

Pooling of Central and State Sample ASI 2009-2010 data – Gujarat experience

Soumendra Chattopadhyay¹, National Sample Survey Office (FOD),
Gangtok, India

Soumya Chakraborty, National Sample Survey Office (DPD), Kolkata, India

Abstract

Given the sampling design currently followed in ASI, district level estimates cannot be obtained from central sample alone whereas estimates at NIC-4 digit level cannot be obtained from state sample alone. It is only through pooling the central and state samples, that estimates at district and NIC-3digit level can be generated provided the two sets of data fulfil a few basic conditions of poolability.

In this paper, an attempt has been made to estimate the parameters at District level after pooling the state level data of ASI for the state of Gujarat, with the corresponding central data. Comparison between the overall state estimates, trend with time series data and utility of survey of state sample ASI units were studied.

This study also analyses the change in variance estimates and points of validation of the data and non-response cases for last five years.

1. Introduction

1.1 Annual Survey of Industries (ASI) is the principal source of industrial statistics on the registered manufacturing sector of the economy and a main component for estimating state domestic product. A part of the ASI frame is surveyed every year by the Field Operations Division (FOD) of National Sample Survey Office (NSSO) and is called the *central sample*. In addition to that, *state samples* are drawn from the *residual frame*, which are surveyed by the State Directorates of Economics and Statistics (DES). A major drawback of the central sample is that it cannot generate district level estimates, which is of paramount importance for micro-level planning. Since districts are taken into consideration at the time of stratum formation for state sample, it is possible to generate district level estimates from state sample. However, a pooled sample (central + sample) should ideally give a better estimate provided the criteria for pooling are satisfied.

1.2 Reference period for ASI 2009-2010, data for which have been used in this study, was the accounting year of the factory, ending on any day during the fiscal year 2009-2010. Thus in ASI 2009-2010, data collected from respective establishment relate to their accounting year ended on any day between 1st April 2009 and 31st March 2010. The Survey was conducted in the year 2010-2011.

¹ e-mail: soumendra1961@gmail.com

1.3 This paper attempts to generate the district level estimates for the state of Gujarat based on pooled sample. Before doing so, the paper also discusses the issues relating to poolability of the central and the state samples and checks for the quality of estimates in terms of RSE. The paper also generates state level estimates of a few important economic parameters and compares them with the estimates based on central sample alone. As an academic exercise, an attempt has also been made in this paper to generate district level estimates from central sample alone based on the available sample observations. In order to do so, notional stratification has been imposed on the central sample, considering that the samples were selected from the entire frame ignoring the census units with District X NIC 3 digit classes as strata. Accordingly, the multipliers have been adjusted.

1.4 The presentation of the study is as follows: Section 2 of the paper describes the ASI frame from which central and state samples are drawn. Section 3 and 4 respectively gives a detailed account of the survey design followed for ASI 2009-10 and the estimation procedures adopted to generate the estimates for this study. Some issues relating to pooling and poolability of central and state sample are discussed in Section 5. A brief account of the data validation carried on the state sample data collected by the DES Gujarat is given in Section 6. Major findings of the study are presented in Section 7. Finally, Section 8 offers some concluding remarks.

2. ASI Frame

2.1 The ASI frame is based on the lists of registered factory units maintained by the Chief Inspector of Factories (CIF) in each state and those maintained by registration authorities in respect of bidi and cigar establishments and electricity undertakings. The frame is being revised and updated periodically by the Regional Offices of the Field Operations Division of NSSO in consultation with the Chief Inspector of Factories in the state. At the time of revision, the names of the de registered factories are removed from the ASI frame and those of the newly registered factories are added. In spite of regular updating of the frame, quite a number of small sized factories selected for the survey are found to be non existing in the field and are termed as deleted factories. However, such factories are not taken into consideration for the purpose of tabulation and analysis in the report. All electricity undertakings other than captive units as well as all departmental undertakings such as Railway workshops, etc. have been kept outside the purview of ASI from 1999-2000.

3. Sample Design and Sample Allocation

3.1 Sample design in ASI has undergone changes from time-to-time keeping in view of technical as well as procedural aspects and also the time and resource constraints for data collection. From the very beginning, the entire ASI frame has been divided into two sectors, viz. Census and Sample, based primarily on some worker size criteria. While the census sector has always been surveyed every year, a part of sample sector has been surveyed following some sampling methodology. The definition of census sector, however, has undergone changes over the time. A brief review of the sample design followed in 2009-10 is given in the following paragraph, which is important for a better understanding of the results.

As per the sample design followed in 2009-10, a census sector has been defined as

- (1) All industrial units belonging to the six less industrially developed states/UT's viz. Manipur, Meghalaya, Nagaland, Sikkim, Tripura and Andaman & Nicobar Islands.
- (2) For the rest of the twenty six states/UTs, (a) units having 100 or more workers and (b) all units covered under 'joint return'.
- (3) Strata (State by 4-digit of NIC-08) having less than or equal to four units after selecting the Census Sector units as defined above were also selected as census sector.

3.2 All the remaining units in the frame were collectively called the sample sector. For central sample, samples have been drawn circular systematically from the sample sector considering a uniform sampling fraction of 19% within each stratum (State X Sector X NIC-4 digit) for each state. An even number of units with a minimum of four units from each stratum were selected and were distributed evenly in two sub-samples. The sectors considered here were Biri, Manufacturing and Electricity.

3.3 After selecting the central sample, the remaining units in the sample sector were treated as residual frame for selection of sample units for the States/UTs. For selecting samples from the residual frame for the State/UTs, stratification was done afresh by grouping units belonging to *District X 3-digit NIC* for each state to form strata. Considering sampling fraction of 10% in general within each stratum, the sample units were then drawn circular systematically from each stratum with a minimum of four units and evenly distributed in two sub-samples. Strata having less than or equal to 4 units were again completely enumerated. The basic purpose of introducing the residual sample was to increase the sample size for the sample sector of the states so as to get more reliable estimates at district level.

