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Changes in the Industrial Composition of Indian Working Force: A District-Wise Analysis

AS an economy moves away from subsistence nature to that of industrialisation some changes in its employment structure are expected, however, slow the economic progress is. The aim of this study is to find out whether the employment structure of the Indian economy as reflected in the industrial composition[1] of the prime age[2] male working force, have undergone any change during the 1961-71 and 1971-81[3] periods. For this purpose, the publication of the national population censuses corresponding to the dates in question will be used, as they are the major sources of employment information at the national level.

Data and Limitations

Employment information is the most widely criticised section of the Indian censuses. In every Indian census one observes constant changes particularly in the worker concepts and their definitions. If one is to study the changes in employment characteristics over the time, it is essential that employment information should be collected under the same set of concepts and definitions. But

1. According to J. Krishnamurthy "A major indicator of changes in the Indian economy would be the changes in the industrial distribution of the working force," Quoted from the paper presented at the Seminar on the First Results of the 1971 Census, Institute of Economic Growth, Delhi, November 22-23, 1971, entitled "The Working Force in the 1971 Census: A Comment on the Provisional Results", p. 5.
2. Aged 15-59 years.
3. To the extent **data** permits.

the changes introduced in all the censuses with respect to employment concepts **in** India, can be Justified particularly on the grounds : (i) with every census one gains knowledge and experience which should be made use of in the next census, and (ii) the Indian economy is undergoing constant changes in its economic structure as a result of, particularly, the developmental programmes, calling for changes in the information collected to reflect the changed nature of the economy.

The misfortune here is located in the fact that the changes that took place were so radical that the data lost comparability with the result that a trend analysis of work participation of persons in India is next to impossible.

The following paragraphs will provide in a brief a description of the concepts and definitions adopted in 1961 and]971 censuses besides the reference period differences.[4]

Both 1961 and 1971 censuses differentiate between seasonal work and regular work and assigned different reference periods for them. If a person had worked not less than one hour a day throughout the greater part of the working season (in 1961), or engaged in economically productive work during the last one year preceding the census (in (1971) he is classified as a worker. For regular work like **trade,** profession etc., if a person had worked any day during the 15 days preceding the census enumeration date (in 1961) or any day during the one week preceding the census enumeration (in 1971) he is classified as a worker.

The results of the actual census enumeration have shown that the 1961 working force was greater than that of 1971 both in terms of absolute numbers and in terms of proportion to the total population.[6] This decline in the total working force was attributed by many, including the then Census Commissioner, Chandrasekhar (1971 : 29) to the definitional changes. Others like Srinivasan and Sharma (1971 : 6) believe that more than the definitions of work and worker, it is the actual wording of the census questions that led to the differential enumeration in the two censuses. In describing the problems of definition

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4. For a detailed description of the problems associated with these changes See the following papers presented at (the Seminar on First Results of 197] Census, Insitiute of Economic Growth, Delhi, November 22-23,1971, K, N. Srinivasan and R.N. Sharma, "Oa making comparisons of the data on economically active population collected in the Censuses of India, 1961-71", J. Krishnamurthy, *op. cit., 3. J.*N Sinha, "A Rational View of Census Economic Data", B. R, Kalra, "A preliminary Appraisal of J971 Census Economic Results", Pravin Visaria, "The Provisional *1971* Census Data on the Working Force."

5.	*1961*	*1971*
Total Workers	188,675,500	180,485,006
Worker Population Ratio	42.98	32.93

and. quality of existing statistics in less developed countries, Turnham **(1971 : 25)** writes that differential "interpretation of questions asked and of replies **given"** and the social attitude towards work participation, particularly in the case of women and children can also affect the results. This also could be one of the main reasons for the differences observed in the economically active population according to 1961 and 1971 censuses of India. All these explanations purport to the fact that there was no actual decline in the working force, which can not happen unless there is a very serious change in the age structure of the population or the age-specific participation rates of the population.

