

Measuring Labour Input in India: A Sectoral Perspective

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Abstract

A time series of labour input and composition index from 1980 to 2004 has been constructed for the aggregate Indian industry as well as its 31 sectors. Employment is measured by usual principal and subsidiary status (UPSS) and is combined with number of days worked in a week and number of hours worked in a day to get total hours worked in a week and a year. Labour composition index based on the methodology of (JGF) Jorgenson, Gollop, and Fraumeni (1987) and using the Tornqvist translog index is also computed for both the total economy and the 31 sectors. The composition index is also decomposed into age, gender and education indices for the total economy. A Mincer wage equation has been used to estimate the wages of the self-employed persons and Heckman's two step method is used to correct for the sample selection bias. For the manufacturing sector, the employment is bifurcated between the organized sector (obtained from ASI) and unorganized sector.

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I: Introduction

The current research is part of an on-going research project to create a data base for India KLEMS whereby an in depth productivity analysis can be undertaken. The basic approach is based on growth accounting framework. Towards that goal, a time series data on output, capital, labour, labour composition and intermediate inputs is to be constructed for both the aggregate economy and at the sectorial level. The major tasks for data base on labour are to prepare a time series of labour input from 1980-81 to 2004-05 and construct a Labour Composition Index for the same period.

The present paper highlights the growth of labour input in India from 1980-81 to 2004-05 paying attention to education, gender and age characteristics. The changes in labour characteristics are discussed both at the total economy and the industry level. The paper develops and implements the methodology of estimating labour input incorporating the indices of labour quality that reflect the changing composition of the workforce. It is essential to estimate labour quality as age- sex- education and even the industrial distribution of the workforce change over time. Though there is a long history of labour quality measurement in US and many other countries, but India does not have any tradition of the same. Though measurement of returns to education has earlier been attempted in India, but the present paper is the first attempt to take into account age and gender characteristics along with education.

Though the data limitations generally make it difficult to quantify the level of skills in the labour force¹, yet the present paper attempts to construct a composition change index for total persons working in 31 different industries in India for the 38th, 43rd, 50th 55th and 61st rounds of NSSO with 1983 (38th round) equal to 100 so as to assess the temporal changes in labour composition. Since the series required is from 1980-81, we have extrapolated it backwards from 1983.

So the major contributions of the current paper are that: a) Efforts have been made for the first time to estimate employment in Hours; b) Average number of Hours worked in a day have been estimated for the first time; c) Both the Quinquennial and the annual rounds have been used, for the first time for constructing the time series; d) A separate decomposition of Labour Quality in to indices of age, sex and education has been attempted.

¹ Because of large data requirement for constructing the quality index, BCV presumed a fixed 7 per cent return for each year of schooling.

The paper is organized in different sections. In section II, we outline the sources of data and the methodology used. While section III contains the Profile of Aggregate Labour Input in India, the distribution of workers by broad industry is presented in section IV and by 31 industries in section V. Section VI attempts to provide the distribution of manufacturing workers into organized and unorganized sectors and the conclusion is given in section VII.

II: Sources of Data and Methodology

While the details about the sources of data are provided in section II.1, section II.2 provides the methodology used in the paper for estimating labour input.

II.1. Sources of Data:

The large scale sample surveys on Employment and Unemployment (EUS) by National Sample Survey Organisation (NSSO) along with estimated population is the main source for estimating the total workforce in the country by industry groups, as per the National Industrial Classification (NIC) and the estimates of labour input thus obtained are also used in National Accounts. However, the methods used to estimate labour input have changed over time. While National Accounts used census based estimates before 1993-94, but since then have used data from the Quinquennial rounds of EUS using mainly the principal and subsidiary status of the worker (CSO; 2004). The source of data for the population is Census of India (different years). For the organized manufacturing sector employment estimates from ASI are also used.

In India major or Quinquennial Rounds of EUS which have been conducted by NSSO since 1980 are 38th (1983), 43rd (1987-88), 50th (1993-94), 55th (1999-2000) and 61st (2004-05). Since 1989-90, the NSSO has also conducted annual surveys with small sample size. While the annual surveys or thin rounds have shorter reference periods, six months in some cases, they also have limited coverage (Refer to Table A1 in the appendix). It relates to both rural and urban sectors of the economy. So while some economists have preferred to ignore them almost completely (Sundaram and Tendulkar), the others have supported their use (Bhalla and Das, 2005; Srinivasan, 2008). It is however, also pointed out that the annual rounds always give WPR estimates which are higher than the nearby major rounds (Himanshu; p 14, 2007).

In the NSS surveys, the workers are classified on the basis of their activity status into usual principal status (UPS), usual principal and subsidiary status (UPSS), current weekly status (CWS) and current daily status (CDS) for Quinquennial rounds (also known as major rounds) and Usual Status & CWS for annual rounds (also known as thin rounds). While UPS,

UPSS and CWS measure number of persons, the CDS gives number of jobs. The issue was the choice of an appropriate measure. Advantages of using usual principal and subsidiary status (UPSS) with other measures were discussed and because of its advantages over others it has been decided to use it². UPSS is the most liberal and widely used of these concepts. It includes all workers who have worked for a longer time of the preceding 365 days in either the principal or in one or more subsidiary economic activity.

Advantages of using UPSS, which gives number of persons employed, are:

- It provides more consistent and long term trend.
- More comparable over the different EUS rounds.
- NAS's Labour Input Method (LIM) is also now based on Principal and Subsidiary Status.
- LIM gives equal weight to full time and part time workers, so with increasing part time jobs, the number may increase and productivity underestimated.
- Wider agreement on its use for measuring employment (Visaria, 1996; Bosworth, Collins & Virmani (BCV), 2007; Sundaram, 2008; Rangarajan, 2009).
- It can also be calculated for thin rounds.

Despite that the UPSS has some limitations³ this is the best measure to use given the data.

Since NSSO uses National Industrial Classification 1970 (NIC) for classification of workers by industry in 38th and 43rd rounds, NIC 1987 for 50th round and NIC 1998 for 55th and 61st rounds, therefore as a starting point *concordance between India KLEMS industrial classification, NIC-1970, 1987 and 1998 for all the 31 sectors was done.*

There are however some data problems which need a mention:

- i) The educational categories in the 38th and 43rd round did not have a separate classification for Higher Secondary (Hr. Sec.) and was introduced for the first time in the 50th round. Hence the categories are not exactly comparable in the five rounds. For this reason, we combined the middle, secondary and Higher Secondary categories into a category of middle to Higher Secondary for the

²See Appendix for a detailed description of these concepts.

³Problems in using UPSS are: The UPSS seeks to place as many persons as possible under the category of employed by assigning priority to work, No single long-term activity status for many as they move between statuses over a long period of one year, and Usual status requires a recall over a whole year of what the person did, which is not easy for those who take whatever work opportunities they can find over the year or have prolonged spells out of the labour force.

purpose of our analysis and the entire population is put into 3 educational groups-up to primary, middle to higher Secondary and above higher secondary.

- ii) There are also some conceptual differences between NSSO major rounds in the way employment and unemployment status of a person is defined.
- iii) The problem of concordance between NIC and KLEMS is observed in the first two rounds, i.e. 38th and 43rd. While the concordance required is at 4 digits for NIC 1970, but the codes used in NSSO surveys are in 3 digits, so proportional bifurcation has been done for some industries, e.g. NIC 265, 321 and 363 in to two KLEMS groups. It may also be mentioned that for these rounds and the 50th round there is no complete specification of the principal and subsidiary industry for all the UPSS employed persons. It is 99.71%, 97.9% and 99.39% in 38th, 43rd and 50th rounds respectively. Also, to maintain consistency with NAS and the earlier rounds, custom tailoring, which is included in manufacturing in 55th and 61st rounds by NSSO, has been included in services in these two rounds also.

II.2. Methodology:

II.2.1 The Growth Accounting Methodology

The standard growth accounting methodology leads to decomposition of value-added growth as the revenue-share weighted growth of inputs and the residual multi-factor productivity growth:

$$\Delta \ln Y_j = \bar{v}_{K,j}^Y \Delta \ln K_j + \bar{v}_{L,j}^Y \Delta \ln L_j + \Delta \ln A_j^Y \quad (1)$$

Each element on the right-hand side of (1) indicates the proportion of output growth accounted for by growth in capital services, labour services and MFP growth representing technical change. The latter cannot be directly measured and is derived as a residual.

In (1), the aggregate labour input L_j is defined as a Törnqvist volume index of hours worked by individual labour types 'j' as follows:⁴

$$\Delta \ln L_j = \sum_l \bar{v}_{l,j}^L \Delta \ln H_{l,j} \quad (2)$$

with weights given by

⁴Aggregate input is unobservable and it is common to express it as a translog function of its individual components. Then the corresponding index is a Törnqvist volume index (see Jorgenson, Gollop and Fraumeni 1987). For all aggregation of quantities we use the Törnqvist quantity index, which is a discrete time approximation to a Divisia index. This aggregation approach uses annual moving weights based on averages of adjacent points in time. The advantage of the Törnqvist index is that it belongs to the preferred class of superlative indices (Diewert 1976). Moreover, it exactly replicates a translog model which is highly flexible, that is, a model where the aggregate is a linear and quadratic function of the components and time.

$$v_{l,j}^L = \frac{p_{l,j}^L H_{l,j}}{p_j^L L_j} \quad (3)$$

where $\Delta \ln H_{l,j}$ indicates the growth of hours worked by labour type l and weights are given by the period average shares of each type in the value of labour compensation, such that the sum of shares over all labour types add to unity. As we assume that marginal revenues are equal to marginal costs, the weighting procedure ensures that inputs which have a higher price also have a larger influence in the input index. So for example a doubling of hours worked by a high-skilled worker gets a bigger weight than a doubling of hours worked by a low-skilled worker. In our analysis, the volume growth of labour input is split into the growth of hours worked and the changes in labour composition in terms of labour characteristics such as educational attainment, age or gender (see below). Let H_j indicate total hours worked by all types $H_j = \sum_l H_{l,j}$ then we can decompose the change in labour input as follows:

$$\Delta \ln L_j = \sum_l \bar{v}_{l,j}^L \Delta \ln \frac{H_{l,j}}{H_j} + \Delta \ln H_j = \Delta \ln LC_j + \Delta \ln H_j \quad (4)$$

The first term on the right-hand side $\Delta \ln LC_j$ indicates the change in labour composition and the second term indicates the change in total hours worked.⁵ It can easily be seen that if proportions of each labour type in the labour force change, this will have an impact on the growth of labour input beyond any change in total hours worked.

Jorgenson (2005) has also obtained first order and higher order contributions of changes in the composition of sex, age, education, and class to the growth of labour quality. The contribution of sex to labour quality, Q^s , is defined as the difference between the growth rates of the first –order partial index of labour input ($\Delta \ln L_j^s$) and hours worked ($\Delta \ln H_j$):

$$\Delta \ln Q^s = \Delta \ln L_j^s - \Delta \ln H_j$$

Analogously, other first order contributions, Q^a , Q^e and Q^c were defined and it was argued that if the higher order contributions are ignored, then

$$Q^L = Q^s * Q^a * Q^e * Q^c$$

⁵The first term is also known as “labour quality” in the growth accounting literature (see e.g. Jorgenson, Ho and Stiroh 2005). However, this terminology has a normative connotation which easily leads to confusion. For example, lower female wages would suggest that hours worked by females have a lower “quality” than hours worked by males. Instead we prefer to use the more positive concept of “labour composition”. It is also argued that the observed differentials may reflect factors other than productivity differences, such as gender or age discrimination (BCV, 2007).

II.2.2 Measuring Inputs in Indian Economy

There have been many studies on productivity in India using the growth accounting methodology. Most these studies use number of employees as labour inputs. Such an approach would implicitly assume that labour is a homogenous input. However, this is hardly the case. Labour input consists of different skill and age levels, which lead to corresponding difference in their productivities. Therefore, we separate the effect of the quantities of these inputs from the effect of different skill compositions.

Measurement of Labour Input:

The construction of time series of Labour Input requires estimation of numbers of persons and total hours worked per person. In earlier studies, especially in India number of persons has been used as a measure of labour input. Some studies have also used person hours as the measure but have not accounted for differences in labour characteristics. So it is taken to be the simple sum of hours worked by different persons. OECD (2001) and EU KLEMS have estimated Labour- productivity in terms of output per labour hour worked. OECD does not favour using count of jobs and has published international comparisons of productivity for OECD countries that uses unadjusted hours. For international comparisons, efforts are made for the first time in this paper to estimate person hours and adjust it for changes in labour characteristics by calculating the labour quality/composition index, thus obtaining the quality corrected labour input.

The methodological issues are i) how to estimate number of persons employed, and ii) how to estimate total number of hours worked from the available data sets?

In India the total workforce in the country and its distribution over economic activities may be obtained from the decennial Population Census and the Employment and Unemployment Surveys (EUS) of the NSSO. Out of the two, the latter are more dependable and have been used to assess the changes in the employment and unemployment for the employment planning and policy analysis. However, the definition of work used by the EUS surveys is still not completely synchronized with the UN system of National Accounts (Sundaram; 2009, pp3). The preference for the use of EUS is generally based on the notion that prior to 2001, the three Censuses have clearly under reported the participation of women in economic activities; whereas the EUS has provided reasonably stable estimates of the level and pattern of employment (Visaria; 1996). While Population Census underestimates work force participation rates (WPRs), the EUS estimates of total population are significantly lower than

the Population Census based estimates – by over 20 percent in Urban India⁶. However, for the Census 2001, the WFPRs are closer to the 1999-2000 NSSO round⁷.

Since the available data on employment from the NSSO is through household enquiry method, it gives data on number of workers. The difference between the number of workers and the number of jobs is the multiple jobs performed by employed persons. To obtain labour input, India KLEMS has used UPSS for employment and combined it with intensity of work, which may be obtained from current daily status (CDS) schedule of the surveys.

The data on employment is essentially derived from the unit level record data of National Sample Survey (NSS) which is made available by NSSO in the form of CD-ROMS for the five Quinquennial rounds. We estimated the number of employed person hours according to UPSS as follows:

- i) Firstly, the proportion of workers per thousand population (WFPR) has been extracted directly from the unit level record data of NSS for the four categories, namely rural male, rural female, urban male and urban female across India.
- ii) Then, we obtained population figures for these four categories mentioned earlier from the population census. Although census population is available only decennially, we used the interpolated population figures for the mid-year survey periods, (BCV, 2007 for 1987-88; and Sundaram, 2007 for other periods), namely 1983(July), 1987-88 (Jan), 1993-94(Jan), 1999-00(Jan) and 2004-05(Jan).
- iii) We use the WPRs by UPSS from EUS and apply them to the corresponding period's population distribution, i.e. rural male (RM), rural female (RF), urban male (UM) and urban female (UF) and the estimates are obtained by appropriate aggregation. The total workforce in the country estimated through this procedure refers to the number of jobs performed (Kolli; 2008).
- iv) Use the 31-industry⁸ distribution of Employment from EUS and apply these proportions to the number of workers in step iii) and obtain L_{ij} for each industry where $i=1$, for rural and 2 for urban sectors and $j=1$, for male and 2 for female.
- v) An adjustment is made in different rounds for a) splitting of few industries into different KLEMS industrial classifications due to Concordance, and b) for custom tailoring.

⁶A very lucid description of the same is given by Sivasubramonian (2004).

⁷While the details of the WFPRs by NSSO are given in Table 2, the same by Census are given in appendix table A3.

⁸The list of the 31 India KLEMS industries used in the current exercise is provided in Appendix A.

- vi) The number of persons employed thus obtained from major rounds is interpolated to obtain a continuous time series from 1983-84 to 1994-95. For extrapolation backward to 1980-81 to 1982-83 the growth rate between 1983-84 and 1984-85 have been used.
- vii) The information available on WFPR by thin rounds (small sample rounds with reference periods of one year, or 6/3 months) for 3-sector industrial classification (primary, secondary and tertiary) is used to estimate the employed persons for the year of the survey and use it as a control number on the interpolated numbers to adjust the latter (refer to appendix table A2 for industrial distribution of workforce in different rounds) and revised numbers L_{ij} were obtained.
- viii) Find out the average number of days worked per week 'd_{ij}' for each industry from the intensity of employment as given in the CDS schedule for five major rounds and necessary interpolation carried out to get the full series.
- ix) Assuming average 48 hours work week for regular workers and 8 hours per day for self employed and casual workers, find out the expected number of hours 'h_{ij}' worked per day from the status-wise distribution, in each industry for rural males, rural females, urban males and urban females for five major rounds and the interpolation carried out to get the full series.
- x) The number of revised workers 'L_{ij}' is multiplied by average no. of days 'd_{ij}' and number of hours 'h_{ij}' and further multiplied by 52 to find out the number of hours worked per year in each industry across rural male, rural female, urban male and urban female. The four series are then added together to get total number of person hours in each industry. Thus we obtained $\sum_i \sum_j L_{ij} * d_{ij} * h_{ij} * 52$.
- xi) For the manufacturing sector we also get the organized sector employment from Economic and Political Weekly's CD for the years 1980-81 to 2003-04 and extrapolates it to 2004-05. These are subtracted from the total employment obtained from NSSO to get employment for the unorganized manufacturing sector. For extrapolation of the series of unorganized manufacturing employment for 1980 to 1982, we have again used the growth rate between 1983 and 1984.