3.4 Following this sample design, for ASI 2009-10, the size of the frame along with the sizes of the central and state sample for the state of Gujarat were as follows:

Number of Units in ASI Frame	Central Sample			State Sample	Total selected Units (for pooled sample)
	Census	Sample	Total		
20,919	1,611	3,792	5,403	3,154	8,557

4. Estimation Procedure:

4.1 For estimating the characteristics at state (district) level using the pooled sample, the entire sample (census as also sample) has been treated as census i.e. with multiplier 1. The details of the estimation procedure is given below:

Notations:

- i = subscript for i -th district, s = subscript for s -th stratum in the i -th district
- m = subscript for sub-sample ($m = 1, 2$),
- k = subscript for k -th sample enterprise under a particular stratum

- E = total number of factories in the residual frame in a stratum
- e = number of factories surveyed out of total number of factories in the residual frame in a stratum
- x, y = observed value of characteristics x, y under estimation
- \hat{X}, \hat{Y} = estimate of population total X, Y for the characteristics x, y

Under the above symbols,

y_{ismk} = observed value of the characteristic y for the k-th enterprise belonging to the m-th sub-sample for the s-th stratum in the i-th district.

The estimate for any characteristic based on the residual sample is obtained first for each district using formula (1) below. Then, the estimate for the i-th district based on the state sample is obtained using formula (2), where \hat{Y}_i'' corresponds to the estimate for that characteristic of the enterprise for the census sector of the i-th district. Note that the census sector of the i-th district would comprise of all units of the census sector as well as sample sector of the central sample belonging to the i-th district. Lastly, the state level estimates are obtained by using formula (3) below, that is, by aggregating the estimates over all the districts in the state.

Estimation formula for any characteristic of the enterprises for the residual sample of the i-th district is:

$$\hat{Y}'_i = \sum_{s=1}^{e_s} \left[\frac{E_{is}}{e_{is}} \left[\sum_{k=1}^{e_{is1}} y_{is1k} + \sum_{k=1}^{e_{is2}} y_{is2k} \right] \right] \dots\dots\dots (1)$$

The corresponding sub-sample wise estimate from the residual sample of the i-th district is:

$$\hat{Y}'_{im} = \sum_{s=1}^{e_s} \left[\frac{E_{is}}{e_{ism}} \sum_{k=1}^{e_{ism}} y_{ismk} \right], m = 1,2. \dots\dots\dots (1.1)$$

If \hat{Y}_i'' be the corresponding estimate for the central sample (treated like census sector in case of a state sample) of the i-th district, then the estimate for that characteristic for the i-th district as a whole is given by:

$$\hat{Y}_i = \hat{Y}'_i + \hat{Y}_i'' \dots\dots\dots (2)$$

The estimate of the characteristic for the entire state is:

$$\hat{Y} = \sum_i \hat{Y}_i \dots\dots\dots (3)$$

4.2 Estimates of Error for Aggregate \hat{Y} : The variance is to be estimated for the residual sample units only. The estimated variances of the estimates at district level are as follows:

$$V\hat{a}r(\hat{Y}_i) = \sum_s V\hat{a}r(\hat{Y}_{is}) \dots\dots\dots (4)$$

where $V\hat{a}r(\hat{Y}_i)$ are

$$V\hat{a}r(\hat{Y}_i) = \sum_s \{(\hat{Y}_{is1} - \hat{Y}_{is2}) / 2\}^2 \dots\dots\dots (5)$$

For the entire state, the estimated variances of the estimates are as follows:

$$V\hat{a}r(\hat{Y}) = \sum_i V\hat{a}r(\hat{Y}_i) \dots\dots\dots (6)$$

4.3 Estimates of RSE:

$$R\hat{S}E(\hat{Y}) = \frac{\sqrt{V\hat{a}r(\hat{Y})}}{\hat{Y}} \times 100 \dots\dots\dots (7)$$

4.4 Multipliers for enterprises:

The formulae for multipliers for a stratum are given below:

formula for sub-sample wise multiplier	formula for combined sample multiplier
$\frac{E_{is}}{e_{ism}}, i= 1 \text{ or } 2.$	$\frac{E_{is}}{e_{is}}$

4.5 Treatment for surveyed cases and casualty cases:

While counting the number of units surveyed (e_{ism}) in the m-th sub-sample of a stratum, all the units with survey codes 1 to 6 and 11 to 14 in Item 12, Block A have been considered, i.e., all the units which were open & functioning, closed but chance of opening in future and units which were not functioning during the reference period.

Casualty cases: Units with survey codes 7 to 10 and 15 as per Item 12, Block A were treated as casualties, i.e. for those units, ASI return were not received due to non-response but the units were functioning during the reference period.

While processing the state sample, eighteen casualty units' data were extracted from last year central sample data as the same procedure is followed in the processing of central sample too. There were three cases where sub-sample was found void and these strata were merged within the district.

In this study, as the Subsample codes for State Sample were not available, pseudo codes were generated to calculate RSE of the characteristics.

5. Poolability of central and state sample data

5.1 There are some basic principles of pooling. Pooling of any two sets of data (central and state sample) require a few fundamental conditions to be satisfied. The most basic requirements for pooling is that State and Central sample data should have common layout, should be poolable and processed simultaneously. In order to achieve them, there should be a mechanism in place which will ensure:

- (a) Use of common software / layout for both State and Central sample data.
- (b) Uniform standard of processing by the state and the central agency (CSO).
- (c) Timely processing of State sample data.

From application point of view, there are a few aspects that are required to be taken care of. Some of these aspects are listed below:

- (a) Both the data sets should be validated. In other words, there should not be wide divergence in the extent of non-sampling errors in two data sets.
- (b) The estimates based on two data sets should be *poolable*, in the sense that the estimated variances of two estimates, primarily, should not vary much and secondly, the two estimates are perceptible, that is, they should closely describe the true situation of the population. In case two estimates are widely divergent, one may seriously doubt their closeness to the true value of the parameter and look for an external source to get an idea of the true value of the parameter.
- (c) Two sets of validated data should be available within a reasonable time after completion of survey.

5.2 As per the methodology suggested by Sardana and Minhas², the question of poolability depends largely on the quality of data – generally measured in terms of the magnitude of the estimates obtained compared to its actual value and secondly, the magnitude of the relative standard errors of the estimates. For the estimates of an indicator (θ), say t_1 and t_2 with relative standard errors r_1 and r_2 , respectively obtained from the central sample and state sample data, if the divergence, $d = t_1 - t_2 \approx 0$ (i.e., small) and r_1 and r_2 are within the acceptable margins (r_0), one may argue that the estimates are acceptable in the sense that they are close to each other and the pooling of the two estimates t_1 and t_2 would improve the reliability. Pooling of both the estimates, even though lie on the same side of the true value, may result in a small loss of information in respect of error, i.e., its closeness to its true value, but may result in significant gain in the precision.

