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Data for 2004–05 and 2011–12

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1 Introduction

Slow growth of employment has been a remarkable feature of economic change in India during the post-liberalisation period. Economic growth over this period has been highly uneven across different sectors and regions. The rate of growth of agriculture and manufacturing sectors has been sluggish for most part of the post-liberalisation period. Growth, even in periods during which it increased, was driven primarily by the service sector. It has been primarily located in urban, particularly metropolitan, areas. Trade and foreign investment have played only a marginal role as drivers of economic expansion. Benefits of economic growth have accrued differently across classes, resulting in a sharp increase in economic inequalities.

Not only has the average employment growth over this period has been low, the uneven pattern of growth has resulted in considerable changes in the structure of employment. There has been a considerable contraction in generation of employment in agriculture since the second half of 2000s. The Mahatma Gandhi National Rural Employment Guarantee Act Programme (MGNREGA) was introduced in the mid-2000s with a promise of providing a guarantee of 100 days of employment to each rural household. Although that promise has never been met, the programme resulted in some increase in availability of employment in rural areas particularly in the initial years of its implementation. On the other hand, an increase in schooling attendance rates among children, albeit slow, is also said to have resulted in withdrawal of a section of younger people from the labour force.

A number of recent scholarly studies have analysed the changes in levels of employment. Mehrotra et. al. (2014) provided a broad overview of changes in employment since 1993–2004. They examined employment trends in the Indian economy as a whole and showed that employment in agriculture decreased while employment in non-agricultural activities increased. They have argued that the decline in work participation rates of women was primarily a result of their increased participation in schooling. Rangarajan, Seema and Vibeesh (2012) also explained the decline in work participation rates of women after 2004–05 on the basis of the rise in school enrolment. Mehrotra et. al. (2014) claimed that withdrawal of adult women from the labour force was also a result of higher school attendance rates among girls and increased out-migration of adult men, which made housework more time-demanding for adult women. Abraham (2013) has maintained that, while agrarian distress forced more women into work between 1999–2000 and 2004–05, better economic conditions in a patriarchal society created social pressures that withdrew them from the labour force and confined them to doing housework. Rawal and Saha (2015) have argued that the long-term decline in women's workforce participation rate was a result of contraction of employment in agriculture and lack of corresponding rise in employment opportunities in rural non-farm sector. They contend that more concentrated land coupled with labour-displacing machines led to the drop in labour absorption in agriculture. On the other hand, lack of access to basic amenities and serious problems of safety for women impede their physical mobility, limiting migration of rural women to the urban labour markets.

This paper presents an analysis of overall trends in the structure of employment, differentiating these trends between men and women, between rural and urban workers, and across different sectors. The emphasis of this paper is on using age-cohort analysis to elucidate the dynamics of change in the employment structure.

An age-cohort-wise analysis of employment is limited by the fact that data related to age in NSSO surveys and censuses, particularly for older people, are not accurate. This, in particular, limits the possibility of using age-cohort analysis to examine long-term dynamics of changes in employment structure. In view of this limitation, the focus of the age-cohort analyses in this paper is on the 61st and 68th rounds of NSS Employment Unemployment Surveys (hereinafter, EUS), which are combined with age-cohort population data from the 2001 and 2011 Censuses. In addition, because of better reliability of age data, the analysis primarily focuses on the changes in levels of educational attainment and the structure of employment among the youth.

Section 1 of this paper presents an overview of the changes in the overall size of the labour force and in work participation rates between 1993–94 and 2011–12. Section 2 explains the changes in employment structure across different industries. Section 3 presents the results of age cohort analyses. Section 4 presents discussion of the impact of improvement in educational attainment on employment conditions of young workers. The paper concludes with a summary of the main findings.

2 Change in Workforce

Since the early 1990s, when full-scale economic reforms were introduced, the Indian economy has experienced sweeping changes in the overall composition of employment, with a considerable shift from agricultural to non-agricultural employment. The changes in structure of employment, however, need to be examined separately for rural and urban areas, and for men and women. While agricultural employment has declined in rural areas, the trends in level of non-agricultural employment in rural and urban areas shows different patterns. Another reason for investigating the employment structure in rural and urban areas separately is because of mushrooming of census towns, a peculiar feature of Indian urbanisation. An increase in sizes of habitation and a shift in composition of workforce towards non-agricultural occupations results in transformation of erstwhile rural habitations into town-like habitations. However, since government notifications recognising them as urban areas are often delayed, these habitations are classified as census towns even though they are not yet recognised as statutory urban areas for administrative purposes. The increase in number of such census towns, and of the population living in these towns, is a reflection of the increasing shift of rural workforce towards non-agricultural occupations.

The importance of separately analysing trends in employment of men and women barely needs to be highlighted. A great difference exists between men and women not only in terms of levels of work participation but also in the types of employment. Therefore, it is expected that both have different patterns when agricultural employment declines and new employment opportunities emerge, particularly in the construction and other services sectors.

Table 1 presents population and workers, along with worker–population ratios of people aged 15 years and above in India, for rural and urban men and women. Rural men of this age group swelled from 186.3 million in 1993–94 to 234.5 million in 2004–05 and further to 267.4 million in 2011–12. The female population of the same age group in rural areas increased from 181 million to 233.2 million and to 263.5 million during the same period. A decline in population growth is apparent. The average annual growth rate for rural men decreased from 2.3 per cent during the

Table 1: Population and labour force in India (age 15 and above) (million persons)

		Population	Workers (PS+SS)	Un- employed	Students	Other non- workers	Worker Population Ratio (%)
Rural Male	1993	186.3	160.9	2.4	13.5	9.5	86.4
	2004	234.5	198.4	3.2	19.2	13.8	84.6
	2011	267.4	213.8	3.7	33.9	16.0	80.0
Rural Female	1993	181.5	88.3	0.7	5.4	87.0	48.7
	2004	233.2	113.1	2.1	11.5	106.5	48.5
	2011	263.5	92.8	1.5	22.4	146.7	35.2
Urban Male	1993	67.7	52.0	2.2	8.6	4.8	76.8
	2004	91.9	70.1	2.7	11.5	7.6	76.3
	2011	119.6	88.7	2.7	17.9	10.4	74.1
Urban Female	1993	61.5	13.7	0.9	5.9	41.0	22.3
	2004	84.6	19.2	1.4	8.5	55.4	22.7
	2011	112.7	21.9	1.2	13.7	75.8	19.5

Source: Based on NSSO's 50th, 61st and 68th Employment and Unemployment Surveys unit-level data.

first period (1993–94 to 2004–05) to 1.3 per cent during the second period (2004–05 to 2011–12). The population of women rose at the rate of 2.5 per cent in the first period and 1.2 per cent per year in the second period. Urbanisation (a result of rural–urban migration as well as transformation of some villages into towns) is reflected in higher population growth in urban areas. The population of urban men of age 15 years and above grew at 3.1 per cent during the first period and at 2.7 per cent during the second period; it reached 119.8 million in 2011–12. For urban women, population growth was 3.2 per cent and 2.9 per cent per annum, respectively, for the same periods.

The increase in the number of workers, including principal and subsidiary status workers, slowed from the first period to the second, and was negative in the case of rural women. As Table 1 shows, there was a significant increase in the proportion of students among rural and urban men. A rise in the likelihood of population attending educational institutions took place also for women workers, but in their case, a greater increase took place in the population of other non-workers. It is noteworthy that the number of other non-workers, which mainly include persons engaged in housework, increased considerably, from 87 million to 146.7 million for rural women and from 40 million to 75.8 million for urban women. In the NSSO data, such people are classified as being outside the labour force.

