All you wanted to know about Jobs in India – but were afraid to ask

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Executive Summary

    1. *Non-availability of benchmark employment surveys since 2011/12*

There is great uncertainty with regard to the status of job creation in the last four years i.e. since May 2014 when Mr. Modi became Prime Minister of India. The uncertainty has been caused by the lack of a large scale NSSO survey on employment – the last such survey was in 2011/12.

However, employment data conducted by the Labor Bureau for 2014 (EUS4) and 2015 (EUS5) are available. The EUS4 survey covers the period prior to Modi becoming PM, and thus presents an "ideal" initial condition reference point.

In this early 2014 survey, the estimated employment in India was 428 million for the age-group >=15 years. This is according to the principal status method of measuring employment. Our estimate for employment in 2017, according to principal status, is 449.8 million, a job gain of 12.8 million over the 2016 employment estimate of 437 million.

    2. *Economic Conditions since May 2014*

The Modi government has undertaken several economic reforms over the last four years, and it is important to assess the growth, and employment, benefits of these reforms. In addition, some reforms have been specifically geared towards employment – e.g. the emphasis on road construction (a labor intensive activity) and the MUDRA initiative (provision of loans to small entrepreneurs).

The first two years – 2014/15 and 2015/16 – after Modi became PM were drought years, only the fourth time in the last 150 years that this has happened. Droughts are not conducive to economic growth, nor conducive to agricultural (rural) employment.

The next two years the weather was normal, but two major economic reforms were undertaken – demonetization and GST. Both reforms have (had) several objectives; in the main, they have had a considerable effect on direct tax compliance (demonetization) and indirect tax collection (GST). Both these reforms introduce uncertainty, and hence, in the short-run, affect economic growth and employment generation.

In addition, the BJP government also inherited a broken state banking sector; NPA's at a decadal high and close to 8 % for state owned banks. Again, reform of banking is non-growth enhancing in the short run.

Finally, as if growth diminishing factors were not present in abundance, the Indian economy witnessed the largest increase in real policy rates post 2014. In May 2014, the monetary policy repo rate was at 8 % and CPI inflation was at 8.3 % i.e. a real policy rate of -0.3 %. The average real policy rate for fiscal year 2017/18 was 2.5 %, the highest observed in India since the start of the repo regime in FY2005 when the real policy rate was 2.07 %, and the third highest in the world (behind Brazil and Russia). Each 1 % increase in the real lending rate leads to a 0.5 % decline in non-agricultural growth.

Thus, there have been several factors arguing against "extra" employment generation in 2017/18.

3. *Jobs Promise by PM Modi.*

It is popularly believed that PM Narendra Modi had promised the generation of 10 million jobs a year. We find no record of any such statement. In the BJP Election Manifesto 2014, there is the following statement "The country has been dragged through 10 years of **Jobless Growth** by the Congress-led UPA Government". At a campaign rally in Agra in August 2013, candidate Modi did talk about the lack of job generation in the UPA years. In the speech, Modi promised that if the BJP/NDA was to be elected, they would create 10 million jobs for the youth of the country (youth defined as those younger than 35 years). This is the only reference to job creation. There is no reference to the promise of 10 million jobs per year that we could find.

4. *Jobs creation post 2013 and specifically 2017/18*

While there are no official employment surveys post 2015 (the Labor Bureau survey which interviewed individuals in the middle of the second successive drought year), there are several individual pieces of data suggesting a healthy growth in employment in 2017/18.

In addition, quarterly surveys of employment, conducted for only labor-intensive industries, and covering less than 5 % of the total workforce in the economy (establishments with more than 10 workers) are available. The last such survey was for October 2017 and it revealed that 3.85 lakh jobs were added between January and October 2017, or approximately 4.6 lakh jobs in 2017. This result, extended to the entire non-farm economy, yields the result that employment change was close to 8 million in 2017.

There has been a large emphasis on road construction in the last few years, and especially in 2017/18. Indeed, GDP growth of 5.8 % in construction in FY18 was the largest in the last six years. *Construction is a labor-intensive activity and we estimate that construction activity alone added between 1.7 and 3 million jobs in FY18.*

The recently released, but controversial, *EPFO (Employee Provident Fund Organization)* employment data suggests a healthy expansion of 7 million jobs in 2017 (Ghosh and Ghosh 2018). For the very young likely first timers – 18-21 years – EPFO job creation has been proceeding at close to a 2 million annual pace, with a worst case estimate of 1.8 million.

While there is no official government survey on employment since 2015 (NSSO-EU survey for 2017/18 covers the period July 2017-June 2018, and it is expected that the results of this survey will be made available over the next few months) there is a national employment survey for 2016 and 2017 – it is conducted by a private company, CMIE, in collaboration with BSE.

The raw results of the CMIE survey are for a 12 million job increase in 2017 for the 25-64 age group (15 million increase for men and a 3 million *decline* in female jobs). For all age-groups >=15 years, the CMIE shows an increase of only 1.4 million jobs.

However, adjusting the survey CMIE data for Census based population estimates (referred to as national account estimates in the text; all NSSO survey data estimates of employment are similarly transformed), 2017 was witness to a job loss of 2 million.

There appear to be mega inconsistencies in the CMIE survey, and major anomalies e.g. the CMIE data show the lowest share of female employment in the economy and less than half that observed in 2014. For example, in 2015 Labor Bureau survey, 22 % of all workers in the economy were women; in CMIE 2017, less than 12 % of all employees were women. In absolute numbers, there were 93 million women workers in EUS5; in CMIE 2017, there were only 47 million women workers!

5. *Our estimates of employment in 2017*

In this paper, we make two significant advances over the literature on employment change in India. *First, we construct a definition of employment that is consistent across the three sources of household level employment data* – NSSO, Labor Bureau (2014 and 2015) and CMIE (2016 and 2017).

Second, we adjust the anomalous labor and work-force participation rates in the CMIE data for eleven 5 year age-groups (15-19, 20-24…59-64 and >=65 years), and the two sexes. After the labor force participation adjustments to CMIE data (adjustments that make 2016 and 2017 the lowest labor force participation rates ever observed in India), we use the CMIE unemployment rates for 2016 and 2017 to estimate employment levels in 2016 and 2017.

These adjustments lead to a net increase of 12.8 million jobs in 2017 (principal status definition). This is unlikely to be the new trend growth of employment, as it contains a bounce-back from the earlier years of drought, and uncertainties induced by demonetization and GST.

For the 2013-2017 period (a span of 3.75 years) net job creation was 22.1 million – a pace considerably higher than the 11 million jobs created between 2004/5 and 2011/12.

6. *Labor force participation rates and jobs needed*

One of the main "conventional wisdom" conclusions about the labor market in India is that the labor force participation rates of women in India have declined, and declined "precipitously". This issue is examined in some detail and our preliminary conclusions are: (i) but about half the decline is explained simply by the fact that more women are attending school (and college) and hence half the decline is "artificial"; (ii) labor force participation rates for women have declined, but male participation rates (PR) have declined at about the same rate; (ii) after accounting for school enrollment, between 1999/00 and 2014, female PR declined from 36.4 % (principal status) to 33.6 %, and male PR declined from 92.8 % to 89.9 %. This issue, of both male and female LFP rates, is presently under study.

It is commonly believed (assumed) that India needs 10 to 12 million jobs a year to keep the unemployment rate constant. We find that this conclusion has not been valid since 2004/5 when the "required" rate was 10.2 million jobs a year. By 2011, this requirement was reduced to 8.3

million; and in 2017, the requirement was only 7.5 million. For 2022, the requirement is further lowered to 6.9 million.

One final conclusion – the estimate of jobs needed rests on the estimates of labor force participation rates, especially for women. If this rises, as we think it will, the requirement for job growth will remain at about 8 million jobs a year.

Introduction

It is of academic, policy, and political interest to examine the nature of job growth in India. That is the goal of this paper. We examine all data available relating to employment from 1999/00 to 2017. The data sources are the NSSO-EU surveys from 1999/00 to 2011/12, the Labor Bureau employment and unemployment surveys for 2014 and 2015 (EUS4 and EUS5) as well as alternative data sources like the Quarterly Employment Survey, the employee provident fund survey of jobs in the formal sector, and the private joint CMIE-BSE employment surveys for 2016 and 2017.

This paper primarily focuses on two specific issues. The first is to estimate the employment levels in the calendar year 2017 (or fiscal year 2017/18). The second is to estimate the number of jobs needed to keep parity with the demand for jobs in the next 5-year period. Although a number of surveys from various years are available, estimating employment in recent years is challenging due to the lack of reliable data. The last quinquennial survey on Employment-Unemployment was conducted in 2011/12. Since then NSSO has not published any large Employment-Unemployment survey. Of course, the Labor Bureau did undertake three surveys – in 2014, 2015, and 2016 – and we had access to the 2014 and 2015 surveys (referred to as EUS4 and EUS5). However, reliable data on labor market indicators after 2016 are not available.