Almost all these issues of pooling central and state sample have been taken into consideration in this paper.

² Sardana and Minhas, Sarvekshana, 1990

6. State Sample Data Validation

6.1 Central Sample data were processed by CSO (I S Wing) and results for ASI 2009-10 have already been published. State Sample data for Gujarat were processed by Gujarat, DES and supplied to CSO (I S Wing) to generate central & state pooled estimates. The same data validation rules, that are followed for processing the central sample were given to the State DES of Gujarat along with some software packages used for this purpose. Hence it may assumed that data validation for both central and state sample were done in a similar manner which is a necessity for pooling such data. However, as the DES Gujarat processed the ASI data for the first time, the state sample unit level data were checked and further validated before pooling the same with the central sample. Some observations are given in the following paragraphs.

6.2 Status of unit code given in the item 12 of Block A of ASI schedule is a very important figure for ASI tabulation as the multipliers are calculated on the basis of these figures. Percentage of units falling in different status for the last few years for central sample and for the Gujarat state sample for the year 2009-10 are given in Annexure-I.

6.3 It may be seen from the table that a significant percentage (21.72%) of state samples were found deleted (less than 3 years). This may be due to the fact that status of a sample sector factory, unless selected for survey, is not updated at the time of dynamic updation of the ASI frame, and hence remains in the frame as a live factory, making it eligible for selection. Another important feature of the state sample is high (more than 5.42%) percentage of casualty (with status of unit code 7, 8, 9, 10) in comparison to the central sample (1.58% in 2009-10). Considering the total size of the state sample, this number is quite high and affects the quality of the estimates.

Validation of other Blocks C to J were also carried on and some observations are given below:

Block-A:

- In DSL-241468, PSL No. was not matching with the Sample List and it was posted.

Block-C:

Block C was checked for column totals in Col. 7 (Closing Gross Value), Col. 11 (Depreciation up to the yearend), Col. 12 (Net opening value) & Col. 13 (Net closing value) and for row totals in Item 8 (Sub-totals) & 10 (Totals). In many cases, figures in col. 7, 11, 12 & 13 were available without the detailed figures in other columns. Details of such cases are given below:

- Details of Col. 12 not available for 6,426 cases.
- Details of Col. 13 not available for 803 cases.
- Details of Col. 11 not available for 6 cases.
- Details of Col. 7 not available for 16 cases.
- Column total mismatch for Col.13 in 6,012 (58%) cases.

- Column total mismatch for Col.12 in 5,677 (55%) cases.
- Column total mismatch for Col.11 in 5,766 (56%) cases.
- Column total mismatch for Col.7 in 2,596 (25%) cases.
- Row total mismatch for Col.13 in 1,451 (33%) cases.
- Row total mismatch for Col.12 in 1,383 (32%) cases.
- Row total mismatch for Col.11 in 48 (1%) cases.
- Row total mismatch for Col.7 in 717 (16%) cases.

It is to be noted that 'cases' here refer to individual records within a schedule and not a schedule as a whole. As Block C detailed data were not available for many small units, Col.13 figures for total item 10 were taken for generating pooled estimates.

Block-D & Block-G:

- All the sub-totals were checked and found correct.

Block-E:

- All the sub-totals were checked and found correct.
- Wages per worker appeared to be very high in many cases. Unit-wise these cases may be checked and modified, if found wrong.

Block-F:

- Mismatch was observed in Item-7, column 3, sub-total (total expenses) in DSL-241553, and the same was corrected with total of Item 1 to Item 6.

Block-H:

- Only column 6, purchase values were checked for sub-totals at item 12 & item 23.
- Item 12 (Total Basic item), column 6 did not match in two cases (DSL-242076 & 242200) with the constituent individual entries and the same were corrected with corresponding individual entries.
- Item 23 (Total input items), column 6 did not match in 2165 cases and all the sub-totals were corrected with the corresponding detailed item values.

Block-I:

- Only column 6, purchase values were checked for sub-total item 7 and mismatch was found in only one case DSL-242257, which was corrected with the corresponding detailed item values.

Block-J:

- Columns 5 to 13 (quantity manufactured, quantity sold, gross sale value, excise duty, sales tax/VAT, other distributive expenses and total distributive expenses respectively in that order) were checked mainly for calculation of ex-factory values.
- In one return (DSL 240891), there was an abnormal variation in the quantity sold and quantity manufactured figure which resulted in an abnormally high unit rate for that item and consequent high ex-factory value of output. The

same was corrected using the mean rate of the item and corresponding adjustment in quantity sold.

- Mismatch in Sub-total for col.13 were found in four cases and were corrected.
- Col.13, calculation of ex-factory values did not match in more than 1500 cases and in all such cases, the same were calculated using the figures in items 5 to 11 using the relation given in the schedule [i.e. Ex-factory value = Quantity manufactured * (Gross Sale Value-Total Distributive Expenses)/Quantity sold].
- 14 cases were found where item 5, quantity manufactured and item 6, quantity sold were non-zero but item 7 or item 13 were zero. These were not modified and need to be checked.

6.4 Overall, it was found that, in 26 cases, entire data were duplicated. The list of DSL No.s is given in Annexure II. These cases should be checked and if found duplicate, accordingly, data may be corrected. However, data for all these units were considered for estimation in this study as the identification particulars (DSL and PSL numbers) of these units were different. It is assumed that the units might have submitted one consolidated return (joint return) and as there cannot be a joint return in the state sample, the figures have been equally distributed (apportioned) among the individual returns.

7. Data Analysis and Major Findings

7.1 District and state level estimates for a few selected characteristics for the state of Gujarat have been generated using the estimation procedure described in Section 4. Table 1 shows the estimated figures obtained from central sample alone (published by CSO) and from the pooled sample (central and state sample pooled) for a few important characteristics.

7.2 It may be observed from the table that only for wages to worker, the variation in two estimates is little more than 10%. For all other characteristics the two estimates resemble closely (with less than 10% variation) with estimates from pooled sample being higher for almost all the parameters except the estimated number of total and open units, and number of female and contractual workers. The GVA from the pooled sample is 9.7% higher from the central sample for the state.