As a result of these changes, the worker–population ratios (WPR) fell. For men, the decline of the WPR was rather slight, from 86.4 per cent in 1993–94 to 80 per cent in 2011–12 for rural men and from 76.8 per cent in 1993–94 to 74.1 per cent in 2011–12 for urban men. The major decline occurred in the 15–24 years age group and can be explained mainly by an increase in the number of people attending secondary and higher educational institutions. In contrast, the female WPR declined markedly in both rural and urban areas. In rural areas, it

was 48.7 per cent in 1993–94. It remained at almost the same level until 2004–05, but dropped to 35.2 per cent in 2011–12.¹ Similarly, the female WPR in urban areas fell from 22.3 per cent in 1993–94 to 19.5 per cent in 2011–12. It is unlikely that educational improvement alone explains this because it occurred across all age groups (see Section 4).

3 Industrial Distribution of Workers

Table 2 presents changes in the industrial distribution of workers during the last two decades. According to the NSS usual and subsidiary activity status definition, workers are classified as (a) self-employed, which includes family helpers and employers, (b) regular wage/salaried employees (hereinafter, regular wage workers), and (c) casual labour. The activity status and industry are combined in Table 2 to show the share of different types of workers in the total work force.

It is noteworthy that self-employment and casual labour in agriculture were the major occupations for rural male workers. In 1993–94, 44.8 per cent of rural male workers were self-employed and 27.7 per cent of rural male workers worked as casual labourers in agriculture. The shares of both occupations declined substantially over the following two decades. The share of self-employed among rural male workers fell to 42.2 per cent in 2004–05 and further to 38.9 per cent in 2011–12. The share of casual labourers dropped to 23.2 per cent in 2004–05 and further to 20.0 per cent in 2011–12. On the whole, the share of total employment in agriculture (including regular wage workers in agriculture) fell sharply, from 73.7 per cent in 1993–94 to 59.4 per cent in 2011–12.

It is also apparent that the proportion of self-employed and regular wage workers in manufacturing, trade and transport rose between 1993–94 and 2004–05, but stagnated or fell thereafter. Employment in other service sectors, either as self-employed, regular wage worker, or casual labour, remained at the level of 1993–94 or flagged slightly.

While the share of every other sector either stagnated or declined, it was casual labour in construction that expanded substantially during the period under study. The share of construction labourers rose from 2.6 per cent in 1993–94 to 5.5 per cent in 2004–05 and then sharply to 11.4 per cent in 2011–12. In 2011–12, construction became the second largest industry aside from agriculture to employ rural male labourers. Between 1993–94 and 2004–05, numerous rural male workers lost employment in agriculture but found it in services (trade and transport). Between 2004–05 and 2011–12, they were pushed out of agriculture and found jobs in construction.

¹The 1999–2000 survey showed a lower female WPR, perhaps because 1999–2000 was a drought year (Himanshu, 2011). However, it rose in 2004–05 to almost the same level as in 1993–94. It seems likely that female work participation started falling since the mid-2000s if one considers 1999–2000 data as an aberration. An alternative explanation has been that the 2004–05 data were an anomaly (Rawal and Saha, 2015). If one treats 2004–05 data rather than 1999–2000 data as an aberration, then the decline in female WPR seems to have started earlier.

Table 2: Percentage distribution of workers by employment status and industry (per cent)

Employment status	Industry	Rural male			Rural female			Urban male			Urban female		
		1993-94	2004-05	2011-12	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Self-employed	Agriculture	44.8	42.2	38.9	50.3	53.8	48.1	5.4	4.3	3.9	14.4	11.5	6.4
	Mining	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0
	Manufacturing	3.5	4.1	3.6	4.6	6.3	7.4	7.3	7.7	7.5	13.3	18.7	19.8
	Electricity	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.2
	Construction	0.5	1.2	1.3	0.0	0.0	0.0	1.7	2.4	2.1	0.1	0.1	0.1
	Trade	4.9	6.6	6.4	2.0	2.4	2.5	16.3	19.7	17.7	8.7	10.0	9.9
	Transport	0.8	1.7	1.8	0.0	0.1	0.0	3.2	5.0	4.4	0.2	0.5	0.1
	Other Services	2.7	2.1	2.4	1.3	1.0	1.0	7.5	5.6	6.1	7.8	6.3	6.1
Regular wage workers	Agriculture	1.2	0.9	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	Mining	0.2	0.1	0.1	0.0	0.0	0.0	1.0	0.7	0.6	0.2	0.1	0.1
	Manufacturing	1.6	1.8	2.5	0.6	0.7	0.9	12.5	11.6	12.0	4.0	5.1	5.4
	Electricity	0.2	0.2	0.2	0.0	0.0	0.0	1.4	0.9	1.2	0.8	0.3	0.7
	Construction	0.1	0.2	0.3	0.0	0.0	0.0	0.8	0.6	1.4	0.1	0.2	0.5
	Trade	0.5	1.1	1.1	0.0	0.1	0.3	4.4	6.7	6.8	0.8	1.6	2.3
	Transport	1.0	1.4	1.7	0.0	0.1	0.1	5.2	5.4	6.5	0.9	1.1	2.5
	Other Services	3.8	3.3	3.6	1.5	2.4	3.9	16.8	14.5	14.7	22.1	27.2	31.1
Casual labourers	Agriculture	27.7	23.2	20.0	35.6	29.2	26.4	3.2	1.5	1.5	10.3	6.4	4.2
	Mining	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.3	0.1	0.2
	Manufacturing	1.8	1.9	2.0	1.7	1.2	1.4	3.4	3.2	2.7	6.1	3.3	3.3
	Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.1
	Construction	2.6	5.5	11.4	0.8	1.4	6.6	4.5	6.2	7.2	4.0	3.5	3.4
	Trade	0.2	0.6	0.5	0.0	0.0	0.1	1.2	1.6	1.5	0.6	0.8	0.6
	Transport	0.5	0.8	0.8	0.0	0.0	0.1	1.9	1.2	1.0	0.3	0.1	0.1
	Other Services	0.7	0.4	0.4	0.5	0.4	0.4	1.6	0.6	0.7	4.3	2.5	2.5
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on NSSO's 50th, 61st and 68th Employment and Unemployment Surveys unit-level data.

It must be noted that the rural–urban demarcation in the NSSO-EUS is based on the usual place of residence of a household. Further, short-term migrants who might be away from their usual place of residence for up to six months are included as household members. According to the NSSO’s 64th Employment & Unemployment and Migration Survey, short-term migrants from rural areas were estimated to be around 12 million, of whom about 40 per cent were employed as construction labourers. In other words, a substantial proportion of rural male workers worked as construction labourers away from home.

Major occupations of rural female workers were self-employment and casual labour in agriculture, which together accounted for 85.9 per cent of workers in 1993–94. The percentage of workers engaged in these occupations fell to 83 per cent in 2004–05 and further to 74.5 per cent in 2011–12. As was the case with male workers, the share of female casual labour in construction rose substantially from 1.4 per cent in 2004–05 to 6.6 per cent in 2011–12. The shares of self-employed in manufacturing and regular wage workers in the other services sector rose gradually. It is possible that this rise in the share of construction labourers was related to the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). The MGNREGA was implemented from 2005–06 in selected districts and from 2007–08 in all the districts. According to NSSO’s 68th EUS results, it is estimated that 34.3 million men and 23.6 million women were engaged in MGNREGA works, although the number of days worked in MGNREGA work was limited. Female workers in public works (status 41) accounted for 45.1 per cent of all casual labourers (categories 41 and 51) in non-agriculture. About 57 per cent of those who reported construction labour as their principal or subsidiary activity had done some construction labour under public works programmes. MGNREGA was the single most important public works programme. Therefore, it would be reasonable to conclude that MGNREGA accounted for the bulk of women’s employment in construction.

Most urban male workers were engaged in manufacturing, trade, and the “other services” sectors in 1993–94. Employment in manufacturing as either self-employed, regular wage worker or casual labour remained almost constant or slightly declined during the period. Among the various kinds of services, the portion of workers self-employed in trade went up from 16.3 per cent in 1999–2000 to 19.7 per cent in 2004–05. The share of workers self-employed in transport sector rose from 3.2 per cent in 1999–2000 to 5.0 per cent in 2004–05. Between 2004–05 and 2011–12, however, these shares remained either unchanged or fell slightly. The share of workers self-employed or with regular wage employment in “other services” sector decreased. For urban men, the share of casual labour in construction rose, whereas the share of the manufacturing and other services sector declined. The service sector employs a substantial proportion of urban male workers. Growth of employment in manufacturing sector has been slow. This calls for serious concern particularly because an increasing proportion of job seekers have secondary and higher level education (see Section 4).