The lack of data on such an important topic is unfortunate. The Union government has recognized the problem and starting October 2018, there will be a large-scale quarterly employment survey in urban areas and an annual employment survey in rural areas. Two major quinquennial NSSO surveys have been undertaken in 2017/18 (July 2017 to June 2018) – an employment-unemployment survey as well as a consumer expenditure survey. It is expected that some results from these two surveys will be available over the next six months or so.

In the meantime, one is left with speculation about employment generation in the Modi years, May 2014 onwards. Recently, an attempt has been made to capture, via employee payroll contribution to pension funds (EPFO), the extent of job generation in the formal sector in 2017. Unlike the US, this is not based on an establishment survey, but on ongoing employee contributions. These data have to be carefully processed to avoid double-counting i.e. if one was

already in the EPFO system, then one is not part of a *new* job. Ghosh and Ghosh(2018) have carefully processed the data, and have estimated that 7 million jobs were created in the formal sector alone in 2017 (the formal sector is about a third of the non-farm economy). The non-farm (non-cultivator) economy contains about 75-80 % of all jobs in India.

Survey data are needed for verification of the EPFO estimate and such data will not be available till the end of 2018. There is, however, a private sector survey of employment in 2016 and 2017 – one conducted jointly by a data service provider (CMIE) and BSE (Bombay Stock Exchange). *These data reveal only a 1.4 million job creation across sectors for all of 2017.*

Usually, official Indian survey data do not provide estimates of employment levels– instead, they report the ratio of employment to population (as well as other ratios – e.g. labor force to employment, etc.). To retrieve the employment levels, these estimated ratios need to be multiplied with the respective Census population equivalent estimate (for the age and sex group under consideration). If one does that with the CMIE data, the *corrected employment estimate of CMIE for 2017 shows a decline of 2 million jobs between 2016 and 2017.*

The reader will thus understand the puzzle that we face – two "credible" estimates of job growth in 2017, but one of the estimates has to be credibly incorrect. Once the NSSO data for 2017/18 are published, the debate about job-creation in 2017 should end. Until then, however, as is the nature of research, "credible" estimates of job growth in the Indian economy will continue to be made. Anticipating the results, our "best" estimates of job growth in India, in 2017/18, are 12.8 or 13.5 million depending on the definition of employment status used. We also find that rising educational attainments play a significant role in slowing the growth in labor force and employment. Additionally, our estimates suggest that about 7 million jobs need to created every year to keep pace with the demand for jobs in the next 5-year period (2017 – 2022). For each of these, we present the methods of calculation in detail and the interested reader can evaluate our estimate with respect to others – and yes, we will stand corrected if the NSSO 2017/18 data of employment generation in 2017/18 is substantially below our estimate of 12.8 million.

The plan of the paper is as follows. Section 2 describes the data sources, and definitions, used. Section 3 documents the method we employ to form a consistent employment series, across

time, and definitions. Section 4 discusses Survey Ratios and National Aggregates i.e. system of estimation of jobs via computation of important ratios like worker participation rate etc. Section 5 discusses the important simultaneous phenomena in India – the expansion in educational enrollment and decline in labor force participation (for both men and women). Section 6 outlines the employment generation reforms undertaken by the Modi government since 2014. Section 7 discusses the results on employment generation in India for the period 1999 to 2017. Section 8 presents estimates of jobs needed in India to keep the unemployment rate constant (and/or absorb population expansion). Section 9 concludes.

Section 2: **Data and Definitions**

The question of employment trends in India is clouded in uncertainty. Employment data are not consistently available, and definitions vary. This section discusses the available data on employment from a variety of sources, and the different definitions used.

Sources of data on employment

NSSO-EU surveys, 1999/00 – 2011/12

In the main, this study uses the large sample quinquennial National Sample Surveys (NSS) for the years 1999/00, 2004/5, 2009/10 and 2011/12. These NSS surveys provide a rich basis for examining labor force and employment issues. The NSSO Employment Unemployment (NSSO-EU) surveys have significant detail on the labor market and are the "gold standard" for analysis of labor force and employment trends.

The NSSO provides estimates for *five* different employment definitions. Three of these definitions have to do with long-term (365 days) employment. These three are usual principal status, usual secondary status, and usual *principal or subsidiary* status. The above three estimates come under the description of "usual activity status". The usual status definition pertains to employment in the *preceding 12 months*. Thus, for interviews conducted in July 2011 (the beginning month of EU surveys which run from July to June, corresponding to the agricultural

year in India), the employment reference period is from July 2010 to June 2011 (for usual and principal status) and centered on December 2010. The "reference" month for interviews conducted in June 2012 is December 2011. Hence, a July 2011-June 2012 interview yields usual activity status estimates centered on June 2011.

In addition, the NSSO-EU reports an estimate of weekly status of employment (i.e. were you employed on any day last week), and daily status of employment (what was your status on each of the seven days in the past week). Data on the daily status of employment, along with principal status, are used to build a comparable series of employment, 1999-2017 *for all definitions of employment.*

Labor Bureau Surveys, 2014-2015

For 2014 and 2015, the study uses Labor Bureau's Annual Employment and Unemployment Surveys (fourth and fifth rounds). Both surveys measure labor force and employment estimates based on the usual activity status definition of employment (i.e. usual (principal + secondary) or principal status (PS). It is PS which is primarily used in this study.

The field work of the annual surveys four and five, however, was less than 12 months unlike the benchmark NSS employment and unemployment surveys. Field work for the fourth round of labor bureau's annual employment survey (EUS4) was conducted between January 2014 and July 2014 and therefore the moving reference period as measured by the usual activity status centers around September 2013 (see discussion above on the "reference" month). In the tables presented in this paper the fourth round survey is referenced as taking place in 2013, not 2014. Similarly, the fieldwork for the fifth round (EUS5) was conducted between April 2015 and December 2015, therefore, the reference period as measured by the usual or principal activity status centers around January 2015.

What this referencing of survey means is that *the employment estimate for the 2014 survey is for economic conditions unaffected by the 2014 drought.* The 2015 survey, centered on January 2015, is

deeply affected by the 2014 drought, indeed its employment estimate is right in the middle of the drought year (Jan 2015).

CMIE employment and unemployment survey 2016, 2017.

Finally, the study employs data from CMIE, a private enterprise, to get comparable labor force and employment estimates for 2016 and 2017. CMIE, in collaboration with BSE, has published detailed statistical reports from their triannual employment and unemployment surveys for the years 2016 and 2017. These triannual reports are publicly accessible from CMIE's website, and have data by age-groups on employment, labor force participation rates and unemployment.

For the most recent two-year period, 2016 and 2017, the CMIE's Consumer Pyramid Survey is the **only** source that presents employment statistics[1]. It is a monthly household survey that collects the most basic labor market information – age, sex, and whether the person was employed. So far CMIE has published six reports based on the surveys conducted during 2016 and 2017. (Three for each year, January-May, June-August and September-December). While the labor market statistics in these reports are useful, using them to assess the changes in the labor market statistics from years (mostly from NSSO-EU surveys) is complicated due to several reasons.

The CMIE data on employment is of a radically different nature than the NSSO and/or Labor Bureau surveys. While the sample size of these surveys is large [>500,000], the questions asked are minimal (age, sex, employed, unemployed (seeking work) or not in the labor force). The minimality of the questions should theoretically lead to better estimates, *if the survey has been conducted properly.* A large part of accuracy has to do with honesty in reporting by the interviewer and interviewee, and by the derivation, and accuracy, of the sampling weights. While one can say little about the former, it is the case that the "accuracy" of the CMIE surveys is severely in question. Why and how this is likely to be the case is documented in some detail in Section 7.

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[1] 'BSE-CMIE Unemployment in India: A Statistical Profile'. These reports are available since 2016.

However, before we get to assessing the accuracy of the CMIE data (accuracy relative to NSSO surveys) there is the important question of the matching of NSSO (and labor bureau) definitions with that of CMIE.

Matching CMIE definitions/data with NSSO definitions/data

CMIE definition of employment is a mixture of daily and usual principal status. CMIE's definition of employment is somewhat different from NSSO-EU's definition of employment. CMIE asks whether the survey respondents worked on the day of the interview. If the respondents did work on the day of interview, CMIE classifies them as employed. If the respondents did not work on the day of the interview, but worked the day prior to the day of the interview, CMIE classifies them as employed. However, if the respondents did not work on any of these two days but *usually* worked over the past year, CMIE also classifies them as employed[2].