Measurement of Labour Composition

The composition of labour force is a matter of concern in the context of productivity measurement, as it provides not only a more accurate indication of the contribution of labour to production but also the impact of compositional changes on productivity. Most of the recent indices of quality of labour input are based on the methodology of (JGF) Jorgenson,

Gollop, and Fraumeni (1987) and uses the Tornqvisttranslog index. Using this methodology Sailaja (1988) obtained similar index for output, labour and price in the case of Indian railways and Aggarwal (2004) estimated labour quality for the Indian manufacturing labour force.

For labour composition index the data required for Composition Index is Employment by sex by age by education by industry and earnings for each cell. There are thus $2*3*3=18$ types of workers for each of 31 industries. Therefore the following additional steps have also been performed:

- xii) Further, the next step involves computing the proportions of the distribution of workers by the three age groups and three educational groups for all the major rounds.
- xiii) These proportions are then applied to the number of employed person hours in different industries to obtain the distribution of person hours by sex, by age and by education groups.
- xiv) Since earnings data is also required for labour composition index, it is estimated from NSSO which relates it mainly to regular and casual workers. It may however be mentioned that even for these two groups, for majority, the wages are either missing or given as zero.
- xv) For earnings of self-employed persons, a Mincer wage equation has been estimated and the sample selection bias is corrected for by using the Heckman⁹two step procedure. The function has been used to the earnings of casual and regular employees where the earnings have been regressed on the dummies of age, sex, education, location, marital status, social exclusion and industry. The identification factors used in the first stage are age, sex, and marital status, type of household / size of households. The corresponding earnings of the self-employed are obtained as the predicted value with similar traits. The average wages per day are then computed for workers of different type of employment, i.e. self-employed, regular and casual combined together, whose wages are more than zero.

Once the above steps are taken to find out the sex, age and educational distribution of all employed persons in all the five rounds, the computation of the labour composition index is carried based on the JGF (1987) methodology with 38th round (July 1983) equal to 100.

The indices have been constructed using the following classifications:

⁹ The details of the function can be obtained from the Stata software.

Table 1: Classification Categories of Labour Force for each Industry

Classification No.	Categories
Gender	2 Males, Females
Age groups	3 <29, 29-50, >50
Education	3 Up to Primary, Between Primary to Higher Secondary , above Higher Secondary
Industries	31

So it is 2*3*3*31 classification.

III: Profile of Labour Input in India

This section includes the WFPRs in different NSSO rounds in section III.1. It also includes the trend in labour input and quality change for the aggregate industry in section III.2. While section III.3 discusses the contribution of education; that of age, gender, and employment class is provided in the subsequent sections III.4 to III.6.

III.1. Workers by UPSS: The WFPRs for different categories by UPSS for different NSSO round are presented in Table 2. While several economists namely Sundaram (2007), Chaddha (2003), and others have not favoured the detailed analysis of the 43rd round on account of it being an abnormal year of drought, Himanshu (2006) on the other hand argues that there was not much adverse impact of it on employment and perceives the trend to be a normal one. He however considers the 50th round results to be an outlier where the WFPRs have increased rather than falling. The falling WFPRs are expected over time at least in rural areas but the WFPRs may change due to demographic changes. Since the LFPR is already very high for age group 29-50 (almost 99%), LFPR and WFPR may increase if either the proportion of 29-50 age group increases in the population as a result of demographic change or LFPR in other two age groups 5-29 and above 50 increases. The trend of the 50th round has mainly been attributed by him to the change in the method of classification of a person into one of the three broad groups ‘employed’, ‘unemployed’ and ‘out of labour force’ based on the major time criterion from a trichotomous classification to a two stage dichotomous one which involved a classification into ‘labour force’ and ‘out labour force’ in the first stage, and thereafter, the labour force into ‘employed’ and ‘unemployed’ in the second stage. As a result many persons, especially rural women, who would have been out of labour force in the 43rd round, may have been counted as employed or in labour force in the 50th round.

While Himanshu (2006) considers the trend in the 55th round i.e. 1999-00 as normal, Sundaram (2007) on the other hand have analysed the age-wise Work population ratio for males and females across rural and urban sectors and concluded that the major reason for the

fall in WFPR in the 55th round is the significant decline in the 10-24 age group LFPR. The decline has been faster in rural India than urban India. Chaddha (2003) is convinced that withdrawal of children from labour force could be due to i) the increased attendance in schools and ii) the difficulties the young adolescents, job aspirants with little or no experience and low level of training, may have started experiencing in the labour market, both in the rural and urban areas.

Table 2: WFPR (UPSS) in different NSS rounds (%)

NSS Round	Rural Males	Rural Females	Rural Persons	Urban Males	Urban Females	Urban Persons	Total Males	Total Females	Total Persons
38th(1983)	54.72	33.97	44.54	51.21	15.11	34.06	53.87	29.6	42.05
43rd(1987-88)	53.89	32.31	43.39	50.65	15.22	33.74	53.15	28.51	41.21
50th(1993-94)	55.30	32.79	44.37	52.11	15.46	34.7	54.49	28.56	41.97
55th (1999-00)	53.06	29.88	41.72	51.76	13.90	33.67	52.73	25.89	39.67
61st(2004-05)	54.62	32.7	43.88	54.86	16.6	36.53	54.68	28.67	42.01

Note: 1.UPSS is usual principal and subsidiary status.WFPR is the workforce participation rate.

Source: NSSO, 38th, 43rd, 50th, 55th, and 61st rounds.

A close analysis of Table 2 shows that at the all India level males WFPR are higher than for females and there have only been marginal changes between 38th and 61st round except for 55th round when the WFPR were relatively lower for all categories. While the WFPR are more than half for rural and urban males, it is 1/4th to 1/3rd for rural females and 1/7th to 1/6th for urban females. The WFPR are thus much higher for rural females as compared to urban females. There is however a tendency for urban WFPR to increase both for males and females over the period. The WFPR are only 42% for total persons and with some variation, have remained at the same level between the 38th and 61st rounds.

While the increase in WFPR between 1999-00 to 2004-05 for rural persons and for urban females is ascribed by Himanshu (2006) to economic distress whereby more labour especially women and other members of the household are forced to join labour force, Sundaram (2007) explains it by change in the age-specific WPR; especially in age 25-29 and 60+ for rural males, for rural females of age 25+, urban males of age 15-29 and for urban females of age 15-44.

III.2. Labour Input for the Total Industry: In this section we describe the labour input of the Indian economy. While employment of persons is measured as a count of number of jobs in a year, the employment hours measures the total number of hours worked during a year. Wages per day are calculated at current market prices. Table 3 indicates that while the growth

in labour quality is 0.41 percent per year, hours per day have almost remained constant with a marginal growth in days per week. It is clear from Table 3¹⁰ that the growth of labour input during the entire period is mainly because of growth of employment-hours worked as the average growth rate is 2.22 percent out of 2.64 percent for the labour input. The contribution of labour quality to labour input is thus limited and is only one-sixth.

A period-wise¹¹ trend is also summarized in Table 3, which indicates that while the labour quality growth is highest, 0.50 percent, in the most recent period of 1997-98 to 2004-05; the growth in labour input is highest in the period of 1986-87 to 1990-91. However, decade-wise periodization shows that both labour input and labour quality have increased the highest in the current decade, i.e. from 2001 to 2004-05 when the Indian economy is booming and the GDP growth is highest. It is to be noted however that while growth in labour input has fluctuated in different sub- periods but the growth in labour quality has consistently been improving. The contribution to labour quality is explained by changes in labour composition and the first order contributions of sex, age and education are calculated and reported in the bottom half of Table 3. It is evident from this that for the entire period the contribution of education is 0.38 percentage points out of 0.41 percentage points of labour quality. If one analyses the decade-wise sub periods then it is evident that in the recent period the entire growth in labour quality is contributed by education indices and this contribution has increased over the previous two decades. The decomposition of labour quality in Table 3 thus shows that while the contribution of gender is almost zero, the age's contribution is also very small.

¹⁰The time series of labour input is given in appendix Table A4.

¹¹The periodization is done a) on the basis of phases of GDP growth and different policy regimes; and b) decade-wise.

Table 3: Growth Rates of Labour Input, Hours and Labour Quality

	1980 to 1985	1986 to 1990	1992* to 1996	1997 to 2004	1980 to 2004	1980 to 1989	1990 to 1999*	2001 to 2004
GDP	5.28	5.89	6.54	5.93	5.71	5.58	6.16	6.41
Aggregate Labour								
Labour Input	1.82	2.93	2.49	2.64	2.64	2.01	2.46	3.42
Labour Persons	1.20	1.55	1.66	2.15	1.85	1.15	1.64	2.83
Labour Hours	1.46	2.55	2.10	2.14	2.22	1.65	2.06	2.85
Labour Quality	0.35	0.37	0.39	0.50	0.41	0.36	0.39	0.56
First order Quality Indices								
Q _s (Gender)	0.01	-0.01	0.00	-0.01	-0.01	0.00	0.00	-0.02
Q _a (Age)	0.07	0.07	0.06	0.04	0.06	0.07	0.06	0.03
Q _e (Education)	0.28	0.33	0.36	0.48	0.38	0.30	0.35	0.56

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

*Year 1991 has been excluded from the current study because of it being an abnormal year.

Table 4: A Comparison with other major studies

Author	Period	Growth rate in Employment Index	Growth in Education Index	Growth in Labour Input Index
Bosworth; Collins & Virmani (2007)	1980-2004	2.00	0.40	-
Sivasubramonian (2004)	1980 to 1999	1.74	0.34	2.22
	1980 to 1990	2.02	0.31	2.47
	1990 to 1999	1.43	0.37	1.93
Current study	1980 to 2004	1.85	0.38	2.64
	1980 to 1989	1.15	0.30	2.01
	1990 to 1999*	1.64	0.35	2.46

Sources: BCV (2007); and Sivasubramonian (2004)

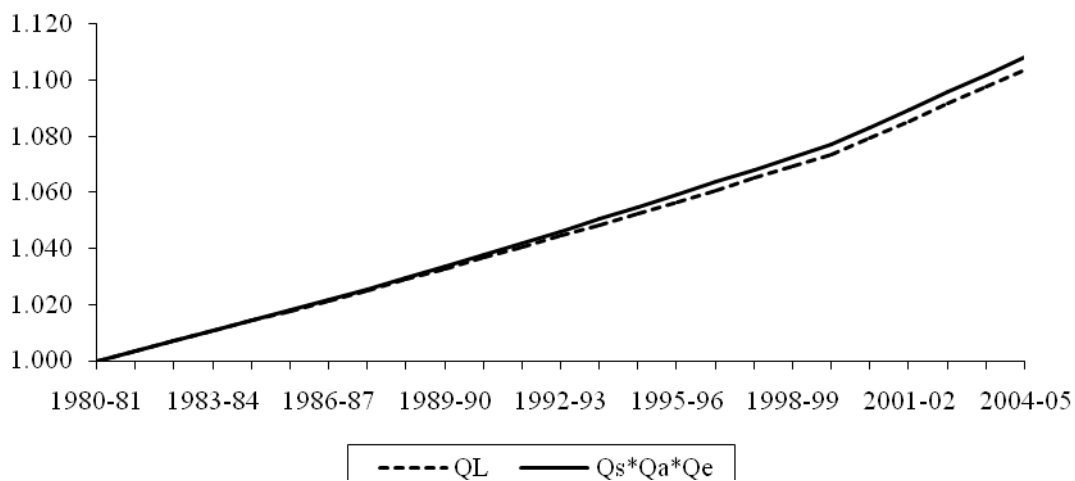
*Year 1991-92 has been excluded from the current study because of it being an abnormal year.

A comparison with other recent major studies on India is shown above in Table 4. It shows that while for the long period from 1980's the average growth rate of employment is still comparable for all the three studies, but the magnitude and the direction of growth for the two decades is very different between Sivasubramonian and the current study. A close look at the two studies reveals that it is firstly due to the different sources of population data and different points of time taken for the two studies. While Sivasubramonian has taken 1st April and mid year values, the current study has used 1st January as the reference period. The

second major difference besides the different sub periods is that while Sivasubramonian's study is based on simple interpolation, we have used thin rounds also as the reference periods for WFPR, thereby inserting wide fluctuations in our employment estimates. It is also to be made clear that while Sivasubramonian's measure of labour input is based on employment of persons, the current study has used number of hours to estimate it. That also accounts for its differences. The growth of education index shows quite close estimates between the present study and that of BCV's but is marginally higher than that of Sivasubramonian's. But for the two sub periods the two estimates are very close for in magnitude and direction.

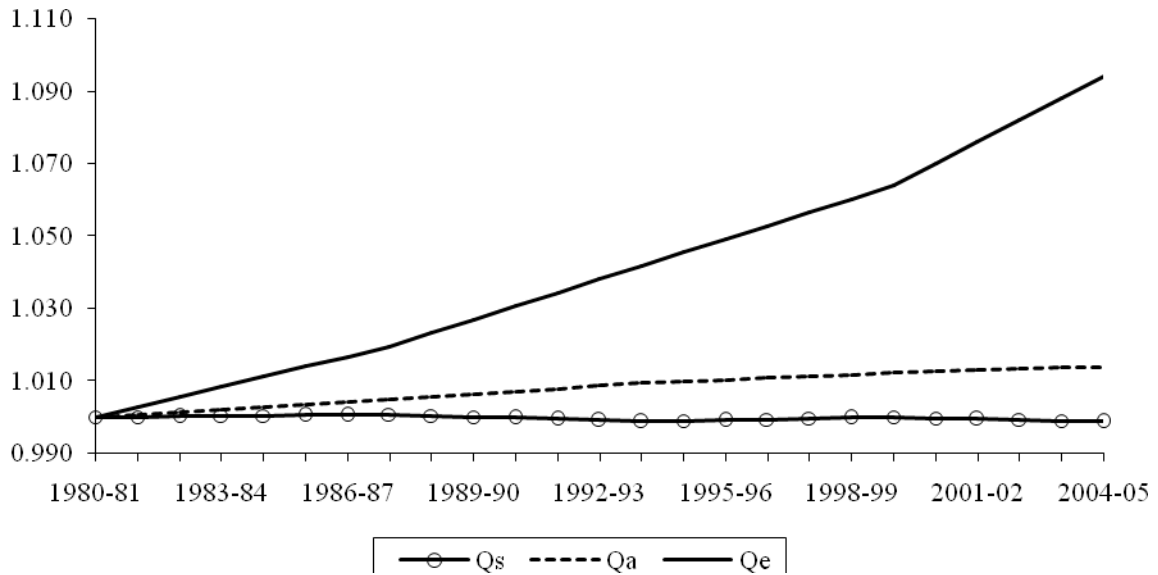
The complete series of decomposition of labour quality Q_L is included in appendix TableA5. But in it we have also included the grand labour quality index Q_{Lg} , which have been computed by taking industry affiliation as one of the labour characteristics. So while Q_L is based on 18 cells ($2*3*3$), Q_{Lg} is calculated from 558 cells ($31*2*3*3$). However, it is noticed that the two indices are not much different. Appendix TableA5 and Figure 2 also make it amply clear that whereas the indices of age (Q^a), and education (Q^e) have gradually increased over time, that of sex increased only between 1982-83 to 1987-88 and again between 1993-94 to 1999-00, and it declined during the remaining period. It is also evident from the last column of the Table and Figure 1 that most of the trend in labour quality is being explained by the first order contributions of the three indices of sex, age & education and education contributed 8.67 percentage points of the total 9.40 percentage points change in labour quality. Since the columns with values close to 100 indicate that the set of interactions are not important in explaining the changes in the grand quality index, it is completely true about the sex quality index and partially true about the age quality index.

Figure 1: Aggregate Quality and its first order Approximation



Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

Figure 2: First order indices of sex, age and education



Source: Same as figure 1

III.3 Education: The educational profile of workers at all India is given in tables 5. The NSSO gives detailed information about the general and technical education of workers in the country. For our analysis, we have clubbed the general education into three categories – literate upto primary, literate from primary to higher secondary (which includes middle level, secondary and higher secondary); and literate above higher secondary (includes graduates in agriculture, engineering/technology, medicine and others, and diploma holders). It may be mentioned that a separate category of higher secondary did not exist in 38th and 43rd rounds. It is, therefore convenient and prudent for comparison purposes that these categories be combined.

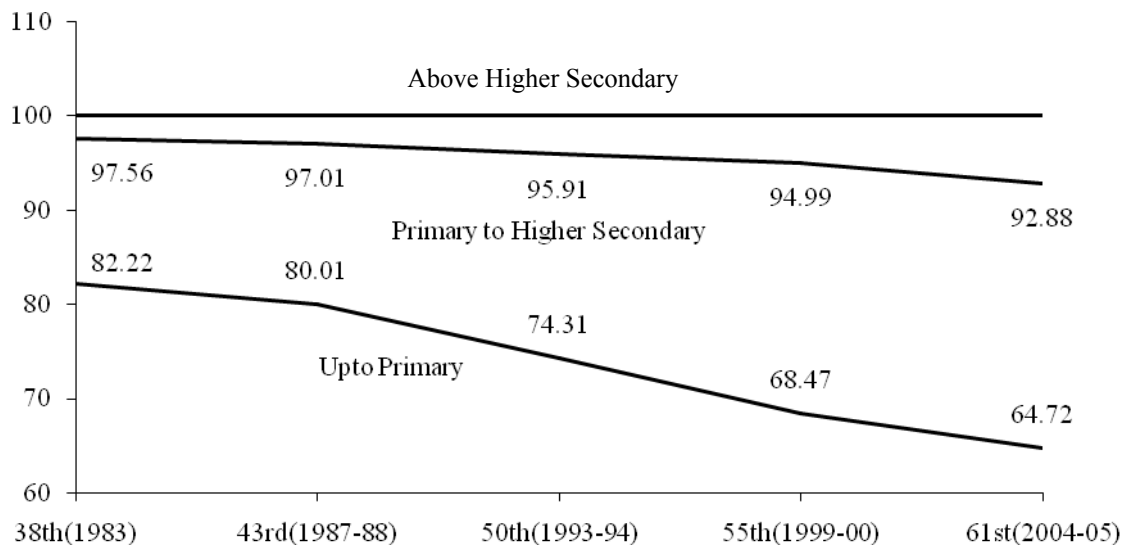
It is observed from Table 5 that there is a general tendency of a decline in the share of upto primary workers in the five rounds and a corresponding increase in the share of *educated* (i.e. literate from primary to higher secondary and above higher secondary workers). The fall in the proportion of upto primary literate is quite substantial and is 17 percentage points. The percentage of persons with higher education (above Higher Secondary) has increased from just around 2 percent to more than 7 percent, i.e. by three and a half times. It is very evident that the proportion of more educated workers in India is consistently increasing over the period. Figure3 shows the distribution of educational attainment of the work force over the period.