In contrast with rural women who mostly worked in agriculture, most urban women workers found employment in manufacturing, trade, and other services sectors. It is noteworthy that, in case of urban women employed in services, a shift occurred towards an increasing proportion of workers being employed as regular workers. Particularly, the share of regular workers in the “other services” sector rose substantially from 22.1 per cent in 1993–94 to 31.1 per cent in 2011–12, while the

share of self-employed and casual labour in this sector declined. In addition, the share of self-employed workers in manufacturing rose from 13.3 per cent in 1993–94, to 18.7 per cent in 2004–05, and to 19.8 per cent in 2011–12, whereas the share of casual labour in the sector fell. Similarly, workers in trade rose from 10.1 per cent, to 15.9 per cent, and to 16.2 per cent, and other services sector, from 34.3 per cent, to 36.1 per cent, and to 38.7 per cent.

4 Change in Distribution of Workers by Age Cohort, Employment Status and Industry between 2004–05 and 2011–12

The percentage distribution of workers sometimes conceals changes in the actual magnitude of each category because of fluctuations in the total number of workers. Estimation of the numbers of workers in different age cohorts allows for an examination of the shift of the workforce across different sectors. Let us first explain the method of age-cohort analysis and its limitations.

Generally speaking, a change in employment structure takes place through the following:

1. Entry of young workers into different sectors
2. Changes in occupations of existing workers
3. Exit or retirement of workers from the labour force

Dividing the workers into age cohorts and making comparisons across two rounds of NSSO EUS provides some clues that elucidate the impact of these three processes on changes in the employment structure. Considering the 7-year gap separating the 61st and 68th Rounds of NSSO EUS, we divide the sample into seven-year age groups starting from 15 years of age (that is, 15–21 years, 22–28 years, and so on). Then, the employment structure of an age group (say, 15–21 years) in 2004–05 is compared with the employment structure of the next age group (22–28 years) from the 2011–12 survey. Since people who were in the 15–21 years age group at the time of 2004–05 would have been in the 22–28 years age group at the time of 2011–12 survey, a comparison of the employment structure of these two age groups enables us to examine how employment conditions of this age group changed during this period.

In principle, one should be able to compare the employment structure of each age cohort in 2004–05 with the employment structure of the next age cohort in 2011–12. However, NSS data pose two limitations in doing so. First, NSSO surveys underestimate the population. Because of this, estimates from the NSSO surveys must be adjusted using population data from population censuses. Doing so requires data on population of age cohorts from the population censuses. Secondly, because many respondents do not know their exact age, information related to age is an approximation. This approximation leads to a problem of age heaping, with a disproportionately high number of people reporting their age in numbers with terminal digits ‘5’ or ‘0’, and among other numbers, smaller preference for numbers ending with ‘1’ and ‘9’. For comparing data of the two NSSO EUS rounds, seven-year age cohorts are necessary to address the seven-year gaps separating the two survey rounds. For that reason, the age heaps (at 5s, 0s, and other minor heaps) are not evenly distributed across these cohorts. Given improvements in the recording

of age over time, the extent of heaping is not so severe for the youngest age groups (15–21 years and 22–28 years). Therefore, it least affects comparisons of data for these groups.

Given that the problem of age-heaping is not severe in the youngest two age cohorts, one can start by comparing data for the 15–21 years age cohort in 2004–05 with data for the 22–28 years age cohort in 2011–12. Of those who had been working in 2004–05, some would have continued working in the same industry, and some would have moved into a different industry, although some would have exited, retired or migrated (from rural to urban or vice versa) by the time the 2011–12 survey took place. In 2004–05, persons in the 15–21 years age group who were non-workers included students, unemployed persons, and other non-workers. Some students would have completed education and entered the labour market (as workers or unemployed persons) by the time the 2011–12 survey took place (and they were in the 22–28 years age group), although others would have gone on to further studies. Some persons who were unemployed or were a part of the category of other non-workers in 2004–05 might have found work by 2011–12. Those who gained employment constitute fresh entrants into the labour market. Combined with educational attainment, employment patterns of young fresh entrants are apparent.

The employment structure changed during the seven years. Table 3a shows the number of rural male workers by age cohort, employment status and industry. The total number of rural male workers increased by 14.8 million during the seven years: from 213 million in 2004–05 to 227.8 million in 2011–12. The number of self-employed people in agriculture (that is, cultivators) decreased by 1.6 million, although the number of agricultural labourers decreased by 4.9 million. Construction was the largest employer of the increased labour force, accounting for 15.1 million persons, followed by the service sector (4.3 million persons). The rise in the number of workers in manufacturing was less than 2 million.

Cohort data show that there were 31.8 million workers in the 15–21 years age group in 2004–05. Persons in this age cohort moved to the 22–28 years age group by 2011–12; the number of workers increased to 44.9 million. The increase by 13.1 million in the number of workers among this group consists mainly of ex-students who completed education and who entered the labour market during the seven years. There were also some unemployed and other non-workers who found jobs as they moved to the 22–28 years age group. Sector data show that the number of workers in manufacturing increased by 2.5 million, the number of workers in construction increased by 1.8 million, the number of workers in services increased by 4.5 million, and the number of self-employed persons in agriculture increased by 4.1 million. We examine the employment patterns of fresh entrants more closely with consideration of their educational attainment in the next section.

For the next age cohort, persons of the 22–28 years age group in 2004–05, it is apparent that only a small increase (0.8 million) in the number of workers occurred among them as they moved into the 29–35 year age group in 2011–12. Two factors are likely to have been responsible for the fact that the increase in work participation rates for rural men in this age group was small: first, the increase in the number of students in higher education was limited (estimated as 1.1 million students in 2004–05); second, migration of workers from this age cohort to urban areas increased. In this age cohort, the number of workers engaged in self-employment in agriculture and agricultural labour diminished by 1.3 million and 1.2 million, respectively

Table 3a: Number of workers by age group, employment status, and industry (rural male) (1000 persons)

Employment status	Number of workers						Total
	2004-05						
Age in 2004-05 (years) →	15-21	22-28	29-35	36-49	50+		
Self-employed in agriculture	12,308	16,051	14,423	21,849	25,624	90,254	
Agricultural labourers	8885	10,570	10,875	13,623	8556	52,509	
Manufacturing	3006	3977	3697	4198	2446	17,323	
Construction	2690	3678	3324	3507	1535	14,735	
Service sector	4908	8284	8681	10,297	6005	38,175	
Total	31,797	42,559	41,001	53,474	44,166	212,997	
	2011-12						
Age in 2011-12 (years) →	15-21	22-28	29-35	36-42	43-56	57+	Total
Self-employed in agriculture	8468	14,827	14,795	13,162	21,348	16,100	88,701
Agricultural labourers	5437	9159	9367	7842	10,828	4957	47,589
Manufacturing	2487	4788	3859	2979	3506	1585	19,204
Construction	4567	7140	6197	4914	5298	1677	29,793
Service sector	3361	9019	9198	7800	9686	3407	42,471
Total	24,319	44,933	43,416	36,697	50,666	27,727	227,759
	Change in number of workers in the age cohort						
Self-employed in agriculture	8468	2519	-1256	-1261	-500	-9524	-1554
Agricultural labourers	5437	274	-1203	-3033	-2795	-3599	-4920
Manufacturing	2487	1782	-118	-718	-691	-860	1881
Construction	4567	4450	2520	1590	1790	142	15,058
Service sector	3361	4111	914	-881	-611	-2598	4296
Total	24,319	13,136	856	-4303	-2808	-16,439	14,762

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

during the period. Workers in the construction and services sector respectively increased by 2.5 million and 0.9 million. Judging from the amount of change in the number of workers, it is most likely that workers shifted from agriculture to construction.