NSSO on the other hand uses three definitions of employment for all the years 1999/00 – 2011/12.[3] The first is the *usual status* where respondents were asked about their activities during 365 days prior to the date of interview. The usual status has two components: the principal usual status and subsidiary usual status. The principal usual status is the activity status in which respondents spent longer time (i.e. majority time criterion) during the 365 days prior to the date of interview. The subsidiary status is the activity status in which respondents spend a shorter period of time during the 365 days prior to the date of interview.

The second definition is the *weekly status* where respondents are considered working if they worked at least one hour on at least one day during the 7 days prior to the date of interview. The third definition is *daily status* where respondents report their daily activities during the 7 days prior to the date of survey. Based in these daily responses their daily status is determined[4].

As evident from these definitions, NSSO's definition of employment substantially differs from CMIE's definition. As a consequence, CMIE's employment estimates cannot be directly compared to the employment estimates from the NSSO surveys.

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[2] For further details, see BSE-CMIE Unemployment in India: A Statistical Profile reports.
[3] See various NSSO-EU reports on Employment and Unemployment in India.
[4] For details, see various rounds of NSSO Employment Unemployment reports.

Our goal is to construct a comparable series of employment across years and surveys. To make any meaningful comparison, it is imperative to ensure that the methods computing the employment levels must follow the *same definitions across surveys*. It should also be noted that our *preferred* employment measure is principal status (and related variables like labor force and unemployment). This choice is made because principal status separates the respondents whose primary activity is to work from those whose main activity is something other than work. In addition, primary status is what is used by CMIE if the interviewee did not work the previous two days.

Section 3: Towards a comparable definition of employment

We construct a definition that makes NSSO and CMIE employment estimates comparable. NSSO collects a variety of information which can be used to construct a definition of employment which is strictly comparable to that used by CMIE. This definition allows us to construct a daily-adjusted series of employment from 1999/00 to 2017.

Each NSSO survey records respondents' daily activity status and intensity of engagement in each of those activities for 7 days prior to the interview dates (daily status and intensity). On each of these days, the respondents report their activity status and the amount of time they spent on each activity (zero, a half-day or a full-day). We use this information to apply CMIE's employment definition to construct a *new* employment definition for NSSO surveys. As in CMIE, we classify a person to be employed if he or she worked on the day preceding to the day of interview. If the person did not work on the day before the interview day but worked 2 days prior to the interview date, we classify him/her as employed. In case the respondent did not work on any of these two days, but usually worked over the year (*according to NSSO usual principal status*), we classify him/her as employed.

This procedure creates a definition of daily employment that is comparable to CMIE's definition of daily employment. In the same manner we construct a new labor force definition. We classify a person as a part of the labor force if he or she either worked or looking for work on the day

preceding the day of the interview. If a person did not work or look for work on the day before the interview day, but did work or look for work two days prior to the interview date, we classify him or her as a part of the labor force. In case the respondents did not work or look for work on any of these two days, but usually worked or looked for work over the year (according to NSSO usual principal status), we classify them as a part of the labor force.

Based on these definitions of employment and labor force status, we compute the number of people employed and number of people in labor force from NSSO 2004/5, 2009/10 and 2011/12. In terms of definitions, our NSSO employment *definition* (combination of principal and daily status) are now fully comparable to the CMIE *definition* of employment. Hence, we have comparable data for all the NSSO years (2004/5 to 2011/12) and for CMIE years 2016 and 2017. However, the Labor Bureau data for 2013 and 2014 does not have any information on daily employment status, and neither does the 1999/00 NSSO data. What is common to the NSSO and Labor Bureau surveys is the data on principal status, a feature we will use to estimate the Daily-PS data for all the years 1999/00 to 2017.

While we use unit level data for the NSSO and Labor Bureau (LB) surveys, we only have access to the CMIE data according to the following 11 age-sex groups: ages [15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64] and a catch-all eleventh group, >=65 years. For purposes of analysis we have converted all the individual level NSSO and Labor Bureau data into these 22 age-sex classifications.

Summarizing, our procedure to obtain comparable labor market data, across definitions and across years, is as follows. First, we transform all survey data to make all variables consistent with Census derived population data. Second, we convert NSSO daily and principal status data for 2004/5, 2009/10 and 2011/12, to the hybrid daily-principal CMIE definition of employment. Third, we estimate daily-principal for 1999/00, 2013, and 2014 based on principal status data for these years. Fourth, we "forecast" labor force trends for 2016 and 2017 based on the trend for labor market variables for daily-principal data for 2011 through 2014. Fifth, we use the change in the CMIE unemployment rate between 2016 and 2017 to obtain employment levels for 2017. And sixth, we use the daily-principal series which we now have for all the years to estimate

employment levels for the definitions for which we have partial data (e.g. weekly status data are only available for the NSSO years.)

Section 4 – Survey Ratios and National Aggregates

Official government of India reports on the labor force, employment and unemployment present employment related results in the form of *ratios* – the ratio of the labor force to the population (labor force participation (LFP) rate), the ratio of the work force to the population (called the worker participation (WP) rate), and the unemployment rate (the ratio of those unemployed to those in the labor force).

NSSO data only report on the two ratios WP and LFP i.e., **NSSO does not report total employment for any age-sex group**. Why? Because the NSSO survey estimate of absolute levels of each of the three variables – population, labor force, and employment - are not considered reliable. The data on the total population in the economy (of particular age-groups etc.) as measured by the surveys are notoriously inaccurate. Studies done by the NSSO itself point to an under-estimation of around 5 to 10 % for the total population in any given survey year *("Review of Concepts and Measurement Techniques in Employment and Unemployment Surveys of NSSO"*, NSSO (SDRD) Occasional Paper/1/2008). If the analyst does not account for this possible discrepancy, gross errors of interpretation, or judgement, can be made.

However, the ratio estimates are considered to be more accurate (because the error present in population cancels out). The ratios are multiplied with more reliable population levels to arrive at the employment figure. For the census years, we draw data from census population data, whereas for the non-census years the population in non-census years, we draw data from the "demographic extensions" in UN data.

The Census equivalent population for each age-sex group is taken from the UN (2015); the UN estimates are based on Census data extrapolated for future years via assumptions of fertility (we take the medium variant). These UN population estimates are taken for each age-sex group and multiplied by the relevant ratios obtained in the survey data to arrive at an estimate of working population, labor force, and employment for each age-sex group. For example, the survey employment to working population ratio is multiplied by the UN (hereafter referred to as Census) population estimate to obtain the national account (NA) estimate of employment.

This is exactly the procedure followed by "official" estimates of employment based on NSSO surveys. In the tables, these adjusted (transformed) values are reported as adjusted values.

To obtain census-equivalent estimates of employment etc., we estimate the following five variables for each age-sex classification:

(1) Working age population (WAP)

(2) Labor force – i.e. those working or willing to work;

(3) Employment

(4) The *ratio* of employment to labor force.

(5) The *ratio* of labor force to WAP – i.e. the labor force participation rate.

Constructing a comparable and consistent employment series (CMIE's definition), 1999-2017

Our goal is to provide a consistent series on employment for all the survey years 1999/00 to 2017. For all the NSSO and Labor Bureau survey years (1999/00 to 2014), there is only one common definition of employment for which all the surveys report employment – principal status. The CMIE definition of employment, however, is slightly different. It is based on a mixture of daily and principal status; which we term as *Daily-PS*. Hence, one method to definitionally link the labor market data across surveys is to construct a consistent consistent employment series from 1999/00 to 2014 based on the PS and CMIE Daily-PS definition. We construct such as series of employment from 1999/00 to 2017 assuming that the rates of change of employment stay the same regardless of definition (a very safe and innocuous assumption)[5].

We follow the following sequence of conversions. First, we create the Daily-PS definition for the 2004/5, 2009/10 and 2011/12 based on the available daily and principal status information in these survey years. We then obtain Daily-PS employment estimates for 2004/05 to 2011/12

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[5] This assumption can be verified from NSSO 2004/05, 2009/10 and 2011/12 data. Estimates based on PS and Daily-PS definitions can be obtained for all three years. Thus, the growth in each of the estimates across definitions can also be assessed. For instance, the growths in employment between 2004/05 and 2011/12 are very similar across these definitions (2.6 percent for PS definition and 2.3 percent for Daily-PS definition respectively).

survey years. This means that both Daily-PS and PS employment estimates are now available for 2004/05, 2009/20, 2011/12. The computation of the Daily-PS estimate of employment for NSSO 1999/00 is not possible because data for per day activity in the week was not collected (unlike subsequent NSSO years). However, labor force, employment, and unemployment based on the principal status definition can still be estimated for these survey years. Based on the *changes* in these principal status estimate for labor force participation and we extrapolate the Daily-PS employment for 1999/00.

That this procedure is reasonably accurate is revealed by the rate of growth estimates of PS (available in NSSO) and PS-daily (constructed by us) for the period 2004/5 to 2011/12. The former shows an increase of 10.9 million; the latter an increase of 10 million.