7.3 The growth rate (in current prices) observed in these characteristics for the last four years is given in Table 2. The growth rates in table 2 are calculated from the central sample alone for the years 2006-07 to 2008-09. For the year 2009-2010, the same has been calculated using the central as well as pooled sample. Both the estimates for 2009-2010 show a marked increase in growth rate for parameters like fixed capital, invested capital, input, output, GVA over the last few years. However, for fixed capital, invested capital, GVA, wages to worker and total emoluments, the growth rate calculated using the pooled sample estimate is significantly higher than that computed from central sample for the year 2009-2010.

7.4 RSE of estimates for these characteristics calculated from the pooled and central sample is given in table 3. Table-3 shows that the RSE of estimates generated from the

central sample alone is consistently lower than that calculated from the pooled sample. However, it may be noted that stratification of the central sample is *NIC-4 digit within State* and state sample is stratified by *District x NIC-3 digit*. Thus, two sets of RSE may not be exactly comparable. As per common notion, state sample stratification is much more heterogeneous than the central sample stratification and that is revealed in these RSE estimates. Although in an ideal situation one would expect the RSE of the pooled estimates to be better than that of the central sample estimates, this may not hold good if the heterogeneity in the state sample is much more.

7.5 The state and central sample results broadly satisfy almost all the pre-requisites for pooling viz. use of same layout and validation rules for data processing, timely availability of state and central data. However, there is ample scope of improvement in the quality of processing of the state sample (even the central sample, so to say). Also it seems that both the estimates are not very widely divergent, indicating thereby that both sets are close to the true population parameter. Although, the estimated RSEs of two sets of estimates are not quite close in many cases, but, pooled estimates is the only option to generate estimates at district level.

7.6 The district level estimates of the selected characteristics based on the pooled sample are given in Annexure-IV. The estimates of RSE for these district level estimates are given in Annexure-V.

7.7 The same district names and district codes as used for ASI frame for 2009-2010 has been used for this study. It is observed from the ASI 2009-10 frame that there is no factory in two districts viz. Dang and Tapi.

7.8 It may be seen from Annexure-IV, that highest number of factories is observed in Ahmedabad (3595) followed by Vadodara (1896), Rajkot (1855) and Surat (1783). Although the district Jamnagar has only 243 factories it has got the highest fixed capital and invested capital followed by Surat, Varuch and Vadodara. However, the total invested capital in Jamnagar is more than double the invested capital in Surat, which indicates presence of some large units in this district. The first three ranking among the states remain the same in terms of total input consumed and total output produced. However, in terms of Gross Value Added (GVA), Jamnagar again tops the list, closely followed by Rajkot and Surat. Among all the districts in Gujarat, Surat generated the highest employment both in terms of total number of workers and total persons engaged, with Ahmedabad being the second in the list. Total compensation paid to the workers in terms of wages to worker and total emoluments to the employees has been highest in the district of Surat followed by Ahmedabad and Vadodara. Wages paid per worker is highest Vadodara with districts Panch Mahal, Bharuch and Amreli being the next in the list in that order. Emolument per employee is, however, highest in Amreli followed by Vadodara.

7.9 An attempt to impose the state-sample stratification criteria (i.e. District X NIC 3 digit) in central sample to generate district level estimates from central sample alone reveals that out of 868 such strata at the state level, there are 283 strata which were not represented by the central sample. All the sample units were assigned pseudo sub-sample (SS) codes (SS1 and SS2) for the purpose of calculation of RSE for such estimates. In 218

cases, it was found that either of the subsamples was void and the affected strata were merged in such cases. Details of the method used are given in Annexure III.

7.10 It may, however, be remembered that such an estimate (district level estimates generated from central sample only) is essentially a post stratification estimate as the (post) stratification variables (i.e. district) is different from the original stratification variables (state) for central sample. A problem with such post stratification is that non-representation of a post stratified domain in terms of sample points does not necessarily mean the stratum (population) itself is void.

7.11 It may be observed from the tables (4 & 5) that the post-stratification estimates from the central sample closely resemble the original estimates obtained from the central sample at the state level. The difference in RSE of estimates for these two sets of estimates from central sample is mainly due to the reconstruction of the stratum.

7.12 District-wise estimates for a few important parameters have been generated from the post-stratified central sample and the results of 4 major districts selected in terms of Output, Fixed capital, Employment and Emoluments are given in the table-6. It may be observed from the table-6 that although district level estimates can theoretically be generated based on the selected central sample units falling under a district, such estimates may significantly differ from the pooled estimates. In case of Jamnagar, the difference in two sets of estimates (post-stratified census sample and pooled sample) is very low because of the presence of a very strong census sector in the district. It has been calculated that more than 99% of the total output, input, GVA, fixed capital of the entire district is contributed by the census factories leaving very little scope of variation among the post-stratum census estimates and pooled estimates. It is also seen that the proximity of two sets of estimates in all other parameters for all other districts is also due to the same fact, i.e. presence of an overwhelmingly strong census sector (with 80% or more contribution) that controls the estimate of the entire district. On the other hand, in case of Rajkot, where contribution of the census sector towards the estimates of the entire district is very low for almost all the parameters, the estimates are largely dependent on the sample sector units (sample units of central sample and state samples respectively), which are quite divergent in many cases.

8. Concluding Remarks

8.1 The study shows that if the state sample is surveyed and processed concurrently with the central sample maintaining a uniform standard of data validation and data processing using the same layout, tabulation strategy and same sets of data validation rules, pooling of state and central sample is possible. Moreover, if the estimates are reasonably close and the variance estimates are also close, such a pooling would result in a better estimate at state level. It may, however, be remembered that RSE of central and state sample may not be exactly comparable because of difference in stratum formation for the two sets of sample. Most importantly, with the help of a pooled sample one can generate estimates at district level which can be used for estimates of District Domestic Product and for micro-level planning. Maintaining a certain quality of data is, however, of utmost importance for such estimates both at central and state level. However, estimated

RSE of principal characteristics at district level from pooled samples are very high in many cases and this requires a thorough evaluation of the sample design that uses different stratification criteria for selection of central and state sample. Moreover, care should be taken to reduce the non-response in the state sample to the maximum extent possible. The ASI state data of Gujarat can be further improved by making some more probing and referring the data back to the field, if required. High incidence of deletion cases in the state sample probably points out to the dynamic updation of the ASI frame using the state sample (surveyed cases) too in addition to the central sample, as is the practice now. Also, noting the small samples from a few districts, it is recommended to increase the size of the state sample, so as to ensure a better representation in terms of units selected for survey and consequent better control over the variability of the estimates.