With nothing but the outcome of two censuses, the results of their own peculiar concepts and definitions and differing interpretations of questions and answers, some scholars have tried to bring some common thread that can connect the two results and get at least a general idea regarding the working force changes. It is agreed that any conceptual or definitional change will affect the marginal workers—children, women and older persons—whose labour force commitment is commonly believed to be weak or intermittent. They are the so-called "secondary" workers. That leaves the "prime" age male workers whom it may be possible to compare and get some general, though not precise, trend of work participation.[6] The present study will confine itself to this group, viz., male workers in the 15-59 age group.

Variables Selected and their Relationship **with** Changes in **Industrial** Composition

The nature and amount of goods and services to be produced in any economy is generally decided by the effective demand for it and effective demand is bound to change with development and consequent changes in the purchasing power of the people and changes in their tastes leading to mutiplied needs with diversified nature. This points to the fact that there is a strong inter-correlation between change in industrial composition and economic development.

By 1971 India had two decades of planned development behind her and based on this fact two assumptions are made for the purposes of this study. The first assumption is that during the period under consideration the economic structure

6	1961	*1971*
Total Workers Males (15-59);	110,985,631	128,784,063
Worker (M 15-59) Population Ratio :	91.60	86.89

Notice that in 1971 even though there is an increase in workers in absolute terms, the rate is 5 percentage points less than that of 1961. The rapid growth of male population in this age group during 1961-71 decade (22%) compared to the growth of workers (16%) can be one of the explanations for this difference.

of the Indian economy has undergone changes and that the changes have occurred throughout the length and breadth of the country; and the second, some areal units have a tendency to change faster than others due to the influence of some specific factors like locational advantage.

The variables chosen to be related to the changes in the industrial composition of the working force are : growth rate of urban population; growth rate of workers; changes in the dependency ratio, farm component and manufacturing component of the workers.

"Urbanisation by itself", said Chandrasekhar, "is an effect of the economic, social and migrational patterns" (1971 : 3). As these factors are highly intercorrelated it is often not easy to find out the extent of influence of these factors separately on urbanisation. "Historically economic development was accompanied by an increase in urban population" (Stockwell, 1966 : 219) and many of the studies that went into the relationship between economic development and urbanisation supports this view. With urbanisation, the usual self-sufficient nature of the rural subsistence economy will be slowly but Surely disappearing to be replaced by specialisation and mutual interdependence. With interdependence of interrelationships the economic structure is expected to become more and more diversified bringing with it rapid changes in the industrial composition of the working force. Thus the latter and the proportion of urban population in an areal unit are hypothesized to have a direct relationship. As an index of urbanisation, growth rate of urban population is used.

The experience of many of the present day developed nations show a slow and steady decline in its work participation rate upto a point as it moved away from its subsistence nature toward industrialisation. This decline was brought about through a decline in child and old age work participation. Later, with economic development more and more women started participating in out-of-the-home employment which compensated for the decline brought about through a reduction in old age and child work participation. Thus, at the initial stages of economic development, other things remaining equal, one could expect a negative relationship between overall participation rate and economic development. But in the present study the workers under consideration being prime age males one may have to look at the situation differently taking into consideration the present Indian context.

In India, where unemployment of prime age males is so rampant and where female work participation in jobs outside home is yet to receive unreserved public support, the new job opportunities created are more than likely to benefit the unemployed prime age males and thereby increase their employment rate. Thus the growth rate of prime age male workers can be taken as an indicator of economic development and consequent diversification of industrial structure. This leads to the proposition that higher the growth rate of workers greater will be the change in the industrial composition.

Further, as economic development leads to an improvement in the employment situation, other things remaining equal, the number of persons economically depending on each working person is expected to decline. This combined with the already postulated hypothesis that higher the growth rate of workers, greater the change in industrial composition gives rise to a further proposition that higher the decline in dependency ratio greater the change in industrial composition.

Another aspect of economic development is that, it brings with it structural changes in the economy such that the GDP and employment accounted by agriculture will decline (Colman and Nixon, 1980 : 130). This is the experience of many a present day developed economy and this pattern is found to be true in many other countries as well. That is, a shift in employment from agricultural to other activities can be expected revealing a negative relationship between farm component and economic development. Since economic development and changes in industrial composition are directly related, farm component and industrial composition are expected to have an inverse relationship. Farm component is defined here as the proportion of workers engaged in agriculture and related activities, and as an index, the change in farm component during 1961-71 period is used.