This same procedure is followed to obtain the Daily-PS series for the Labor Bureau Surveys for 2013 and 2014 (EUS4 and EUS5). Theoretically, with these adjustments we have the Daily-PS estimates for all the years 1999/00 to 2017. However, as mentioned earlier (and discussed in detail in Section 5) the CMIE results on labor force participation for women are not within the ballpark of any known estimate for India (or for that matter in the world, circa 2015). Hence, we need to construct a Daily-PS series for the CMIE years which uses information from CMIE results and is consistent with official employment surveys.

We suggest the following method, a technique which preserves almost (all) attributes of the CMIE data. The procedure is almost identical to that used for deriving Daily-PS estimates for NSSO 1999/00, and Labor Bureau 2013 and 2014 surveys. To obtain Daily-PS estimates for 2016, we take the rate of change in Daily-PS LFPR (and unemployment rate) from 2013 to 2014 and assume that this rate of change persists in the change in LFPR (and unemployment rates) from 2014 to 2016. In other words, we are allowing Daily-PS LFPR to follow a trend (usually decline) for all the twenty-two age-sex groups.

This leaves estimation for 2017. Two options are available – assume the same rate of change, as observed in 2011 to 2014 to persist in 2017. If this assumption is made, the female LFP rate declines to 22.3 % in 2017, roughly the same as in Saudi Arabia and the third lowest in the world, behind Algeria (17 %) and Iran (16.3 %). Or assume that LFP rates (especially for women

– on average, the LFP rates for men show an increase in 2016!) remain the same in 2017 as in 2016.

There are at least three reasons to assume that the likely LFP rates are *higher* in 2017 than in 2016. First, that female LFP rates in 2016 are historically, and comparatively, very low; second, and more importantly, economic conditions improved in 2017. Third, that CMIE unemployment rates for women (and men) are significantly lower in 2017 relative to 2016 – for example, CMIE unemployment rate for men declines from 8.4 % in 2016 to 5.8 % in 2017; for women, the decline is from 26.6 % in 2016 to 17.1 % in 2017. Another indication that the raw CMIE data for 2016 and 2017 are problematical are these historically high unemployment rates for women.

Note that the 2016 is an average for the calendar year 2016. De-monetization was announced on November 8, 2016, and it cannot be the "cause" for the high unemployment rate in 2016. Further, 2016 was a normal agricultural year, after two successive droughts. Thus, as a *worst-case* estimate, we assume that the LFP rates for both men and women stay at the same historically low level in 2017 as in 2016.

Knowledge of Daily-PS labor force participation rates for 2017, and the change in CMIE unemployment rate from 2016 to 2017, allows the estimation of Daily-PS employment (and unemployment) in 2017. With this estimation we are able to have a consistent Daily-PS series for the three labor-market variables of interest – LFP rates, unemployment, and employment – for the 22 age-sex groups. This consistent Daily-PS series allows the estimation of the missing labor market variables for all definitions of employment e.g. principal status, usual status, daily status and weekly status.

Section 5a – Education and Labor Force Participation (LFP) rates – Any link?

The determinants of labor force participation are in large part the determinants of employment. The former reflects supply, and the latter is what results from a resolution of supply and demand. Historically, as fertility rates have declined, the labor force participation rates of women have tended to increase. One other factor associated with female LFPR is the increase in educational attainment. As women get more educated, they tend to participate more in the

formal labor market, and this increase in formal work shows up in an increased participation rate.

But the most talked about statistic is not the comparatively low LFPR of women in India but also the decline in labor force participation over the last decade, termed the "precipitous drop" by World Bank authors Andres et. al. (2017). Co-incident with this drop is the observation that there has been a large increase in school (school and college) enrollment. Are the two linked or is it a case of correlation not causation?

It is well known that individuals invest in human capital to enhance their earnings capacity. Typically, this process takes place in two phases. In the first phase individuals invest full time in production of human capital enhancing their productivity. This is the phase of specialization in human capital production or commonly known as schooling where individuals enroll full-time in educational institutions. In the second phase, individuals devote one part of their time to work and receive earnings, and devote the other part to accumulate skills that raises their future earnings. This phase is commonly known as work where individuals receive on-the-job training.

Although the activities in these two phases may seem different, from the perspective of earnings they are very similar. Both activities enhance productive capacity which raises individuals' future earnings. Both incur the similar type of cost, namely foregone earnings. The factors (e.g. innate ability, ease of credit constraint for education etc.) that raises the time in school also raises the time invested during on-the-job trainings. Thus, one cannot be separated from the other, especially in the context of employment. What that means is that *school attendance* must be considered as an integral part of the *employment process*.

Going to school is not much different than a job in terms of "labor force activity". Indeed, Nobel prize winner Gary Becker outlined in his "Allocation of Time" article how the choice of going to school (and college) is really a choice about employment and occupational choice post schooling.

One of the big "missed" stories on employment in India (and other developing economies undergoing this transition), indeed the biggest story, is what has been happening to educational enrollment over the last twenty odd years. Bhalla-Kaur(2011) were the first to empirically point out that labor force participation rates appear *distorted* because of this educational expansion.

The simple point is that in order to interpret employment and associated data, we need to incorporate the changing dynamics of education. Labor force can alternatively be defined as the conventionally defined labor force (employed + unemployed) plus those attending school/college on a full-time basis (code 91 in the employment survey codes, NSSO and LB data.

Table 1 documents the increase in educational enrollment for the young (15 – 24 years). Enrollment increased from 49 million (m) in 1999 to 99 m in 2011. [The tables truncate the NSSO year to just the first year e.g. 1999/00 is 1999}. Total population in this age-group increased from 199 m to 230 m i.e. the fraction going to school in 1999 was 25 %; in 2011, this fraction was 43 %.

Table 1: Population, Schooling, Labor Force & Employment among Youth[1], 1999-2017

	1999	2004	2009	2011	2013	2014	2016	2017
				(in mil)				
Population	198.8	215.4	226.9	230.1	232.3	233.4	235.4	236.2
Enrolment	49.2	59.3	87.7	98.7	103	105.3	107.8	109.1
Labor Force - PS[2,3]	89.1	96.7	82.7	76.9	72.3	65.9	60.1	60.4
Labor Force - PS, adjusted	138.3	156	170.5	175.6	175.3	171.2	149.6	150.2
LFPR - PS	44.8	44.9	36.5	33.4	31.1	28.2	25.5	25.6
LFPR - PS, adjusted	69.6	72.4	75.1	76.3	75.5	73.3	63.6	63.6

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16; NSS Surveys 04/05, 09/10, 11/12; MOSPI; "Unemployment in India", CMIE, Statistical Profiles 2016, 2017; World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.
Notes: 1) Youth are defined as the age group between 15-24 years old.
2) Estimates of Labor Force and its derivatives presented are as per principal activity status (PS).
3) The survey estimates (raw data) are adjusted by gender and age-group population, as per Census - National Accounts (NA); population data for non-Census years obtained from UN. See text for more details.

Now consider the implications for the labor force (principal status) for this age group. The labor force *declined* by 12 m from 89 m to 77 m!

Note the decline in LFPR for the young (listed as LFPR-PS in the table) – there is indeed a precipitous drop – from 44.8 % in 1999/00 to 33.4 % in 2011. But, after accounting for school enrollment, (LFPR-PS adjusted), the participation rate for the young increases from 70 % in 1999 to 76 % in 2011.

Table 2 presents detailed data on LFP rates for the age-group 15-24 years, and Table 3 presents the data for the adult population (> 25 years) and Table 4 for the working age population (ages >=15 years). The conventional LFP rate, as well as LFP adjusted for education, are presented for all the years 1999 to 2017. This allows us to examine the nature of the drop in LFP rates for both

men and women. While the table presents data for all the years, in the discussion we will concentrate on the 14 year period, 1999/00 to 2014.

Table 2: Trends in Labor Force Participation Rates among Youth, 1999-2017

	All		Men		Women	
	PS[1]	PS adjusted[2]	PS[1]	PS adjusted[2]	PS[1]	PS adjusted[2]
	(in %)					
1999	*44.8*	*69.6*	*64.1*	*94.2*	*24*	*42.9*
2004	44.9	72.4	63.9	96.3	24.3	46.5
2009	36.5	75.1	53.8	98.6	17.5	49.5
2011	33.4	76.3	50.5	99.1	14.8	51.4
2013	*31.1*	*75.5*	*44.1*	*94.1*	*16.9*	*55*
2014	*28.2*	*73.3*	*41.3*	*92*	*13.8*	*52.8*
2016	*25.5*	*63.6*	*38.6*	*83.8*	*11.1*	*41.2*
2017	*25.6*	*63.6*	*38.6*	*83.8*	*11.1*	*41.2*

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16;NSS Surveys 04/05, 09/10, 11/12; MOSPI; World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.
Notes: 1) The survey estimates (raw data) are adjusted by gender and age-group population, as per Census - National Accounts (NA); population data for non-Census years obtained from UN. See text for more details.
2) The population adjusted estimates are further adjusted accounting for School and College Enrolment. See text for more details.
3) Data is presented for the age group 15-24 years old.
4) Estimated data is in Italics.