As for the age cohorts of 29-49 in 2004-05, it is not possible to compare them strictly because of severe heaping in age tables. It is striking that the pattern of change is the same across all cohorts: decreases in employment in agriculture, manufacturing and service sector, and an increase in construction labour suggest shifts of occupation to construction labour from other sectors. A drop of 16.4 million workers occurred in the age cohort of 50 and over in 2004-05 which is attributable to retirement from the labour force.

Table 3b shows the distribution of rural female workers by age cohort, employment status, and industry. A marked falling-off occurred in the number of rural women workers: from 116.2 million in 2004-05 to 95.1 million in 2011-12. The decrease (21.1 million), which accounts for 18.1 per cent of all female workers in 2004-05, took place across all age cohorts. Moreover, the fall in self-employed workers in agriculture (16.7 million) was much greater than that of rural

Table 3b: Number of workers by age group, employment status, and industry (rural female) (1000 persons)

Employment status	Number of workers						
	2004-05						
Age in 2004-05 (years) →	8-14	15-21	22-28	29-35	36-49	50+	Total
Self-employed in agriculture		8191	11,114	11,995	18,285	12,987	62,572
Agricultural labourers		5049	6609	7648	9905	5450	34,661
Manufacturing		2305	2132	1884	2299	1025	9645
Construction		346	370	382	433	176	1706
Service sector		673	1532	1627	2312	1450	7593
Total		16,563	21,757	23,536	33,235	21,088	116,178
	2011-12						
Age in 2011-12 (years) →	15-21	22-28	29-35	36-42	43-56	57+	Total
Self-employed in agriculture	4584	7403	8553	8622	11,476	5192	45,830
Agricultural labourers	2617	3924	5249	4853	6557	2506	25,706
Manufacturing	2010	2055	1832	1357	1425	660	9337
Construction	477	981	1364	1395	1404	658	6278
Service sector	622	1435	1621	1615	1856	813	7963
Total	10,309	15,798	18,619	17,842	22,718	9829	95,114
	Change in number of workers in the age cohort						
Self-employed in agriculture	4584	-787	-2561	-3373	-6809	-7795	-16,742
Agricultural labourers	2617	-1124	-1360	-2796	-3348	-2944	-8955
Manufacturing	2010	-251	-301	-527	-874	-365	-308
Construction	477	635	994	1014	970	482	4571
Service sector	622	762	90	-12	-456	-637	370
Total	10,309	-765	-3138	-5694	-10,517	-11,259	-21,064

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

male workers who left cultivation (1.6 million). This fact suggests that the decline in women's work participation rate was not driven merely by a higher participation in education. Many women had to give up cultivation and agricultural labour, and were left only household work to do.²

Female construction workers increased by 4.6 million. As described earlier, it is probable that some MGNREGA workers were classified as construction workers. Therefore, MGNREGA might have contributed to the larger number of rural women employed in construction. It is noteworthy that, among service sector workers, an increase was found for young women, although workers of age 29 and

²Rangarajan et al. (2012) explained the decline in work participation rates of women after 2004-05 based on the increase in school enrolment. Mehrotra et al. (2014) argued that withdrawal of adult women from the labour force was also a result of increased school attendance rates among girls and increased out-migration of adult men, which made housework more time-demanding for adult women. Rawal and Saha (2015) have argued that the long-term decline in the women's workforce participation rate has derived from contraction of employment in agriculture and lack of a corresponding rise in employment opportunities in the rural non-farm sector.

above exhibited a decline over time. In such cases, young educated women started working in the other services sector, as discussed later.

The number of urban male workers increased by 19.2 million during the period, as shown in Table 3c. A clear upsurge was apparent among young workers. Chiefly, workers of the 15–21 years age cohort doubled from 10.1 million in 2004–05 to 21.7 million in 2011–12. This increase was partly attributable to fresh entrants to the labour market and partly to rural–urban migration. Employment in the service sector (10.2 million), manufacturing (4.5 million) and construction (3.3 million) grew. It is noteworthy that most of the added workers in these sectors are young workers: more than two-thirds of the increase in industry and service sector workers was attributable to workers in the 15–21 years age cohort in 2004–05. Workers belonging to the 22–28 years age cohort in 2004–05 rose by 4.3 million, most of whom were employed in the service sector.

Table 3d shows that urban female workers increased from 24.1 million in 2004–05 to 26.6 million in 2011–12. The additional workers were mostly employed as regular workers in the services sector (2.4 million). Change in employment structure by age cohort shows that there was a rise in young workers of age 28 and younger in 2004–05 (2.2 million in the 15–21 years age cohort and 1.3 million in the 22–28 years age cohort) during the seven years, which suggests that, like urban men, the fresh entrants from this age group outnumbered those that exited from labour market. However, the number of female workers of age cohorts 29 years and above shrank, indicating mostly exit from employment in agriculture. As in the case of rural women, more young educated women in urban areas were engaged as regular wage workers in the services sector.

Table 3c: Number of workers by age group, employment status, and industry (urban male) (1000 persons)

Employment status	Number of workers					
	2004–05					
Age in 2004–05 (years) →	15–21	22–28	29–35	36–49	50+	Total
Agriculture	591	905	967	1863	1983	6309
Self-employment (manufacturing)	952	1312	1367	2023	1294	6948
Regular wage employment (manufacturing)	1527	2997	2416	2852	1311	11,103
Construction	1296	2011	1877	2125	954	8263
Self-employment (services)	2329	5295	6379	8371	4678	27,052
Regular wage employment (services)	2093	4651	5009	7842	4073	23,669
Casual labour (manufacturing+services)	1309	1534	1253	1262	503	5861
Total	10,097	18,704	19,269	26,339	14,795	89,205

Age in 2011–12 (years) →	2011–12						
	15–21	22–28	29–35	36–42	43–56	57+	Total
Agriculture	484	956	1170	1123	2107	1270	7110
Self-employment (manufacturing)	788	1381	1464	1545	2210	891	8279
Regular wage employment (manufacturing)	1360	3720	3157	2344	3099	557	14,237
Construction	1269	2597	2624	2027	2417	604	11,538
Self-employment (services)	1520	4766	6701	6190	8283	3102	30,562
Regular wage employment (services)	1726	6792	6547	5609	8098	1605	30,376
Casual labour (manufacturing+services)	1005	1485	1375	901	1126	389	6281
Total	8152	21,696	23,039	19,738	27,340	8419	108,383

	Change in number of workers in the age cohort						
	15–21	22–28	29–35	36–42	43–56	57+	Total
Agriculture	484	365	265	156	244	–712	802
Self-employment (manufacturing)	788	428	152	178	186	–402	1330
Regular wage employment (manufacturing)	1360	2193	161	–72	246	–754	3134
Construction	1269	1300	613	150	293	–351	3274
Self-employment (services)	1520	2437	1406	–189	–88	–1576	3510
Regular wage employment (services)	1726	4698	1896	599	256	–2468	6707
Casual labour (manufacturing+services)	1005	176	–159	–352	–137	–114	419
Total	8152	11,598	4334	469	1001	–6377	19,178

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO 61st and 68th EUS unit data.

