

Being Out of Work: An Analysis of Unemployment and Its Duration in India



Mousumi Dutta and Zakir Husain

1 Introduction

Unemployment refers to a state of not being engaged in any economic activity and seeking work. Though the value placed on employment depends on the type of employment, it is widely acknowledged that unemployment is ‘bad’. There are several reasons for this.

Nordhaus (1975) observes that conditions of slump and high unemployment may reduce working hours and overtime opportunities even if the worker is not thrown out of work. Those who are unemployed find it difficult to get a new job, as even opportunities for part-time work become restricted. In such cases, Stewart and Streeten (1971) point out employment creation may be the only mechanism for redistributing income to those who would otherwise remain unemployed.

Unemployment may leave a scar even after the worker regains a new job (Ruhm 1991). Studies in the USA and Britain show post-unemployment earnings losses to be permanent (Gregory and Jukes 2001; Brand 2015; Gangl 2006). Factors responsible for scarring include ‘... stigma effects of unemployment, loss of workers’ firm-specific human capital, human capital depreciation through intensified economic restructuring, and constraints on worker search behaviour’ (Gangl 2006). The financial strain associated with being out of work may also affect health status (Marmont et al. 2013). While the reduction in absolute income may reduce family budget on health-related expenditure, the decline in relative income can affect self-esteem and social status, affecting health through psychosocial channels (Tøge 2016).

M. Dutta (✉)

Economics Department, Presidency University, Kolkata, India

e-mail: mousumi.econ@presiuniv.ac.in

Z. Husain

Humanities & Social Sciences Department, Indian Institute of Technology, Kharagpur, India

e-mail: dzhusain@gmail.com

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Unemployment and its accompanying economic hardships may create political instability. Nordhaus's theory of political business cycles is based on the assumption that high unemployment levels will lead to a swing in the electorate against the incumbents; this induces parties in power to control unemployment by stimulating the economy just before elections (Nordhaus 1975).

Puritanism views work as valuable, irrespective of its contribution to production. Based on this ethic, writers have underlined the intrinsic worth of employment is intrinsically good, whatever its impact on morale, self-respect and other subjective feelings. This has led researchers emphasising on the demoralising effect of unemployment—'To feel unwanted, not to be able to make any contribution, lowers a man's morale and makes him lose his self-respect' (Stewart and Streeten 1971: 152).

For these reasons, unemployment is treated as one of the important macroeconomic variables, and considerable attention is paid to its measurement. In India, there are two main sources of data on unemployment. They are the decadal Census and quinquennial surveys by the National Sample Survey Office (NSSO). Both these sources have been criticised for their narrow definition of unemployment (Sen 1975). In this paper, we will use a new addition to the NSSO questionnaire (in the 68th round) to show how unemployment can be measured. We will estimate unemployment rates, study its variation over important correlates, identify determinants of unemployment and conclude by a study of the duration of unemployment.

2 Defining Unemployment

2.1 *Official Definition of Unemployment*

In India data on employment are reported in the decadal Census, Economic Census (for the non-agricultural sector), surveys of the Labour Bureau and NSSO. However, it is only in the NSSO reports and surveys of Labour Bureau that we get estimates of unemployment. The 1961 Census also provides estimates of unemployment.

In NSSO surveys, the definition of unemployment is as follows¹:

The activity status is determined by the activity situation in which a person is found during a reference period or at a point of time under reference, which occurs with the person's

¹The following discussion is largely based on GoI (2001).

participation in economic and non-economic activities.² According to this, a person will be in one or a combination of the following three statuses during a reference period:

- (i) working or being engaged in economic activity (work),
- (ii) being not engaged in economic activity (work) and either making tangible efforts to seek 'work' or being available for 'work', if the 'work' is available, and
- (iii) being not engaged in any economic activity (work) and also not available for 'work'.

Activity status (i) above is associated with 'employment', (ii) with 'unemployment' and the last with 'not being in the labour force'. (GoI 2001: 43).