Table 5: Percentage Distribution of Workers(of all age groups) by Education Categories

NSS Round	Upto Primary	From Primary to Higher Secondary	above Higher secondary
38th(1983)	82.22	15.34	2.44
43rd(1987-88)	80.01	17.00	2.99
50th(1993-94)	74.31	21.60	4.09
55th (1999-00)	68.47	26.52	5.01
61st(2004-05)	64.72	28.17	7.12

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55and 61rounds.

Figure 3: Cumulative Distribution of educational attainment of workers

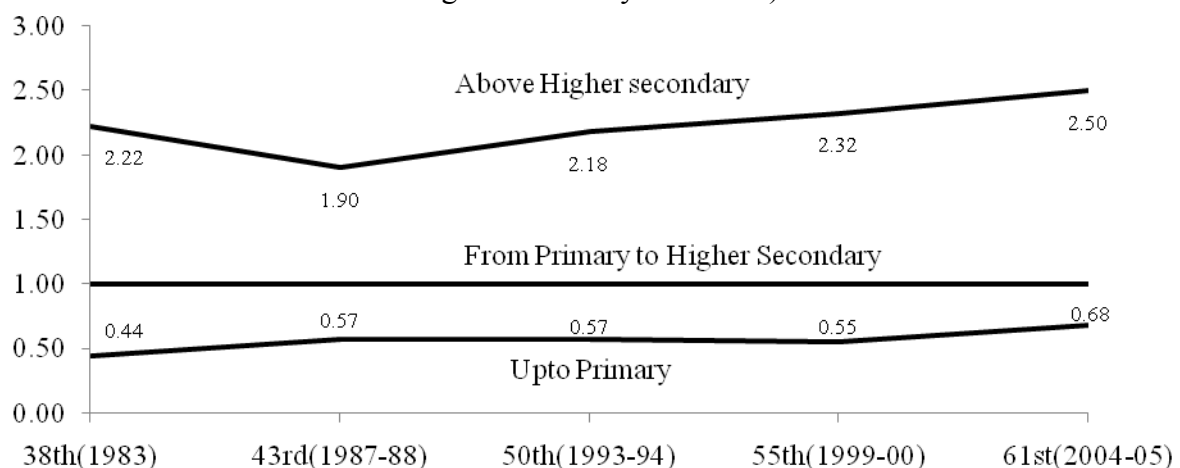


Source: Same as figure 1

The rising rates of educational attainment led to the increase in the quality index, as rates of labour compensation (wages per day) tend to rise with level of education. The relative wages of the lowest (Upto Primary) and the highest education (above Higher secondary) categories with the middle category (From Primary to Higher Secondary) are shown in Figure 4. In year 2004-05, while a worker with education above higher secondary was getting 2.5 times the wages of a worker with education from primary to higher secondary, a worker with education up to primary only was getting just two-third of it. However, the wage differential has increased for a worker with above higher secondary education over the period and especially during the last two rounds (i.e. between the periods 1999-00 to 2004-05). It reduced however, between the first two education categories from less than half to two-third now, though the

differential remained stagnant during the period of 1987-88 to 1999-00. The relative wages for the highest education category declined in the initial period but improved in the later period. The faster pace of increase in relative wages of more educated workers perhaps could be attributed to the increase in the demand of the more skilled manpower after the economic reforms began in India during the 1990's. The same relationship between education and wages of the workers was estimated by BCV through the regression for each round separately. They found that the average rate of return for each year of schooling varies between 9.1 and 9.8 per cent. The results thus emphasize the contribution of education to improvement in the quality and the living standard of labour and calls for more efforts to improve the pace of educational attainment.

Figure 4: Wages of workers by Educational Attainment (relative to those with primary to higher secondary education)



Source: Same as figure 1

Table 6 provides the number of days employed per week by education level. Days employed per week have been calculated from the current daily status and current weekly status information of the workers. It is evident from the Table that the average number of days worked by workers has consistently increased over the years from 5.24 days to 5.68 days at an average annual growth rate of 0.39 percent. Along with an increase in the number of persons, the increase in the number of days has contributed to the increase in labour input. However, the increase in number of days is not uniform across all education categories. The increase is maximum for the most educated category and minimum for the least educated category. The reason could be again demand induced.

Table 6: Number of Days Employed per week by Education Level
(Based on CDS)

NSS Round	Upto Primary	From Primary to Higher Secondary	Above Higher secondary	Total Persons
38th(1983)	5.17	5.58	5.71	5.24
43rd(1987-88)	5.24	5.56	5.71	5.31
50th(1993-94)	5.55	6.03	6.46	5.69
55th (1999-00)	5.51	5.95	6.26	5.66
61st(2004-05)	5.46	5.96	6.52	5.68

Note: Estimated from unit level data of NSSO.

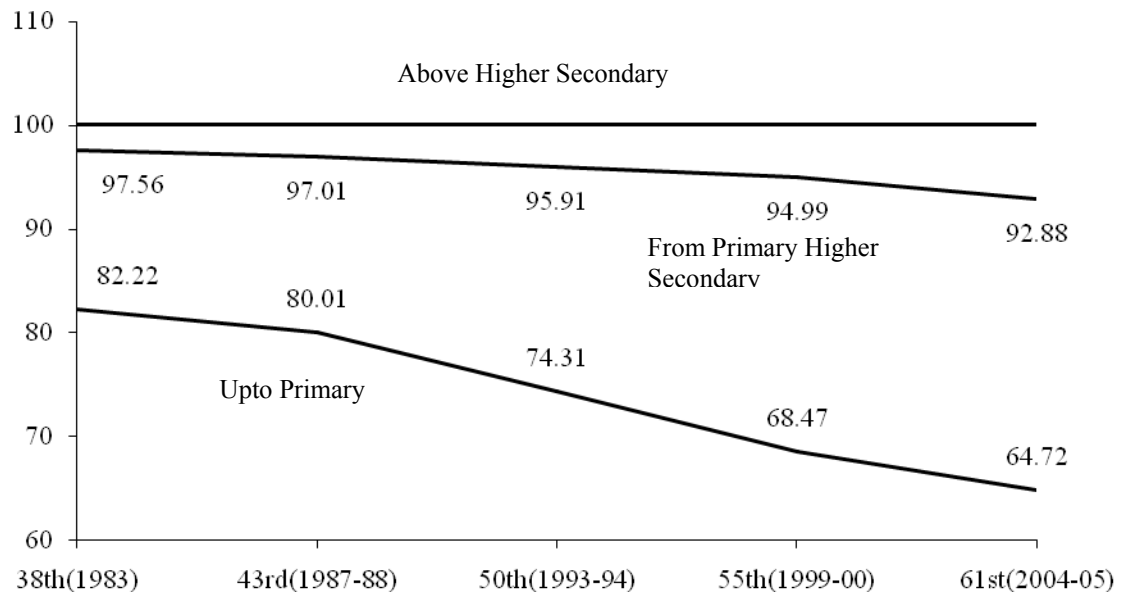
III.4 Age: The changes in the profile of workers by age, the second labour characteristics are given in Table 7. Though the persons of any age may be actually working but for India KLEMS, the age of the workers is divided into three groups –less than 29, 30-49 and 50+. Table 7 shows that between 1983 and 2004-05 there is not much change in the proportion of 50+ age group workers. However, the proportion of younger age group 15-29 has declined and that of middle age (30-49) has increased during this period. The trend may also be due to the relatively high growth of population in the earlier period of India’s economic development giving rise to the “demographic dividend” in the later period whereby those who were born in early or mid sixties are now in the middle age category. It could also happen because more and more persons of the age group <29 move out of the labour force into educational institutions. Also because of longevity of life and more opportunities of employment, persons are staying longer in the jobs even beyond the age of 50. It implies that the proportion of more experienced workers has increased in India during the last two decades.

Table 7: Percentage Distribution of Employment by Age Groups (years)

NSS Round	<29	30-49	50+
38th(1983)	44.31	38.62	17.07
43rd(1987-88)	42.39	40.18	17.43
50th(1993-94)	39.33	42.68	17.99
55th (1999-00)	37.04	44.94	18.02
61st(2004-05)	35.41	46.23	18.36

Note: Estimated from unit level data of NSSO.

Figure 5: Distribution of workers by age groups



Source: Same as figure 1

Wages per day by age groups are given in Table 8. Wages along with trends in age profiles determine the impact on labour quality. It is clear from the Table that it is the middle age group (30-49) which has been getting the highest compensation, except for a marginal lower wage in the last round which could be due to the conditions of economic distress during this period. The relative wages have however, generally improved for the remaining two age groups over the period. The rising share of age group 30-49 along with its rising wages, however could not have much impact in raising the quality of labour, (as can be seen in table 3) due to the opposite trends in the other two categories. As a result the contribution of age to labour quality has not only been small but also stable over the period except for few recent years when its annual growth rate has actually fallen (Table 3).

Table 8: Money Wages per day by Age Groups

NSS Round	<29	30-49	50+
38th(1983)	11.5	17.6	15.1
43rd(1987-88)	26.8	38.6	37.8
50th(1993-94)	29.6	43.2	40.0
55th (1999-00)	51.3	59.3	54.2
61st(2004-05)	72.2	105.2	111.0

Note: Estimated from unit level data of NSSO when Wages are more than zero.

Table 9 summarizes the distribution of days employed per week by workers by their age groups. It is evident from the Table that the average number of days worked by workers of age group 30-49 has been consistently more than the other two age groups. So not only this particular age group has increased its share in employment of persons but has been consistently working for more days in a week, thus possibly increasing its share in total hours employed.

Table 9: Total Number of Days Employed per week by age group
(Based on CDS)

NSS Round	<29	30-49	50+	Total
38 th (1983)	5.09	5.38	5.33	5.24
43 rd (1987-88)	5.11	5.47	5.42	5.31
50 th (1993-94)	5.52	5.81	5.77	5.69
55 th (1999-00)	5.51	5.77	5.71	5.66
61 st (2004-05)	5.50	5.78	5.75	5.68

Note: Estimated from unit level data of NSSO.

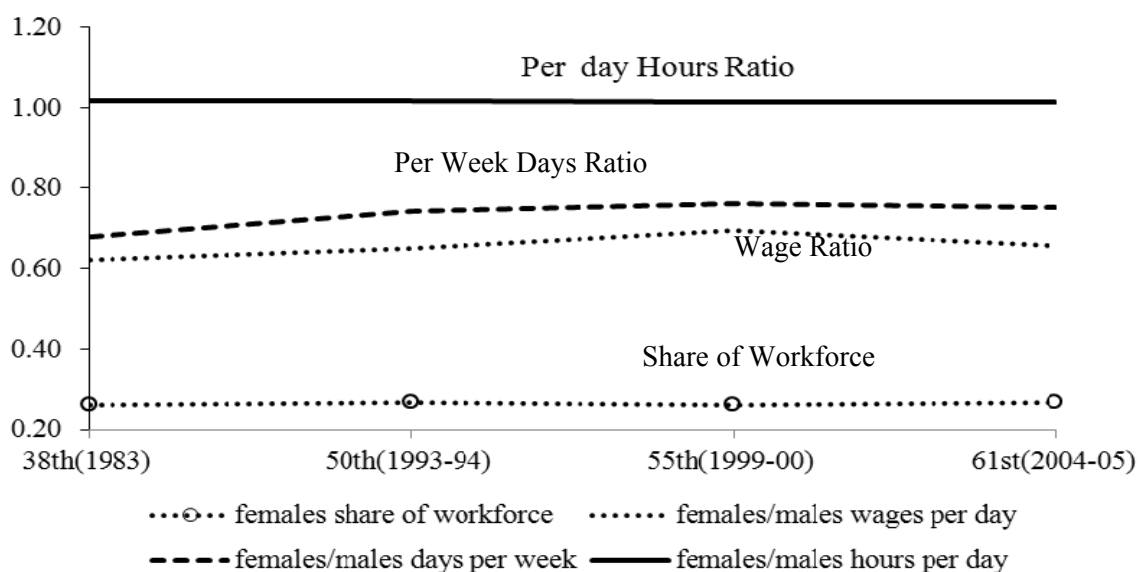
III.5 Gender: In this section we analyze the third important labour characteristic- namely gender. We plot the female share of workforce, female's relative wages, days and hours differentials in figure 6 for the four rounds. The proportion of female workforce has almost remained stagnant over the time at 26%. The females are also catching up in terms of number of days per week and number of hours per day worked. The catching up is showing in the trend in relative wages which have marginally increased from 62 per cent to two-third. The lower ratios for females is also reflected in the quality index for the period which remained stagnant because of the impacts of opposite changes in relative wages and the relative share of workforce since 1993-94. Any changes in the labour quality index would thus be determined by the changes in these relative ratios.

Table 10: Gender Characteristics

NSS Round	Females share of workforce	Females/males wages per day	Females/males days per week	Females/males hours per day	Qs
38 th (1983)	0.26	0.62	0.68	1.02	99.85
43 rd (1987-88)	0.26	0.40	0.70	1.02	100.05
50 th (1993-94)	0.27	0.65	0.74	1.02	99.86
55 th (1999-00)	0.26	0.69	0.76	1.01	100.05
61 st (2004-05)	0.27	0.66	0.75	1.01	100.00

Note: Calculated from different Tables and author's calculations.

Figure 6: Female share of workforce, relative wages, days and hours differentials



Source: Same as figure 1

III.6 Types of Employment: In India three types of employment are distinguished- self employment, regular employment and casual employment. The concept of wages applies mainly to the last two types. We have estimated the wages of self employed by using the Heckman methodology but no separate labour quality index is calculated because of more data requirements which are not easily available and reliable. However, a preliminary analysis of the employment by class is attempted in the subsequent discussion. Table 11 shows self employed constitute more than half of the total employment in India. This proportion declined till 1999-2000 but has again increased in the recent years. Except for the last round, while the share of regular employees has remained constant that of casual labour has increased. Many economists have termed it as the casualization of the labour force due to the search for cheap labour force and the near abandonment of the expansion of the public sector, the major source of organized employment.

Table 11: Percentage Distribution of Employment (UPSS)by type of employment

NSS Round	Self-Employed	Regular-Wage Employees	Casual labour	All
38 th	57.65	13.43	28.93	100.00
43 rd	56.35	13.73	29.92	100.00
50 th	54.75	13.22	32.03	100.00
55 th	52.84	13.99	33.17	100.00
61 ST	56.89	14.25	28.85	100.00

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55and 61rounds.

The days worked per week by employment class are reported in Table 12 where, as expected it is clear that the regular employees work for the maximum days and the casual employees work for the minimum days. Regular employees, especially the permanent ones are generally paid for the entire month, so they are assumed to be working for all the seven days of a week. On the other hand casual labour by the nature of their employment may not get work every day, so have to remain without work for few days a week.

Table 12: Total Number of Days Employed per week by type of employment
(Based on CDS)

NSS Round	Self-Employed	Regular-Wage Employees	Casual labour	Total
38th(1983)	5.29	6.01	4.80	5.24
43rd(1987-88)	5.33	5.95	4.98	5.31
50th(1993-94)	5.71	6.54	5.31	5.69
55th (1999-00)	5.74	6.35	5.25	5.66
61st(2004-05)	5.70	6.77	5.09	5.68

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

IV: Distribution of Workers by Broad Industry Classification

In this section we broadly present the period wise growth of labour input by broad industrial classification.

Table 13: Period wise Growth of Labour Input in Broad Industries

Industry	1980 to 1985	1986 to 1990	1992 to 1996	1997 to 2004	1980 to 2004	1980 to 1989	1990 to 1999*	2001 to 2004
Agriculture	0.63	1.19	1.46	0.84	1.37	0.79	1.08	1.25
Industry	4.29	3.52	2.44	4.84	3.88	3.76	2.45	6.8
Services	3.00	6.70	5.35	4.27	4.45	3.68	5.76	4.88
Total Economy	1.82	2.93	2.49	2.64	2.64	2.01	2.46	3.42

* excludes 1991-92

The growth in labour input is driven by the service sector over the period 1980-2004 and agriculture has been the laggard in growth of employment. While industry experienced faster employment growth in 1980's, services led the growth in 1990's. In the recent decade, industry has again taken the lead in the faster growth of employment. The growth in

employment has been higher at 2.46% in the second decade of reforms as compared to the 2.01 in the first decade, contrary to the belief of many.