With a decrease in farm component, naturally its complement the non-farm component increases. In the non-farm component generally non-household manufacturing rises very fast because economic development has a tendency to bring a shift in manufacturing activities from household to factories. Manufacturing component in this study refers to the proportion of total workers engaged in non-household manufacturing activities. This proportion, thus, is expected to have a direct relationship with economic development and, therefore, on changes in industrial composition. Here again change in this component during the period is used as an index,

Unit of Analysis and Method Adopted

For any study of population distribution, the most meaningful unit of analysis is what the human ecologists refer to as "communities". But, as the demarcation of boundaries of each community is not possible, the social researcher will have to necessarily depend on areas demarcated for administrative purposes. In India, district is the lowest administrative unit for which the required data are available and thus district is taken as the unit of analysis for this study. Because of the boundary changes of some of the districts during the 1961-71 period either by acquiring some area from another district or by losing some area to another district, or by splitting one district into two, some adjustments had to be made. In cases where the 1961 enumerated population of the 1961 district (boundary-wise) is different from the 1961 enumerated population of the

1971 district, by only less than 5 per cent (arbitrarily chosen) no adjustment is made assuming that such small differences may not distort the total picture. In cases with more than 5 per cent difference, districts were combined to make the population of the units comparable.

Only the districts in the 15 major states[7] in India are considered for this study. Altogether there were 302 and 311 districts in these states for 1961 and 1971 respectively, and after necessary adjustments, there were 292 units for analysis.

For each of these units the per cent distribution of workers into each of the nine industrial divisions[8] of the Indian Standard Industrial Classification was done for both the years 1961 and 1971 and from it the coefficient of dissimilarity[9] was calculated. This coefficient is an index showing the minimum percentage of either population (1961 or 1971) that would have to shift categories to provide identical proportions in the 9 industrial categories in the 1961 and 1971 population. A larger coefficient means a larger shift in the industrial composition.

While examining the 1971-81 data a few facts are to be kept in mind. Even-though, as in the case of 1961-71 only male workers are considered, no age stipulation could be made for the 1971-81 data as age data are not yet available for economically active population of the 1981 census. Further, detailed classification of industries also are not yet available for 1981. Thus, all working males in the four industrial divisions available are used for computing the coefficient of dissimilarity. There were 326 districts in the 14 states[10] under consideration in 1981. Because of the boundary changes that took place during 1971-81 period several districts became directly non-comparable. As details of the territorial changes were not available at the time of computation of the information, some of the districts had to be excluded from the 1971-81 analysis resulting in only 265 units available for the analysis.

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7. **With a population of 10** million **or more.**

8. **The industrial divisions are: I:** Cultivation; **II; Agricultural** Labourers; **III: Livestock, forestry, fishing, hunting** etc; **IV;** Mining and quarrying; V: Manufacturing, processing, **servicing and repairs—*(a)* Household industry,** *(b)* **Other** than household **industry; VI: Construction; VII: Trade and Commerce; VIII; Transport,** storage and Communications; **IX; Other services.**

9. **The formula used is;**

$$\left.\begin{array}{l}\text{Coefficient of}\\ \text{Dissimilarity}\end{array}\right\} = \frac{\sum_i | P_{1i} - P_{2i} |}{2}$$

Where P_{1i} and P_{2i} refer to the percent of population in industrial category *i,* respectively **for population 1 and population 2. The** coefficient can take any value between **0 (identical distribution) and ICO (non-ovtrlapping** distribution) (between 0 **and** l, if **proportions, instead of percent is used).**

10 Excluding Assam where **census enumeration was not done due to "disturbed conditions", Census of India 1981, Series-[India. Paper 3 of 1981,** ***Provisional Population Totals, Workers and Non-Workers,*** **p. 3.**

Findings

The frequency distribution of the coefficient of dissimilarity is given in Table 1 along with all-India value of the coefficient.