Table 3d: Number of workers by age group, employment status, and industry (urban female) (1000 persons)

Employment status	Number of workers						
	2004–05						
	15–21	22–28	29–35	36–49	50+	Total	
Age in 2004–05 (years) →							
Agriculture	523	653	914	1389	927	4406	
Self-employment (manufacturing)	949	859	1108	1170	490	4576	
Regular wage employment (manufacturing)	236	325	323	322	119	1325	
Construction	3	22	24	17	11	77	
Self-employment (services)	414	767	878	1267	708	4034	
Regular wage employment (services)	747	1494	1537	2341	1039	7157	
Casual labour (manufacturing+services)	337	403	645	761	343	2489	
Total	3208	4523	5429	7266	3637	24,064	
	2011–12						
Age in 2011–12 (years) →	15–21	22–28	29–35	36–42	43–56	57+	Total
Agriculture	186	353	525	672	883	359	2978
Self-employment (manufacturing)	748	1058	1176	1052	966	335	5334
Regular wage employment (manufacturing)	266	360	352	362	263	36	1639
Construction	9	26	73	28	19		155
Self-employment (services)	196	725	944	962	1065	379	4271
Regular wage employment (services)	690	2435	2144	1617	2269	383	9538
Casual labour (manufacturing+services)	215	401	590	580	634	218	2638
Total	2312	5358	5803	5273	6098	1708	26,553
	Change in number of workers in the age cohort						
Agriculture	186	-169	-128	-243	-506	-568	-1428
Self-employment (manufacturing)	748	109	317	-56	-204	-155	759
Regular wage employment (manufacturing)	266	124	27	39	-59	-83	314
Construction	9	23	50	4	2	-11	78
Self-employment (services)	196	311	178	84	-202	-329	238
Regular wage employment (services)	690	1688	649	80	-72	-656	2380
Casual labour (manufacturing+services)	215	64	187	-65	-127	-125	149
Total	2312	2150	1280	-156	-1168	-1928	2489

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

5 Employment Structure of Fresh Entrants by Educational Attainment

The observations presented above confirm that differences in the nature of employment of those who enter the labour market and those who leave the labour market are important drivers of changes in the employment structure. In this section, we examine the changes in employment conditions of young people who freshly enter the labour market. There has been an improvement in the levels of educational attainment in this age group. An important question to ask here is whether a rise in educational attainment had any bearing on the nature of young workers' occupation. For this purpose, two types of comparison are needed: first, a comparison between the employment situation of 'less-educated' fresh entrants into labour market in 2004–05 and that of 2011–12, and second, a comparison of employment situations between 'less-educated' and 'educated' fresh entrants.

Table 4 shows the distribution of rural and urban populations of the 15–21 years age group according to educational attainment and activity status in 2004–05 and 2011–12 separately for men and women. It is readily apparent that the educational attainment of this age group improved substantially during the seven years. Nevertheless, a considerable number of workers were aged 15–21 years with primary school education and below. Because of various social, economic, and other reasons, they were unable to continue attending a school and started working at a young age. They are designated as 'less-educated' workers. With improvement in educational attainment in general, the number of less-educated male workers in rural areas dropped from 18.1 million in 2004–05 to 11.3 million in 2011–12. Similarly, less-educated female workers in rural areas decreased from 11.5 million to 5.9 million during the same period. However, it is notable that the less-educated workers account for more than 40 per cent of young people aged 15–21 years.

A comparison of the employment situation of less-educated fresh entrants in 2004–05 and those in 2011–12 is presented in Table 5. Marked differences were found in the nature of employment of young persons who had freshly entered the labour market by the time of 2004–05 survey and those who had freshly entered the labour market by the time when the 2011–12 survey was administered. Historically, agriculture has been the sector that employed a large share of rural workers who had low levels of education. It is apparent that 34.1 per cent of them had joined the labour force to work on their household landholding and 35.1 per cent to work as agricultural labourers if one looks at rural male workers who were in the 15–21 years age group in 2004–05 (Table 5). The table also shows that the shares declined to 30.4 per cent and 28 per cent, respectively by 2011–12. A similar fall was apparent for rural women of this age group: 47.9 per cent and 34.8 per cent in 2004–05 to 43.4 per cent and 29.2 per cent in 2011–12, for self-employed people in agriculture and agricultural labour, respectively.

Although a smaller share of less-educated fresh entrants into the rural work force were employed in agriculture, construction emerged as a sector that employed a much larger share of young rural male workers. In 2011–12, about 21 per cent of rural male workers of the 15–21 years age group were employed in construction; the corresponding share in 2004–05 had been only 9.9 per cent. For rural women, the decline in absorption of young workers in agriculture caused a large share of them to be unable to enter the labour force at all, although some found employment in manufacturing, services, and construction.

Unlike rural workers, changes in the nature of employment of less-educated fresh labour market entrants in urban areas were not very striking (Table 5). A slight shift occurred in the shares in favour of construction and manufacturing, whereas the proportion of workers freshly entering the labour market through self-employment in the service sector shrank.

Next, we present a comparison of employment situations between 'less-educated' and 'educated' fresh entrants. We explored this question by examining the employment structure of people in the age cohort who were in the 15–21 years age group in 2004–05 and in 22–28 years age group in 2011–12. Tables ?? and ?? present the distribution of population of this age cohort by educational attainment and usual activity status (PS+SS). From these tables, we can estimate the number of 'educated' workers, higher secondary and above, who freshly entered the labour market during the seven years between 2004–05 and 2011–12. According to Table ??, in rural areas, there were 17.1 million male students of secondary level and above in 2004–05. During the seven years between 2004–05 and 2011–12, some of these students in 2004–05 completed education and started working. Thereby, they constituted educated fresh entrants to the labour market. The remaining students proceeded to higher education and remained as students. It is estimated that there were 1.2 million higher secondary students and 1.3 million students with college-plus students when the 2011–12 survey was undertaken. The difference in the number of workers with higher secondary, diploma or college-plus in 2004–05 (aged 15–21 years) and 2011–12 (aged 22–28 years) are presumably freshly entered 'educated' workers during the period. Consequently, it is estimated that, among rural men 4.3 million with educational attainment of secondary school, 3.3 million of higher secondary school, 0.7 million with diploma and 2.8 million of college graduates are freshly entered educated workers during the period under study.

Similarly, the number of fresh entrants with the educational attainment of secondary school and above were 1.4 million for rural women, 9.6 million for urban men, and 2.3 million for urban women.

Tables 7a-7d present distribution of workers of this age cohort by educational attainment and employment status and industry. Table 7a, for rural men, presents some interesting patterns. Rural male workers of this age cohort went up from 31.8 million in 2004–05 to 44.9 million in 2011–12. Consequently, the fresh entrants to the labour market were 13.1 million, most of whom had educational attainment of secondary school and above (11.1 million). Consequently, the number of workers of this age cohort with educational attainment of higher-secondary, diploma, and college graduates increased, respectively, by 3.3 million, 0.7 million, and 2.8 million. They are fresh entrants during the seven years. It is also noteworthy that the difference in the numbers of 'less-educated' workers between two points of time was negligible. This fact suggests that there were very few additions in this category of young workers during the period. Most of the workers of this category are those already employed at the time of the 2004–05 survey.

Table 4: Distribution of population of age group 15–21 years by educational attainment and usual activity status, 2004–05 and 2011–12 (1000 persons)