V: Distribution of Workers by Industry

In this section, an analysis of the labour input levels in section V.1 and of growth in section V.II is attempted. This section provides a brief description of proportion of total workers in different industries grouped in to 31 sectors for international comparisons and the time period covered is 1980 to 2004. It provides us information about the dependence of workers on different industries and the variation in the sectorial distribution over the period. It also explains how far the process of industrialization or de-industrialization has taken place in a particular industry.

V.1: Labour Input Levels

The distribution of total labour input (million hours), the compensation bill and the labour share of output in 31 KLEM industries in the year 2004 are summarized in appendix Table A6. The biggest industry for labour absorption is agriculture, forestry and fishery; followed by Retail trade (industry 20); Construction (industry 17) and transport and storage (industry 22). The compensation of labour being high in construction, it has relatively a high compensation bill as compared to retail trade, transport and agriculture. While employment is less in construction but the compensation bill is more than retail trade. Similarly though the employment is only 40 percent more in construction but its wage bill is almost double to that of transport and storage. The labour share of output along with labour input determines the contribution of labour to output. The table shows that the high labour input industries are public administration and Defence ((industry 27), Construction (industry 17), agriculture (industry 1) and other Community, Social and Personal Services (industry 30). In all these industries more than 80 percent of the output receipt is paid to labour. At the other extreme we have very low labour intensive industries, especially Coke, Refined Petroleum and Nuclear Fuel (industry 7) where the labour share is only 4.4 percent.

Some of the key labour characteristics for the recent period (61st round) are presented in Table 14. These characteristics include the percentage of workers with the highest, i.e above Higher Secondary education; percentage of male workers with above Higher Secondary education; percentage of female workers with above Higher Secondary education; percentage of total hours worked by females and compensation of workers per day.

The first column of table 14 shows that the median across all 31 industries for workers with above Higher Secondary education is 17.79 with lot of variation among the industries. Figure 7 shows the rank wise position of the industries on the variable. It indicates that the industries with the highest proportion of above Higher Secondary educated workers in 2004-05 are education, financial intermediation, renting of machinery, health and social work, and Coke, refined petroleum and nuclear fuel. The first four industries with more than 45 per cent share of above Higher Secondary educated workers belong to the services sector where higher skills are generally expected and required; the fifth is part of manufacturing with very low labour share of output. So it is an industry which requires less labour input but of higher skills. The industries which lie on the other end with very low (less than 5 per cent) proportion of more educated labour are Private households with employed persons; agriculture; wood and products of wood; construction; other non-metallic minerals; food and beverages and tobacco; hotels and restaurants; and textiles, textile products, etc.

The compensation per day of workers, which could be construed as an indicator of labour quality is shown in Figure 8. As is expected it generally shows that the industries that have higher proportion of workers with above Higher Secondary education are generally also the ones with higher compensation of labour and the vice versa. It thus confirms the existence of some sort of positive correlation between the level of education and that of compensation. But the variation is almost 9 times between the industry with highest compensation of Rs 441 (coke, refined Petroleum) and the one with the lowest compensation of Rs. 50 (Private HHs with employed persons).

The third characteristic of the percentage of total hours worked by females in the third column of the Table 14 is shown by Figure 9. While the average share of the female hours worked is about 27 per cent, the median across industries is only 12.4 per cent, which is due to the presence of many small industries in manufacturing and services sectors with very small female shares. Few of such industries, where the female's share is very low are Transport and storage; Sale, maintenance & repair of motor vehicles; Transport equipment; Wholesale trade; Real estate and Construction with just 10 per cent share. However, there are industries where the share is very high; especially Private households with employed persons (71%) and Food & beverages & tobacco (44%).

The distribution of educated females and of males is however different. Table 14 also shows that more educated females have higher share in employment mainly in the services industries such as Renting of Machinery (industry 26); Financial Intermediation (industry 24); Education; Health and social work (industry 29). The only manufacturing industry where

educated females have significant share is Coke, refined petroleum and nuclear fuel (industry 7). We find a similar distribution for the educated males. The distributions thus reveal that more educated workers, both females and males have been recently employed in the growing service sectors of the economy.

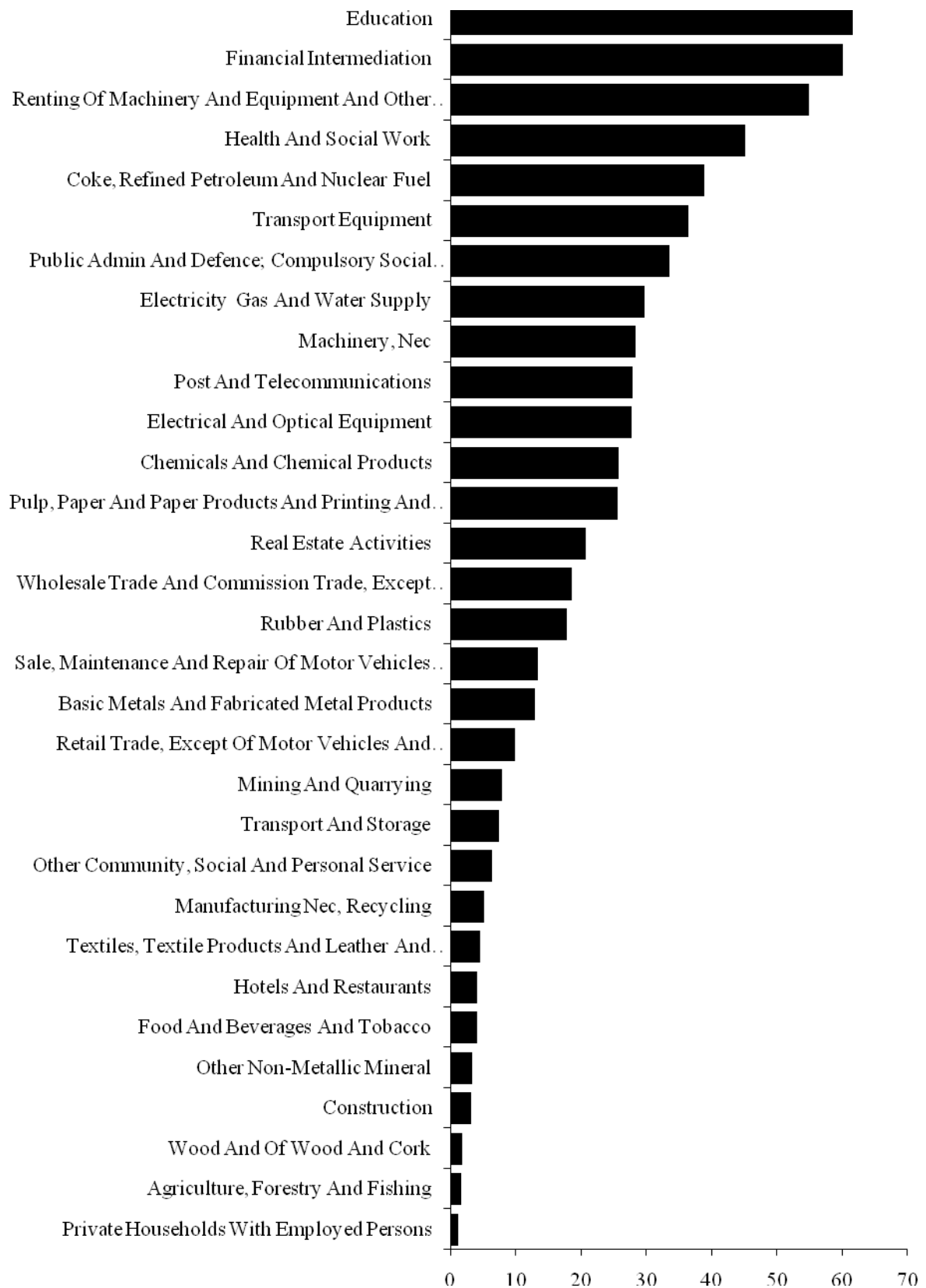
Table 14: Labour Characteristics by industry- 61st round (2004-05)

Industry Description	% Workers above Higher Sec Education	Compensation per day (Rs.)	% of Total hours; females	% Females above Higher sec education	% Males above Higher sec education
1 Agriculture, Forestry And Fishing	1.74	70.09	33.95	0.4	2.7
2 Mining And Quarrying	7.96	169.65	13.78	2.2	9.08
3 Food And Beverages And Tobacco	4.09	76.65	44.42	0.95	7.21
4 Textiles, Textile Products And Leather And Footwear	4.6	91.63	31.52	2.2	6.02
5 Wood And Of Wood And Cork	1.89	101.34	26.05	0.68	2.43
6 Pulp, Paper And Paper Products And Printing And Publishing	25.56	142.55	12.16	18.92	26.7
7 Coke, Refined Petroleum And Nuclear Fuel	38.87	441.53	13.16	53.17	36.51
8 Chemicals And Chemical Products	25.74	170.87	37.86	9.1	36.35
9 Rubber And Plastics	17.79	122.84	10.50	10.64	18.76
10 Other Non-Metallic Mineral	3.29	87.78	23.26	0	4.48
11 Basic Metals And Fabricated Metal Products	13.02	127.21	4.09	5.99	13.36
12 Machinery, Nec	28.36	166.99	4.05	30.26	28.27
13 Electrical And Optical Equipment	27.73	161.22	9.82	14.31	29.37
14 Transport Equipment	36.38	250.14	3.26	17.96	37
15 Manufacturing Nec, Recycling	5.12	112.59	13.65	1.72	5.8
16 Electricity Gas And Water Supply	29.77	297.82	4.75	37.15	29.41
17 Construction	3.24	90.05	9.30	1.32	3.46
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	13.42	92.96	2.59	33.71	12.85
19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles And Motorcycles	18.65	125.55	4.50	11.59	19.07
20 Retail Trade, Except Of Motor Vehicles And	9.96	92.91	11.20	4.05	10.86

Industry Description	% Workers above Higher Sec Education	Compensation per day (Rs.)	% of Total hours; females	% Females above Higher sec education	% Males above Higher sec education
Motorcycles; Repair Of Household Goods					
21 Hotels And Restaurants	4.13	106.12	18.25	3.47	4.29
22 Transport And Storage	7.51	144.71	1.42	24.18	7.24
23 Post And Telecommunications	27.9	217.13	12.43	23.88	28.54
24 Financial Intermediation	60.08	342.46	13.62	74.97	57.57
25 Real Estate Activities	20.75	107.48	7.90	0.32	22.72
26 Renting Of Machinery And Equipment And Other Business Activities	54.93	236.71	9.43	76.03	52.48
27 Public Admin And Defence; Compulsory Social Security	33.49	261.45	12.00	30.25	33.94
28 Education	61.6	218.03	41.24	56.97	65.04
29 Health And Social Work	45.15	212.18	35.16	38.67	49.07
30 Other Community, Social And Personal Service	6.4	92.78	24.54	7.07	6.11
31 Private Households With Employed Persons	1.29	49.70	71.20	0.63	2.97
Industry Mean	20.66	160.68	18.10	19.12	21.60
Industry Median	17.79	127.21	12.43	10.64	18.76

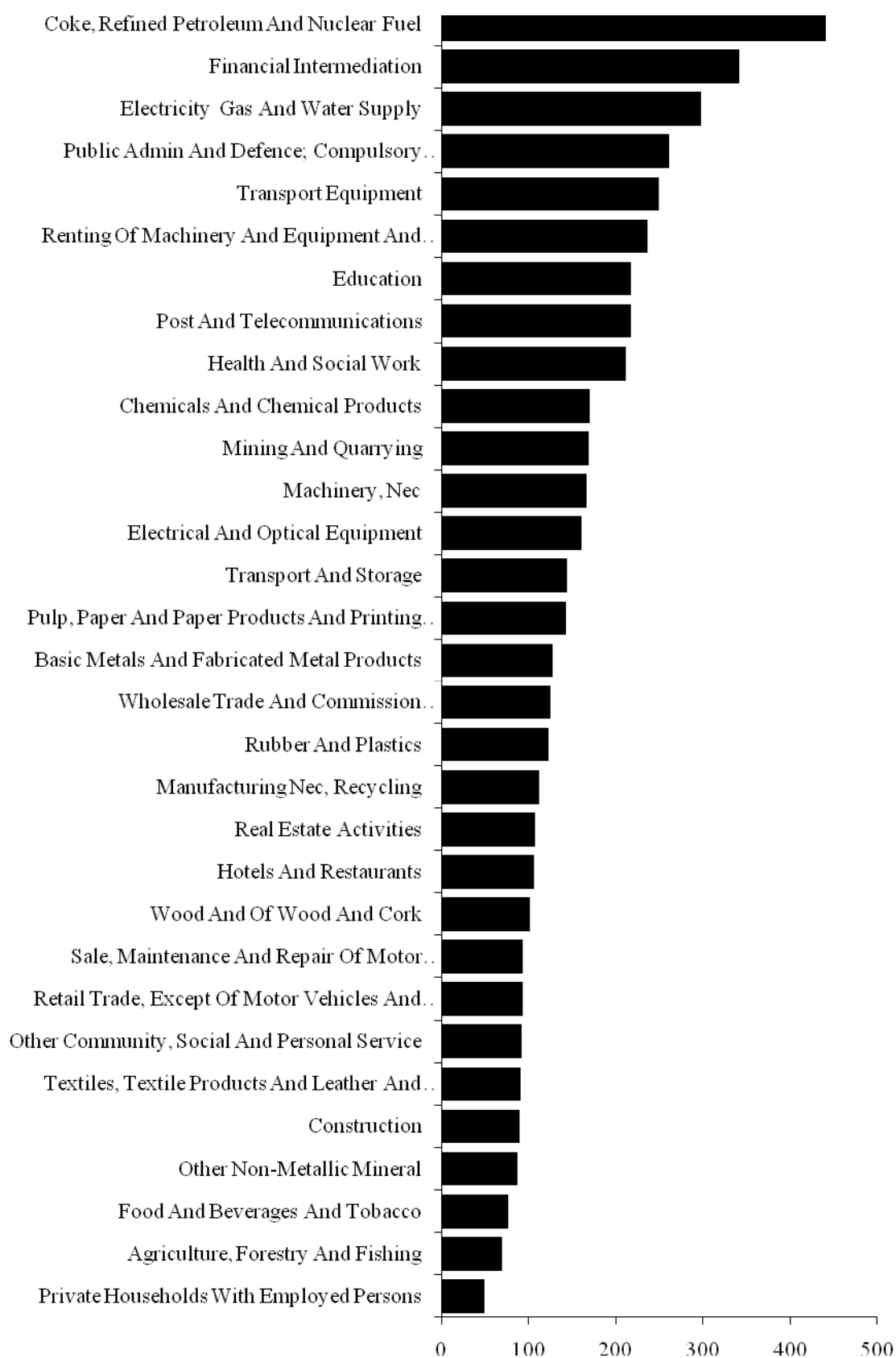
Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

Figure 7: Percentage of workers with above Higher Secondary Education in 2004-05 (61st round)



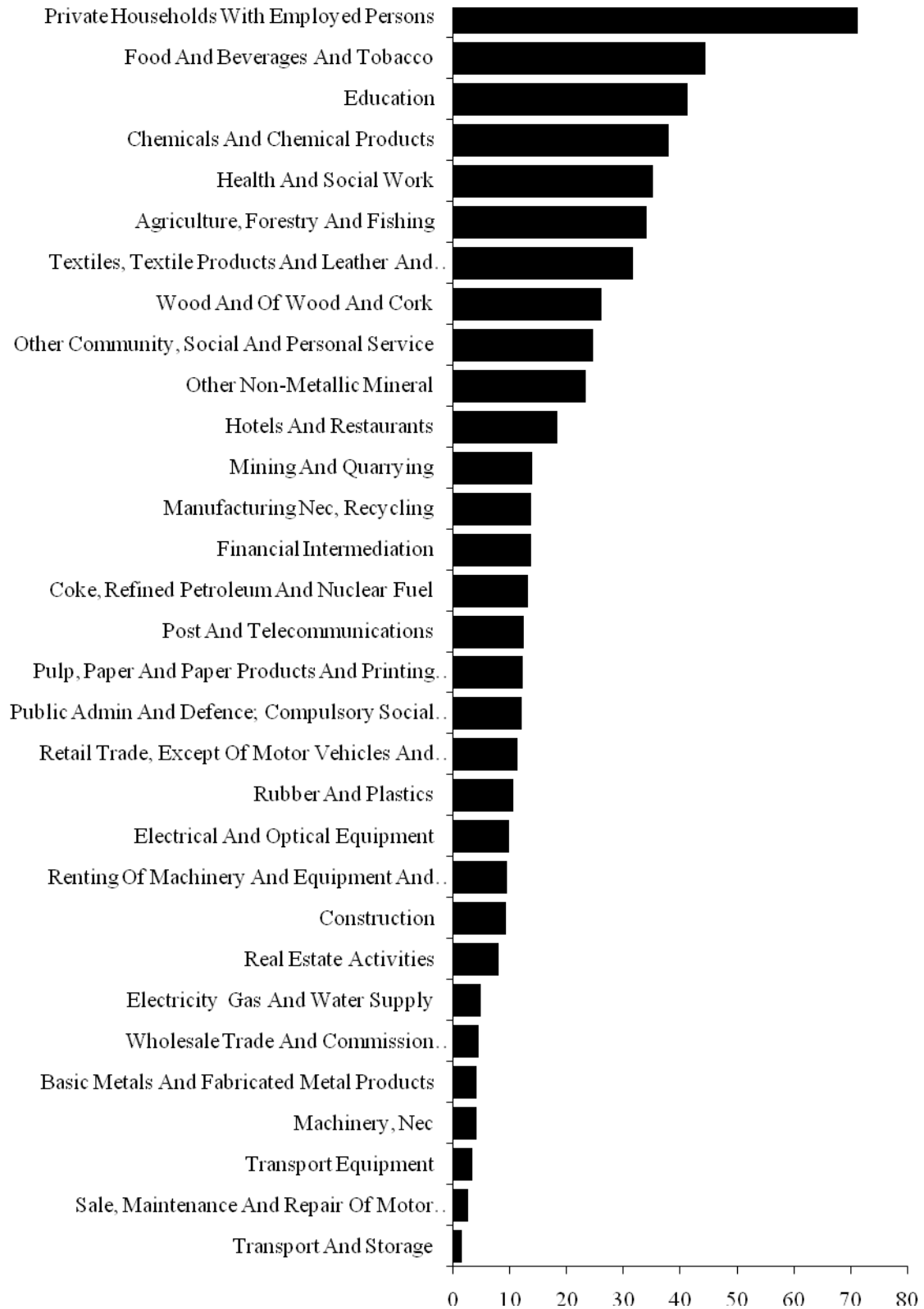
Note: Figure shows the rank wise position of the industries on the variable.