Table 1: Table showing estimates of a few selected characteristics from central and pooled sample for the state of Gujarat for ASI 2009-10 along with their percentage difference.

Estimated Principal Characteristics**	(Value Figures in Rs.Lakhs & Others in numbers)		
	Central Sample	Pooled Sample	Percentage difference
1. Number of units	15,576	15,349	-1.46
2. Number of Open Units	15,339	15,183	-1.02
3. Fixed Capital	2,40,38,135	2,56,84,246	6.85
4. Invested Capital	3,42,81,035	3,62,59,863	5.77
5. Total Input	5,34,38,782	5,59,69,037	4.73
6. Total Output	6,42,65,756	6,78,49,688	5.58
7. Gross Value Added	1,08,26,974	1,18,80,651	9.73
8. Workers	8,90,600	9,05,870	1.71
8.1 Male Worker	5,23,057	5,63,150	7.67
8.2 Female Worker	27,741	27,539	-0.73
8.3 Contractual Workers	3,39,803	3,15,181	-7.25
9. Wages to Worker	6,79,673	7,49,143	10.22
10. Wage per worker*	0.76	0.83	9.21
11. Total Persons Engaged	11,59,239	12,25,235	5.69
12. Total Emoluments	15,58,915	16,58,415	6.38
13. Emolument per person employed*	1.34	1.35	0.75

* Rates in Item 10 & 13 are in Rs. Lakh

** All the figures are estimated based on the central sample alone or pooled sample, as the case may be.

Table 2: Table showing growth rate (in current prices) using last five years data

Principal Characteristics	Central Sample				Pooled ASI 09-10
	ASI 06-07	ASI 07-08	ASI 08-09	ASI 09-10	
1. Number of units	1.9	5.4	-1.6	4.8	3.3
2. Number of Open Units	1.9	4.9	-0.6	5.6	4.6
3. Fixed Capital	10.1	10.5	18.5	39.5	49.0
4. Invested Capital	12.9	13.2	17.8	38.8	46.9
5. Total Input	24.7	19.6	16.2	23.3	29.2
6. Total Output	21.0	20.3	13.4	26.5	33.5
7. Gross Value Added	5.0	24.2	-0.6	44.8	58.9
8. Workers	12.0	6.4	9.3	2.2	3.9
8.1 Male Worker	11.4	2.7	4.9	5.3	13.4
8.2 Female Worker	1.2	1.6	-0.9	1.5	0.8
8.3 Contractual Workers	14.4	13.5	17.3	-2.2	-9.3
9. Wages to Worker	21.1	18.9	12.2	14.5	26.3
10. Wage per worker	7.3	11.9	3.0	11.8	22.1
11. Total Persons Engaged	10.9	6.3	7.7	3.0	8.9
12. Total Emoluments	21.5	19.1	18.1	19.6	27.2
13. Emolument per person employed	9.3	12.8	9.4	15.5	16.4

Table 3: RSE of selected characteristics from central and pooled sample for the state of Gujarat for ASI 2009-2010

Principal Characteristics	Central Sample	Pooled Sample
1. Total Output	1.36	2.39
2. Total Input	1.02	1.72
3. Gross Value Added	4.46	9.57
4. Fixed Capital	0.63	1.87
5. Invested Capital	0.58	1.61
6. Worker	1.34	2.65
7. Wages to worker	1.06	3.32
8. Employee	1.26	3.49
9. Total Emoluments	2.15	2.64

Table 4: Table showing estimates of a few selected characteristics from central sample maintaining the original stratification and with the new stratification (District X NIC 3 digit) and pooled sample for the state of Gujarat for ASI 2009-10

Principal Characteristics	(Value Figures in Rs. Lakhs & Others in Numbers)		
	Central Sample (original)	Central Sample (post-stratification)	Pooled Sample
1. Number of units	15,576	14,951	15,349
2. Number of Open Units	15,339	14,721	15,183
3. Fixed Capital	2,40,38,135	2,38,31,148	2,56,84,246
4. Invested Capital	3,42,81,035	3,39,70,313	3,62,59,863
5. Total Input	5,34,38,782	5,29,95,246	5,59,69,037
6. Total Output	6,42,65,756	6,37,41,073	6,78,49,688
7. Gross Value Added	1,08,26,974	1,07,45,828	1,18,80,651
8. Workers	8,90,600	8,77,372	9,05,870
9. Wages to Worker	6,79,673	6,71,855	7,49,143
10. Wage per worker*	0.76	0.77	0.83
11. Total Persons Engaged	11,59,239	11,40,188	12,25,235
12. Total Emoluments	15,58,915	15,35,512	16,58,415
13. Emolument per person employed*	1.34	1.35	1.35

* Rates in Item 10 & 13 are in Rs. Lakh

Table 5: RSE of selected characteristics from central sample maintaining the original stratification and with the new stratification (District X NIC 3 digit) and pooled sample for the state of Gujarat for ASI 2009-2010

Principal Characteristics	Central Sample (original)	Central Sample (post-stratification)	Pooled Sample
1. Total Output	1.36	1.17	2.39
2. Total Input	1.02	1.04	1.72
3. Gross Value Added	4.46	4.18	9.57
4. Fixed Capital	0.63	0.71	1.87
5. Invested Capital	0.58	0.69	1.61
6. Worker	1.34	1.86	2.65
7. Wages to worker	1.06	1.46	3.32
8. Employee	1.26	1.72	3.49
9. Total Emoluments	2.15	2.13	2.64

Table 6: Estimates of a few selected characteristics from post-stratified central sample and pooled sample for 4 selected districts of Gujarat for ASI 2009-10 along with their percentage difference.