Usual Activity Status	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher sec- ondary	Diploma	College+	
<i>Rural men aged 15–21 years in 2004–05</i>								
Workers	11,186	6915	8616	3358	1321	175	224	31,797
Unemployed	365	293	435	432	236	60	90	1911
Student	640	2372	7765	5956	2927	143	263	20,071
Other non-workers	916	342	358	77	61	0	8	1763
Total	13,108	9923	17,174	9823	4545	379	586	55,542
<i>Rural women aged 15–21 years in 2004–05</i>								
Workers	8741	2763	3238	1169	486	86	75	16,563
Unemployed	74	72	168	182	171	35	61	762
Student	416	1496	4364	3363	1895	70	170	11,782
Other non-workers	9945	3415	3978	1818	686	23	120	19,986
Total	19,175	7747	11,748	6532	3238	214	426	49,093
<i>Urban men aged 15–21 years in 2004–05</i>								
Workers	2438	2357	3146	1253	578	156	168	10,097
Unemployed	161	195	446	235	129	79	117	1364
Student	212	651	3326	4091	3597	204	367	12,451
Other non-workers	293	110	192	56	30	1	28	710
Total	3104	3313	7110	5635	4334	440	679	24,622
<i>Urban women aged 15–21 years in 2004–05</i>								
Workers	1080	613	710	331	242	83	148	3208
Unemployed	17	68	94	89	120	33	114	536
Student	106	495	2506	3396	3018	170	417	10,108
Other non-workers	2405	1445	2068	1084	552	19	145	7719
Total	3609	2621	5378	4900	3931	304	825	21,572
<i>Rural men aged 15–21 years in 2011–12</i>								
Workers	6494	4831	6817	3886	1846	260	186	24,319
Unemployed	385	378	591	313	205	70	82	2024
Student	368	2411	10,761	12,486	7388	408	577	34,400
Other non-workers	747	317	363	207	93	8	18	1754
Total	7993	7937	18,532	16,893	9533	746	863	62,498
<i>Rural women aged 15–21 years in 2011–12</i>								
Workers	3774	2137	2246	1298	669	53	131	10,309
Unemployed	74	17	159	150	100	54	67	620
Student	366	1867	7841	8360	4916	184	409	23,943
Other non-workers	7327	3605	5169	3109	1538	45	227	21,021
Total	11,541	7627	15,415	12,916	7223	336	834	55,893
<i>Urban men aged 15–21 years in 2011–12</i>								
Workers	1948	1658	2087	1370	752	158	177	8152
Unemployed	156	131	211	180	256	67	110	1110
Student	108	665	3841	6614	5712	636	640	18,215
Other non-workers	255	120	91	49	61	13	22	611
Total	2467	2574	6230	8213	6781	875	948	28,088
<i>Urban women aged 15–21 years in 2011–12</i>								
Workers	628	369	474	298	284	81	177	2312
Unemployed	26	22	56	91	65	25	82	368
Student	62	380	3167	4851	5519	445	787	15,211
Other non-workers	1818	1154	1850	1361	880	33	299	7396
Total	2535	1926	5547	6601	6748	584	1345	25,286

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

Table 5: Percentage distribution of less educated workers by employment status and industry, by sector, 2004–05 and 2011–12

Employment status and industry	Male				Female			
	2004–05		2011–12		2004–05		2011–12	
	Educated up to primary & below	Educated up to middle	Educated up to primary & below	Educated up to middle	Educated up to primary & below	Educated up to middle	Educated up to primary & below	Educated up to middle
<i>Rural</i>								
Self-employed in agriculture	34.1	42.9	30.4	35.8	47.9	53.2	43.4	42.7
Agricultural labourers	35.1	22.2	28.0	20.8	34.8	24.7	29.2	26.3
Manufacturing	9.0	9.9	9.5	10.6	12.5	16.1	19.1	21.4
Construction	9.9	7.4	21.1	19.3	2.6	1.2	5.8	2.6
Services sector	12.0	17.6	11.0	13.5	2.2	4.7	2.5	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total workers	(18102)	(8616)	(11325)	(6816)	(11504)	(3238)	(5911)	(2246)
<i>Urban</i>								
Agriculture	6.6	4.7	5.9	6.8	21.9	13.3	9.9	9.9
Self-employment (manufacturing)	10.9	8.4	11.6	10.0	33.4	34.3	42.2	32.5
Regular wage employment (manufacturing)	13.9	16.7	18.2	16.3	5.6	10.5	6.7	16.6
Construction	15.5	14.0	19.2	15.8	3.2	1.3	4.4	3.4
Self-employment (services)	20.8	21.2	13.6	18.3	7.0	12.3	5.1	7.0
Regular wage employment (services)	16.8	21.1	15.3	20.4	20.1	13.6	22.6	25.4
Casual labour (manufacturing+services)	15.6	13.9	16.2	12.5	8.7	14.6	9.1	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total workers	(4795)	(3146)	(3607)	(2087)	(1693)	(710)	(997)	(474)

Note: Figures in parentheses are absolute numbers in 1000 persons. Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

It is particularly interesting that not only between 'less-educated' and 'highly educated' workers, but also even among rural men with more than 10 years of education, clear differences are apparent in the kind of employment gained by persons with different kinds of education. Persons with higher secondary education came to be employed primarily in agriculture, working on their household landholdings and as agricultural labourers, which suggests a lack of non-agricultural employment opportunities suitable to their educational attainment. In contrast, a markedly higher share of persons who obtained technical diplomas found employment in manufacturing (40.1 per cent) and service sectors (30.1 per cent). In addition, persons with college education became employed in household landholdings (38.4 per cent), and in various service sectors (44.3 per cent).

However, it is noteworthy that those 'less-educated' workers, who had already been employed in 2004–05, changed the pattern of employment. The number of cultivators and agricultural labours decreased, respectively, by 1.3 million and 1 million. Construction labourers increased by 2.1 million. Therefore, with increased number of men with higher secondary and college education joining the workforce, workers who joined the workforce early and with low levels of educational attainment were not only excluded from jobs in the manufacturing and services sectors but were also edged out of employment in agriculture to work mainly in construction. During the period of our study, construction emerged as the sector that used increasing numbers of workers with low levels of education, whereas educated workers cornered a disproportionate share of the limited new jobs in manufacturing and services sectors.

Why were so many educated fresh entrants engaged in self-employment in agriculture? Two interpretations might be made. A sort of mismatch in the labour market might be occurring because educated fresh entrants, particularly college graduates in arts, were unable to find employment of their choice. For them, few options are available aside from employment in family farming. If this is true, then it reflects the problem of invisible unemployment among the educated youth. Another interpretation is that the recent economic environment related to agriculture has been changing towards more market-orientation, which requires more management skills of farmers. Consequently, highly educated fresh entrants would have found future prospects on family farms. Further exploration of reasons behind increased participation of educated workers in agriculture remains a subject for future study.

Table 7b presents similar data for rural women who were in the 15–21 years age cohort in 2004–05, and who moved to the 22–28 years age group in 2011–12. Unlike rural men, the most important feature of rural female workers of this age cohort is that numerous such women who had joined the workforce early (in 2004–05) with limited educational attainment dropped out of the labour force altogether. The number of less-educated workers decreased from 11.5 million in 2004–05 to 10 million in 2011–12.

The relation between educational status and employment among rural women of this age cohort was similar to that for rural men in terms of increased employment of persons with higher levels of education and the edging out of persons with low levels of education. Many female workers were employed in the service sector, some of the most important occupations being school teachers, *anganwadi* workers, and workers for cooking mid-day meals in schools.³ Like rural men, the most

³*Anganwadis* are public child care centers in rural areas.

Table 6a: Distribution of population of age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 by educational attainment and usual activity status (rural men and women) (1000 persons)

Usual (PS+SS) Activity Status)	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher secondary	Diploma	College+	
<i>Rural men aged 15–21 years in 2004–05</i>								
Workers	11,186	6915	8616	3358	1321	175	224	31,797
Unemployed	365	293	435	432	236	60	90	1911
Student	640	2372	7765	5956	2927	143	263	20,071
Others	916	342	358	77	61	0	8	1763
Non-workers	1921	3008	8558	6465	3224	203	361	23,745
Total	13,108	9923	17,174	9823	4545	379	586	55,542
<i>Rural men aged 22–28 years in 2011–12</i>								
Workers	11,481	6655	10,583	7622	4652	930	3008	44,933
Unemployed	46	83	179	258	255	159	710	1690
Student	8	8	65	227	1221	100	1297	2924
Others	326	78	147	188	36	1	51	828
Non-workers	380	169	391	673	1512	260	2057	5442
Total	11,861	6824	10,974	8295	6164	1190	5065	50,375
<i>Rural women aged 15–21 years in 2004–05</i>								
Workers	8741	2763	3238	1169	486	86	75	16,563
Unemployed	74	72	168	182	171	35	61	762
Student	416	1496	4364	3363	1895	70	170	11,782
Others	9945	3415	3978	1818	686	23	120	19,986
Non-workers	10,434	4984	8510	5363	2752	129	351	32,531
Total	19,175	7747	11,748	6532	3238	214	426	49,093
<i>Rural women aged 22–28 years in 2011–12</i>								
Workers	7521	2494	2546	1499	795	164	779	15,798
Unemployed	21	4	72	123	135	40	329	725
Student	8	1	17	126	435	21	638	1246
Others	12,435	4495	5783	3676	2514	186	1537	30,627
Non-workers	12,464	4500	5872	3926	3084	247	2504	32,598
Total	19,985	6994	8419	5425	3879	412	3282	48,396