Figure 8: Compensation (Rs.per day) in 2004-05 (61st round)



Note: Figure shows the rank wise position of the industries on the variable.

Figure 9: Percentage of Total hours; Females in 2004-05 (61st round)



Note: Figure shows the rank wise position of the industries on the variable.

V.2: Labour Input Growth rates

Growth of labour input is discussed in this section. While Appendix Table A7 provides Industrial Distribution of Employment (million hours) for both males and females, Table A8 summarizes the share of each industry in total employment over the period. These tables give us information about the structure and change in the structure of the economy over the period of 1980 to 2004.

It is evident from the Table A7 that while the number of male workers increased from 200 million to 309 million (almost 50%) between the 38th and 61st round, the number of female workers has increased from 102 million to 148 million (almost 45%) over the same period. It is thus clear that along with the males, more females are also entering the job market. However, the overall proportion of males is almost 2/3rd in all the rounds while it is just 1/3rd for females. But, the proportion of female workers is more than males in private households with employed persons and is expectedly quite high in few other industrial groups e.g. in education, health and social work, food & beverages and in agriculture, forestry & fishing. In all others it is the domination of male workers especially in industries of basic metals; machinery; transport equipment; electricity, Gas and water supply; sale & maintenance of vehicles and transport and storage where female workers just constitute less than 5%.

Not only the level but the share of females in total employment has also increased substantially between these rounds in some of the industries e.g. in food & beverages; textiles; wood & products of wood; chemical; electrical & optical equipment; financial intermediation; real estate activities; education and health & social work.

In India agriculture still remains the biggest employer of workforce and still (2004-05) employs 54 per cent of them (Table A8). Though the dependence on agriculture for employment has reduced from two-third to almost half for the total workforce, but two-third of the female workforce still depend on agriculture for employment. While the other industries which are the major source of employment in 2004-05 for males are retail trade; construction; transport & storage; and textiles, it is mainly education; textiles; food & beverages and trade for female workers. The variation in the relative contribution of different industries can be gauged from the fact that on the other extreme there are industries which do not contribute significantly to employment either because they are too small in size or they use capital intensive technology. Any meaningful policy aimed at employment generation has to account for these differences in the industries besides other considerations. The variation is also found in the number of days worked in a week across these sectors (Appendix Table

A9). Though the average number of days worked in a week has increased over the period for both male and female workforce, but it varies a great deal across industries. The average number in 2004-05 is minimum in agriculture at 5.3 days a week, may be because of its seasonal nature in India; it is the highest, as expected, at 6.87 days for public administration.

The growth in labour input and labour quality for the entire period and different sub periods based on policy regimes and decade wise is given in Table 15 and 16 respectively. While figure 10 is based on the ranks of the 31 industries by growth in labour input, Figure 11 ranks the 31 industries on the basis of change in growth rates between the first sub period and last sub period. Similarly Figure 12 ranks the growth in labour quality and Figure 13 ranks the change in labour quality growth between the first sub period 1980-81 to 1985-86 and the last sub period 1997-98 to 2004-05.

The rate of growth of labour input is very different in different industries reflecting a structural change during the period. While for the full period the median growth of labour input is 4.75 per cent, but large variations are observed between the median growth rates in different sub periods. The growth rate increased between the first two sub periods from 3.40 per cent to 5.90 per cent but declined during the sub period of 1992-93 to 1996-97 when the first phase of major reforms started and structural adjustment of the economy was taking place. Since then the growth in labour input has consistently increased belying any criticism that the growth of the Indian economy has been with out any improvement in the employment generation. One may also notice that if we describe the first decade of 1980-81 to 1989-90 as the decade of pre-reforms and the next decade as the decade of post reforms, then the growth of labour input has been substantially higher in the post reform decade and that trend of high growth has continued beyond that till 2004-05 also.

However, there have been structural changes in terms of employment growth in the Indian economy. While some industries grew very fast the others remained stagnant during this period. The industries which grew the fastest (Figure 10) have been real estate activities; renting of machinery; construction; post & telecommunication; sale, rubber & plastics; maintenance and repair of motor vehicles; and financial intermediation all growing at more than around 6 per cent. At the other extreme there have been industries where employment growth has been quite slow i.e. agriculture; wood and products of wood; public administration; food & beverages and textiles. Table 15 and Figure 11 however show that the growth rate of industries has not been uniform in all the sub periods. A comparison of the first (1980-81 to 1986-87) and the last sub period (1997-98 to 2004-05) growth rates indicates that whereas few industries, e.g. private households with employed persons; real estate; post

& telecommunication;renting of machinery; and health & social work picked up their pace of growth, there are others who lost the momentum somewhere in there growth path and the rate slowed down in the recent period. Some of these industries are coke, refined petroleum & nuclear fuel; rubber and plastic; public administration & defence;construction; and electrical & optical equipment. These relative growth rates indicate towards a possible reallocation of resources from one set of industries to another. A closer look at it points out the dilemma between the growth pattern of construction and that of real estate activities. While the manufacturing of construction slowed down, the services of real estate boomed. It may be partly explained by demand pull leading to heightened activity in the sector. The expansion of the post and telecommunication is expected to increase the connectivity and bridge the gap between the rural and urban population. Fast pace of growth of health and education in recent period is a good omen for the Indian economy and may improve the already very low development indicators.

An understanding of how the underlying labour input (labour hours multiplied by labour quality) in the output growth process might have changed during the period is investigated by an analysis of the growth in labour quality and the changes in it during the different sub periods. The median growth in labour quality of all the 31 industries during 1980-2005 has been 0.25 per cent (Table 16) much below the aggregate growth of 0.41 per cent, mainly due to large variations among the industries. The growth in labour quality was fastest(Figure 12) in real estate activities; machinery; electricity, gas & water supply; and financial intermediation and very slow in wood & products of wood; construction; non-metallic minerals, agriculture and wholesale trade & commission.The industries may be identified with, may be modern and emerging industries on the one hand and may be traditional, where the skill composition has not changed much on the other hand. Though there are some industries where the growth is simultaneously high or low for both the variables but the correlation between growth in labour and growth in labour quality is low, only 0.34 indicating the absence of any relationship between the two.

The growth has not been uniform in all the sub periods. It increased faster between 1986-87 to 1990-91 as compared to the earlier period of 1980-81 to 1985-86 and the growth rate slowed there after. However if one looks at the decade wise growth rate, the conclusion would be different as we find that the growth in labour quality was only 0.19 per cent in the pre reform period and it increased to 0.29 in the post reform decade indicating change in the composition of the workforce. The inter industry differences in the pattern of change in growth rate as depicted in Figure 13shows that the variation in growth rates has reduced over

the period and the industries with either negative or very low growth rate in the first sub period (Sale, maintenance of motor vehicles etc., Construction, mining & quarrying, etc.) have generally been able to pick up the growth rate in the last period. But the reverse has also happened where the growth rate in labour quality for these industries has slowed down over the period (real estate, chemicals & chemical products, financial intermediation, etc.).

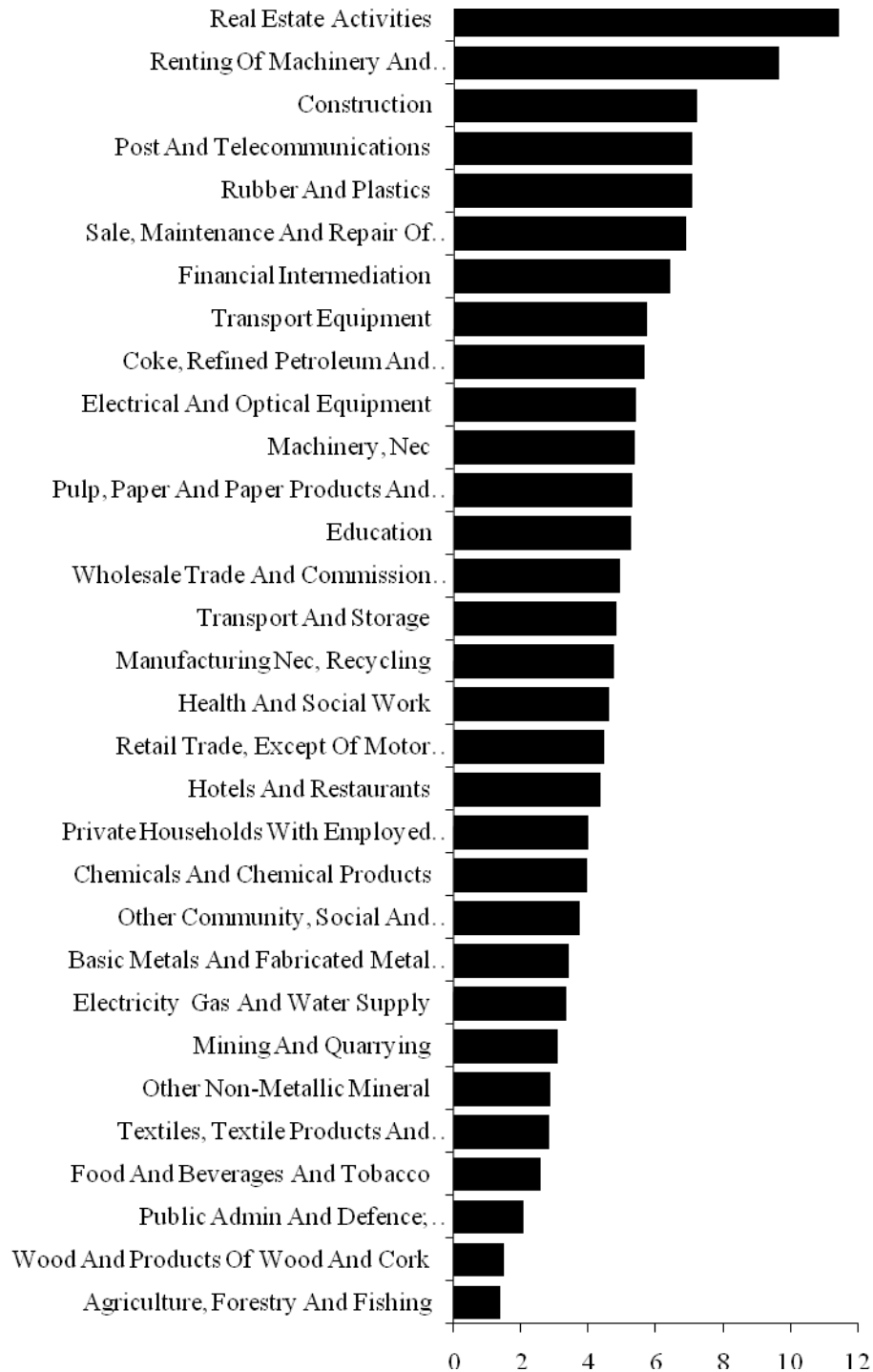
Table 15: Growth of Labour Input by Industry

Industry Description	1980-81 to 1985-86	1986-87 to 1990-91	1992-93 to 1996-97	1997-98 to 2004-05	1980-81 to 2004-05	1980-81 to 1989-90	1990-91 to 1999-00	2001-02 to 2004-05
1 Agriculture, Forestry And Fishing	0.63	1.19	1.46	0.84	1.37	0.79	1.08	1.25
2 Mining And Quarrying	5.31	4.86	-0.05	2.53	3.09	5.02	-0.49	6.01
3 Food And Beverages And Tobacco	1.54	3.14	3.18	1.64	2.57	2.95	1.98	1.60
4 Textiles, Textile Products And Leather And Footwear	2.46	1.34	-1.98	7.05	2.81	1.80	-2.50	14.37
5 Wood And Products Of Wood And Cork	1.64	-1.83	1.62	4.17	1.48	0.31	2.23	3.52
6 Pulp, Paper And Paper Products And Printing And Publishing	5.66	4.70	4.77	6.25	5.30	3.33	6.45	7.54
7 Coke, Refined Petroleum And Nuclear Fuel	9.82	12.80	8.11	-3.41	5.67	9.00	9.59	-8.20
8 Chemicals And Chemical Products	3.17	5.78	3.76	2.86	3.94	3.29	4.07	4.02
9 Rubber And Plastics	8.06	12.28	10.12	0.96	7.06	7.72	11.58	-2.74
10 Other Non-Metallic Mineral	2.48	1.93	2.02	4.32	2.86	2.61	1.68	5.62
11 Basic Metals And Fabricated Metal Products	3.40	4.01	4.13	3.02	3.42	1.71	5.90	2.67
12 Machinery, Nec	-1.90	17.80	4.47	1.22	5.38	4.58	5.04	5.01
13 Electrical And Optical Equipment	5.36	8.54	7.25	2.19	5.41	4.29	9.06	0.61
14 Transport Equipment	7.91	4.58	0.52	9.27	5.74	4.15	2.78	15.36
15 Manufacturing Nec, Recycling	6.60	5.18	1.84	5.45	4.75	5.24	2.38	8.64
16 Electricity Gas And Water Supply	4.49	6.82	0.84	1.91	3.32	3.78	1.69	5.35
17 Construction	11.68	5.90	5.25	7.18	7.22	9.39	5.10	8.25
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	3.08	10.46	8.28	6.31	6.87	4.25	9.23	7.64
19 Wholesale Trade And Commission Trade, Except Of Motor	3.49	7.25	3.70	5.77	4.92	3.70	4.26	9.35

Industry Description	1980-81 to 1985-86	1986-87 to 1990-91	1992-93 to 1996-97	1997-98 to 2004-05	1980-81 to 2004-05	1980-81 to 1989-90	1990-91 to 1999-00	2001-02 to 2004-05
Vehicles And Motorcycles								
20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of Household Goods	3.98	6.50	5.60	3.94	4.47	4.21	6.07	3.86
21 Hotels And Restaurants	2.60	4.31	5.75	5.82	4.36	2.47	6.32	6.15
22 Transport And Storage	3.00	6.21	6.33	5.19	4.84	3.17	7.05	5.44
23 Post And Telecommunications	0.16	8.06	10.20	9.54	7.07	2.21	10.45	10.90
24 Financial Intermediation	5.02	10.71	5.34	5.37	6.42	5.91	5.69	8.79
25 Real Estate Activities	5.34	15.40	5.73	16.38	11.41	7.43	6.35	27.87
26 Renting Of Machinery And Equipment And Other Business Activities	5.27	9.16	12.59	11.47	9.63	5.32	12.72	12.91
27 Public Admin And Defence; Compulsory Social Security	3.99	5.24	2.61	-0.73	2.06	3.58	3.08	-1.32
28 Education	1.41	8.00	6.03	6.27	5.25	3.80	5.86	8.08
29 Health And Social Work	1.36	5.00	6.14	6.29	4.60	2.29	6.28	7.15
30 Other Community, Social And Personal Service	1.49	10.13	5.82	0.37	3.72	4.44	6.09	-0.92
31 Private Households With Employed Persons	-0.78	0.78	-0.89	12.86	3.98	0.09	-1.86	22.88
Industry Total	1.82	2.93	2.49	2.64	2.64	2.01	2.46	3.42
Industry Median	3.40	5.90	4.77	5.19	4.75	3.78	5.69	6.01