In NSSO reports the concept of usual status is important. This relates to the activity status of a person during the reference period of the year preceding the date of survey. The activity status on which a person spent relatively longer time (major time criterion) during the reference period is considered his or her principal usual activity status. Initially, NSSO used a threefold categorisation of activity status—'employed', 'unemployed' and 'out of labour force'—based on how the respondent had spent the major part of the reference period. From the 50th round, a two-stage dichotomous procedure was adopted. Respondents were initially classified as being 'in the labour force' or 'out of the labour force'; those respondents who were 'in the labour force' were further classified as either unemployed or unemplotted.

This is easily understood if we consider the NSSO codes on principal status.

NSSO also has a reference period of the week preceding the date of survey. If the respondent has not been engaged in any economic activity on any of the seven days but was looking for work, (s)he is classified as unemployed. This is called the current activity status and was used in the 11–18th rounds. Subsequently, till the 22nd round, the economic status during the majority of the week was considered in determining whether the respondent was unemployed. From the 27th round, the term current weekly status was introduced.

An approach similar to that of NSSO is followed by the Bureau of Labour. Economic activity is defined as any activity for market-oriented production, agricultural production for self-production and own production of fixed assets. Using a reference period of one year, respondents are classified as workers, unemployed or being out of labour force depending upon how they have spent the majority of the reference period. A second estimate, using a reference period of the week preceding date of survey, is also used to determine the weekly status. Thus, unemployed means:

Persons, who owing to lack of work, had not worked but either sought work through employment exchanges, intermediaries, friends or relatives or by making applications to prospective

²Initially, while referring to 'work', NSSO used the term 'gainful activities'. This referred to any activity adding value to the 'national product' of the country. However, in addition to production of goods and services for exchange, any agricultural production for own consumption and did not go for sale was also considered 'gainful' or 'work'. From the 50th round, NSSO substituted 'economic activities' instead of 'gainful activities'. Economic activity refers to any activity resulting in production of goods and services that adds value to national product is considered as economic activity. It includes production of all goods and services for market, production of primary commodities for own consumption and own account production of fixed assets. This is a slightly broader definition than gainful activities, including own account production of fixed assets.

employers or expressed their willingness or availability for work under the prevailing condition of work and remuneration are considered as those who are 'seeking or available for work' (or unemployed) (GoI 2012: 16).

Information on economic activity is being collected in the Census since 1872. The 1872 Census, as well as the 1881 Census, also collected information on occupation. In 1891 information on means of subsistence too was elicited. Information on principal and subsidiary occupations of actual workers was collected in the period 1901–1921, with workers being defined as any person earning income.³ The 1941 Census obtained information on means of livelihood, while the 1951 Census classified the population into dependents and employed (using economic status) and principal and subsidiary means of livelihood. In the 1961 Census, it was decided to classify the population into workers and non-workers. As the category of non-workers comes closest to what we mean by unemployment, this classification merits our attention.

In the case of seasonal activities, any person working regularly for more than one hour daily throughout the greater part of the working season was regarded as a worker. In the case of regular employment in any trade, profession, service, business or commerce a person had to be employed during any of the fifteen days preceding the day on which he was enumerated. If the person was normally working but was absent from work during the reference period due to illness or other cause, was also considered to be a worker. Among others considered to be workers were: trainee or apprentice working with or without wages, public or social service worker engaged in public service activities and political worker engaged in political activities. A person who was offered work but had not actually joined was treated as a non-worker. Adult women engaged in extended System of National Accounts activities, beggars, pensioners, etc., who received income without doing any work were also regarded as non-workers. Thus, the non-worker category includes both persons normally considered to unemployed and those outside the labour force.

From the 1971 Census, the population was classified by main activity. The main activity of a person was ascertained on the basis of how (s)he spent (her)his. For regular work in Industry, Trade or Services the reference period was the week prior to the enumeration; it was one year for seasonal work. In addition, if any person, whether worker or non-worker, made marginal contribution to work this was recorded under secondary activities. From this Census onwards, information on unemployed was not recorded; unemployed were included—along with housewives, rentiers, pensioners, beggars and students—under the category of non-workers.

³Thus, even rentiers and pensioners were considered to be workers.