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

Table 6b: Distribution of population of age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 by educational attainment and usual activity status (urban men and women) (1000 persons)

Usual (PS+SS) Activity Status)	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher secondary	Diploma	College+	
<i>Urban men aged 15–21 years in 2004–05</i>								
Workers	2438	2357	3146	1253	578	156	168	10,097
Unemployed	161	195	446	235	129	79	117	1364
Student	212	651	3326	4091	3597	204	367	12,451
Others	293	110	192	56	30	1	28	710
Non-workers	666	956	3964	4382	3757	284	512	14,525
Total	3104	3313	7110	5635	4334	440	679	24,622
<i>Urban men aged 22–28 years in 2011–12</i>								
Workers	3058	2450	4441	3652	2498	803	4794	21,696
Unemployed	76	49	149	121	220	82	939	1635
Student	7	0	25	133	909	269	1677	3020
Others	112	23	45	42	75	4	88	392
Non-workers	195	73	218	296	1204	356	2703	5047
Total	3253	2522	4659	3948	3701	1159	7498	26,743
<i>Urban women aged 15–21 years in 2004–05</i>								
Workers	1080	613	710	331	242	83	148	3208
Unemployed	17	68	94	89	120	33	114	536
Student	106	495	2506	3396	3018	170	417	10,108
Others	2405	1445	2068	1084	552	19	145	7719
Non-workers	2529	2008	4668	4569	3689	221	677	18,363
Total	3609	2621	5378	4900	3931	304	825	21,572
<i>Urban women aged 22–28 years in 2011–12</i>								
Workers	1053	478	723	462	483	190	1969	5358
Unemployed	17	20	27	54	73	36	600	828
Student	0	0	32	65	539	68	1301	2006
Others	3331	1741	3172	3110	2632	263	3251	17,500
Non-workers	3348	1762	3231	3229	3244	368	5152	20,334
Total	4401	2240	3954	3691	3727	558	7121	25,692

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

commonly available employment opportunities for less-educated female workers were self-employment in agriculture and agricultural labourers. With a decline in employment in agriculture, 1.8 million workers who were engaged in agriculture in 2004–05 left. Some of them were engaged in construction, most likely in MGNREGA works, but most are engaged in domestic duties. With few employment opportunities for rural women of this age cohort, the main trend in the case of young rural women is that many of them dropped out of the labour force in their early twenties to mid-twenties.

The number of urban male workers of this cohort doubled from 10.1 million in 2004–05 to 21.7 million in 2011–12 (Table 7c). This large increase by 11.6 million during the period is partly attributable to fresh young entrants with higher education and partly to rural–urban migration. Improvement of workers' educational attainment is clear. A marked expansion (4.6 million) of college graduates and more educated people is apparent during the period. The new entrants of this age group were employed as regular workers in manufacturing (2.2 million), the service sector (7.1 million), and construction (1.3 million). However, no large change has occurred in the employment structure of less-educated workers, except for a slight rise in manufacturing and construction workers.

Urban female workers of this cohort increased by 2.2 million during the seven years. It is noteworthy that the number of workers with the least educational attainment fell. Those workers with middle and higher education increased. Like urban men, many young female college graduates entered the labour market. Most these fresh entrants were employed as regular wage workers in the service sector.

Table 7a: Number of rural male workers by employment status, industry and level of educational attainment, age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 (1000 persons)

Employment status and industry	Educational attainment							Total
	Below primary	Primary	Middle	Second-ary	Higher secondary	Diploma	College+	
<i>15–21 years in 2004–05</i>								
Self-employed in agriculture	3710	2456	3694	1592	699	53	103	12,308
Agricultural labourers	4299	2048	1912	489	117	5	15	8885
Manufacturing	814	810	855	381	98	38	10	3006
Construction	1124	674	639	173	68	10	2	2690
Service sector	1239	927	1516	723	339	69	94	4908
Total	11,187	6915	8616	3358	1321	175	224	31,797
<i>22–28 years in 2011–12</i>								
Self-employed in agriculture	3115	1786	3604	2953	2050	162	1155	14,827
Agricultural labourers	3672	1660	1949	1177	546	50	105	9159
Manufacturing	905	687	1203	803	550	343	297	4788
Construction	2493	1429	1824	855	349	72	118	7140
Service sector	1297	1095	2002	1834	1157	303	1332	9019
Total	11,481	6655	10,583	7622	4652	930	3008	44,933
<i>Change between 2004–05 and 2012–13</i>								
Self-employed in agriculture	–595	–671	–90	1361	1350	109	1053	2519
Agricultural labourers	–628	–388	37	688	429	45	90	274
Manufacturing	91	–123	347	422	452	305	288	1782
Construction	1369	755	1186	682	281	62	116	4450
Service sector	58	167	486	1110	818	234	1237	4111
Total	294	–260	1966	4264	3331	755	2784	13,136

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO 61st and 68th EUS unit data.

Table 7b: Number of rural female workers by employment status, industry and level of educational attainment, age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 (1000 persons)

Employment status and industry	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher secondary	Diploma	College+	
<i>15–21 years in 2004–05</i>								
Self-employed in agriculture	4117	1395	1723	625	281	16	27	8191
Agricultural labourers	3263	739	800	198	39	9	1	5049
Manufacturing	928	513	523	221	83	26	11	2305
Construction	261	36	40	9	0	0	0	346
Service sector	171	80	151	116	83	35	36	673
Total	8741	2763	3238	1169	486	86	75	16,563
<i>22–28 years in 2011–12</i>								
Self-employed in agriculture	3623	1047	1321	731	469	14	198	7403
Agricultural labourers	2264	768	557	286	40	2	9	3924
Manufacturing	793	483	380	210	124	11	54	2055
Construction	644	132	132	59	5	2	6	981
Service sector	196	64	157	214	157	136	511	1435
Total	7521	2494	2546	1499	795	164	779	15,798
<i>Change between 2004–05 and 2012–13</i>								
Self-employed in agriculture	–494	–348	–402	106	188	–2	171	–787
Agricultural labourers	–999	29	–244	88	1	–7	8	–1124
Manufacturing	–135	–31	–143	–11	40	–15	44	–251
Construction	383	96	91	50	5	2	6	635
Service sector	25	–16	6	97	74	101	475	762
Total	–1220	–270	–692	330	309	79	704	–765

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO's 61st and 68th EUS unit data.

Table 7c: Number of urban male workers by employment status, industry and level of educational attainment, age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 (1000 persons)

Employment status and industry	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher secondary	Diploma	College+	
<i>15–21 years in 2004–05</i>								
Agriculture	172	146	147	93	24	3	6	591
Self-employment (manufacturing)	221	300	265	119	39	4	4	952
Regular wage employment (manufacturing)	340	325	527	190	73	35	36	1527
Construction	409	332	439	90	11	12	3	1296
Self-employment (services)	536	461	667	351	222	52	41	2329
Regular wage employment (services)	366	438	665	321	183	44	74	2093
Casual labour (manufacturing+services)	394	355	436	88	25	6	4	1309
Total	2438	2357	3146	1253	578	156	168	10,097
<i>22–28 years in 2011–12</i>								
Agriculture	166	138	240	172	106	6	129	956
Self-employment (manufacturing)	263	190	386	205	135	11	191	1381
Regular wage employment (manufacturing)	486	514	835	546	361	322	655	3720
Construction	704	407	624	458	176	80	147	2597
Self-employment (services)	563	469	872	1056	647	110	1049	4766
Regular wage employment (services)	481	425	1068	983	1008	242	2584	6792
Casual labour (manufacturing+services)	394	307	416	232	64	33	38	1485
Total	3058	2450	4441	3652	2498	803	4795	21,696
<i>Change between 2004–05 and 2012–13</i>								
Agriculture	–6	–8	93	79	82	3	123	365
Self-employment (manufacturing)	42	–110	120	85	96	7	187	428
Regular wage employment (manufacturing)	146	189	309	356	288	287	619	2193
Construction	295	74	185	368	165	68	145	1301
Self-employment (services)	27	8	206	705	425	58	1008	2437
Regular wage employment (services)	116	–13	403	662	825	198	2510	4699
Casual labour (manufacturing+services)	0	–48	–20	144	40	27	34	176
Total	620	92	1296	2399	1920	647	4627	11,599

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO 61st and 68th EUS unit data.

