informal vocational training	-0.804*** (0.05)	-0.021*** (0.001)
Rural	-0.135*** (0.019)	-0.007*** (0.001)
Technical education in agriculture/ engineering/ technology/ medicine, etc.	0.249*** (0.063)	0.015*** (0.005)
Diploma or certificate (below graduate level)	0.171*** (0.036)	0.009*** (0.002)
Diploma or certificate (graduate and above level)	0.203*** (0.05)	0.012*** (0.004)
High industrial states	-0.367*** (0.023)	-0.016*** (0.001)
Medium industrial states	-0.086*** (0.011)	-0.004*** (0.0006)
Constant	2.37*** (0.125)	
Log likelihood = -11628.369 Number of observations = 65752 Wald chi2(19) = 5768.71 Prob > chi2 = 0 Pseudo R2 = 0.298		

Note: *** indicate statistical significance at 1% level.

Source: Same as figure 1.

The sign of coefficients for age, age-squared, household size, religion, gender and informal vocational training for the national level estimation of the determinants of educated unemployment is the same as expected and also statistically significant. As we have explained before, the justification for the expected sign, signs of coefficients for age and age-squared are different because the probability of getting employment increases as age increases but, after a certain age, the probability decreases even for the educated people. This may be mainly due to the presence of age restrictions in the formal job market. Further, the household size is also an important factor in determining educated unemployment i.e., larger the household size, higher the unemployment rate. In other words, people belonging to the large household size (if some other members are earning) can afford being unemployed for a certain time period for searching a better job. The negative and significant coefficient for religion variable can be interpreted that Hindu educated people are better exposed to finding jobs than other minority religious groups. Further, educated males are better exposed to the job market than educated females. People with informal vocational training along with their general education are more likely to find jobs. At the same time, like informal vocational training, the formal vocational training variable shows a negative relation with respect to unemployment, but the coefficient is statistically insignificant.

However, the sign of coefficients with respect to social groups is different from our expected sign in that coefficients for SC and OBC are negative, but insignificant for SC. The possible reason could be that the educated people who belong to OBCs are more likely to find jobs, largely in view of their greater aspirations and awareness than other socially disadvantaged groups like ST and SC. Surprisingly, educated people registered with government employment exchanges and private

placement agencies are also found unable to find jobs and expectedly, the coefficient is positive and significant. More unexpectedly, people with all the three types of technical education, namely, technically educated in agriculture or engineering or technology or medicine etc. and diploma or certificate below graduate level and diploma or certificate above graduate level show a positive and significant coefficient which can be interpreted that possessing technical education byitself doesn't necessarily guarantee employment, in the event of a deficiency in demand for technically-educated people. Further, educated people belonging to rural areas exhibit a greater probability of finding jobs, may be because of the presence of relatively less number of educated people in rural areas create less competition in the job market. Moreover, the negative and significant coefficients of industrialised states show that capital formation increases the demand for educated workforce which, in turn, reduces the unemployment rates.

Marginal effects explain an explanatory variable's magnitude of influence with respect to becoming educated (un)employed. In the above analysis for 2011-12, at the national level, age and household size are continuous variables and their marginal effect on employment/ unemployment can be interpreted as follows: With a one-year increase in age, the probability of getting a job increases by 0.007 on an average, and with an increase of one member in the household size, probability of finding a job decreases by 0.0007. The rest of the variables are dummies with the probability change being due to the variables' discrete change from zero to one. The marginal effect of Religion can be interpreted as follows: An increase in a Hindu religion level from zero to one, increases the probability of getting absorbed in the job market by an average of 0.007, while the marginal effect with respect to SC, OBC and gender being -0.002, -0.007, -0.03 respectively, which can be explained as follows: A change in the SC, OBC and gender variables from zero to one enhances the probability of getting a job by an average of 0.002 and 0.007 and 0.03 respectively. Most interestingly, the marginal effect of two demand-side variables (high and medium industrialised states) are -0.016 and -0.004, which can be interpreted as the movement of a person from low to high industrialised states enhances the probability of getting a job by an average of 0.016 and to medium industrialised states as 0.004. The impact of other variables can also be interpreted in a similar way.

Comparison of developed, developing and underdeveloped states

States are divided into three groups, namely developed, developing and underdeveloped for identifying the determinants of educated unemployment by way of testing the hypothesis as to whether or not the nature and extent of determinants are different with respect to the levels of development across states. The states have been clubbed on the basis of composite indices, using the levels of development based on Human Development Index (HDI). Table-1A in the appendices presents the categorisation of states/UTs on the basis of HDI score-2006. Category-1 is considered a group of the developed states with a HDI score of more than 0.7, while category-2 (developing states) includes the middle performing states with a HDI score of 0.601 to 0.7. Third category includes the states in the bottom pile with a HDI score of less than 0.6.