2.2 *Sen's Criticism*

Sen (1975) starts by pointing out that the basic principle underlying the definition of unemployment in the NSSO reports is the intersection of, what he calls, the income and recognition criteria.⁴ This is explained as follows:

The test, therefore, is based on the *intersection* of two criteria. If one recognises oneself as unemployed and 'seeks work', but regularly does one or two hours of work in the family farm, one does not qualify as 'not working' and therefore has no chance of being taken as unemployed. Similarly if one is 'not working' but not 'seeking work', then again one is not unemployed. The... definition of unemployment covers precisely those who pass *both* the tests (Sen 1975: 120).

Given the stringency of the test, it is not surprising, therefore, that the estimates of unemployment are 'low enough to put may advanced countries to shame' (Sen 1975: 119).

Further, Sen argues, the definitions of both income and recognition criteria are narrow.

For instance, if a person feels that although (s)he is not making any worthwhile contribution, there are no possible sources of work (s)he will not seek work. In that case, under the NSSO definition, the person will be not be treated as unemployed—even though the person falls in the category of unemployed using the recognition approach. 'The interpretation of the recognition approach is, therefore, rather narrow' (Sen 1975: 121). Over time, the addition of the clause 'actively seeking work' to the clause 'making tangible efforts to seek work' had further tightened the recognition criterion.⁵

Similarly, the income approach is also narrowly defined:

The income approach should, strictly speaking, count as employed only those who would not receive their share of the family income if they stopped working. The test is not whether one is working and receiving an income, but whether one is receiving an income *because* one is working (Sen 1975: 121).

Although this may not make a major quantitative difference, as the distinction between the two is not easily verified empirically, the income criterion does make it difficult for a person to be classified as unemployed, particularly as we are considering only the intersection with the recognition criterion.

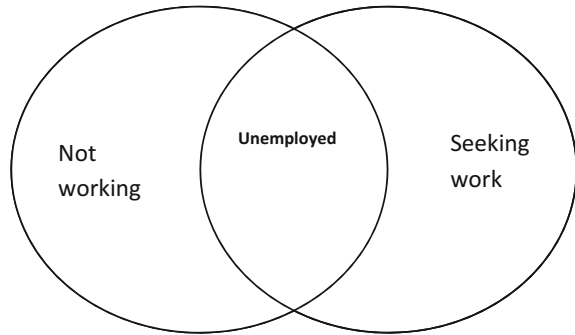
Thirdly, NSSO imposes an age restriction. Only persons above 15 years are considered to be in the workforce and can be classified as being either employed or unemployed. Persons below 15 years are not considered unemployed even if they are actively seeking work.⁶

⁴The income criteria require the person to be earning an income in order to be classified as employed, while the recognition criteria state that the person must have a sense of being engaged in some activity worth his while' (Sen 1975: 5).

⁵Recognising the importance of this point, NSSO has added the clause 'if work is available', thereby widening the recognition criterion.

⁶This criterion is imposed to eliminate child workers from being counted as part of the work force. There is, thus, an ethical dilemma whether we should accept Sen's criticism and treat children

Fig. 1 View of unemployed
(Note Sen 1975: 120)



2.3 An Alternative Concept

The NSSO elicits information on how many months a worker (i.e. respondent with principal or subsidiary status codes 11–51) has been unemployed. Respondents are also asked whether (s)he had sought work, was available for work and their respective reasons. A comparison of those without work for at least six months with unemployment figures is interesting.

Figure 2 reports the percentage of unemployed workers using the NSSO definition (principal status code of 81). In both rural and urban areas, as well as for both genders, it is very low—well below unity in all cases. However, 1.03% of workers as classified by NSSO have been without work for six months or more (code 11–51); the figure is 2.47% for all persons deemed to be in the labour force (code 11–81). Figure 1 shows the breakup across gender and place of residence for percentage of unemployed workers (as classified by NSSO), percentage of employed workers without work for more than 5 months (labelled ‘Without work (Pr. Stat. Worker)’) and percentage of persons in labour force without work for at least 6 months (labelled ‘Without work’).

It can be seen that the discrepancy between the proportion of respondents without work for the greater part of the year preceding the survey and NSSO figures for unemployment is quite large, particularly for females. Further, 3.17% of employed workers were reportedly seeking work; the main reason was that there was not enough work (3.01% of workers). This may be treated as an equivalent of disguised unemployment.