Principal Characteristics	Pooled Sample	Central Sample	Percentage difference	Pooled Sample	Central Sample	Percentage difference
	RAJKOT			JAMNAGAR		
1. Number of units	1,855	1,761	5.37	243	237	2.48
2. Number of Open Units	1,840	1,739	5.81	234	232	0.73
3. Fixed Capital	7,18,978	3,70,763	93.92	81,93,415	81,94,610	-0.01
4. Invested Capital	10,59,415	6,84,703	54.73	1,10,62,018	1,10,62,108	0.00
5. Total Input	18,78,441	17,82,747	5.37	1,83,38,640	1,83,28,194	0.06
6. Total Output	37,86,991	20,53,566	84.41	2,06,94,682	2,06,82,854	0.06
7. Gross Value Added	19,08,550	2,70,819	604.73	23,56,042	23,54,660	0.06
8. Workers	91,562	63,296	44.66	35,006	34,083	2.71
9. Wages to Worker	47,563	37,564	26.62	33,598	32,923	2.05
10. Total Persons Engaged	1,19,449	78,957	51.28	40,577	39,387	3.02
11. Total Emoluments	88,584	70,765	25.18	51,454	51,422	0.06

Table 6(Contd.): Estimates of a few selected characteristics from post-stratified central sample and pooled sample for 4 selected districts of Gujarat for ASI 2009-10 along with their percentage difference.

Principal Characteristics	Pooled Sample	Central Sample	Percentage difference	Pooled Sample	Central Sample	Percentage difference
	VADODARA			SURAT		
1. Number of units	1,896	1,934	-1.96	1,783	1,757	1.51
2. Number of Open Units	1,887	1,921	-1.79	1,752	1,732	1.14
3. Fixed Capital	25,84,073	24,05,325	7.43	36,19,819	34,94,609	3.58
4. Invested Capital	36,80,296	34,08,525	7.97	54,18,612	53,28,552	1.69
5. Total Input	68,49,335	64,17,287	6.73	69,37,090	69,43,221	-0.09
6. Total Output	81,40,463	76,11,078	6.96	88,04,784	93,45,332	-5.78
7. Gross Value Added	12,91,128	11,93,791	8.15	18,67,694	24,02,111	-22.25
8. Workers	83,067	84,800	-2.04	1,88,681	1,93,263	-2.37
9. Wages to Worker	1,03,005	88,956	15.79	1,68,622	1,72,043	-1.99
10. Total Persons Engaged	1,23,482	1,21,319	1.78	2,28,388	2,33,856	-2.34
11. Total Emoluments	2,73,698	2,40,753	13.68	2,85,119	2,95,825	-3.62

*Annexure I***Table A-I: “Status of unit” code (A12) wise percentage distribution of units**

Status of Unit code	Status of Units	Central Sample (%)									State (%)
		ASI 02-03	ASI 03-04	ASI 04-05	ASI 05-06	ASI 06-07	ASI 07-08	ASI 08-09	ASI 09-10	ASI 09-10	
1	Open	76.00	76.34	76.99	75.67	72.68	72.16	75.00	76.50	67.91	
2	Closed	1.31	1.66	1.63	1.78	1.72	2.00	1.30	0.96	0.76	
3	Not in operation	6.67	5.49	4.78	5.80	4.33	4.51	4.94	5.62	0.82	
4	Deleted less than 3yr	6.19	7.26	6.42	10.09	11.54	11.58	10.59	10.25	21.72	
5	NR closure	1.95	2.27	1.00	0.93	1.38	1.10	1.83	1.76	1.08	
6	NR non-existence	0.18	0.43	0.33	0.13	0.29	0.78	0.67	0.68	2.28	
7	NR records with IT/Court	0.31	0.16	0.15	0.09	0.03	0.08	0.21	0.02	0.00	
8	NR reactant/Refusal	0.41	0.28	0.31	0.33	0.69	0.65	0.44	0.24	3.01	
9	NR prosecution	0.08	0.02	0.00	0.02	0.05	0.00	0.10	0.02	0.00	
10	NR other	1.77	0.57	1.04	0.48	1.57	1.83	1.83	1.30	2.41	
11	Deleted more than 3yr	2.75	4.60	6.20	3.03	4.20	3.10	2.02	1.07	0.00	
12	De-registered	0.62	0.10	0.08	0.02	0.13	0.34	0.17	0.26	0.00	
13	Out of coverage	0.21	0.16	0.13	0.07	0.05	0.08	0.08	0.02	0.00	
14	Identical PSL	1.13	0.55	0.40	0.67	0.84	1.07	0.57	0.87	0.00	
15	Deleted any other reasons	0.44	0.12	0.54	0.87	0.51	0.72	0.25	0.43	0.00	
ALL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Note: NR means Non-response, thus NR closure means Non-response due to closure of the units etc.

*Annexure II***Table A-II: The duplicate DSL numbers found in the state data**

Srl.	DSL duplicate
1	240536 with 240896
2	240487 with 240797
3	242013 with 242045
4	240215 with 240216
5	242967 with 242968
6	242077 with 242083
7	240100 with 240111
8	242911 with 242912
9	241709 with 241710
10	240375 with 240380
11	241905 with 241911
12	241760 with 241829
13	240263 with 240288
14	240109 with 240121
15	242824 with 242847
16	242468 with 242493
17	240642 with 240651
18	240997 with 240998
19	242232 with 242259
20	240131 with 240134
21	240252 with 242137
22	242943 with 242944
23	242368 with 242369
24	240189 with 240190
25	242494 with 242496
26	240151 with 240152

*Annexure III****Method used for generation of District level estimates
from Central Sample alone***

ASI units are stratified at NIC 4 digit level within state/u.t. for Central Samples. Then two sets of samples are selected from each stratum one for Sub-sample 1 and other for Sub-sample 2. RSE is calculated as sum of the function of the sub-sample 1 and sub-sample 2 estimates of each stratum as given in formula (7) of *Estimation Procedure*.

Whereas, stratification used for State sample is at District X NIC 3 digit level. Now, from the 20,919 ASI units of Gujarat (during 2009-2010), 868 strata at District x NIC 3 digit level can be formed. Now, considering 5,403 Central Sample units selected from these strata, it is found that there is no selected units from 283 such strata and 218 strata do not have any sample in either sub-sample 1 or in sub-sample 2.

Pseudo Sub-sample numbers were allotted to each Central Sample units as 1 or 2 as alternate numbers within each stratum, starting randomly with the ascending order of DSL number of the selected units. (DSL number is despatch serial number, a unique running number allotted to each selected unit each year.) The process is adopted to divide the units of each stratum into two equal sub-samples. In case of odd number of samples, divisions are not equal.