The Probit model estimation results for the developed, developing and underdeveloped states are presented in Table 6.

Table 6: Determinants of Educated Unemployment in the Developed, Developing and Underdeveloped States in India: Probit Model Estimates

Variable	Developed states	Developing states	Underdeveloped states
Age (years)	-0.136*** (0.02)	-0.184*** (0.01)	-0.13*** (0.018)
Age-squared	0.001*** (0.0003)	0.002*** (0.0001)	0.0008*** (0.0003)
Household size	0.059*** (0.01)	0.009 (0.005)	0.012*** (0.005)
Religion	-0.06 (0.054)	0.014 (0.037)	-0.038 (0.039)
ST	-0.406*** (0.105)	0.04 (0.042)	-0.216*** (0.059)
SC	0.058 (0.095)	-0.009 (0.046)	-0.072 (0.05)
OBC	0.009 (0.051)	-0.074** (0.037)	-0.251*** (0.035)
Male	-0.68*** (0.046)	-0.363*** (0.029)	-0.388*** (0.038)
Registered with government employment exchanges only	0.524*** (0.049)	0.8*** (0.029)	0.655*** (0.036)
Registered with private placement agencies only	0.295 (0.28)	0.962*** (0.092)	0.866*** (0.106)
Registered with both government and private placement agencies	0.019 (0.15)	0.307*** (0.098)	0.475*** (0.106)
Formal vocational training	-0.005 (0.07)	-0.045 (0.05)	-0.03 (0.066)
Informal vocational training	-0.764*** (0.131)	-0.737*** (0.077)	-0.871*** (0.077)
Rural	0.041 (0.048)	-0.143*** (0.028)	-0.161*** (0.032)
Technical education in agriculture/ engineering/ technology/ medicine, etc.	0.072 (0.162)	0.159 ().101)	0.41*** (0.097)
Diploma or certificate (below graduate level)	0.041 (0.076)	0.149*** (0.053)	0.265*** (0.065)
Diploma or certificate (graduate and above level)	0.088 (0.115)	0.152** (0.075)	0.327*** (0.086)
High industrial states	0.031 (0.05)	-0.703*** (0.036)	
Medium industrial states		-0.227*** (0.023)	-0.026 (0.016)
Constant	2.02*** (0.323)	2.91*** (0.167)	1.99*** (0.26)
Number of observations = Wald chi2(19) = Prob > chi2 = Pseudo R2 = Log Likelihood	8142 1010.07 0 0.302 -1904.729	32209 2909.19 0 0.349 -5162.812	25401 1881.22 0 0.269 -4250.604

Note: **, *** indicate statistical significance at 5% and 1% level respectively.

Source: Same as figure-1.

The above table shows that irrespective of the development levels, the probability of finding employment increases as age increases in all the states, but the probability decreases after a certain age. Individuals belonging to large family size are more likely to remain unemployed. However,

variations exist in the sign across social groups. The positive coefficients with respect to the SC and OBC people belonging to the developed states can be interpreted as SC and OBC people are less likely to find jobs in the developed states. Similarly, the possibility of males finding employment is higher than females in all the states. Considering that in all the states, educated people registered with government employment exchanges and private placement agencies find it difficult to find jobs, it is no surprise that the coefficient is positive and significant. Although the coefficient for formal vocational training is insignificant in respect of the developed states, it is negative and significant for developing states. The coefficient with respect to informal vocational training is negative and significant for all the states irrespective of their levels of development, which can be interpreted that people with informal vocational training are more likely to find jobs. Further, the probability of educated people belonging to rural areas finding employment is high in the developing and underdeveloped states, while at the same time, their probability of finding jobs is low in the developed states. This may be due to the fact that various schemes of the government supporting self-employment and casual labour activities are more visible in rural areas, particularly developing regions. As far as urban areas are concerned, in both the developing and underdeveloped regions, the government sponsored schemes are not sufficient to provide employment for all the educated people.

5. Conclusion

The study results indicate that the relationship between education and unemployment differs across the developed and developing countries. In the case of developed countries, the higher the educational level, the lower is the likelihood of unemployment. However, in developing countries, what is observed is that the unemployment rate increases with an increase in the educational level. Perhaps, this could be due to demand or skill mismatches or low absorption capacity of the labour markets in the developing countries vis-à-vis the developed countries. There exists a similar situation in the Indian context, i.e., a negative relationship between higher education and employment rate.