Table 7d: Number of urban female workers by employment status, industry and level of educational attainment, age cohort 15–21 years in 2004–05 and 22–28 years in 2011–12 (1000 persons)

Employment status and industry	Educational attainment							Total
	Below primary	Primary	Middle	Secondary	Higher secondary	Diploma	College+	
<i>15–21 years in 2004–05</i>								
Agriculture	265	106	95	41	11	5	1	522
Self-employment (manufacturing)	353	213	244	77	31	26	5	949
Regular wage employment (manufacturing)	29	66	75	35	9	14	8	236
Construction	36	18	9	2	4	1	0	71
Self-employment (services)	79	40	88	75	88	8	36	414
Regular wage employment (services)	236	105	96	100	87	25	98	747
Casual labour (manufacturing+services)	83	65	104	2	12	3	0	269
Total	1080	613	710	331	242	83	148	3208
<i>22–28 years in 2011–12</i>								
Agriculture	202	29	40	51	22	0	9	353
Self-employment (manufacturing)	340	154	274	122	86	13	69	1058
Regular wage employment (manufacturing)	42	78	42	68	27	23	80	360
Construction	87	27	2	0	2	5	24	147
Self-employment (services)	86	81	123	80	89	16	250	725
Regular wage employment (services)	216	66	173	96	238	124	1521	2435
Casual labour (manufacturing+services)	79	43	69	44	19	10	16	280
Total	1053	478	723	462	483	190	1969	5358
<i>Change between 2004–05 and 2011–12</i>								
Agriculture	–62	–77	–55	10	12	–5	8	–169
Self-employment (manufacturing)	–13	–59	30	45	55	–13	64	109
Regular wage employment (manufacturing)	13	12	–33	33	18	9	72	124
Construction	50	9	–7	–2	–2	3	24	76
Self-employment (services)	7	41	35	6	0	8	213	311
Regular wage employment (services)	–19	–39	77	–3	151	99	1423	1688
Casual labour (manufacturing+services)	–4	–22	–35	43	7	7	16	11
Total	–27	–135	13	131	241	107	1.820	2.150

Note: Workers in this table include both usual principal and subsidiary activity status workers.

Source: Based on age tables of population census of 2001 and 2011 and NSSO 61st and 68th EUS unit data.

6 Concluding Remarks

A severe contraction of employment took place in India between 2004–05 and 2011–12. NSSO surveys show a fall in work participation rates in rural and urban areas, and for men and women. Sectoral data show a considerable decline in employment in agriculture. After 2004–05, employment in manufacturing and services sectors stagnated or declined. Between 1993–94 and 2004–05, numerous rural male workers lost employment in agriculture but found employment in services (mainly, trade and transport). Between 2004–05 and 2011–12, rural male workers who lost employment in agriculture had to move to construction. In 2011–12, construction became the second largest industry next to agriculture to employ the rural labour force. Construction accounted for employment of 11 per cent of rural male workers, 6.6 per cent of rural women workers, 7.2 per cent of urban male workers, and 3.7 per cent of urban women workers. Although data also show an expansion of employment in construction for rural women, much of this was attributable to employment under public works programmes, mainly reflecting the impact of MGNREGA.

The chief contribution of this paper is its detailed age-cohort analysis of employment. Age-cohort analysis can throw light on how differences in employment conditions of young people entering into the labour force and old people exiting the labour force, and changes in employment conditions of existing workers who continue in the labour force, affect the overall employment structure.

Given the seven-year gap separating the NSSO two EUS surveys, this study uses seven-year age cohorts. There are two limitations of the age-cohort analysis using NSSO data. First, the age cohort data from NSSO surveys must be combined with data on population of age cohorts from the population censuses to correct underestimation of population in the NSSO surveys. Secondly, because of inaccuracies in age reporting, and because of the consequent age heaping at certain numbers, information cannot be extracted reliably for all age cohorts. In general, information related to age is more accurate for younger cohorts. For this reason, the age-cohort analysis in this paper focuses mainly on younger age cohorts.

The most interesting results from age-cohort analysis are for rural men. The rural male workforce increased by 14.7 million between 2004–05 and 2011–12. This larger workforce was employed mainly by the construction sector. The greatest increase in the size of the workforce, 13.7 million workers, took place among those who were in the 15–21 years age cohort in 2004–05. By the time they moved to the 22–28 years age group (at the time of 2011–12 survey) many more persons in this age group had finished their education and had joined the workforce. About 65 per cent of these workers came to be employed in agriculture, and only 13 per cent in construction. While the young workers entered the workforce, and while many of them sought employment in agriculture, older people had to shift from agriculture to construction. This point is readily apparent in the dynamics of change for the 22–28 years age cohort. In this age cohort, the number of workers engaged in agriculture (as cultivators or as agricultural labour) declined by about 2.5 million, whereas the number of workers in construction increased by roughly the same amount between 2004–05 and 2011–12.

Contraction of employment in agriculture affected rural women much more. Other than the youngest age group in 2011–12 (15–21 years), all age cohorts, including the 15–21 years age cohort in 2004–05, showed a stark drop in the

number of workers. The decline in work participation rates of women was not merely attributable to the expansion of education, it was also attributable to a large contraction of agricultural employment.

Cross-tabulating the age-cohort data with education shows that, although agriculture had historically employed the bulk of the workers with little or no education, between 2004–05 and 2011–12, contraction of agricultural employment caused workers with higher secondary education to leave agriculture, in addition to edging out some workers with low levels of education. Construction emerged as the sector employing workers with the lowest educational attainment. Many persons in the 15–21 years age cohort in 2004–05 obtained higher secondary, technical, and college education, and joined the workforce by the time the 2011–12 survey was administered. Among such young workers, workers with education up to higher secondary level moved into agriculture as both cultivators and agricultural workers, persons with technical diplomas cornered manufacturing sector jobs, whereas workers with college degrees came to be employed in household enterprises (as cultivators) or in the service sector as regular wage workers.

To sum, the paper shows that changes in employment conditions between 2004–05 and 2011–12 were primarily driven by low levels of employment creation except in a few activities like construction that absorbed male workforce with lowest levels of skills. With declining labour absorption in agriculture, rural women workers were left high and dry, and were forced to withdraw from the labour force. On the other hand, new young male workers, jostling for employment opportunities, entered the agricultural labour force. As young and more educated rural male workers entered agriculture, their older brethren, with lower levels of education, were pushed into the construction sector. Over this period, construction emerged as the employer of last resort, requiring most arduous labour and employing workers with lowest levels of education.

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A severe contraction of employment took place in India between 2004–05 and 2011–12. NSSO surveys show a fall in work participation rates in rural and urban areas, and for men and women. This monograph presents a detailed age-cohort analysis to throw light on dynamics of changes in structure of employment in the economy.

The study shows that changes in employment conditions between 2004–05 and 2011–12 were primarily driven by low levels of employment creation except in a few activities like construction that absorbed male workforce with lowest levels of skills. With declining labour absorption in agriculture, rural women workers were left high and dry, and were forced to withdraw from the labour force. On the other hand, new young male workers, jostling for employment opportunities, entered the agricultural labour force. As young and more educated rural male workers entered agriculture, their older brethren, with lower levels of education, were pushed into the construction sector. Over this period, construction emerged as the employer of last resort, requiring most arduous labour and employing workers with lowest levels of education.

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