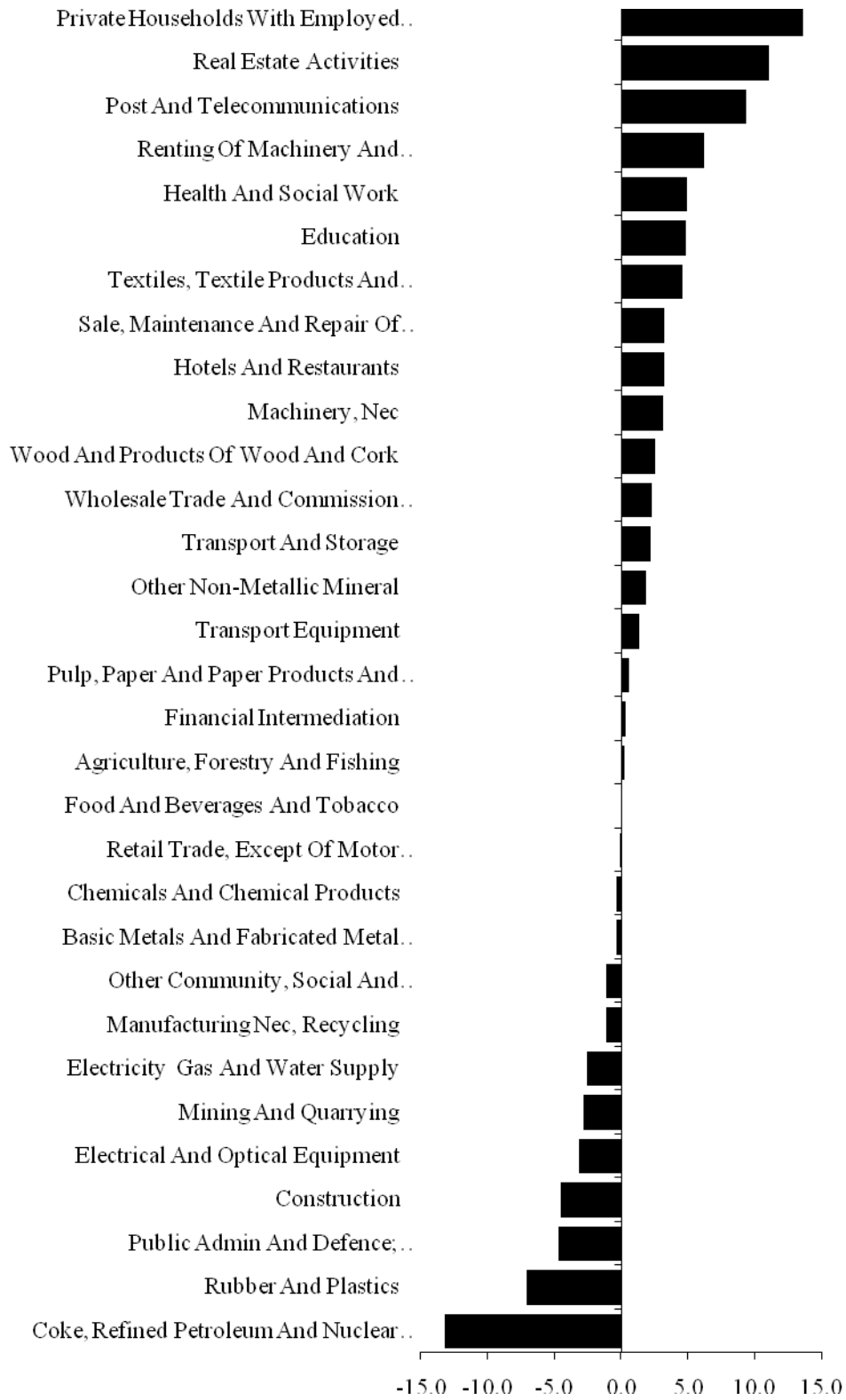
Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

Figure 10: Growth in Labour Input (% per year), 1980-81 to 2004-05



Note: Figure shows the rank wise position of the industries on the variable.

Figure 11: Change in Labour Input Growth, 1997-98 to 2004-05 less 1980-81 to 1985-86



Note: Figure shows the rank wise position of the industries on the variable.

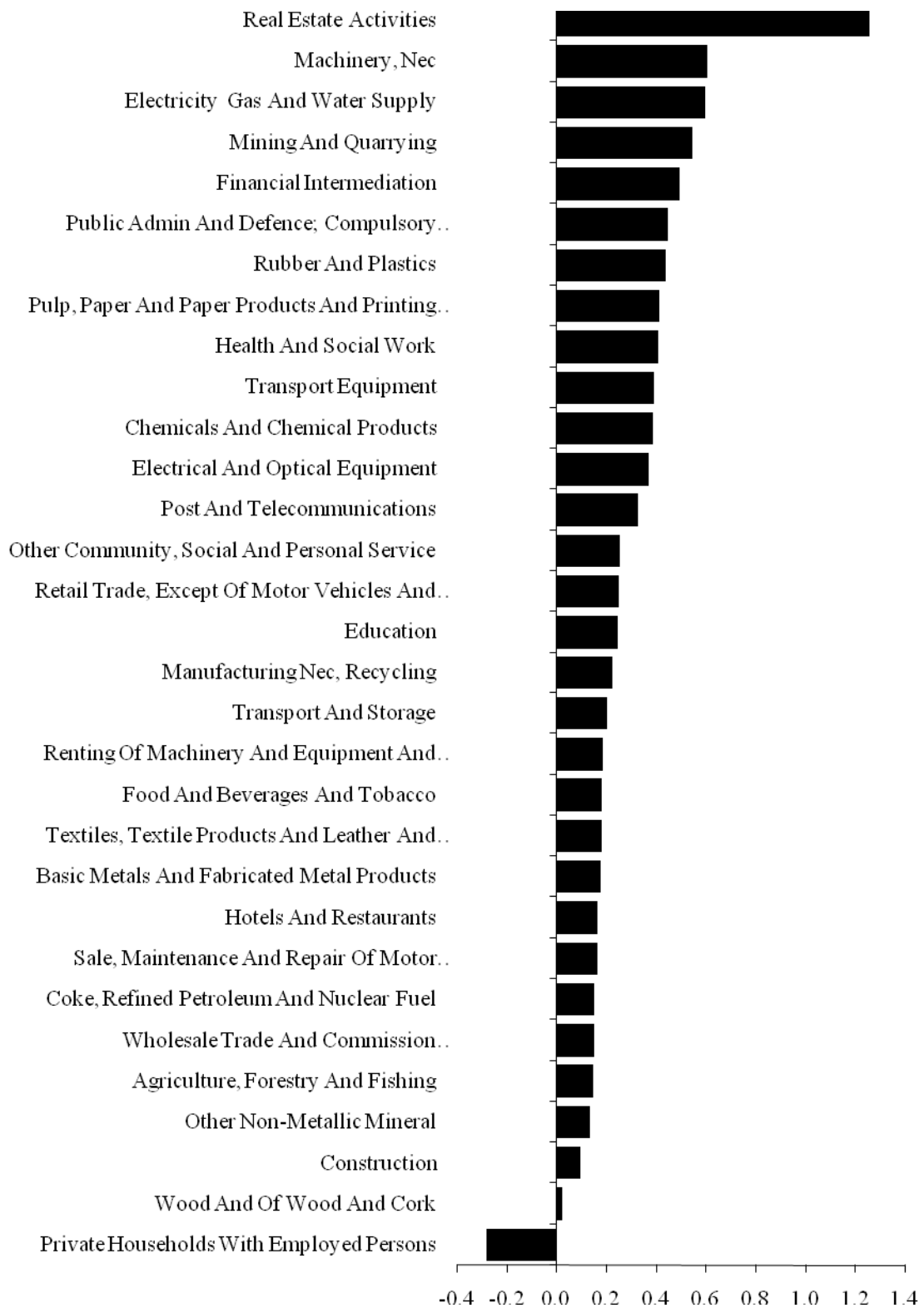
Table 16: Growth in labour quality

Industry Description	1980-81 to 1985-86	1986-87 to 1990-91	1992-93 to 1996- 97	1997-98 to 2004-05	1980-81 to 2004-05	1980-81 to 1989-90	1990-91 to 1999-00	2001-02 to 2004-05
1 Agriculture, Forestry And Fishing	0.16	0.12	0.13	0.17	0.15	0.14	0.14	0.18
2 Mining And Quarrying	0.12	0.59	0.24	0.93	0.55	0.30	0.17	1.61
3 Food And Beverages And Tobacco	-0.04	0.14	0.26	0.29	0.18	0.03	0.26	0.30
4 Textiles, Textile Products And Leather And Footwear	0.16	0.17	0.27	0.14	0.18	0.16	0.28	0.03
5 Wood And products of Wood And Cork	0.21	-0.19	-0.01	0.12	0.02	0.06	0.04	0.01
6 Pulp, Paper And Paper Products And Printing And Publishing	0.13	0.40	0.40	0.59	0.41	0.23	0.38	0.77
7 Coke, Refined Petroleum And Nuclear Fuel	-0.38	0.32	1.40	-0.49	0.15	-0.12	1.44	-1.81
8 Chemicals And Chemical Products	0.96	0.53	0.18	0.08	0.39	0.80	0.17	0.05
9 Rubber And Plastics	0.75	0.50	0.29	0.31	0.44	0.66	0.29	0.33
10 Other Non-Metallic Mineral	-0.09	0.24	0.36	0.02	0.13	0.03	0.35	-0.14
11 Basic Metals And Fabricated Metal Products	0.21	0.10	0.19	0.21	0.18	0.17	0.21	0.15
12 Machinery, Nec	-0.18	0.92	0.84	0.62	0.61	0.23	0.77	0.79
13 Electrical And Optical Equipment	0.25	0.84	0.42	0.01	0.37	0.47	0.34	0.07
14 Transport Equipment	0.06	0.85	0.33	0.23	0.39	0.35	0.22	0.57
15 Manufacturing Nec, Recycling	-0.07	0.27	0.43	0.22	0.22	0.05	0.43	0.12
16 Electricity Gas And Water Supply	0.59	0.34	0.54	0.85	0.60	0.50	0.58	0.90
17 Construction	-0.83	0.32	0.48	0.16	0.09	-0.41	0.42	0.21
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	-0.54	0.04	0.13	0.67	0.16	-0.33	0.10	1.11
19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles And Motorcycles	0.00	0.15	0.37	0.09	0.15	0.06	0.39	-0.12
20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of Household Goods	0.17	0.22	0.29	0.28	0.25	0.19	0.30	0.27

Industry Description	1980-81 to 1985-86	1986-87 to 1990-91	1992-93 to 1996- 97	1997-98 to 2004-05	1980-81 to 2004-05	1980-81 to 1989-90	1990-91 to 1999-00	2001-02 to 2004-05
21 Hotels And Restaurants	0.00	0.16	0.29	0.18	0.17	0.06	0.30	0.10
22 Transport And Storage	0.09	0.18	0.27	0.24	0.20	0.12	0.27	0.21
23 Post And Telecommunications	0.83	0.42	0.07	0.14	0.33	0.68	0.06	0.22
24 Financial Intermediation	0.78	0.87	0.42	0.07	0.49	0.81	0.37	0.06
25 Real Estate Activities	1.73	1.67	1.02	0.79	1.25	1.70	0.96	0.90
26 Renting Of Machinery And Equipment And Other Business Activities	-0.05	0.06	0.16	0.43	0.19	-0.01	0.17	0.58
27 Public Admin And Defence; Compulsory Social Security	0.55	0.61	0.33	0.32	0.45	0.57	0.30	0.44
28 Education	0.50	0.34	0.22	0.05	0.25	0.44	0.22	-0.05
29 Health And Social Work	0.41	0.50	0.30	0.40	0.41	0.44	0.27	0.57
30 Other Community, Social And Personal Service	0.23	0.21	0.06	0.41	0.25	0.23	0.05	0.68
31 Private Households With Employed Persons	-0.44	-1.01	0.23	0.11	-0.28	-0.65	0.40	-0.61
Industry Median	0.16	0.32	0.29	0.22	0.25	0.19	0.29	0.21

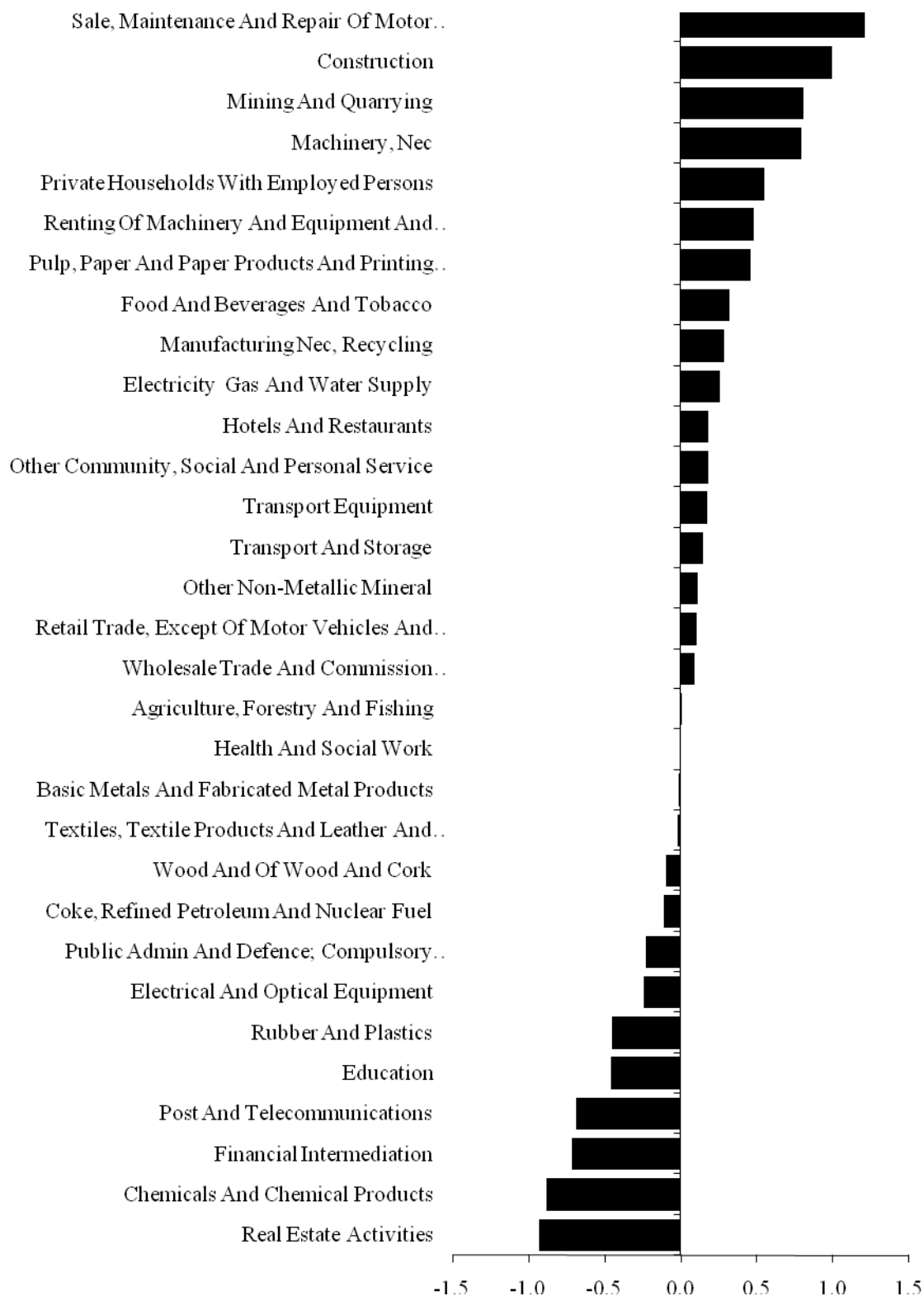
Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55and 61rounds.

Figure 12: Growth in Labour Quality (% per year), 1980-81 to 2004-05



Note: Figure shows the rank wise position of the industries on the variable.

Figure 13: Change in Labour Quality Growth, 1997-98 to 2004-05 less 1980-81 to 1985-



Note: Figure shows the rank wise position of the industries on the variable.

VI: Distribution of Manufacturing Workers into Organized and Unorganized Sectors

This section shows the distribution of workers in the manufacturing industries between organized and unorganized sectors over the five rounds. The summary results are presented in Table 17

Table 17: Share of organized Manufacturing in Employment of Indian Manufacturing Industry in different NSSO Rounds

	38th	43rd	50th	55th	61st
	Organized	Organized	Organized	Organized	Organized
Food and beverages and tobacco	16.69	16.50	14.64	16.73	18.09
Textiles, Textile products and Leather and footwear	15.84	13.11	13.86	20.43	11.18
Wood and Products of wood and cork	1.46	1.30	1.67	0.96	0.86
Pulp, paper and paper products and printing and publishing	40.11	31.96	29.03	22.20	17.54
Coke, refined petroleum and nuclear fuel	90.19	65.80	44.66	40.98	67.11
Chemicals and chemical products	43.91	45.04	37.14	44.39	39.81
Rubber and plastics	51.77	39.94	30.21	26.05	34.78
Other non-metallic mineral	12.86	11.97	11.89	10.98	9.47
Basic metals and fabricated metal products	36.71	32.21	28.49	24.77	22.25
Machinery, nec	74.22	77.41	24.92	34.50	29.43
Electrical and optical equipment	61.61	55.88	43.33	31.83	35.07
Transport equipment	94.76	66.22	72.34	72.43	41.09
Manufacturing nec, and recycling	1.99	1.68	2.09	3.43	2.47
Total	19.33	17.34	16.76	18.37	14.99

Source: NSSO 38, 43, 50, 55 and 61 rounds and ASI.

Table 17 shows that the share of unorganized sector in the Indian manufacturing has consistently increased from 78 percent to 85 percent over the period from 1983-84 to 2004-05. So there is a significant fall in the importance of organized sector in generating employment in the manufacturing sector of the Indian economy and more and more employment is being sought in the unorganized sector where it has increased by 80 percent from 25 million to 45 million as compared to just 17 percent in organized sector.

The table also shows that the share of organized manufacturing sector in employment is significantly different in different manufacturing industrial groups. While few industries, e.g. Wood and products of wood and cork; Textiles, Textile products and Leather and footwear; Food and beverages and tobacco; other non-metallic mineral; and Manufacturing nec, and recycling are highly concentrated in the unorganized sector, there is the other extreme of coke & Petroleum where most of employment is in the organized sector. There are quite a few industrial groups where both the sectors play an important role in employment generation. Though the share of unorganized employment however has increased in all the industrial groups but the face of employment in transport equipment industry has completely changed in last few years from a predominantly organized sector employment to unorganized sector employment.