Several major conclusions follow.

First, there is a decline in LFP rates for the youth according to the conventional labor force definition for PS, and the decline in LFP rate for men is more than twice that for women! For men, the decline is 23 ppt (between 1999 and 2014) and for women, the decline is 10 ppt. For all young workers, the decline in LFP is about 17 ppt. This group accounts for approximately 15-20 % of the total labor force, so the decline in LFP for the population>=15 years (Table 4), due to the decline in youth LFP, is about 3 ppt.

Adjusted for schooling, the trend in LFP tells a fascinating, and different story. For young men, there is a minor decline of 2 ppt – from 94.2% in 1999 to 92 % in 2014. For young women, there is an increase of 10 ppt in the LFPR (from 42.9 % in 1999 to 52.8 % in 2014). Over the years, young women have gradually caught up with men in terms of educational attainment. This trend, of female catch-up, is worldwide and has been documented in some detail in Bhalla(2017).

This comparative performance of young men and young women for years prior to the CMIE data is also indicative of the "fact" that CMIE LFPR rates are not consistent with historic data, and historic trends.

Table 3: Trends in LFPR among Adults, 1999-2017

	Principal Activity Status (PS)[1]		
	All	Men	Women
	(in %)		
1999	63.5	91.8	33.4
2004	64.7	92.1	35.8
2009	61.3	92	29.2
2011	59.8	91.7	26.3
2013	58.5	87.3	28.5
2014	58.3	88.6	26.7
2016	58.1	89.8	25.1
2017	58.1	89.7	25.1

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16;NSS Surveys 04/05, 09/10, 11/12; MOSPI; World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.
Notes: 1) Data is presented as per the principal activity status.
2) The survey estimates (raw data) are adjusted by gender and age-group population, as per Census - National Accounts (NA); population data for non-Census years obtained from UN. See text for more details.
3) Data is presented for the age group 25 years and above.

Table 3 presents the data for adults (>= 25 years). This group is not much affected by increases in educational enrollment so just the data for LFPR-PS are reported. Two distinct trends emerge. First, that for both men and women there is a decline in the LFPR, but that the decline for women (6.7 ppt between 1999 and 2014) is slightly more than double the rate for men (3.2 ppt). Second, that the decline for women was over by 2011, and indeed the Labor Bureau data for 2013 and 2014 shows a marginal increase in LFPR between 2011 (26.3 %) and 2014 (26.7 %). Note that the principal status data for 1999 to 2014 has not been adjusted by us – these are the original survey figures (adjusted by Census population data).

For adult men, however, the pattern is slightly different. The LFPR stays constant at 91.8 % between 1999 and 2011, but then declines by 3 ppt to 88.6 % in 2014. Though this deserves a separate study (and explored in Das-Bhalla-Kaur(2018)), the phenomenon of declining labor force participation rates for men appears to be a global phenomenon. For both men and women, in developing economies excluding the Middle East, LFPR rates have declined by an average of 3 ppt between 2000 and 2015.

Table 4 presents the trend in LFP rates for the entire (age>=15) population. Traditional LFP rates show a large decline of 7.5 ppt - from 57.9 % in 1999 to 50.4 % in 2014. However, adjusted for schooling, the decline is a much smaller 3 ppt – from 65.5 % to 62.5 %.

There is no question that there is a decline in the LFPR of (men) and women; it is just the magnitude that is in question. There are three papers that one or both of us are involved in that explore this important question; see Das-Bhalla-Kaur (2018), Kaur et al (2016) and Bhalla-Kaur (2011) for details. The transition from poor to emerging middle class to middle class – and/or from uneducated to educated – may provide some clues. There is even the (likely) possibility that LFPR for women will increase from now on (in India).

Table 4: Trends in Labor Force Participation Rates, All Ages, 1999-2017

	All		Men		Women	
	PS[1]	PS adjusted[2]	PS[1]	PS adjusted[2]	PS[1]	PS adjusted[2]
			(in %)			
1999	*57.9*	*65.5*	*83.5*	*92.8*	*30.6*	*36.4*
2004	*58.9*	*67.1*	*83.8*	*93.5*	*32.5*	*38.9*
2009	54.4	65.4	81.2	94.1	26	35
2011	52.6	64.5	80.4	94.1	23.2	33.2
2013	*51.3*	*63.3*	*75.6*	*89.4*	*25.5*	*35.6*
2014	50.4	62.5	*76*	89.9	23.4	33.6
2016	*49.8*	*59.8*	*76.5*	*88.6*	*21.6*	*29.3*
2017	*49.9*	*59.7*	*76.5*	*88.5*	*21.6*	*29.2*

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16;NSS Surveys 04/05, 09/10, 11/12; MOSPI; World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.

Notes: 1) The survey estimates (raw data) are adjusted by gender and age-group population, as per Census - National Accounts (NA); population data for non-Census years obtained from UN. See text for more details.
2) The population adjusted estimates are further adjusted accouting for School and College Enrolment. See text for more details.
3) Data is presented for the age group 15 years and above.
4) Estimated data is in Italics.

Section 5b – CMIE data on Labor Force Participation rates – How Reliable?

Labor Force Participation rates – CMIE data for 2016 and 2017

We had mentioned earlier that the CMIE estimates of LFPR were not very "reliable". We now document why we reach that conclusion. The CMIE data problem is the following – it allows the female labor force participation rate (FLFPR) to drop to historically low levels for India, and one of the lowest in the world over the last 40 years. The raw CMIE data (Daily-Original in Table 6) indicates a FLFPR of 11.7 % in 2017 for the age group >=15 years. The last available estimate of LFPR for the (CMIE) Daily-PS definition is for 2014 – 26.4 % (in the 2011/12 NSSO survey the estimate is 26.2 %). If the CMIE raw data is correct, then this is a very steep fall, from 26.4 % to 11.7 %, in just three years.

Analysis for other countries suggests that such a fall in LFPR only occurs in war times. For men, Daily-PS data does not show much of a decline – from 80.7 % in 2011 to 74.3 % in 2017, a decline of 6 ppt or (log) 8.2 %. For women, the decline is 14.5 ppt or a decline of (log) 81 percent. In other words, for the same time-period, the decline in LFPR is ten times greater for women than women.

How unusual is the CMIE data for the *ratio* of declines in LFPR for women and men? Note that for CMIE data the ratio is +10. According to World Bank data for over 150 countries, there is no parallel to the CMIE estimate. Indeed, the highest ratio observed for male LFPR decline of less than 3 % is Uruguay in 1974. In that year, male LFPR decline was 3 %, female LFPR decline was 23 %, yielding a ratio of 7.5. While the CMIE estimate of female LFPR for 2017 is the lowest in the world post 2000 (excluding war torn Iraq, and the Arab countries of Algeria and Yemen), its estimate of the log decline in male and female LFPR is the highest in the world, and that too by a large margin.

Section 6: Employment Generation Reforms since 2014

At a campaign rally in Agra in August 2013, BJP PM candidate Mr. Narendra Modi stated that if the BJP were to win the next election, that it would, unlike Congress, provide 10 million jobs to the youth of the country (the youth defined as those under 35 years of age). The BJP manifesto talks about job creation, but does not mention any specific number. Indeed, we have not been able to find any public record of a public promise of the number of jobs by the BJP government. Nevertheless, the belief persists that the BJP (Modi) promised to *deliver 10 million jobs a year*, and the fact that this has not happened, is a promise not kept. [Note how 10 million jobs for the youth has metamorphosed into 10 million jobs a year).

The veracity of job promises notwithstanding, it is a fact that the Modi government has been conscious of implementing policies linked to job creation. Towards this end, it has initiated a number of economic and labor market reforms. Some of these reforms are expected to yield results within a short period of time, whereas others are structural in nature and are expected to deliver over a longer time horizon. But irrespective of the time factor, these reforms are expected to either directly or indirectly boost employment. We discuss some of the potential employment generation reforms below.

MUDRA

On April 8 2015, Government of India announced the creation of MUDRA (Micro Units Development & Refinance Agency). The primary objective of this scheme is to bring small or micro enterprises into the financial system and thereby boost employment generation. It is essentially a refinancing initiative where MUDRA helps various commercial banks, small finance banks, co-operative banks and other lending institutions to finance small or micro business units. Any non-corporate, non-firm, small or micro enterprises may participate in this scheme and seek a loan of 10 lacs or less to develop its business.