In India, not only is the rate of unemployment higher with an increase in levels of education, but also, when it comes to the issue of gender bias, it becomes obvious that women face much higher rates of unemployment as against their male counterparts across all the educational categories. Moreover, we find both from descriptive and regression analyses that possessing technical education byitself does not necessarily guarantee employment which questions the present government's inatitive to promote technical education. In fact, a large number of technically-educated people across all the three categories (technically educated in agriculture or engineering or technology or medicine etc., diploma or certificate below graduate level and diploma or certificate above graduate level) are unemployed. Thus, besides promoting technical education, the government needs to focus more on the creation of productive jobs and demand for workers since all industries, in view of the competitive global market environment, try to reduce the aggregate cost of production and there is no additional scope for the creation of sufficient jobs to engage all the technically-educated people. As the number of technically-educated people is likely to increase in the coming years due to the special intiative of the present Central government of India, creation of adequate job opportunities to engage these people

should expand at a more rapid rate. Otherwise, it could lead to a great loss of human capital investment.

Both descriptive and regression analyses confirms that high-industrialised states account for low unemployment rates across higher educational categories than medium and low industrialised states. The possible reason could be that high-industrialised states are able to create more jobs for educated people compared to other states. However, high-industrialised states are also unable to engage all educated people in the production process, which clearly shows the deficiency in demand for educated workforce in India. Moreover, since the number of unemployed is higher for both the educated and uneducated people, those who are not registered with employment exchanges, search and matching problem may also be an important reason for educated unemployment in India.

The probability of finding jobs increases as age increases but, after a certain age, the probability decreases irrespective of the levels of development across states. This may be mainly due to the presence of age restrictions in the formal job market and a decrease in productivity with an increase in age. Further, the household size is also an important factor in determining educated unemployment. People belonging to a larger household size, can afford being unemployed for a certain period, provided some other members are earning in the household. Moreover, Hindu educated people tend to enjoy more exposure to the job market as compared to other minority religious groups. The results also highlight that educated people, even after registering with government employment exchanges and private placement agencies, find it difficult to find jobs.

Differences have been found in the sign across social groups and developed, developing and underdeveloped states. The positive coefficients with respect to the SC and OBC people for developed states can be interpreted as the probability of SC and OBC people finding employment is less in the developed states. However, educated people belonging to rural areas are more likely to find jobs in the developing and underdeveloped states compared to the developed states. This could be due to the fact that various schemes of the government aimed at supporting self-employment and casual labour activities are more visible in the rural areas, particularly developing regions. As far as urban areas are concerned, in both developing and underdeveloped regions, the government sponsored schemes are not sufficient enough to provide employment for all the educated people.

The analysis has been restricted to individual, household and state based characteristics. In addition to that, identifying the other macro level variables along with the aforementioned features which tend to impact the educated unemployment in India could be useful for policy framing.

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Appendices

Table 1A: Development Category of States/UTs by HDI Score-2006

Category	States/UTs
Category-1 (0.701 and above)	Chandigarh, Goa, Kerala, Delhi, Pondicherry, A & N Islands, Manipur.
Category-2 (0.601 to 0.700)	Nagaland, Daman & Diu, Lakshadweep, Maharashtra, Mizoram, Dadra & Nagar Haveli, Punjab, Himachal Pradesh, Tamil Nadu, Sikkim, Tripura, Uttarakhand, Arunachal Pradesh, Haryana, West Bengal, Gujarat, Meghalaya, Karnataka.
Category-3 (below 0.600)	Assam, Jammu & Kashmir, Andhra Pradesh, Jharkhand, Chhattisgarh, Rajasthan, Orissa, Madhya Pradesh, Uttar Pradesh, Bihar.

Source: Ministry of Women and Child Development, Government of India (2009).

Table 2A: Industrial Category of States/UTs in India for 2006 Based on Per Capita Private Capital Formation

Category	States/UTs
High industrial states (Above Rs. 12,000)	Chandigarh, Dadra & Nagar, Daman & Diu, Goa, Gujarat, Haryana, Himachal Pradesh, Kerala, Maharashtra, Pondicherry, Tamil Nadu, Uttarakhand.
Medium industrial states (Rs. 5,000 to Rs. 12,000)	A & N Islands, Andhra Pradesh, Chhattisgarh, Delhi, Lakshadweep, Punjab, Sikkim, Karnataka, Manipur, Orissa, Rajasthan.
Low industrial states (below Rs. 5,000)	Arunachal Pradesh, Assam, Jammu & Kashmir, Jharkhand, , Madhya Pradesh, Uttar Pradesh, Bihar, Meghalaya, Mizoram, Nagaland, Tripura, West Bengal.

Source: Author's estimation based on private capital formation data from Rajeswari, Ray and Sahoo (2009) and population projection figures for 2006 from Ministry of Statistics and Programme Implementation, Government of India.

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