As RSE is function of both sub-sample estimates, stratum void cases will not have any effect in RSE estimate, therefore, each such void stratum were merged with other homogeneous stratum, in this case, it is merged with same 3-digit NIC with nearer District or nearer 3-digit NIC within the same District. In case, such stratum is not available, then it is merged with nearer 3-digit NIC with nearer District.

After merging, total number of units in each stratum and number of surveyed units are calculated to generate multiplier for each such merged stratum. Accordingly, as per the formulae given in the section *Estimation Procedure*, estimates of Principal Characteristics and RSE are calculated.

*Annexure IV***Table A-IV: District wise estimates of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	GUJARAT STATE	KACHCH	BANS KANTHA	PATAN
1. Factories	15,349	294	82	83
2. Open Units	15,183	290	81	82
3. Fixed Capita	25,684,246	1,858,991	58,387	93,343
4. Invested Capital	36,259,863	2,623,723	96,801	199,111
5. Total Input	55,969,037	3,470,410	524,805	467,157
6. Total Output	67,849,688	4,069,673	535,289	709,171
7. Gross Value Added	11,880,651	599,263	10,484	242,015
8. Workers	905,870	53,818	4,651	3,965
8.1 Male Worker	563,150	22,089	3,695	2,550
8.2 Female Worker	27,539	2,939	17	52
8.3 Contractual Workers	315,181	28,791	939	1,362
9. Wages to Worker *	749,143	38,243	3,298	3,506
10. Wage per worker	0.83	0.71	0.71	0.88
11. Total Persons Engaged	1,225,235	67,617	7,977	4,841
12. Total Emoluments	1,658,415	80,991	8,064	7,477
13. Emolument per person employed*	1.35	1.20	1.01	1.54

Principal Characteristics	MAHESANA	SABAR KANTHA	GANDHI NAGAR	AHMEDA-BAD
1. Factories	659	141	748	3,595
2. Open Units	656	141	748	3,547
3. Fixed Capita	387,082	73,615	740,705	1,330,621
4. Invested Capital	637,255	135,258	991,658	2,142,422
5. Total Input	1,673,927	294,469	1,799,423	4,274,156
6. Total Output	1,932,873	322,925	2,103,941	4,960,243
7. Gross Value Added	258,946	28,456	304,518	686,087
8. Workers	30,185	10,054	45,323	144,485
8.1 Male Worker	17,692	5,172	27,112	72,955
8.2 Female Worker	791	535	550	3,241
8.3 Contractual Workers	11,702	4,347	17,661	68,289
9. Wages to Worker *	20,372	6,030	34,153	115,212
10. Wage per worker	0.67	0.60	0.75	0.80
11. Total Persons Engaged	41,202	12,749	62,970	197,608
12. Total Emoluments	47,707	12,149	92,328	283,936
13. Emolument per person employed*	1.16	0.95	1.47	1.44

* Rates in Item 9 & 13 are in Rs. Lakh

*Annexure IV***Table A-IV(Contd.): District wise estimates of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	SURENDRA NAGAR	RAJKOT	JAM NAGAR	POR BANDAR
1. Factories	296	1,855	243	31
2. Open Units	292	1,840	234	31
3. Fixed Capita	34,319	718,978	8,193,415	69,054
4. Invested Capital	56,045	1,059,415	11,062,018	89,387
5. Total Input	103,011	1,878,441	18,338,640	94,141
6. Total Output	124,192	3,786,991	20,694,682	115,039
7. Gross Value Added	21,182	1,908,550	2,356,042	20,898
8. Workers	6,020	91,562	35,006	5,259
8.1 Male Worker	3,855	79,252	6,359	1,508
8.2 Female Worker	590	6,321	473	143
8.3 Contractual Workers	1,576	5,989	28,174	3,608
9. Wages to Worker *	3,230	47,563	33,598	2,921
10. Wage per worker	0.54	0.52	0.96	0.56
11. Total Persons Engaged	8,711	119,449	40,577	6,395
12. Total Emoluments	7,689	88,584	51,454	5,507
13. Emolument per person employed*	0.88	0.74	1.27	0.86

Principal Characteristics	JUNAGADH	AMRELI	BHAV NAGAR	ANAND
1. Factories	199	32	255	415
2. Open Units	197	30	247	410
3. Fixed Capita	494,718	265,005	154,659	143,698
4. Invested Capital	571,231	336,422	342,166	254,755
5. Total Input	306,286	249,157	443,118	509,014
6. Total Output	386,149	477,962	524,470	531,575
7. Gross Value Added	79,863	228,805	81,352	22,561
8. Workers	12,201	3,160	10,233	15,308
8.1 Male Worker	7,093	1,178	6,957	8,924
8.2 Female Worker	1,136	6	299	235
8.3 Contractual Workers	3,973	1,976	2,977	6,150
9. Wages to Worker *	11,969	3,174	6,409	10,473
10. Wage per worker	0.98	1.00	0.63	0.68
11. Total Persons Engaged	15,550	4,692	14,000	21,130
12. Total Emoluments	19,863	10,784	14,287	27,243
13. Emolument per person employed*	1.28	2.30	1.02	1.29

* Rates in Item 9 & 13 are in Rs. Lakh

*Annexure IV***Table A-IV(Contd.): District wise estimates of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	KHEDA	PANCH MAHAL	DOHAD	VADO DARA
1. Factories	206	251	59	1,896
2. Open Units	204	251	59	1,887
3. Fixed Capita	129,682	371,358	58,813	2,584,073
4. Invested Capital	176,692	562,685	79,981	3,680,296
5. Total Input	254,378	750,295	108,836	6,849,335
6. Total Output	308,895	886,055	162,534	8,140,463
7. Gross Value Added	54,516	135,760	53,699	1,291,128
8. Workers	10,523	16,930	1,416	83,067
8.1 Male Worker	4,294	10,265	970	48,053
8.2 Female Worker	477	315	26	1,667
8.3 Contractual Workers	5,753	6,350	420	33,348
9. Wages to Worker *	6,256	20,943	1,179	103,005
10. Wage per worker	0.59	1.24	0.83	1.24
11. Total Persons Engaged	13,541	27,113	2,109	123,482
12. Total Emoluments	12,205	56,930	3,646	273,698
13. Emolument per person employed*	0.90	2.10	1.73	2.22