The performance of the scheme in the past three years shows significant promise for employment generation. The total amount sanctioned for the scheme has almost doubled since its inception (in 2017-18, around 254 thousand crores (thcr)). The number of new loans

sanctioned have also increased from 35 million in 2015/16 to 40 million in 2016/17 and 48 million in 2017-18. If it is assumed that each Rs. 10 lac loan creates at least half a new job, then the scheme has possibly generated a total of 4 million new non-farm jobs in 2017-18 (derived as 8 million new loans in 2017/18 each providing half a job – note it is the change in number of loans disbursed in 2017/18 relative to 2016/17 that provides the change in jobs estimated as 4 million).

The government has also introduced a number of structural reforms to ensure a smoother functioning of the labor market. Among these, labor law reforms are most prominent. Reforms that aim to enhance workers' rights[6] can potentially raise workers' productivity. Similarly, the reforms that restrict child labor[7] can raise productive capacity of the future workforce. Introduction of Skill-India project is another reform that aims to enhance productive capacity of the future workforce through human capital investments.

The government has also introduced a number of business centric amendments to facilitate "ease of doing business".[8] These steps incentivize entrepreneurship by lowering transactional costs, and thereby raises the possibility of more investment. In the FY19 Budget, the government proposed to contribute 12 percent of employees' contribution towards their Employee Provident Fund; *this applies to all new employees.* The scheme (Pradhan Mantri Rojgar Protsahan Yojana (PMRPY) Scheme was started in April 2016 with the government committing to payment of 8.33 %; this has now been expanded to the entire 12 % contribution that is required.

This social security initiative may have profound implications for work efforts and savings behavior of the workforce. Even though each of these initiatives differs from the others, and aims to achieve different goals, in totality they can potentially improve the labor market functioning by benefitting the stakeholders, that is the employers and the employees. It is too early to make an estimate of its impact on employment, though a minimum of a million new

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[6] Maternity Benefit Amendment Act, 2017, The Employee Compensation Act, 2017 etc.

[7] Child Labor Amendment Act, 2016.

[8] For instance, the amendments such as Ease of *Compliance to maintain Registers under various Labour Laws Rules (2017)*, Model Shops and Establishments (RE&CS) Bill (2016), Rationalization of Forms and Reports under Certain Labour Laws Rules (2017).

jobs a year may not be far-fetched.

Road Construction

There is yet another policy initiative of the Modi government which may have had a solid contribution to employment generation – road construction. Construction of roads and rural roads in particular comes with a lot of positive externalities. Khandker et al. (2009) show that in Bangladesh the rehabilitation of rural roads has reduced poverty by raising agricultural production, wages, output prices and by lowering input and transportation costs. The study also finds that rural roads also lead to higher girls' and boys' schooling and further states road investments are pro-poor, meaning the gains are proportionately higher for the poor than for the non-poor.

More recently and pertaining to the Indian context, Aggarwal (2017) analyses the impact of Prime Minister's Rural Road Scheme between the years 2001 and 2010 and finds that road construction lowers prices paid by rural households for goods produced in urban areas; increases availability of non-local goods, and increases the labor force participation rate of prime-aged women.

Between March 2009 and March 2014, construction of highways increased from 70934 km to 91287 km, or an increase of 20353 km over 5 years, or an average building rate of 11.2 km a day. In FY17, per day construction of highways averaged 22.6 km a year and FY18 topped 27.3 km/day. A 21 % increase in the pace of road construction in FY18 and is bound to have added jobs in FY18.

An RBI Working Paper by Misra-Suresh, *Estimating Employment Elasticity of Growth for the Indian Economy*, 2014, documents that construction has the highest employment elasticity of all the sectors, 1.13, compared to an average of 0.19 for the entire economy. In the 2011/12 NSSO survey, the share of employment in construction was 10.6 %; in 2009/10 the share was 9.6 %. On a base of 450 million, jobs in construction increased by 4.5 million between 2009/10 and 2011/12.

Highway road construction between 2009/10 and 2011/12 increased from a rate of 70934 km to 76818 km – an increase of 8.3 %. According to the NSSO surveys (for occupational category 931

– road construction) jobs increased from 21.2 million in 2009/10 to 22.4 million in 2011/12 – an increase of 1.2 million jobs associated with an 8.3 percent increase in road construction.

GDP data for FY18 is also very revealing and indicative of solid job creation in the construction sector in FY18. In 2011/12, GDP growth in construction averaged 5.8 %. Since then, *FY18 is not only the first year in which construction growth has topped 4 %, but it is also the first year in which construction growth has matched the 5.8 % average of 2011/12.* Incidentally, as far as *acceleration* in construction growth is concerned, acceleration of 4.4 ppt (1.4 to 5.8) in 2018 *is the highest in the last twenty years.*

This increase in GDP growth (in construction) is bound to have had a handsome effect on employment growth in FY18. How much impact? As noted above, the elasticity is close to 1.13 i.e. a rough calculation would be that increase in construction jobs in 2018, if past elasticities hold, would be close to 5.7 percentage points. *On a base of 10 % of total non-farm jobs in construction (or 35 million), a 5.7 ppt increase means an additional 2.0 million jobs.*

An alternate calculation of jobs in construction: Surface road construction, as shown above, increased by 21 % in 2017/18. *If the 2009/10 to 2011/12 relationship holds (8.3 per cent increase in road construction means 1.2 million jobs), this means that (1.2*2.5) or 3 million jobs were added via road construction alone in 2017/18.*

Adding it all up (road construction, MUDRA loans, pension fund contributions) a 3-5 million job addition from these schemes alone in 2017/18 seems a reasonable, and conservative, estimate. In the next section, we summarize all the available evidence with regard to job creation in 2017/18.

 [Note that preliminary results of the NSSO employment survey for 2017/18 should be available over the next few months – we await anxiously whether our estimates are in the ballpark of the NSSO estimates].

Section 7 – Results on employment, 1999/00 – 2017

In this section, we turn our attention towards estimates of employment in the post 2014 period. This estimate is of great policy and political concern, and relevance. This is the first year in the four-year Modi regime that the Indian economy has not suffered from shocks. The first two years were severe drought years; the third year - 2016/17 – contained a demonetization shock (November 2016). Hence, calendar 2017 (and more likely FY18, starting April 2017) is the first "clean" year to understand employment (and GDP) trends in the economy.

There is both a large scale NSSO EU survey presently underway (July 2017-June 2018) as well as a consumer expenditure survey. The former will form the basis of an annual rural survey and a quarterly urban survey starting October 2018. There will not be a surfeit of data, but more than adequate data, for studying the Indian economy, and the all-important job trends starting October 2018.

This year is also a big election year (though that is the case every year in India!) and national elections are scheduled for April 2019. Hence, there is more than a casual interest to what happened to job growth in India in 2017/18, a subject to which we now turn.

   A. Quarterly Economic Survey Estimates of Employment

Since 2016, the government has been conducting a Quarterly Economic Survey (QES). While used by many as an indicator of employment (e.g. *"Stagnant Employment Growth"* EPW, Vol. 52, Issue No. 38, 23 Sep, 2017.), *it* **is** *not* **a valid indicator of employment for the entire economy**. The QES covers only the non-agricultural sector and within this sector, only firms which are part of 8 non-farm sectors i.e. Manufacturing, Construction, Trade, Transport, Education, Health, Accommodation & Restaurant and IT/BPO. The basis of the QES is the Sixth Economic Census (SEC) of 2013/14, "according to which 58.5 million establishments were found to be in operation employing 131.29 million persons….the aforesaid 8 sectors constitute approximately 15 % of the total employment (131.29 million persons) as per 6th EC (Ministry of Labour, 2018, p1). Hence, the QES coverage is approximately 20 million workers (.15*131.3).

Two questions arise with respect to the use of the QES survey. First, the extent to which the number of jobs of the 20 million covered in the QES (> 10 workers) matches the growth in the remainder of the establishments not covered by the QES (111 million workers). Second, the extent to which knowledge about 131 million workers helps predict job growth in the rest of the non-farm economy (220 million workers). (Farmers (cultivators) are estimated to be constant at around 90-100 million workers).

If the *employment growth rate* in QES is taken as a rough proxy for non-farm employment in the economy, then the rate of growth of QES employment can be employed as a rough proxy for growth in overall employment. The new QES series started in June 2016. The latest data available is for July-September 2017. During the previous four quarters, employment increased by a cumulative 0.57 million. On a base of 20 million (underling worker population of QES), this represents a 2.85 % rate of increase. On a non-farm employment base of around 350 million in 2016, a 2.85 % increase in employment means a 10 million job gain in 2017.

The QES based estimate of job growth in 2017 (or FY18) is 10 million.

