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Comparing NSSO's Employment Surveys - A Methodological Note

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Correcting for an error in method, it can be shown that the National Sample Survey Organisation had underestimated employment in 2009-10 and therefore overestimated the number of jobs created between 2009-10 and 2011-12 by over 4 million, bringing the figure down from 13.9 million to around 9.35 million.

The press release on the results of the Employment and Unemployment Survey (EUS) conducted by the National Sample Survey Organisation (NSSO) in 2011-12 claimed that as many as 13.9 million jobs were created in just the two years since the previous EUS conducted in 2009-10.

This piece of statistics was picked up and played up by sections of the media (Padmanabhan and Rao 2013). But look a bit more closely at the numbers and the methodology and you will find that the NSSO may have erred – not in its survey but in how it made its estimates based on the survey. Specifically, it seems to have used out-dated projections of the total population in 2009-10 which have since been shown to be under-estimates. This has therefore placed employment in 2009-10 at a lower level than it actually was and therefore gives an exaggerated picture of the growth of employment between 2009-10 and 2011-12.

A correction of the numbers shows that the NSSO had underestimated employment in 2009-10 by over 4 million and therefore the number of jobs created between 2009-10 and 2011-12 was over 9.35 million and not 13.9 million, over 30% less than claimed. How is this so?

Method of estimation

The sample surveys conducted by the NSSO are designed to be representative of the population and the ratios presented (worker population ratio, labour force participation rates etc.) in the survey are considered to be accurate (NSSO 2008: 11).

But total population figures have been found to be a problem. It has been found that the NSS surveys fail to estimate the total population accurately (ibid). Most reports of the NSSO suggest a method to calculate the absolute figures of the population by using the Census of

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India's decadal numbers and the inter-decadal projections the Census makes (for example NSSO 2011: 4). Recent reports of the NSSO have a section called "Projected Population", which provides the projections relevant to the report (see NSSO 2011: C1-C2).

The estimates for any category/parameter like the unemployment rates are presented in terms of distribution per 1000 of relevant units like persons, households etc. or in ratios and can be compared across years meaningfully.

However, in order to assess the magnitude of changes one looks to the actual numbers. To estimate an absolute number in any category, the survey-estimated ratios are multiplied by the population. For example, to convert the results of the sample of 456,999 persons surveyed by NSSO during 2011-12 into absolute figures one has to use the total population at the mid-point of the NSSO survey period (in this case 1 January 2012). As the population censuses are conducted decennially, the total population in any year between two Census years is based either on projections made in the earlier Census or on estimates using the average decadal growth rates between two consecutive censuses. Using these projections, absolute figures of the number of employed people or the number of people in the labour force and so on can be estimated.

This is how the NSSO has calculated the absolute numbers of the number of employed (ps+ss) for the two surveys in 2009-10 and 2011-12 and has said that 13.9 million new jobs were created between the two years. However, most reports of the NSSO do not calculate these absolute estimates, as they are approximate (NSSO 2008: 4), but the NSSO seems to have gone out of its way to compare these two surveys in absolute terms.

Error in method

The NSSO report of the EUS 2009-10 made a population projection for 1 January 2010 using the projections made in the Census of India 2001 for each year of the subsequent decade from 2002 onwards. Likewise the NSSO report of the EUS 2011-12 made a population projection for 1 January 2012 based on the Census of India 2011 population figures, using decadal growth rate of population between 2001 and 2011. Since the two NSSO surveys were done in such quick succession it is important to verify whether there is any anomaly in the population projections.

The Census of 2001 projected India's population for 2011 at 1,192,506,000. According to the Census of 2011 the actual population of India that year was 1,210,569,573. Therefore the Census of 2001's projection for 2011 underestimated the actual number by 18,063,573 (18.06 million). This is for the year 2011. It can also be safely assumed that the population projection for 1 January 2010 made by the NSSO using Census of 2001 is also an underestimate.

This underestimation of the 2010 population by the Census of 2001 means that the absolute number of persons employed in 2009-10 as estimated by the NSSO that year (worker-

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population ratio multiplied by the population projection for 1 January 2010) cannot be compared with the similar estimate of employed in 2011-12 as thrown up by the NSSO survey for that year, but by using the Census of 2011 figures. This does indicate that if estimates drawn from EUS 2009-10 using Census 2001 are most likely underestimates, then comparing them with the estimates drawn from EUS 2011-12 using Census 2011 only make the "growth" in employment in India look better than it really was.

New estimates

If one wants to compare the employment situation in two surveys, EUS 2009-10 and EUS 2011-12, then Census 2011 population figures can be used along with the worker-population ratios in the two surveys to estimate the number of employed. First, the decadal growth of population between 2001 and 2011 is used to estimate the population on 1 January 2010. This method is different from the Census of India which releases projections, but the NSSO does use the average decadal growth method (see NSSO 2013: C1-C2 and for older surveys also). Then, the number of employed is estimated for each category such as rural male and female, and urban male and female separately using worker population ratios mentioned in the EUS reports. Through these estimates, the approximate number of employed workers on 1 January 2010 can be obtained. Likewise, the NSSO has projected the population on 1 January 2012 based on the decadal growth rate between 2001 and 2011 (censuses) for both survey years can be found.

The new figure for increase in employment between 1 January 2010 and 1 January 2012 (based on the growth of population between Census 2001 and Census 2011) according to usual status (ps+ss)[i] is approximately 9,354,810 (9.35 million),whereas, NSSO estimates the same at 13.9 million. [A note of caution is due here about the nature of the new figures. For example NSSO reported 13.9 million, while the figure for the same was 13.36 million according to this approximate method. Disaggregated state-wise data was not used to calculate these figures so there is an error of 3.88% with regard to NSSO calculations.]

Finally, using this revised method to calculate absolute estimates of number of employed persons in 2009-10 tells us that the number of jobs created (ps+ss) between 2004-05 and 2009-10 must be more than what was estimated at the time. Deviation in population projections increased cumulatively towards the end of the decade and got corrected with the actual Census figures at the beginning of this decade. The actual population growth between 2001 and 2011 was higher than the projected growth of population. The revised number for employment we have presented above suggest two things, (i) The growth in total employment between 2009-10 and 2011-12 was a good 30% less than that claimed by the NSSO, (ii) The increase in employment in 2009-10 over 2004-05 (the previous year of the EUS) may have been larger than earlier estimated since the total population figures used in 2009-10 were, it now turns out, an under-estimate.

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Correction: The abstract of the article has been changed (after publication) to make it more clear.

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[i] Usual status (ps+ss): "…includes (a) the persons who worked for a relatively long part of the 365 days preceding the date of survey and (b) those persons from among the remaining population who had worked at least for 30 days during the reference period of 365 days preceding the date of survey."