TABLE 1—FREQUENCY **DISTRIBUTION OF THE COEFFICIENT OP** DISSIMILARITY **FOR** 1961-71 and 1971-81

Coefficient of Dissimilarity	*Frequency*			
	1961-71		*1971-81*	
	No. of Cases	*Percent*	*No. of Cases*	*Percent*
0.01.1.00	—	—	*5*	1.88
1,01-2.00	—	—	21	7.92
2.01-3.00	—	—	43	16.23
3,01-4.00	*7*	2.40	41	15.47
4.01-5.00	11	3.77	*38*	14.34
5-01-6,00	27	9.25	34	12.83
6.01-7.00	32	10,96	26	9.81
7.01-8.00	22	7.53	27	10.19
8.01-9.00	*29*	9.93	7	2.64
9,0140.00	17	5.82	11	4.15
10.01-11.00	24	8.22	3	1.13
11.01-12.00	21	7.19	*3*	1.13
12.01-13,00	*22*	7.53	*2*	0,75
13.01-14.00	18	6.16	2	0.75
14.01-15.00	9	3.08	I	0.38
15.01-16,00	14	4.79	—	—
16.01-17.00	11	3.77	—	—
17.01-18.00	10	3.42	—	—
18.01-19.00	*4*	1.37	—	—
19.0 1-20.00		*1.71*	—	—
20.01-21.00		0.68	—	—
21,01-22.00		1.03	—	—
22.60		0.54	—	—
26.88		0.34	—	—
27.68		0.34	—	—
33.29		0.34	—	—.
39.46		—	I	0.38
Total		100.CO	265	100.00

All India value of coefficient of dissimilarity : 1961-71 : 10.60
1971-81: 5.10

It appears that during 1961-71 period the changes in the industrial composition of the prime age male workers was much higher than that observed during 1971-81—respective coefficients being 10.6 percent and 5.1 percent. This situation is clearly seen from the frequency distribution also. During the first decade under consideration (1961-71) only 50 percent of the units have shown a coefficient less than 10 percent, whereas during the decade that followed 96 percent were within this limit.

The units were classified into two groups and the basis of classification of each variable is as follows. For two characteristics, viz,, the growth rate of urban population, and the growth rate of workers, the all-India value of the characteristic in question was used as the dividing line and a value less than that of the all-India value is considered to be at a lesser level of development compared to the units with a value above that of the all-India value. The mean coefficient of dissimilarity, thus, is expected to be higher for the second group.

During the 1961-71 period there were only 4 units that showed actual decline in the dependency ratio.[11] Thus the classification has to be lesser increase or greater increase, the dividing line being the corresponding all-India value. In 1971-81, actual decline in dependency ratio was noted in many cases and thus it was possible to classify units with decline and units with increase separately. Where the increase is less, or where there was actual decline, it is assumed that they are comparatively better off in the development scale, and therefore, the mean coefficient of dissimilarity has to be higher in this group than that of the other group.

In the case of farm and manufacturing components, declines were noticed in many cases. A decline in farm component is a welcome feature as far as industrialisation goes and it was, thus, decided to club all the districts that have shown a definite decline into one group leaving those with a definite increase for the other group. The first group is expected to be at a higher level and to have a higher mean coefficient of dissimilarity compared to the other group.

Unlike the case of farm component, a decline in manufacturing component is not expected.[12] It is suspected that the observed decrease in this component would not have been there had the 1961 definitions and procedures of enumeration were adopted. But it is feared that even then these units may not have indicated any increase either. Hence all those units which recorded a decline was put in one group and this group was in the lower level of development compared to those that marked a definite increase. The group with definite increase is expected to have a comparatively high mean coefficient of dissimilarity.

11. This increase in dependency ratio in the case of almost all units could be the result of differential enumeration between 1961 and 1971 censuses. It is assumed here that the effect of differential enumeration is uniform in all the districts.

12. The result of a strict definition adopted in 1971 but here again the assumption is **uniform** distribution of the effect of the changes in definition.