B. EPFO data for 2017--2018

The employee provident fund data is now being released to the public. This sector covers only the formal sector, and within the formal sector, only those establishments with a firm size of 20 employees or more. According to the Economic Survey (Chapter 2: *"A New, Exciting Bird's-Eye View of the Indian Economy Through the GST"*), these firms accounted for 0.68 per cent of total enterprises (4.9 lakh out of a total 712.9 lakh firms), and accounted for 60 million workers out of a total of 220 million.

Ghosh and Ghosh (2018) have used the EPFO data to estimate employment growth in 2017. Their methodology relies on total number of newly created provident fund accounts, especially by workers belonging to the 18-25 year age group. After adjusting for possible duplications, they find that the formal sector accounts for about 91.9 million jobs as on March 2017. Based on

this and other estimates they claim that about 0.6 million formal sector jobs were added to the economy every month or 7 million formal, non-farm jobs were added during 2017/18.

Ghosh and Ghosh (GG) estimate of 7 million jobs is for the organized sector of the economy - a sector that employs 108 million. In 2017, population aged >=15 years was 937 million, and those going to school numbered 112 million. The Indian economy has averaged a 50 % worker to population ratio but in 2017, because of increasing educational enrollment this average is likely to be around 48 %. This means that expected workers in the economy in 2017, for a 940 million population, will be around 450 million.

There is a partial check or estimate to the GG method. *It is to take only the 18-21 age group from EPFO data and see how many such "new" employees are present*. For the eight-month period Sept 17 thru April 18, 1.43 million new entrants were added to the payroll. It is likely that many of these jobs are first time jobs.

In 2013 (Sixth Economic Census), only a small fraction of establishments (0.123 million out of a total 71 million) employed 15-19 workers, the firm size group that could add workers and be newly eligible for EPFO because they pass the cut-off level of 20 employees. Given the small fraction of firms (and total employment of approximately 2 million in 2013), it is unlikely that over-estimation due to firm-size growth is a major factor in the estimation of new employment from EPFO data.

What remains to be estimated is the fraction of the 18-21 age group who are *not* first time workers. At an annualized rate, 1.43 million in 8 months is 2.2 million. A liberal estimate would be that 20 % of this 2.2 million are *not* first-time jobs. Which means that we have an estimate of *1.8 million new workers in 2017/18 in just the 18-21 age group.*

A. CMIE employment survey 2016 and 2017

The CMIE data is not our first choice for analysis of employment in 2016 and 2017; it is our only choice. The raw CMIE data paints a rather gloomy picture for job growth in India. There are two different estimates of CMIE job growth. The raw data itself shows an employment increase of only 1.4 million jobs for the age group >=15 years – this is the basis of the common refrain

that there has been jobless growth in India. The adjusted by population estimate (i.e. multiplying the worker population ratios by the UN population estimates) *one obtains a decline of 2 m jobs in 2017* as per CMIE data. These data are very inconsistent with any other available data for 2017 whether it be partial employment surveys like QES or employment growth based on provident fund contributions.

Deconstructing CMIE data for 2016/17

How accurate is the CMIE estimate of job growth in 2017? The job growth (more accurately job decline) estimate is at odds with whatever we know about FY18. We have noted above the unprecedented (at least for last twenty years) acceleration in construction GDP in 2017/18, a universally acknowledged job creation sector. We also have information on job growth via the QES labor force surveys for 2016 and 2017. And job growth according to the newly available EPFO data for 2017/18. All these partial estimates of job growth in the economy point to an estimate of 7 m and above; the CMIE estimate is minus 2 million for 2017.

Table 5 provides some clues – it presents the data on employment as revealed by four different definitions of employment in the various labor force surveys conducted between 1999/00 and 2014.

Important Trends in Employment, 1999/00 - 2017

While estimates of employment according to all definitions are presented in Table 5, the discussion below pertains to the principal status definition.

Note that, as mentioned earlier, the 4th Labor Bureau Employment-Unemployment Survey (LB-EUS) for 2014 is actually "centered" in December 2013 - January 2014 (recall period of one year) and so is reported as 2013. As such, it serves as a convenient benchmark for employment *prior* to the Modi government assuming power. The 2015 LB-EUS survey results are reported for 2014 as its centering is around December 2014. It also should be noted that the first two years of the BJP-NDA government were drought years, only the fifth time this has happened in the last 150 years (the earliest rainfall data available is for 1871).

Of the four employment definitions, the commonly used *usual status* definition is the one that shows the least employment change (only a 5 million job increase) between 2004/5 and 2011/12. All the other three definitions (principal, weekly, and adjusted daily) show a near equal 10 m job increase. Throughout our analysis, we will be using the principal status, and adjusted daily status (which in large part is based on principal status) definitions (Table 5).

Table 5: Trends in Employment, Ages >= 15 years, 1999-2017

Activity Status	1999	2004	2009	2011	2013	2014	2016	2017
				(in mil)				
Survey Estimates								
Daily-CMIE	-	-	-	-	-	-	403.5	404.9
Usual	282.7	400.7	395.6	417.2	456.4	423	-	-
Principal	261.2	363.3	369.7	383.2	424.3	400.8	-	-
Weekly	263.7	372	374.3	392.7	-	-	-	-
Daily-PS	-	376.3	378.1	395.9	-	-	-	-
NA adjusted estimates[1]								
Daily-CMIE	-	-	-	-	-	-	394.5	392.5
Usual	404.5	465.6	463.7	471.1	461.6	451.6	459.2	473.1
Principal	374.5	423.2	434.3	434.1	427.7	428	437.0	449.8
Weekly	377.6	432.7	439.2	444.1	440.0	439.0	446.7	460.1
Daily-PS	387.1	437.9	443.8	447.9	443.3	442.7	450.8	464.3

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16; NSS Surveys 04/05, 09/10, 11/12; MOSPI; "Unemployment in India", CMIE, Statistical Profiles 2016, 2017; World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.
Notes: 1) The survey estimates (raw data) are adjusted by gender and age-group population, as per Census - National Accounts (NA); population data for non-Census years obtained from UN. See text for more details.

These employment data are surprising – for two important reasons. First, that conventional wisdom believes that India should have been providing around 10 to 12 million jobs a year in order to keep the unemployment rate constant. Second, that the employment data are not very consistent with estimates of growth in labor productivity. Both these caveats (or surprises) should be kept in mind as we explore the facts, and reasons, behind employment growth in India.

If one were to look at just the raw survey data i.e. without the required population adjustments, then according to the *principal status definition*, employment in India increased by 20 million between 2004 and 2011 (from 363 m to 383 m). Adjusting for population (as "required" by the survey authorities themselves) the increase in employment during the very high GDP growth period 2004 to 2011 (average growth of 7.84 % per annum), was only 11 million, or only at a 0.36 % (CAGR) annual rate. Employment level in 2004/5 was 423.2 million, and 434.1 million in 2011. Note also that there is zero growth in principal status employment between 2009/10 and 2011/12.

By 2013, total employment had declined to 427.7 million, and it stayed at this same level in 2014 (actually increased, very marginally by 0.3 million) in the drought year versus the previous non-drought year. This zero-growth in employment between 2013 and 2014, and a decline of 6 million from 2011/12 levels, is suggestive of the importance of employment growth in the 2014 election.

For 2017, we obtain an increase in employment of 12.8 million, principal status (from 437 million in 2016 to 449.8 million in 2017. For women, the increase is from 87.8 to 92.1 million, an increase of 4.3 million. For men, the increase is 8.6 million (from 349.2 million jobs in 2016 to 357.8 million in 2017. We now anxiously await for confirmation (or rejection) of our estimates from the NSSO survey for 2017/18.

Unemployment

Table 6 provides details according to principal status for two different measures of unemployment – the conventional definition, and the adjusted definition. In the aggregate, the

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unemployment rate stayed relatively constant at 4 % and then jumps, somewhat inexplicably, to 6.6 % in 2013 and 7.2 % in 2014 as per the Daily-PS definition. The adjusted labor force and employment series, on the other hand, shows only a 2 percentage point increase in the unemployment rate.

Table 7 below is a compilation of all the estimates of employment contained in this paper for 2017 or 2017/18. Regardless of the source of data (except the extremely problematical CMIE survey) job increase in 2017/18 was between 7 and 13 million. We are partial to our finding of 12.8 million, but await confirmation from the NSOO 2017/18 survey.