Thus, if we take as unemployed the following sum:

(Respondents with Principal status code = 81) + (Respondents with principal status code = 11–51 and not working for at least 6 months) + (Respondents with principal status code = 11–51 and seeking additional work because present work is not enough)

the figure comes to 4.53% of those in labour force. Since the third component is disguised unemployment, we may also drop it. In that case, the unemployment level falls to 2.54%.

seeking work as unemployed. Further, given their non-adult status, it may also be claimed that it is not the children who are seeking work, but their parents/guardians.



Fig. 2 Comparison of levels of unemployment and workers without work for at least six months—by place of residence and gender

So far we have not considered subsidiary status. The NSSO definition uses information on both principal and subsidiary status. So a worker is defined as:

$$(\text{Principal status } 11-81) + (\text{Subsidiary status } 11-51)$$

so that unemployment level is defined as:

$$\frac{(\text{Principal status } 81)}{(\text{Principal status } 11-81) + (\text{Subsidiary status } 11-51)}$$

The definition of unemployment that we propose to use is:

$$\frac{(\text{Principal status } 81) + (\text{Principal status } 11-51 \text{ and without work for at least 6 months})}{(\text{Principal status } 11-81) + (\text{Subsidiary status } 11-51)}$$

In the next section, we shall examine the variation of unemployment—or, as we shall call it, ‘being without work’—across economic and demographic covariates, and undertake an econometric analysis to identify its determinants. We will also estimate a model to study what are the factors affecting the duration of being without work.

3 Database and Methodology

The study is based on the employment and unemployment survey conducted in the 68th round of NSSO during July 2011–June 2012. A stratified multi-stage design was adopted for the 66th round survey. The first stage units (FSU) were the 2001 Census villages (Panchayat wards in case of Kerala) in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. In addition, two non-UFS towns of Leh and Kargil of Jammu & Kashmir were also treated as FSUs in the urban sector. The ultimate stage units (USU) were households in both the sectors. Hamlet groups/sub-blocks constituted the intermediate stage whenever these were formed in the sample FSUs.

The survey was spread over 7,469 villages and 5,268 urban blocks covering 1,01,724 households consisting of 59,700 in rural areas and 42,024 in urban areas. The survey enumerated 4,56,999 persons, of which 2,80,763 were in rural areas and 1,76,236 in urban areas. About 69% of the households in India belonged to rural areas and accounted for about 71% of total sample respondents.

The following variables were used in the study:

1. **Place of residence:** This could be either rural or urban.
2. **Age:** Age of respondent.
3. **Education Level:** Information on the education level of respondents was recoded into five categories—illiterate, below primary, secondary completed, higher secondary completed and graduation and above. Under the category ‘illiterate’ we have included, apart from illiterates, literate persons without formal schooling, and persons educated under adult education schemes like Total Literacy Campaign, etc.
4. **Vocational Training:** Vocational training is defined as any training which prepared an individual for a specific vocation or occupation. Respondents were classified into two groups—those with vocational training and those without vocational training.
5. **Socio-Religious Community:** Respondents were grouped by religion and caste into Hindu-Forward Castes (HFC), Hindu-Scheduled Tribes (HST), Hindu-Scheduled Castes (HSC), Hindu-Other Backward Castes (HOBC), Muslims (Muslim) and other non-Muslim religious minorities (Others).
6. **Household Type:** The household type was decided based on sources of the household’s income during the 365 days preceding the date of survey. For this purpose, only the household’s income (net income and not gross income) from economic activities was considered; the incomes of servants and paying guests were not taken into account. In rural areas, households were categorised into self-employed in agriculture, self-employed in non-agriculture, regular wage/salary earners, casual labour in agriculture, casual labour in non-agriculture and others.

In urban areas, the household types are self-employed, regular wage/salary earners, casual labour and others.