Principal Characteristics	NARMADA	BHARUCH	SURAT	NAVASARI
1. Factories	9	659	1,783	282
2. Open Units	9	647	1,752	278
3. Fixed Capita	15,864	3,362,180	3,619,819	94,162
4. Invested Capital	26,945	4,386,060	5,418,612	172,175
5. Total Input	24,658	4,625,385	6,937,090	296,581
6. Total Output	27,225	5,792,087	8,804,784	311,898
7. Gross Value Added	2,567	1,166,703	1,867,694	15,317
8. Workers	761	44,726	188,681	15,018
8.1 Male Worker	551	22,586	157,460	10,394
8.2 Female Worker	40	762	1,465	1,873
8.3 Contractual Workers	170	21,379	29,756	2,751
9. Wages to Worker *	653	52,381	168,622	8,958
10. Wage per worker	0.86	1.17	0.89	0.60
11. Total Persons Engaged	958	63,989	228,388	20,981
12. Total Emoluments	1,148	139,690	285,119	26,511
13. Emolument per person employed*	1.20	2.18	1.25	1.26

* Rates in Item 9 & 13 are in Rs. Lakh

*Annexure IV***Table A-IV(Contd.): District wise estimates of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	VALSAD
1. Factories	1,275
2. Open Units	1,267
3. Fixed Capita	831,709
4. Invested Capital	1,158,750
5. Total Input	1,696,326
6. Total Output	2,140,571
7. Gross Value Added	444,245
8. Workers	73,518
8.1 Male Worker	42,187
8.2 Female Worker	3,589
8.3 Contractual Workers	27,742
9. Wages to Worker *	46,995
10. Wage per worker	0.64
11. Total Persons Engaged	119,206
12. Total Emoluments	101,404
13. Emolument per person employed*	0.85

* Rates in Item 9 & 13 are in Rs. Lakh

*Annexure V***Table A-V: District wise RSE of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	GUJARAT STATE	KACHCH	BANS KANTHA	PATAN
1. Total Output	2.39	2.88	53.40	2.82
2. Total Input	1.72	3.55	54.14	4.76
3. Gross Value Added	9.57	1.59	18.67	1.67
4. Fixed Capital	1.87	0.67	37.28	1.18
5. Invested Capital	1.61	0.88	41.89	2.54
6. Worker	2.65	1.40	22.47	4.83
7. Wages to worker	3.32	1.52	33.22	2.99
8. Employee	3.49	1.43	40.32	4.61
9. Total Emoluments	2.64	1.50	43.69	1.79

Principal Characteristics	MAHESANA	SABAR KANTHA	GANDHI NAGAR	AHMEDA BAD
1. Total Output	8.05	4.72	15.98	14.00
2. Total Input	8.16	5.61	18.74	14.71
3. Gross Value Added	10.44	5.91	9.01	11.18
4. Fixed Capital	16.34	19.23	26.95	15.30
5. Invested Capital	10.97	13.47	20.47	13.11
6. Worker	9.17	9.06	5.56	5.56
7. Wages to worker	13.95	11.29	10.25	18.42
8. Employee	7.55	7.40	4.73	4.99
9. Total Emoluments	7.17	5.95	7.17	11.94

Principal Characteristics	SURENDRA NAGAR	RAJKOT	JAM NAGAR	POR BANDAR
1. Total Output	6.17	34.17	0.15	2.22
2. Total Input	8.20	11.89	0.13	2.70
3. Gross Value Added	8.95	60.62	1.13	4.73
4. Fixed Capital	4.69	40.99	0.02	1.22
5. Invested Capital	5.93	33.94	0.03	1.18
6. Worker	7.31	23.58	1.52	0.45
7. Wages to worker	4.69	15.67	0.65	2.43
8. Employee	5.33	23.76	1.79	1.00
9. Total Emoluments	5.21	15.75	0.88	2.22

*Annexure V***Table A-V (Contd.): District wise RSE of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	JUNAGADH	AMRELI	BHAV NAGAR	ANAND
1. Total Output	5.24	15.29	11.67	4.29
2. Total Input	5.79	6.29	17.49	4.67
3. Gross Value Added	11.62	25.09	22.32	73.00
4. Fixed Capital	0.23	0.12	0.68	13.02
5. Invested Capital	1.69	0.18	4.22	9.45
6. Worker	4.22	0.25	4.23	6.64
7. Wages to worker	1.74	0.05	3.08	5.79
8. Employee	3.73	0.22	2.73	7.30
9. Total Emoluments	1.62	0.04	6.97	8.60

Principal Characteristics	KHEDA	PANCH MAHAL	DOHAD	VADO DARA
1. Total Output	11.12	6.10	3.53	4.86
2. Total Input	10.57	4.71	5.09	4.65
3. Gross Value Added	21.00	17.18	0.41	13.48
4. Fixed Capital	7.14	10.38	0.40	5.24
5. Invested Capital	6.08	7.33	0.79	5.40
6. Worker	4.07	4.77	0.40	3.47
7. Wages to worker	3.94	4.82	0.25	7.23
8. Employee	6.09	12.65	0.27	4.67
9. Total Emoluments	6.77	9.01	2.06	6.71

Principal Characteristics	NARMADA*	BHARUCH	SURAT	NAVA SARI
1. Total Output	0.00	2.49	4.02	14.99
2. Total Input	0.00	2.68	5.06	12.56
3. Gross Value Added	0.00	2.22	2.62	248.99
4. Fixed Capital	0.00	2.40	5.02	31.62
5. Invested Capital	0.00	2.00	3.54	31.47
6. Worker	0.00	2.31	3.68	12.56
7. Wages to worker	0.00	2.57	3.32	8.79
8. Employee	0.00	2.01	3.81	14.30
9. Total Emoluments	0.00	2.83	3.01	22.74

* All the units of Narmada district were surveyed under complete enumeration of state sample.

*Annexure V***Table A-V(Contd.): District wise RSE of Principal Characteristics from Pooled Sample of Gujarat for ASI 2009-10**

Principal Characteristics	VALSAD
1. Total Output	3.41
2. Total Input	4.49
3. Gross Value Added	7.47
4. Fixed Capital	4.18
5. Invested Capital	3.64
6. Worker	2.56
7. Wages to worker	2.07
8. Employee	24.01
9. Total Emoluments	3.33