Table 2 below shows the classification scheme, number of units and mean coefficient of dissimilarity for the corresponding groups. Of the 5 proxies for

TABLE 2—CLASSIFICATION OF UNITS ACCORDING TO THE CHARACTERISTICS HYPOTHESIZED TO BE RELATED TO CHANGES IN THE INDUSTRIAL COMPOSITION AND MEAN COEFFICIENT OF DISSIMILARITY, 1961-1971

Characteristics	*Description of Class*	*Size of Class (Per cent)*	*Number of Cases*	*Mean Coefficient of Dissimilarity*
Change in farm component	Definite increase	> 0.00	212	10.45
	Definite decrease[1]	< 0.00	80	11.03
Change in manufacturing component	Definite decrease	< 0.00	55	10.18
	Definite increase	> 0.00	235	10.80
Change in dependency ratio	Greater increase	> 71.07	140	9.74
	Lesser Increase[2]	< 71.07	143	11.52
Growth rate of workers	Lesser increase[3]	< 16.04	175	10.31
	Greater Increase	> 16.04	117	11.05
Growth rate of urban population[4]	Lesser increase	< 38.21	154	10:76
	Greater increase	> 38.21	137	10.47

1. One case with no change in farm component
2. Four cases with actual decline
3. Three cases with negative growth
4. One district has no urban population

Inclusion or exclusion of these units did not make much difference in either the mean coefficient or the direction of relationship.

economic development used 4 of them indicated results in the expected direction. The exception was the relationship between growth rate of urban population and changes in the industrial composition. It was postulated at the beginning that since economic development and urbanisation are found to go hand-in-hand, with an increase in urban population greater changes can be expected in the industrial composition of the working force. But an inverse relationship was observed. No logical explanation can be provided if the theoretical exposition is correct. Perhaps definition of urban could provide a clue to this unexpected observed relationship. In this analysis as an index of urbanization, the growth rate of total urban population was used. That could be a mistake. According to the censuses in India, all places with a municipality, corporation, cantonment or notified area and those having a minimum population 5,000 with atleast 75 per cent of the male working force in non-agricultural activities, together with a population density of 400 per square kilometre are treated as

urban (Chandrasekhar, 1971 : 3). Some of these areas need not necessarily have other urban characteristics which are reflections of economic and social development. Thus, instead of considering all urban population, if a cut off point-.of 50,000 is used, the findings could be different. But this could not be done without further reducing the number of units of analysis as some districts did not have an urban population of 50,000 or more. Furthermore even for large urban areas in India it is argued that one often finds in them "layers of differentially urbanised people", (Hoselitz, 1962 : 172) which also could distort the total picture.

An explanation can also be sought in migration. It may be recalled that when presenting the variable it was pointed out that urbanisation is the result of economic, social and migrational patterns. Perhaps in the case of India, migration has played a greater role than the economic or social factors. That is, urbanisation was the result of large-scale rural to urban migration of popula tion with the fond hope of obtaining a non-farm job and to enjoy the so-called urban way of life. The number of people, thus, drawn to urban areas could be much larger than the number of job opportunities available, especially in the initial stages of development. Such swellings in urban population need not necessarily be accompanied by changes in industrial composition.

The necessary information for the 1971-81 period is provided in Table 3. The only relationship of importance found here is that between change in farm component and change in the industrial composition. That is, a definite decrease in the farm component was associated with a greater change in the industrial composition. Change in dependency ratio showed practically no difference.

TABLE 3-CLASSIFICATION OF UNITS ACCORDING TO THE CHARACTERISTICS HYPOTHESIZED TO BE RELATED TO CHANGES IN THE INDUSTRIAL COMPOSITION AND MEAN **COEFFICIENT OF** DISSIMILARITY, 1971-81

Characteristics	*Description of Class*	*Size of Class*	*Number of Cases*	*Mean Coefficient of Dissimilarity*
Change in farm component	Definite decline	< 0.00	248	5.19
	Definite increase	> 0.00	17	3.38
Change in dependency ratio	Definite decline	< 0.00	150	5.07
	Definite increase	> 0,00	115	5.07
Growth rate of workers	Lesser increase	< 20.91	117	5.11
	Greater increase	> 20.91	148	5.04
Growth rate of urban population	Lesser increase	< 46.02	123	5.06
	Greater increase	< 46.02	142	5.08