Tables 6: Trends in Unemployment Rate, by Activity Status, Both Sexes, 1999-2017

Activity Status	1999	2004	2009	2011	2013	2014	2016	2017
					(in %)			
Usual	2.5	2.7	2.7	2.9	4.7	5.5	*6.0*	*4.1*
Principal	3.1	4	3.6	4.1	7.3	8	*8.7*	*6.0*
Weekly	4	4.3	4.2	4.3	*7.7*	*8.4*	*9.1*	*6.3*
Daily-PS	2.9	3.6	3.5	3.7	6.6	7.2	7.8	5.4
Daily-Original	-	3.6	3.5	3.7	-	-	17.2	11.3

Sources: Labor Bureau Annual Employment-Unemployment Surveys 2013/14, 2015/16;NSS Surveys 04/05, 09/10, 11/12; MOSPI; "Unemployment in India", CMIE, Statistical Profiles 2016, 2017.
Notes: 1) The survey estimates (raw data) are adjusted by gender and age-group wise population, as per National Accounts (NA), obtained from United Nations population estimates which in turn are based on census population estimates. The NA adjusted estimates are presented in the table. See text for more details.
2) Data is presented for the age group 15 years and above.
3) "Daily-Original" is the NSSO estimates as per daily status for the years 1999-2011 and CMIE estimates for 2016 & 2017. "Daily - PS" is the CMIE equivalent definition of daily status. See text for details

Table 7: Estimates of Job Growth in India in 2017 - Different Methods

	Explanation	Estimate for 2017/18
		(im mil)
EPFO Payroll-only 18-21 age group	The latest (September 2017-April 2018) data are taken for only 18-21 year old because this group is likely to be in their first job and hence double-counting is minimized. *Estimate for just 18-21 year old*	1.8 m; only 18-21 year old
EPFO (Payroll, all years, formal sector) Ghosh & Ghosh	This is the first study to comprehensively estimate employment growth on the basis of the newly available EPFO data - *Their estimate is only for the formal sector (about one-third of non-farm jobs)*	7
Quarterly Economic Survey QES (non-farm)	The Quarterly Economic Survey, covers 20 million workers, indicates that there was a 2.85 % growth in employment; growth rate applied to non-farm sector suggests a 10 million job gain.	10
Construction (GDP in construction, road construction in kms	Highest GDP growth in construction, matching 2011/12, in last 20 years; highest acceleration in construction growth in 2017/18 in 20 years (from 1.4 % in 2016/17 to 5.8 % in 2017/18	1.7-3 m; only construction
CMIE -raw data	For the 2017 calendar year, indicates job growth of 1.4 million	1.4
CMIE - adjusted by Census Population	If CMIE population estimates adjusted to Census based population, then there was negative job growth in 2017	-2
Estimated CMIE - LFPR for 11 age-sex groups	CMIE labor force participation rates at lowest ever for both males and females and forecast for 2016 on basis of principal status Labor Bureau data; CMIE unemployment rates for 2016 and 2017 used to forecast unemployment and employment in 2016 and 2017; employment change is 12.8 million jobs created in 2017	12.812.8

Source: Annual Employment-Unemployment Survey 2013/14; CMIE; NSS Surveys 99/00, 04/05, 09/10, 11/12; MOSPI
Notes:

Section 8 – *Jobs necessary to meet the rising supply of labor*

No discussion about job growth is complete without reference to the number of jobs "needed". The "needed" jobs are with reference to an assumed population growth for each age-sex combination, and assumptions about LFPR. Population data by age-sex are available from the UN (medium fertility variant) for all the years till 2100. Labor force participation rates are available from household surveys.

Given these two variables (population growth and LFP rates), estimates for the future (say till 2022) can be obtained by assuming that the LFPR for different age-sex groups is equal to the last observed rate.

Table 8 reports the estimates of number of jobs necessary for three selected years – 2011/12, 2017 and 2022. Some noteworthy results.

First, that there is virtually no growth in population (between 2017 and 2022) for the 15-19 age group, and only a 2.3 million gain for the 20-24 age-group. Thus, for the 15-24 age-group, population growth will increase by a paltry 2.5 million. What happened to the demographic dividend? Fertility decline – for the better part of a decade, fertility has been declining by approximately 0.1 percentage point a year and in 2017 is estimated to have reached the "constant population" rate of 2.1 births per woman. India's population growth rate has reduced to about 1.1 % per annum; it would have been lower if mortality rates had not declined at a fast rate.

All of this adds up to the following conclusions. First, that even in 2011/12, India needed only 8.3 million jobs to maintain the same unemployment level. By 2017, this requirement had reduced to 7.5 million – and by 2022, the requirement will be for less than 7 million.

Table 8: Jobs Needed, 2011-2022

Age Group	2011		2017		2022	
	Population	Jobs Needed	Population	Jobs Needed	Population	Jobs Needed
			(in mil)			
15-19	117.5	0.1	120.1	0.1	120.3	-0.1
20-24	113.1	0.4	116.8	0.2	119.1	0.2
25-29	104.8	1	112.4	0.5	115.5	0.3
30-34	95	1.1	104.8	1	111	0.5
35-39	84.1	1.3	95.1	1.2	103.3	1.1
40-44	75.4	0.9	84.3	1.3	93.4	1.2
45-49	66.4	1	74.7	0.8	82.3	1.3
50-54	57.3	0.8	65.3	0.9	72.2	0.8
55-59	47.6	0.8	55.4	0.8	62	0.8
60-64	34.2	1	44.7	0.6	50.8	0.5
>=65	54.3	0.4	65.2	0.6	79	0.7
All	950.6	8.3	1019.1	7.5	1072.3	6.9

Section 9: Conclusions

Our study into the past (and partial present) has led us to re-examine some of the prevailing conclusions about the job market in India. The first "finding" is that it is incorrect to conclude, based on historical labor force participation (LFP) trends, that India needs 12 million (range often mentioned is 10-14 million jobs) jobs a year. The reality is closer to 7-8 million jobs and the highest needed, over the last 20 years, is the 10 million estimate for 2004/5.

Related to this result is the finding that the size of the young 15-24 age group is expected to increase by only 2.5 million over the next five years (from 236.2 million in 2017 to 238.7 million in 2022). Even with the more expansive definition of the young (15-34 years), the increase is only 11.7 million over the next five years, compared to an increase of almost twice this rate between 2012 and 2017 (433.9 million to 453.1 million).

Both the demographic dividend and high population growth are now part of history. The national fertility rate is now at replacement levels (2.1 children per woman) and the population growth rate has declined to just 1.1 % a year, from a 1.8 % level two decades ago.

The second important result pertains to the rather robust expansion of educational enrollment. Between 2004/5 and 2011/12, about 40 million more went to school or college (age group >=15 years). Over the next six years, it is estimated that education enrollment increased from 101 million in 2011/12 to 112 million in 2017.

This result has implications for job growth. A person cannot be a full-time worker and a full-time student. If the two activities are considered as "working" then this adjusted definition of employment (working or full-time student) provides some clues about the changing labor and job market in India. The aggregate unemployment rate increases by almost 500 bp between 1999 and 2014 (from 3,1 to 8 %), but the unemployment rate (adjusted for education) shows an increase of only 250 bp (from 2.3 % in 1999 to 4.8 % in 2014).

Our third important finding pertains to labor force participation (LFP) rates for both women and men. Much has been discussed in the literature about the so-called precarious drop in female LFP rates. We find that there has been an equal magnitude drop in LFP rates for men!

Further, the LFP rate fall is exaggerated by the fact that educational expansion has occurred during the same time-period when the LFP rate fall has been the greatest. Adjusting for educational enrolment, both men and women LFP rates have declined by an equally small amount – about 3 ppt between 1999 and 2014. A separate paper on this subject will soon be made available, but the fact remains that LFP rates have not faced a "precipitous" drop for either males or females.

There is little doubt that 2017 was a good year for employment growth. Using the newly released EPFO payroll reports, Ghosh and Ghosh estimate that 7 million jobs were added in 2017. Our estimate of the same EPFO data, for the 18-21 age group where there is a minimum of error due to double counting, indicates about 1.8 million jobs for just this four year age group. Historically, this is a large job-addition for this age-group. Use of the Quarterly Employment Survey also indicates job addition to be greater than 7 million in 2017.

In this paper, we have generated employment series for all the various definitions – usual status, principal status, weekly status, daily status and the CMIE definition (a hybrid daily-principal status). All the definitions give broadly similar results – for the principal status, we obtain a 12.8 million jobs gain between the 437 million employment level in 2016 and the 449.8 million employment level in 2017. The 2011/12 NSSO survey reported such employment level to be 434.1 million, and the 2004/5 survey employment was 423.2 million. What these data indicate is that in the high economic growth period 2004 to 2011, the economy added 10.9 million jobs; in the recent 2014 to 2017 period, the economy has added 15.7 million jobs, with most of the gains in 2017. The data also indicate that just prior to 2014, employment in India was 6 million less than the 434 million level of 2011/12.

Some of the outsized employment gain in 2017 might be due to the fact that the previous year employment levels were below normal – two successive droughts, and major economic reforms. What is ironic is that the year for which there has been the maximum number of claims of jobless growth, may turn out to be the year of maximum employment gains in the last 15 years.

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