7. **Monthly Per capita Household Expenditure:** NSSO collects information on the expenditure of households. This was used to estimate monthly per capita expenditure. We have used a logarithmic transformation of this variable.
8. **Land cultivated:** In rural areas, land cultivated is an important indicator of economic status. Further, land holdings can provide a source of employment.
9. **Membership in the Labour Union:** Union/association meant any registered/recognised body whose membership is open to a section of those engaged in a specific activity or trade and whose main objective is to look after the interests of its members. Working respondents were categorised into three groups—union members, not a union member and worker in the enterprise without any union.
10. **Sub-rounds:** The NSSO survey was undertaken from July 2014–June 2015. The one-year period was divided into four sub-rounds based on each quarter.

4 Unemployment: Levels and Its Determinants

Unemployment level using the NSSO definition and the alternative definition is given in Table 1. The difference in terms of magnitude is not much, but rural unemployment goes up by seven times, while urban unemployment quadruples. These are substantial changes.

Analysis of unemployment levels over sub-rounds (Fig. 3) using the alternative definition shows rural unemployment peaking in July–August (monsoon), followed by a smaller peak in January–March (Kharif). In urban areas, the peak is in the October–December period (monsoon).

Table 1 Estimates of unemployment using the NSSO and the alternative definition—by place of residence and gender (percentage)

Place of residence	Gender	NSSO	Alternative	Increase factor
Rural	Male	0.35	1.65	5
	Female	0.42	5.27	13
	All	0.37	2.75	7
Urban	Male	0.23	0.74	3
	Female	0.48	3.00	6
	All	0.28	1.19	4
All India	Male	0.31	1.38	4
	Female	0.43	4.84	11
	All	0.35	2.34	7

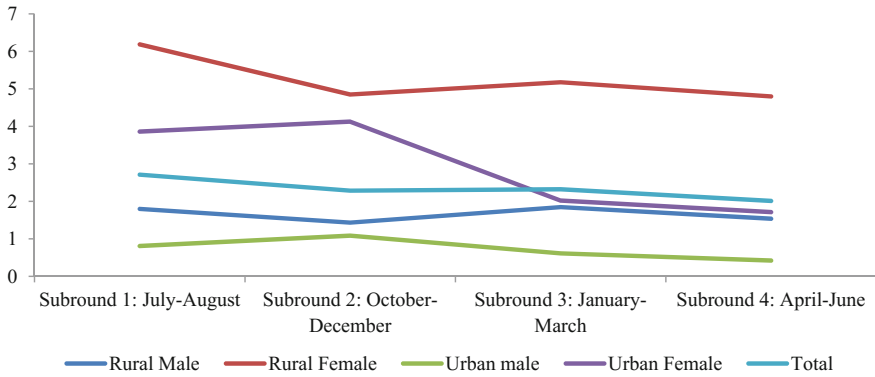


Fig. 3 Unemployment levels by sub-rounds

4.1 Variations in Unemployment by Correlates

Table 2 examines variations in unemployment rates across socio-demographic groups. There is no substantial variation in unemployment across groups. However, in case of certain variables, a relationship with unemployment levels may be seen.

Rural unemployment is highest among HSCs and Muslims. In urban areas, male unemployment is highest among HSCs; if women workers are considered, the unemployment rate is highest among HST workers. The social marginalisation of these groups is thus reinforced by market forces operating through the labour market.

If we consider male workers, unemployment levels are lower in higher expenditure quintiles. Among females, a clear relationship is absent. This may be because males are the main earners in the family and their earnings can compensate for unemployment of female members.

No clear relationship is found between education and unemployment. In case of rural males, unemployment is observed to be higher for those with at least secondary education. In contrast, unemployment levels among urban males and rural females are marginally higher among the more educated respondents. An inverse U shape is observed for urban females. Somewhat surprisingly, unemployment rates are higher among respondents with technical education.

The presence of unions in enterprise reduces the probability of being without work. The unemployment rate is lowest among union members.

Unemployment is high among the residual others category in both rural and urban areas. In rural areas, casual workers (rural males) and wage/salaried category (rural females) also display high rates of unemployment. In urban areas, unemployment is also high among casual workers (both male and female workers).