This is surprising especially considering the fact that during 1971-81 period more than half the units, recorded a definite decline in dependency ratio. The direction of relationship with the growth rate of urban population was as expected but the difference is so small that it could also be explained away as the effect of rounding of figures. The behaviour of growth rate of workers also was disappointing as lesser growth rate was associated with larger change in industrial composition. Here again, it should be pointed out, the difference is negligible.

Summary and Conclusions

This is an attempt to identify changes in the industrial composition of the Indian working force during 1961-71 and 1971-81 periods. The variables to be related to changes in industrial composition are (1) change in farm component, (2) change in manufacturing component, (3) change in dependency ratio, (4) growth rate of workers and (5) growth rate of urban population.

When the 1961-71 data were examined, the finding relating to the last characteristic was not in the expected direction. It is admitted that all the other variables are not mutually exclusive and as such perhaps they are all expected to behave in the same manner. But a shadow of doubt falls on this generalisation when the 1971-81 data are analysed. Except farm component none of the other variables seemed to be important in determining the changes in the industrial composition of Indian working force during the 1971-81 period.

On the whole 1961-71 period had shown a larger shift in the industrial composition than the 1971-81 period. To what could this be attributed is not clear. Perhaps, when the detailed data on all industrial divisions are available for 1981 it might make a difference, All the same, it appears that, though not very marked, there is some shift in the industrial composition of the working force, and this appears to be related, though faintly, to the level of development. Perhaps if better indices of development were available, more prominent relationship may emerge. But the actual picture, it is feared, will evade any researcher as long as radical changes are introduced in the concepts and definitions relating to and the procedures adopted in economic data collection.

References

1. Census of India, 1981, Series 1—India, Paper 3 of 1981, *Provisional Population Totals, Workers and Non-Workers.*
2. Chandrasekhar, A., 1971, Census of India, 1971, Series 1—India, Paper 1 of 1971—Supplement, *Provisional Population Totals.*
3. Colman, David and Nixon, Frederick, 1980, *Economics of Changes in Less Developed Countries,* B. R. Publishing Corp., Delhi.
4. Hosclitz, Bert F., 1962, The role of Urbanisation in economic development; Some international comparisons. *In:* **Roy** Turner (ed.), *India's Urban Futuer,* University of Californea **Press,** Berkely and Los Angeles.

5. **Kalra, B. R.,** 1971, *A Preliminary Appraisal of 1971 Census Economic Results* presented at the Seminar on the First Results of the 1971 Census, Institute of Economic Growth, Delhi, November 22-23,1971.
6. Krishnamurthy, J., 1971, *The Working Force in 1971 Census: A comment on the Provisional* ***Results,*** paper presented at the Seminar on The First Results of the 1971 Census, Institute of Economic Growth, Delhi, November 22-23, 1971.
7. Sinha, J. N., 1971, *A Rational View of Census Economic Data,* Presented at the Seminar on **First** Reiults of the 1971 Census, Institute of Economic Growth, Delhi, November 22-23,1971. ,
8. Srinivasan, K. N. and Sharma, R. N., 1971, *On Making Comparisons of the Data on Economically Active Population collected in (he Censuses of India, 1961-71,* presented at the Seminar on The First Results **of** the 1971 Census, Institute of Economic Growth, Delhi, November 22-23, 1971.
9. Stockwell, Edward G., 1966, Some demographic correlates of economic development, ***Rural*** *Sociology,* 31(4), 216-345.
10. Turnham, **David,** 1971,. *The Employment Problem in Less Developed Countries,* **OECD,** Paris.
11. Visaria, Pravin, 1971, *The Provisional 1971 Census Data en the Working Force,* presented **at the** Seminar on The First Results of the 1971 Census, Institute of Economic **Growth, Delhi,** November 22-23, 1971,