VII: Conclusion

A time series of labour input and composition index from 1980-81 to 2004-05 has been constructed for the Indian industry by using NSSO's Employment and Unemployment Survey's data from the major and thin rounds and the series has been interpolated for years between the rounds. Employment is measured by usual principal and subsidiary status and is combined with the intensity of work to get total days worked in a week. A Mincer wage function has been used to estimate the wages of the self-employed persons and sample selection bias is corrected for by using the Heckman two step procedure.

A Labour composition index based on the methodology of (JGF) Jorgenson, Gollop, and Fraumeni (1987) and using the Tornqvist translog index has also been constructed and the labour composition index has also been decomposed into education, age and gender indices.

The results show that the WFPR remained almost unchanged over the period and the share of 30-49 age-group is the highest. The share of educated workforce has gradually increased during the period. There is also a tendency for the share of female workers to increase, though it is almost half to that of males. Money Wages for females are much lower than for males and a wide variation is found in the wages between different industrial groups. Money wages have increased over the period and are generally higher for more educated and experienced workers. Along with increase in employment of labour hours there has also been increase in labour quality, leading to a faster growth of labour input. Most of the increase in labour quality has however been contributed by education and age and gender characteristics have not contributed much to the quality. It is also noted that growth of labour input and

growth of labour quality have not been uniform across all periods and across all industries but a lot of variation is found in them and we have quite extremes between them. For the manufacturing sector, the employment is bifurcated between the organized (obtained from ASI) and unorganized sectors. The share of unorganized sector has increased in the Indian manufacturing sector.

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Appendix:

Definitions of Employment in NSSO employment & unemployment surveys

The surveys of NSSO on employment and unemployment aim to measure the extent of 'employment' and 'unemployment' in quantitative terms disaggregated by various household and population characteristics following the three reference periods of (i) one year, (ii) one week, and (iii) each day of the week. Based on these three reference periods three different measures, termed as *usual status*, *current weekly status*, and the *current daily status*, are arrived at. While all these three approaches are used for collection of data on employment and unemployment in the quinquennial surveys, the first two approaches only are used for the purpose in the annual surveys.

Usual principal status: In NSS 27th round, the usual principal activity category of the persons was determined by considering the normal working pattern, i.e., the activity pursued by them over a long period in the past and which was likely to continue in the future. For the identification of the usual principal status of an individual based on the major time criterion, in NSS 27th, 32nd, 38th, 43rd rounds, a trichotomous classification of the population was followed, that is, a person was classified into one of the three broad groups 'employed', 'unemployed' and 'out of labour force' based on the major time criterion. From NSS 50th round onwards, the procedure was changed and the prescribed procedure was a two stage dichotomous one which involved a classification into 'labour force' and 'out labour force' in the first stage, and thereafter, the labour force into 'employed' and 'unemployed' in the second stage.

Usual subsidiary status: In the usual status approach, besides principal status, information in respect of subsidiary economic status of an individual was collected in all employment and unemployment surveys. For deciding the subsidiary economic status of an individual, no minimum number of days of work during the last 365 days was mentioned prior to NSS 61st round. In NSS 61st round, a minimum of 30 days of work, among other things, during the last 365 days, was considered necessary for classification as usual subsidiary economic activity of an individual.

Current weekly status: It is important to note at the beginning that in the EUS of NSSO, a person is considered as worker if he/she has performed any economic activity at least for one hour on any day of the reference week and uses the priority criteria in assigning work activity

status. This definition is consistent with the ILO convention and used by most of the countries in the world for their labour force surveys. In NSSO, prior to NSS 50th round and in all the annual surveys till NSS 59th round, data on employment and unemployment in the CWS approach was collected by putting a single-shot question ‘whether worked for at least one hour on any day during the last 7 days preceding the date of survey’. The information so collected was used to determine the CWS of the individuals. This procedure was criticised for being not able to identify the entire workforce, particularly among the women. It was then decided to derive the CWS of a person from the time disposition of the household members for the 7 days preceding the date of survey. The procedure was used for the first time in NSS 50th round. It is seen that the change in the method of determining the current weekly activity had resulted in increasing the WPR in current weekly status approach - more so for the females in both rural and urban areas than for males. The trend observed in NSS 50th round in respect of the WPR according to CWS suggested continuing with the procedure for data collection in CWS in NSS 55th and NSS 61st rounds.

Current Daily Status

Current Daily Status (CDS) rates are used for studying intensity of work. These are computed on the basis of the information on employment and unemployment recorded for the 14 half days of the reference week. The employment statuses during the seven days are recorded in terms of half or full intensities. An hour or more but less than four hours is taken as half intensity and four hours or more is taken as full intensity.

An advantage of this approach was that it was based on more complete information; it embodied the time utilisation, and did not accord priority to labour force over outside the labour force or work over unemployment, except in marginal cases. A disadvantage was that it related to person-days, not persons. Hence it had to be used with some caution.

Appendix Table A: 31 sector India KLEMS industrial classification

- 1 Agriculture, Forestry And Fishing
- 2 Mining And Quarrying
- 3 Food And Beverages And Tobacco
- 4 Textiles, Textile Products And Leather And Footwear
- 5 Wood And products of Wood And Cork
- 6 Pulp, Paper And Paper Products And Printing And Publishing
- 7 Coke, Refined Petroleum And Nuclear Fuel
- 8 Chemicals And Chemical Products
- 9 Rubber And Plastics
- 10 Other Non-Metallic Mineral
- 11 Basic Metals And Fabricated Metal Products
- 12 Machinery, Nec
- 13 Electrical And Optical Equipment
- 14 Transport Equipment
- 15 Manufacturing Nec, Recycling
- 16 Electricity Gas And Water Supply
- 17 Construction
- 18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles;
Retail Sale Of Fuel
- 19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles
And Motorcycles
- 20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of
Household Goods
- 21 Hotels And Restaurants
- 22 Transport And Storage
- 23 Post And Telecommunications
- 24 Financial Intermediation
- 25 Real Estate Activities
- 26 Renting Of Machinery And Equipment And Other Business Activities
- 27 Public Admin And Defence; Compulsory Social Security
- 28 Education
- 29 Health And Social Work
- 30 Other Community, Social And Personal Service
- 31 Private Households With Employed Persons

Table A1: Data used to compute workforce

NSS Round	survey period	MID PERIOD	POPULATION (000)				WFPR per thousand				TOTALWORKERS(000)			
			RM	RF	UM	UF	RM	RF	UM	UF	RM	RF	UM	UF
38	1/83 to 12/83	01-Jul-83	281288	266637	91217	80445	547	340	512	151	153865	90657	46703	12147
43	7/87 to 6/88	01-Jan-88	305500	287900	104400	92800	539	323	506	152	164665	92992	52826	14106
45	7/89 to 6/90	01-Jan-90	316881	298404	110944	98901	548	319	412	146	173651	95191	45709	14440
46	7/90 to 6/91	01-Jan-91	322571	303656	114216	101952	553	292	513	143	178382	88667	58593	14579
47	7/91 to 12/91	01-Oct-91	326839	307594	116669	104240	546	294	516	132	178454	90433	60201	13760
48	1/92 to 12/92	01-Jul-92	331107	311533	119123	106528	556	313	507	146	184095	97510	60395	15553
49	1/93 to 6/93	01-Apr-93	335374	315472	121577	108816	545	311	509	130	182779	98112	61883	14146
50	7/93 to 6/94	01-Jan-94	339642	319411	124031	111104	553	328	521	155	187822	104767	64620	17221
51	7/94 to 6/95	01-Jan-95	345440	325140	105789	114461	560	317	519	136	193447	103069	54904	15567
52	7/95 to 6/96	01-Jan-96	351239	330869	87547	117817	551	295	525	124	193533	97606	45962	14609
53	1/97 to 12/97	01-Jul-97	359936	339463	60183	122852	550	291	521	131	197965	98784	31356	16094
54	1/98 to 6/98	01-Apr-98	364285	343759	46502	125370	539	263	509	114	196350	90409	23669	14292
55	7/99 to 6/00	01-Jan-00	374432	353785	145878	131244	531	299	518	139	198823	105782	75565	18243
56	7/00 to 6/01	01-Jan-01	379719	358848	149649	134662	544	287	531	140	206567	102989	79464	18853
57	7/01 to 6/02	01-Jan-02	385005	363912	153420	138079	546	314	553	139	210213	114268	84841	19193
58	7/02 to 12/02	01-Oct-02	388970	367709	156248	140642	546	281	534	140	212378	103326	83436	19690
59	1/03 to 12/03	01-Jul-03	392935	371507	159076	143206	547	311	541	146	214935	115539	86060	20908
60	01/04 to 6/04	01-Apr-04	396900	375304	161904	145769	542	315	540	150	215120	118221	87428	21865
61	7/04 to 6/05	01-Jan-05	400865	379102	164732	148332	546	327	549	166	218872	123966	90438	24623

Note: RM=rural male; RF= rural females; UM= urban male; and UF= urban female

Source: NSS (1997, 2001, 2005, 2006).

Table A2: Sectoral Distribution of Workforce per thousand for different rounds.

NSS Round	Rural Male				Rural Female				Urban Male				Urban Female			
	Primary Sector	Secondary sector	Tertiary sector	Total	Primary Sector	Secondary sector	Tertiary sector	Total	Primary Sector	Secondary sector	Tertiary sector	Total	Primary Sector	Secondary sector	Tertiary sector	Total
38	775	100	122	997	875	74	48	997	103	342	550	995	310	306	376	992
43	745	121	133	999	847	100	52	999	91	340	564	995	294	317	385	996
45	717	121	162	1000	815	124	61	1000	100	319	581	1000	241	303	456	1000
46	710	121	169	1000	849	81	70	1000	92	336	572	1000	249	316	435	1000
47	749	112	139	1000	863	79	58	1000	95	307	598	1000	237	282	481	1000
48	757	104	139	1000	862	78	60	1000	107	343	550	1000	224	308	468	1000
49	750	109	141	1000	872	74	54	1000	102	344	554	1000	258	306	436	1000
50	741	112	147	1000	862	83	56	1001	90	329	580	999	247	291	463	1001
51	756	103	141	1000	872	83	46	1001	88	329	583	1000	205	343	453	1001
52	748	114	137	999	868	80	52	1000	82	335	583	1000	209	309	482	1000
53	758	106	136	1000	885	72	42	999	78	340	581	999	200	324	476	1000
54	757	102	141	1000	885	66	49	1000	92	322	586	1000	221	280	499	1000
55	714	126	160	1000	854	89	57	1000	66	328	606	1000	177	294	529	1000
56	690	136	174	1000	818	133	49	1000	66	356	578	1000	183	342	475	1000
57	678	145	177	1000	840	109	51	1000	78	321	600	999	211	332	457	1000
58	688	138	174	1000	849	87	65	1001	70	337	593	1000	171	316	513	1000
59	708	141	151	1000	852	95	53	1000	63	336	601	1000	190	313	497	1000
60	659	160	180	999	841	94	65	1000	64	346	590	1000	161	309	530	1000
61	665	156	179	1000	833	101	65	999	61	345	594	1000	181	324	495	1000

Source: NSS (1997, 2001, 2005, 2006).

Table A3: WFPR from Census

Census	Rural Male	Rural Female	Urban Male	Urban Female
1971	53.6	15.5	48.8	6.7
1981	53.8	23.2	49.1	8.3
1991	52.5	26.7	48.9	9.2
2001	52.4	31.0	50.9	11.6

Source: Himanshu (2006)

Table A4: Labour Input of Indian Economy

Year	Quality(Q _L)	Employment of persons (000)	Days per week	Hours per day	Nominal Wages per day(Rs.)	Employment (million hours in a year)
1980-81	99.12	296959	5.16	7.85	8.38	630914
1981-82	99.47	299004	5.20	7.85	10.53	636726
1982-83	99.82	301136	5.23	7.85	13.23	642738
1983-84	100.18	305729	5.26	7.85	16.62	654362
1984-85	100.53	310444	5.29	7.85	20.88	666271
1985-86	100.89	315159	5.32	7.84	25.14	678206
1986-87	101.24	319873	5.35	7.84	29.40	690167
1987-88	101.60	324588	5.39	7.84	33.66	702157
1988-89	101.98	332895	5.44	7.84	34.28	728783
1989-90	102.37	328990	5.49	7.85	34.89	730442
1990-91	102.75	340221	5.54	7.85	35.51	768608
1991-92	103.14	357816	5.59	7.85	36.13	811265
1992-93	103.53	366123	5.64	7.85	36.74	839625
1993-94	103.91	374430	5.69	7.85	37.36	868557
1994-95	104.33	366987	5.69	7.85	40.36	850854
1995-96	104.74	351710	5.68	7.85	43.36	815593
1996-97	105.15	386421	5.68	7.84	46.36	894963
1997-98	105.57	390419	5.67	7.84	49.37	903650
1998-99	105.98	394416	5.67	7.84	52.37	912258
1999-00	106.40	398413	5.66	7.84	55.37	920787
2000-01	107.00	407873	5.67	7.84	63.23	946198
2001-02	107.60	428515	5.67	7.84	71.10	990668
2002-03	108.20	434105	5.67	7.84	78.96	1003581
2003-04	108.80	446002	5.67	7.84	86.82	1031377
2004-05	109.40	457900	5.68	7.84	94.69	1059270
Average growth rate	0.41	1.85	0.39	-0.01	10.93	2.22

Source: Authors calculations based on unit level data of NSSO, 38th, 43rd, 50th 55th and 61st rounds.

Note: Mid year of 1983 i.e. July =100 for quality index and other indices in subsequent tables.

Table A5: Decomposition of Quality Index of Aggregate Labour

Year	Q_{Lg}	Q_L	Q_s	Q_a	Q_e	$Q_s * Q_a * Q_e$
1980-81	98.98	99.12	99.97	99.83	99.31	99.11
1981-82	99.39	99.47	99.98	99.90	99.59	99.47
1982-83	99.80	99.82	99.99	99.97	99.86	99.82
1983-84	100.21	100.18	100.01	100.03	100.14	100.18
1984-85	100.62	100.53	100.02	100.10	100.42	100.54
1985-86	101.03	100.89	100.03	100.17	100.70	100.90
1986-87	101.44	101.24	100.04	100.24	100.97	101.25
1987-88	101.86	101.60	100.05	100.31	101.25	101.61
1988-89	102.17	101.98	100.02	100.39	101.62	102.03
1989-90	102.48	102.37	99.98	100.46	101.99	102.44
1990-91	102.79	102.75	99.95	100.54	102.36	102.86
1991-92	103.09	103.14	99.92	100.62	102.72	103.28
1992-93	103.40	103.53	99.89	100.69	103.09	103.69
1993-94	103.71	103.91	99.86	100.77	103.46	104.11
1994-95	104.10	104.33	99.88	100.82	103.83	104.55
1995-96	104.50	104.74	99.90	100.86	104.20	104.99
1996-97	104.89	105.15	99.91	100.91	104.56	105.43
1997-98	105.28	105.57	99.93	100.96	104.93	105.87
1998-99	105.67	105.98	99.95	101.01	105.30	106.31
1999-00	106.06	106.40	99.97	101.05	105.66	106.75
2000-01	106.65	107.00	99.95	101.09	106.27	107.37
2001-02	107.25	107.60	99.92	101.12	106.87	107.98
2002-03	107.84	108.20	99.90	101.15	107.47	108.60
2003-04	108.43	108.80	99.88	101.19	108.07	109.22
2004-05	109.02	109.40	99.85	101.22	108.67	109.83

Source: Authors calculations based on unit level data of NSSO, 38th, 43rd, 50th, 55th and 61st rounds.