Table 2 Variations in unemployment rates across socio-demographic groups—percentage

Correlate	Rural male	Rural female	Urban male	Urban female
Hindu FC	1.89	4.30	0.54	2.74
Hindu-OBC	1.42	5.10	0.81	2.94
Hindu-SC	1.88	7.06	1.37	2.34
Hindu-ST	1.04	3.75	0.49	9.46
Muslim	2.07	4.85	0.44	2.92
Others	2.03	6.75	1.01	2.85
Low	1.79	6.91	1.29	3.14
Low medium	1.61	4.98	0.85	3.67
Medium	1.67	4.26	0.63	2.68
High medium	1.68	5.00	0.60	3.31
High	1.43	4.61	0.56	2.26
Illiterate	1.50	5.67	0.73	2.73
Below primary	1.52	4.31	0.89	2.79
Below secondary	1.37	5.15	0.78	4.29
Secondary completed	2.28	4.23	0.55	2.99
Graduation and above	2.25	3.96	0.63	2.22
No technical education	1.64	5.26	0.70	3.02
Technical education	2.64	7.40	1.20	2.80
No union formed	1.80	5.37	0.94	3.48
Not union member	1.29	5.88	0.61	1.99
Union member	1.80	5.37	0.94	3.48
Rural self-employed agriculture	1.56	4.10		
Self-employed non-agriculture	1.45	4.11		
Wage/salaried class	1.09	6.31		
Casual labour in agriculture	2.10	5.63		
Casual labour in non-agriculture	1.69	8.05		
Others	7.24	20.39		
Self-employed			0.71	3.18
Wage/salaried earners			0.69	2.17
Casual labour			0.84	4.31
Others			3.25	9.01

4.2 *Econometric Analysis*

Table 2 presents the results of a simple bivariate association; it does not control for other variables or study causation. In this section we estimate an econometric model to identify causal factors underlying the phenomenon of being without work. Given the binary nature of the dependent variable, a probit model is estimated. The model structure is as follows:

Being without work = f (log of per capita monthly expenditure, age and its square, education, technical education, socio-religious identity, land cultivated (in rural areas), union membership)

A problem with this model is that a respondent without work will have low per capita monthly expenditure. The presence of reverse causality between the log of per capita monthly expenditure and being without work implies that the assumption $E(u_i, x_{ji}) = 0$ is violated. Given endogeneity we have used an instrumental variable model, taking the worker/dependent ratio as an instrument.⁷ The model has been estimated without sub-round dummies and with sub-round dummies (Table 3). Comparison of results for the two sets of models does not reveal substantial differences.

Unemployment is related to the instrument, worker/dependent ratio in the family. The nature of this relationship, however, varies between rural and urban areas. In rural areas, the probability of unemployment increases with this ratio; a possible cause is that a worker/dependent ratio may result in some workers withdrawing from the labour market for part of the year. For instance, some workers may join the workforce only when seasonal demand for labour from primary activities peaks (during the harvesting season). In urban areas, the relationship between the two is negative.

Studies have reported that aged people are less likely to be unemployed (Love and Torrence 1989; OECD 2017). Although this is confirmed in the study, the relation between the probability of being without work and age is found to be nonlinear, yielding a U-shaped curve. However, in the case of urban females, we find a positive relationship between the two.

In rural areas, HFCs are less likely to be unemployed than the marginalised social groups and Muslims. In urban areas, however, we observe the opposite. This broadly supports findings reported in NSSO reports about variation in unemployment rates across social groups and religious groups (GoI 2006, 2014).

Possessing larger plots of cultivated land reduces the probability of being without work. This is expected as land provides scope for all willing family workers to contribute to production (Grabowski et al. 2013).

The relationship between unemployment and education differs sharply between rural and urban areas. In rural areas, educated respondents are less likely to be without work. In urban areas, on the other, unemployment is higher among the educated respondents. This contradicts Mincer (1993), who had argued that education would

⁷This is defined as number of workers as a proportion of number of children below 15 years and non-working persons aged above 60 years.

Table 3 Results of instrumental probit model—by place of residence and gender

Variable	IV probit model (without sub-rounds)				IV probit model (with sub-round dummies)			
	RM	RF	UM	UF	RM	RF	UM	UF
Worker/dependent ratio (INS)	3.616***	4.468***	-21.410***	-2.925***	2.984***	1.995***	-89.205***	-2.583***
Age	-0.083***	-0.110***	-0.417***	0.003***	-0.087***	-0.070***	-1.300***	0.001***
Age2	0.001***	0.001***	0.007***	0.000***	0.001***	0.001***	0.024***	0.000***
Hindu-Forward Caste (REF. CAT.)								
Hindu-OBC	0.281***	0.587***	-3.076***	-0.426***	0.196***	0.263***	-13.140***	-0.385***
Hindu-SC	0.691***	1.012***	-5.783***	-0.729***	0.565***	0.476***	-24.783***	-0.647***
Hindu-ST	0.876***	1.519***	-6.688***	-0.423***	0.676***	0.591***	-27.353***	-0.308***
Muslim	0.225***	0.230***	-5.600***	-0.850***	0.157***	0.029***	-23.129***	-0.736***
Others	-0.464***	-0.238***	0.311***	-0.012***	-0.380***	-0.110***	0.299***	-0.003
Cultivated land	-0.319***	-0.366***			-0.292***	-0.256***		
Illiterate (REF. CATEGORY)								
Below primary	-0.455***	-0.362***	2.168***	0.321***	-0.417***	-0.232***	8.836***	0.269***
Below secondary	-0.585***	-0.613***	4.308***	0.774***	-0.508***	-0.295***	18.200***	0.697***
Completed secondary	-0.467***	-1.338***	7.340***	1.226***	-0.332***	-0.0644***	30.829***	1.097***
Completed graduation	-0.782***	-2.134***	17.044***	2.636***	-0.543***	-0.899***	70.452***	2.323***
No technical education (REF. CAT.)								

(continued)

Table 3 (continued)

Variable	IV probit model (without sub-rounds)				IV probit model (with sub-round dummies)			
	RM	RF	UM	UF	RM	RF	UM	UF
Technical education	0.390***	-0.105***	-2.714***	-0.348***	0.323***	-0.122***	-11.072***	-0.319***
No union (REF. CATEGORY)								
Union present, but not member	-0.843***	-0.616***	0.931***	-0.032***	-0.689***	-0.187***	5.019***	-0.048***
Member of union	-1.620***	-1.212***	1.667***	0.002	-1.466***	-0.859***	8.685***	-0.056***
SRI:								
July–September (Ref. Cat.)								
SR2: October–December					-0.347***	-0.132***	4.792***	0.227***
SR3: January–March					-0.386***	-0.248***	6.987***	0.030***
SR4: April–June					-0.378***	-0.321***	7.467***	-0.128***
Intercept	-25.214***	-30.078***	160.912***	19.208***	-20.540***	-13.647***	665.658***	16.709***
N	102,805,202	51,219,712	71,941,291	18,777,539	102,805,202	51,219,712	71,941,291	18,777,539
Wald χ^2	1142508.73	290014.55	74866.33	101008.69	1261981.45	385973.35	5696.13	162843.71
χ^2 statistic for exogeneity test	87862.6	3227.39	64960.85	6743.55	84249.7	2846.07	53650.6	2026.13
Instrument: log of worker/dependency ratio								

Note * p < 0.05; ** p < 0.01; *** p < 0.001

Table 4 Results of equidispersion assumption test

Alpha	Coef.	Std. err.	t ratio	Prob>t
RM	1.41	0.02	59.64	0.00
RF	1.25	0.02	72.70	0.00
UM	5.81	0.15	39.03	0.00
UF	2.57	0.05	50.30	0.00

increase avenues of work and reduce chances of being without work. In general, however, studies report 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 (Bairagya 2015: 4).

Technical education, in contrast to general education, reduces the probability of being without work. This is consistent with findings in earlier studies. Technical education facilitates entry from the educational system into the job market; it also increases the productivity of workers and increases chances of innovation (Biavaschi et al. 2013). A study by Cologne Institute for Business Research (Solga et al. 2014) reported that vocational training reduced the rate of unemployment among German youth. This is observed for all groups, except rural males. In rural areas, the limited job market opportunities outside the primary sector—where technical education may be a relevant asset—may result in higher unemployment rates among technically educated respondents.