Table A6: Industry Characteristics (2004-05)

Industry Description	Total Labour Input (million hours)	Compensation Bill (Rs Ten million)	Labour Share of output
1 Agriculture, Forestry And Fishing	587942	476584	0.863
2 Mining And Quarrying	7259	26417	0.312
3 Food And Beverages And Tobacco	25707	16096	0.273
4 Textiles, Textile Products And Leather And Footwear	37211	22500	0.383
5 Wood And Of Wood And Cork	12466	2748	0.379
6 Pulp, Paper And Paper Products And Printing And Publishing	4398	4372	0.322
7 Coke, Refined Petroleum And Nuclear Fuel	318	1148	0.044
8 Chemicals And Chemical Products	5334	13144	0.178
9 Rubber And Plastics	2138	3695	0.243
10 Other Non-Metallic Mineral	11052	4143	0.191
11 Basic Metals And Fabricated Metal Products	9703	11053	0.148
12 Machinery, Nec	4072	6360	0.263
13 Electrical And Optical Equipment	3261	6701	0.170
14 Transport Equipment	2991	5643	0.220
15 Manufacturing Nec, Recycling	12104	4594	0.315
16 Electricity Gas And Water Supply	3664	22296	0.372
17 Construction	60476	183687	0.863
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	7318	7066	0.328
19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles And Motorcycles	14513	31648	0.220
20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of Household Goods	99063	126358	0.495
21 Hotels And Restaurants	16463	23852	0.585
22 Transport And Storage	43576	99729	0.522
23 Post And Telecommunications	5252	24040	0.449
24 Financial Intermediation	8621	65661	0.391
25 Real Estate Activities	1667	34251	0.236
26 Renting Of Machinery And Equipment And Other Business Activities	11095	32706	0.347
27 Public Admin And Defence; Compulsory Social Security	23901	150504	0.868
28 Education	28842	65478	0.614
29 Health And Social Work	10194	34574	0.658
30 Other Community, Social And Personal Service	31414	52326	0.816
31 Private Households With Employed Persons	11137	3131	0.499
Total	1158858	1562506	0.574

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

Table A7: Sex -wise Industrial Distribution of Employment (million hours)

NSS Round→ Industry description	61st		55th		50th		43rd		38th	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Agriculture, Forestry and Fishing	376434(66.05)	193523	367696(67.98)	173226	366650(67.99)	172642	309720(69.98)	132857	301890(69.79)	130656
Mining and Quarrying	5512(86.23)	881	4411(83.87)	848	5297(83.01)	1084	4282(81.45)	976	3243(80.05)	808
Food and beverages and tobacco	13663(55.58)	10921	13442(56.37)	10405	12378(56.14)	9672	9500(57.42)	7045	9232(60.52)	6021
Textiles, Textile products and Leather and footwear	24502(68.48)	11280	13828(73.39)	5013	18326(70.29)	7746	18301(73.31)	6663	16518(74.4)	5685
Wood and Products of wood and cork	9219(73.95)	3247	8335(77.78)	2382	5943(75.19)	1961	8587(83.72)	1669	7996(84.07)	1516
Pulp, paper and paper products and printing and publishing	3511(87.84)	486	2587(88.28)	343	2018(86.89)	304	1780(86.45)	279	1331(84.79)	239
Coke, refined petroleum and nuclear fuel	264(86.78)	40	380(87.82)	53	305(84.05)	58	184(96.97)	6	101(88.32)	13
Chemicals and chemical products	3095(62.13)	1886	2794(66.55)	1404	2953(72.75)	1106	1896(70.11)	808	1725(71.89)	675
Rubber and plastics	1757(89.52)	206	2173(93.55)	150	1393(92.55)	112	660(85.49)	112	501(91.37)	47
Other non-metallic mineral	8197(76.74)	2485	6294(76.34)	1951	5878(78.6)	1601	5072(73.03)	1873	4629(75.43)	1508
Basic metals and fabricated metal products	8970(95.91)	383	7949(95.15)	406	6578(95.82)	287	5681(96.82)	186	4750(95.27)	236
Machinery, nec	3366(95.94)	142	2787(96.4)	104	3780(94.06)	239	1147(93.95)	74	1283(94.1)	80
Electrical and optical equipment	2710(90.17)	295	2583(87.06)	384	1985(89.83)	225	1302(89.23)	157	1079(96.16)	43
Transport equipment	2640(96.73)	89	1339(95.71)	60	1420(96.88)	46	1533(97.51)	39	1063(98.26)	19
Manufacturing nec, recycling	9886(86.35)	1563	6705(86.73)	1026	7058(88.74)	895	5638(84.9)	1003	4064(84.96)	719
Electricity gas and water supply	3070(95.26)	153	2537(96.64)	88	3272(94.39)	194	2307(96.11)	93	1904(96.77)	64
Construction	52549(90.7)	5391	35810(89.61)	4152	25337(88.51)	3289	20016(76.54)	6136	12580(86.22)	2010
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	6765(97.41)	180	5033(98.93)	55	3870(99.23)	30	2106(99.28)	15	1747(99.55)	8
Wholesale trade and commission trade, except of motor vehicles and motorcycles	13369(95.5)	630	8398(94.19)	518	8675(93.6)	593	6189(95.48)	293	5135(95.36)	250

NSS Round→	61st		55th		50th		43rd		38th	
Industry description	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Retail trade, except of motor vehicles and motorcycles; repair of household goods	83226(88.8)	10493	69718(88.61)	8959	54736(88.42)	7172	42770(87.88)	5899	34599(86.85)	5240
Hotels and restaurants	12935(81.75)	2888	9788(82.77)	2037	7391(85.38)	1265	6328(82.37)	1354	5652(84.88)	1006
Transport and Storage	41026(98.58)	592	31755(98.33)	540	23901(98.23)	432	18379(98.37)	305	15613(97.88)	338
Post and telecommunications	4340(87.58)	616	2672(89.36)	318	1685(91.19)	163	992(90.85)	100	1031(93.12)	76
Financial intermediation	6747(86.38)	1064	4507(87.5)	644	4692(88.67)	600	2664(90.07)	294	2203(92.66)	174
Real estate activities	1189(92.07)	102	387(97.05)	12	473(98.64)	7	205(97.91)	4	173(99.52)	1
Renting of machinery and equipment and other business activities	9600(90.56)	1000	5481(91.97)	479	2968(91.55)	274	1847(93.64)	125	1450(96.48)	53
Public admin and defence; compulsory social security	19169(88)	2615	21401(89.81)	2429	21041(89.01)	2598	18564(90.47)	1956	15792(92.63)	1256
Education	16180(58.76)	11355	11939(63.8)	6775	10153(65.7)	5301	6549(67.35)	3175	6697(72.88)	2493
Health and social work	6055(64.83)	3284	4562(66.74)	2274	3603(70.9)	1478	2824(70.4)	1188	2838(74.87)	953
Other community, social and personal service	22438(75.45)	7299	22801(70.55)	9519	21604(77.73)	6190	11924(76.79)	3604	11045(76.56)	3382
Private households with employed persons	3397(28.8)	8397	1591(38.39)	2553	1101(19.56)	4529	1331(27.07)	3588	1379(27.37)	3659
Total	775782(73.24)	283488	681682(74.03)	239105	636464(73.28)	232093	520280(74.1)	181877	479244(73.9)	169229

Table A8: Industry wise Distribution of Total Employment

NSS Round→	61st			55th			50th			43rd			38th		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1 Agriculture, Forestry And Fishing	48.52	68.27	53.81	53.94	72.45	58.75	57.61	74.38	62.09	59.53	73.05	63.03	62.99	77.21	66.70
2 Mining And Quarrying	0.71	0.31	0.60	0.65	0.35	0.57	0.83	0.47	0.73	0.82	0.54	0.75	0.68	0.48	0.62
3 Food And Beverages And Tobacco	1.76	3.85	2.32	1.97	4.35	2.59	1.94	4.17	2.54	1.83	3.87	2.36	1.93	3.56	2.35
4 Textiles, Textile Products And Leather And Footwear	3.16	3.98	3.38	2.03	2.10	2.05	2.88	3.34	3.00	3.52	3.66	3.56	3.45	3.36	3.42
5 Wood And Of Wood And Cork	1.19	1.15	1.18	1.22	1.00	1.16	0.93	0.84	0.91	1.65	0.92	1.46	1.67	0.90	1.47
6 Pulp, Paper And Paper Products And Printing And Publishing	0.45	0.17	0.38	0.38	0.14	0.32	0.32	0.13	0.27	0.34	0.15	0.29	0.28	0.14	0.24
7 Coke, Refined Petroleum And Nuclear Fuel	0.03	0.01	0.03	0.06	0.02	0.05	0.05	0.02	0.04	0.04	0.00	0.03	0.02	0.01	0.02
8 Chemicals And Chemical Products	0.40	0.67	0.47	0.41	0.59	0.46	0.46	0.48	0.47	0.36	0.44	0.39	0.36	0.40	0.37
9 Rubber And Plastics	0.23	0.07	0.19	0.32	0.06	0.25	0.22	0.05	0.17	0.13	0.06	0.11	0.10	0.03	0.08
10 Other Non-Metallic Mineral	1.06	0.88	1.01	0.92	0.82	0.90	0.92	0.69	0.86	0.97	1.03	0.99	0.97	0.89	0.95
11 Basic Metals And Fabricated Metal Products	1.16	0.14	0.88	1.17	0.17	0.91	1.03	0.12	0.79	1.09	0.10	0.84	0.99	0.14	0.77
12 Machinery, Nec	0.43	0.05	0.33	0.41	0.04	0.31	0.59	0.10	0.46	0.22	0.04	0.17	0.27	0.05	0.21
13 Electrical And Optical Equipment	0.35	0.10	0.28	0.38	0.16	0.32	0.31	0.10	0.25	0.25	0.09	0.21	0.23	0.03	0.17
14 Transport Equipment	0.34	0.03	0.26	0.20	0.03	0.15	0.22	0.02	0.17	0.29	0.02	0.22	0.22	0.01	0.17
15 Manufacturing Nec, Recycling	1.27	0.55	1.08	0.98	0.43	0.84	1.11	0.39	0.92	1.08	0.55	0.95	0.85	0.43	0.74
16 Electricity Gas And Water Supply	0.40	0.05	0.30	0.37	0.04	0.29	0.51	0.08	0.40	0.44	0.05	0.34	0.40	0.04	0.30
17 Construction	6.77	1.90	5.47	5.25	1.74	4.34	3.98	1.42	3.30	3.85	3.37	3.72	2.62	1.19	2.25
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	0.87	0.06	0.66	0.74	0.02	0.55	0.61	0.01	0.45	0.40	0.01	0.30	0.36	0.00	0.27
19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles And Motorcycles	1.72	0.22	1.32	1.23	0.22	0.97	1.36	0.26	1.07	1.19	0.16	0.92	1.07	0.15	0.83
20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of Household Goods	10.73	3.70	8.85	10.23	3.75	8.54	8.60	3.09	7.13	8.22	3.24	6.93	7.22	3.10	6.14
21 Hotels And Restaurants	1.67	1.02	1.49	1.44	0.85	1.28	1.16	0.55	1.00	1.22	0.74	1.09	1.18	0.59	1.03
22 Transport And Storage	5.29	0.21	3.93	4.66	0.23	3.51	3.76	0.19	2.80	3.53	0.17	2.66	3.26	0.20	2.46

NSS Round→ Industry Description	61st			55th			50th			43rd			38th		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
23 Post And Telecommunications	0.56	0.22	0.47	0.39	0.13	0.32	0.26	0.07	0.21	0.19	0.05	0.16	0.22	0.05	0.17
24 Financial Intermediation	0.87	0.38	0.74	0.66	0.27	0.56	0.74	0.26	0.61	0.51	0.16	0.42	0.46	0.10	0.37
25 Real Estate Activities	0.15	0.04	0.12	0.06	0.00	0.04	0.07	0.00	0.06	0.04	0.00	0.03	0.04	0.00	0.03
26 Renting Of Machinery And Equipment And Other Business Activities	1.24	0.35	1.00	0.80	0.20	0.65	0.47	0.12	0.37	0.36	0.07	0.28	0.30	0.03	0.23
27 Public Admin And Defence; Compulsory Social Security	2.47	0.92	2.06	3.14	1.02	2.59	3.31	1.12	2.72	3.57	1.08	2.92	3.30	0.74	2.63
28 Education	2.09	4.01	2.60	1.75	2.83	2.03	1.60	2.28	1.78	1.26	1.75	1.38	1.40	1.47	1.42
29 Health And Social Work	0.78	1.16	0.88	0.67	0.95	0.74	0.57	0.64	0.58	0.54	0.65	0.57	0.59	0.56	0.58
30 Other Community, Social And Personal Service	2.89	2.57	2.81	3.34	3.98	3.51	3.39	2.67	3.20	2.29	1.98	2.21	2.30	2.00	2.22
31 Private Households With Employed Persons	0.44	2.96	1.11	0.23	1.07	0.45	0.17	1.95	0.65	0.26	1.97	0.70	0.29	2.16	0.78
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Author's calculations based on unit level data of NSSO, 38, 43, 50, 55 and 61 rounds.

Note: Figures in parentheses are percentages for the male Category.

Table A9: Total Number of Days Employed per Week by gender and Industry

NSS Round→ Industry Description	61st			55th			50th			43rd			38th		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
1 Agriculture, Forestry And Fishing	6.00	4.32	5.30	6.00	4.47	5.40	6.10	4.40	5.43	5.95	4.01	5.19	5.87	3.77	5.02
2 Mining And Quarrying	6.30	5.25	6.13	6.22	5.43	6.07	6.33	5.45	6.16	5.84	5.42	5.76	5.94	5.45	5.84
3 Food And Beverages And Tobacco	6.51	5.32	5.92	6.28	4.97	5.64	6.41	5.34	5.90	6.08	5.15	5.64	6.00	4.95	5.54
4 Textiles, Textile Products And Leather And Footwear	6.43	4.97	5.89	6.25	4.97	5.84	6.39	4.74	5.82	6.02	4.21	5.40	5.85	4.06	5.26
5 Wood And Of Wood And Cork	6.12	5.04	5.79	6.04	4.97	5.76	6.17	4.79	5.76	5.98	4.89	5.76	5.92	4.66	5.68
6 Pulp, Paper And Paper Products And Printing And Publishing	6.57	5.24	6.37	6.20	4.87	6.02	6.46	4.98	6.23	5.93	4.37	5.67	5.70	3.86	5.33
7 Coke, Refined Petroleum And Nuclear Fuel	6.69	6.25	6.63	5.69	5.80	5.71	6.24	5.07	6.04	5.65	0.88	5.51	5.90	5.37	5.84
8 Chemicals And Chemical Products	6.40	5.93	6.22	6.14	5.52	5.93	6.43	5.43	6.13	5.75	5.00	5.50	5.77	5.46	5.69
9 Rubber And Plastics	6.57	5.45	6.44	6.23	4.43	6.07	6.28	4.81	6.15	5.74	4.58	5.55	5.75	4.48	5.62
10 Other Non-Metallic Mineral	6.14	5.16	5.88	6.24	5.09	5.93	5.96	4.90	5.69	5.94	5.15	5.69	5.67	4.50	5.33
11 Basic Metals And Fabricated Metal Products	6.48	5.52	6.43	6.27	5.29	6.22	6.44	5.76	6.41	5.98	5.50	5.96	5.87	5.11	5.83
12 Machinery, Nec	6.70	5.93	6.66	6.19	5.79	6.18	6.42	5.49	6.36	6.02	5.92	6.02	5.91	4.87	5.84
13 Electrical And Optical Equipment	6.78	6.11	6.71	6.38	6.13	6.34	6.56	5.07	6.37	5.69	5.44	5.66	5.89	5.99	5.90
14 Transport Equipment	6.66	6.46	6.65	6.20	6.81	6.22	6.50	6.11	6.49	5.88	6.28	5.87	5.69	4.22	5.66
15 Manufacturing Nec, Recycling	6.31	5.00	6.10	6.17	4.89	5.96	6.23	4.75	6.02	6.07	4.84	5.84	5.99	4.68	5.75
16 Electricity Gas And Water Supply	6.85	6.87	6.85	6.44	6.22	6.44	6.54	6.12	6.52	5.96	5.94	5.94	5.96	5.81	5.95
17 Construction	5.45	4.77	5.38	5.59	4.93	5.51	5.80	5.13	5.71	5.36	4.88	5.23	5.28	4.70	5.19
18 Sale, Maintenance And Repair Of Motor Vehicles And Motorcycles; Retail Sale Of Fuel	6.57	6.67	6.57	6.35	6.72	6.35	6.49	5.24	6.48	6.23	6.43	6.23	6.19	6.30	6.19
19 Wholesale Trade And Commission Trade, Except Of Motor Vehicles And Motorcycles	6.46	5.05	6.38	6.34	5.72	6.31	6.38	5.47	6.32	5.95	5.00	5.90	6.01	4.52	5.92
20 Retail Trade, Except Of Motor Vehicles And Motorcycles; Repair Of Household Goods	6.65	5.61	6.52	6.44	5.25	6.28	6.56	5.42	6.41	6.31	5.31	6.17	6.23	5.23	6.08
21 Hotels And Restaurants	6.59	5.96	6.46	6.53	6.07	6.45	6.62	5.72	6.48	6.42	5.92	6.32	6.44	5.92	6.35
22 Transport And Storage	6.41	5.84	6.40	6.23	5.67	6.22	6.32	5.59	6.31	5.91	5.91	5.89	5.09	5.90	5.86
23 Post And Telecommunications	6.72	6.09	6.64	6.32	6.22	6.31	6.63	5.28	6.49	5.64	5.67	5.64	5.89	5.38	5.85

NSS Round→ Industry Description	61st			55th			50th			43rd			38th		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
24 Financial Intermediation	6.81	6.48	6.77	6.39	5.94	6.33	6.62	6.06	6.55	5.75	4.78	5.64	5.74	5.24	5.70
25 Real Estate Activities	6.49	6.42	6.48	5.96	2.95	5.79	6.75	5.91	6.74	6.29	6.16	6.29	6.29	2.57	6.25
26 Renting Of Machinery And Equipment And Other Business Activities	6.58	6.17	6.53	6.26	5.70	6.21	6.40	5.92	6.35	5.94	5.22	5.89	5.99	4.83	5.93
27 Public Admin And Defence; Compulsory Social Security	6.88	6.84	6.87	6.44	6.14	6.41	6.63	6.51	6.62	5.95	5.54	5.91	6.06	5.81	6.04
28 Education	6.70	6.32	6.54	6.31	5.79	6.11	6.59	6.22	6.46	5.55	5.40	5.49	5.54	5.21	5.44
29 Health And Social Work	6.84	6.36	6.66	6.62	6.26	6.49	6.58	6.13	6.44	6.17	5.37	5.90	6.23	5.53	6.03
30 Other Community, Social And Personal Service	6.45	4.87	5.97	6.26	5.60	6.05	6.33	5.67	6.18	5.92	5.27	5.75	5.95	5.08	5.72
31 Private Households With Employed Persons	6.58	6.52	6.54	6.69	6.29	6.44	6.40	5.94	6.03	6.31	5.95	6.03	6.33	5.93	6.04
Total	6.19	4.65	5.68	6.11	4.68	5.66	6.22	4.62	5.69	5.91	4.13	5.39	5.89	4.00	5.24