Unionisation has been known to increase wages. This, however, is supposed to have an adverse long-run impact on employment rates (Olson 1986; Freeman and Medoff 1984). A positive correlation between unionisation and unemployment rate has been reported in the literature for developed countries; this has also been supported by studies in Asian countries (Kim 2005). Our analysis is not consistent with this evidence. Unionisation reduces chances of being without work, particularly if the respondent is a union member.

5 Duration of Unemployment

Another important issue is the duration of being without work. Since the duration is given in months, the dependent variables take the values 1, 2, 3,... 12. A count data model is appropriate in this context. Two competing count data models are Poisson and negative binomial model. The choice between them involves testing the equidispersion assumption that mean and variance are equal. Results of the test (Table 4) indicate that this assumption is not valid, so that the negative binomial model should be used.

Table 5 Results of negative binomial model for duration of being without work

Variable	RM	RF	UM	UF
AGE	-0.068***	-0.032***	-0.090***	-0.021***
AGE ²	0.001***	0.000***	0.001***	0.000***
Hindu-Forward Caste (RC)				
Hindu-OBC	-0.052***	-0.001	0.245***	-0.110***
Hindu-SC	0.037***	0.114***	0.591***	-0.098***
Hindu-ST	-0.098***	0.003*	0.598***	0.647***
Muslim	-0.098***	0.011***	0.180***	0.119***
Others	0.010***	0.096***	0.691***	-0.241***
Cultivated land	-0.163***	-0.161***		
Illiterate (RC)				
Below primary	-0.173***	-0.140***	-0.154***	-0.169***
Below secondary	-0.155***	-0.076***	-0.302***	0.011***
Completed secondary	-0.178***	-0.254***	-0.578***	-0.200***
Completed graduation	-0.145***	-0.336***	-1.026***	-0.577***
No technical education (RC)				
Technical education	-0.085***	-0.257***	-0.167***	-0.386***
No trade union (RC)				
Union present, but not member	-0.433***	0.003*	-0.309***	-0.353***
Member of union	-1.158***	-0.664***	-0.988***	-0.895***
SR1: July–September (Ref. Cat.)				
SR2: October–December	-0.206***	-0.239***	-0.037***	-0.061***
SR3: January–March	0.063***	-0.011***	0.179***	-0.006***
SR4: April–June	-0.262***	-0.222***	-0.194***	-0.206***
Intercept	1.984***	1.353***	1.233***	0.726***
N	78662763	40923194	54684743	14668572
χ^2	1346571.45	422824.29	449340.61	114126.31
Pseudo-R ²	0.05	0.02	0.08	0.05

When estimating the negative binomial model we have taken all variables used in the probit model, barring log of per capita monthly expenditure. Results are given in Table 5.

Results indicate that young workers are likely to be without work for longer periods. This, however, is not a linear relation; rather, the positive and significant coefficient of the square of age indicates an inverse U shape. HOBCs, HSTs and Muslims are without work for a shorter duration, while HSCs are out of work for longer periods compared to HFCs (rural males). Among rural females, marginalised groups (HSCs, HSTs and Muslims) are without work for longer periods. In urban areas, HFCs are without work for shorter periods (male respondents). Among urban females, HSTs and Muslims are unemployed for longer periods, while HOBCs and HSCs are without work for shorter periods, compared to HFCs. Illiterates are without work for longer periods; so are respondents without technical education. Respondents are likely to be without work for long periods if their last enterprise does not have any union, or if they are not union members.

6 Conclusion

Despite the economic and social importance of unemployment, political considerations have created a tendency to under-report levels of unemployment in India. This is achieved by adopting a narrow definition of unemployment. In this study, we argue that an alternative definition of unemployment, based on the same surveys used to report unemployment, can produce somewhat more realistic estimates of unemployment levels.

The definition of unemployment proposed by us is to use the information on duration over which the respondent is without work in the year preceding the survey. We argue that policymakers and researchers have failed to utilise the potential of this information. This information can not only generate more realistic levels of unemployment, but also provide information on the duration of unemployment. Both are important parameters with substantial implications for welfare levels of the population. Further, this information is provided in earlier rounds also; hence, it may be used to understand the temporal nature of the labour market and its ability to absorb the increasing number of workers. This exercise has not been addressed in the current study but is one that may be addressed in the future.

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