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INTERSTATE VARIATION IN FEMALE LABOUR FORCE PARTICIPATION RATES IN INDIA - AN ANALYSIS OF THE 1971 CENSUS DATA

by

Bakul H. Dholakia* and Ravindra H. Dholakia**

The economic data thrown up by the 1971 census reveal that the incidence of labour force participation varies considerably among the female population of different states. The census data also reveal that the coefficient of interstate variation for the female participation rate (FPR),[1] is substantially higher than that observed for male participation rate. It is evident, therefore, that the interstate variation in the overall labour participation rate tends to be governed primarily by the corresponding interstate variation in the female participation rate. In fact, recent studies on the subject have shown that on the whole, the observed interestate variation in FPR explains as much as 90 per cent of the observed interstate variation in the overall labour participation rate among states[2]. A Study of the interstate variation in FPR, therefore, assumes vital importance in the analysis of the regional variation in the overall labour participation rate in India.

The main factors which govern the regional variation in FPR can be divided into the broad categories: (a) The structural differences in female population among different regions, and (b) a variety of other factors including various socio-economic and cultural factors. The observed interregional variation in FPR can accordingly

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be divided into two parts, viz., the part that can be attributed to the structural differences in female population and the remaining part which can be attributed to other factors. It is only the latter which represents the true indicator of the real of fundamental interregional variation in the tendency to participate in economic activity on the part of females. In the present paper, we have made an attempt to isolate the influence of structural differences in female population on the FPR in different states and thereby measure the extent of the actual regional variations in the female labour participation rate in India. Having derived the series of FPR adjusted for the structural differences in female population, we have also made an attempt to examine thevarious factors that influence the interstate variation in the adjusted FPR.

The present studyis based primarily on the data available from the 1971 population census. It covers all the states of India as they existed at thetime of 1971 census. The paper is divided into six sections. In the next section we examine the analytical framework to separate the structural factors from other factors influencing the interstate variations in FPR. The third section contains an analysis of the interstate variations in FPR. The third section contains an analysis of the observed interstate variation in age-specific FPR. The fourth section is devoted to the quantificationof the sources of interstate variations in FPR. In the fifth section, an attempt is made to explain the interstate variation in FPR in terms of some conventional socio-economic and cultural factors using the standard

technique of multiple regression analysis. The sixth and final section of th paper presents the me n conclusions of he study.

The overall FPR in j^{th} state can be looked upon as a weigted average of the FPR in rural areas (RPFR) and the FPR in urban areas (UFPR) in that state, the weights being the proportion of the female population of the respective areas (i.e. RFP and UFP) in the total female population (FP) in the state. Using the respective symbols, we can represent this as follows:

$$FPR_j = \frac{RFP_j}{FP_j} (RFPR_j) + \frac{UFP_j}{FP_j} (UFPR_j) \qquad \dots (1)$$

Further, the $RFPR_j$ is nothing but the weighted average of age-specific FPR in rural areas of the jth state, the weights being the corresponding age-structure of the female population in the rural areas of the jth state, i.e.,

$$RFPR_j = \sum_{i=1}^{n} \frac{RFP_{ij}}{RFP_j} (RFPR_{ij}) \qquad \dots (2)$$

where, i stands for i^{th} age-group and n for the total number of age-groups distinguished. Similarly, the $UFPR_j$ is the weighted average of age-specific FPR in urban areas of the jth state, the weights being the corresponding age-structure of the female population in urban areas of the jth state, i.e.,

$$UFPR_j = \sum_{i=1}^{n} \frac{UFP_{ij}}{UFP_j} (UFPR_{ij}) \qquad \dots (3)$$

Hence, overall FPR in j^{th} state can be represented as:

$$FPR_j = \frac{RFP_j}{FP_j} \sum_{i=1}^{n} \frac{RFP_{ij}}{RFP_j} (RFPR_{ij}) + \frac{UFP_j}{FP_j} \sum_{i=1}^{n} \frac{UFP_{ij}}{UFP_j} (UFPR_{ij}) \qquad \dots (4)$$

It can be seen from equation (4) that FPR_j is a function of three distinct sets of variables: 1) the extent of urbanisation of as represented by $\dfrac{RFP_j}{FP_j}$ and $\dfrac{UFP_j}{FP_j}$, 2) the age-structure of the female population as represented by $\dfrac{RFP_{ij}}{UFP_j}$ and 3) the age-specific female participation rates, represented by $RFPR_{ij}$ and $UFPR_{ij}$.

Obviously the first two of these factors are largely structural in nature, in the sense that they do not represent the basic tendecies to work on thepart of females in a given state. In order to get the idea about interstate variatinns in the baisc work force tendencies arong females in India, therefore, we have to abstract from the interstate variations in these factors by not allowing them to very from state to state. If we take the all India average values of these variables for each state and calculate the overall FPR for different states, we can measure the interstate variations in the work force tendencies among females with reasonable standard of accuracy. In terms of symbols without subscript j to represent the corresponding national average value, then,

$$AFPR_j = \frac{RFP}{FP} \sum_{i=1}^{n} \frac{RFP_i}{RFP} (RFPR_{ij}) + \frac{UFP}{FP} \sum_{i=1}^{n} \frac{UFP_i}{UFP} (UFPR_{ij}) \qquad \ldots (5)$$

represents the adjusted female participation rate for j^{th} state which, in turn, can be used to measure the interstate variations in the basic work force tendencies among females. Similarly, for measuring the interstate variations in the work force tendencies among females in rural areas, we can use the equation:

$$ARFPR_j = \sum_{i=1}^{n} \frac{RFP_i}{RFP} (RFPR_{ij}) \qquad \ldots (6)$$

For measuring the interstate variations in the basic work force tendencies among females in urban areas, we can use the equation:

$$\text{AUFPR} \qquad \text{AUFPR}_j = \sum_{i=1}^{n} \frac{\text{UFP}_i}{\text{UFP}} \; (\text{UFPR}_{ij}) \qquad \qquad \qquad \qquad \text{... (7)}$$

The Census of India 1971 provides the relevant data on all the so factors. It reports the population and workers in urban and rural areas of different states by eight broad age-groups, viz., D-14, 15-19, 20-24, 25-29, 30-39, 40-49, 50-59 and 60 and above, besides the category of age not stated. For our purpose, we have lumped the category of age not stated with the age-group 60 and above. Then, by applying equations (5), (6) and (7) above, we can arrive at the adjusted FPR in all areas, rural areas and urban areas respectively for each state in India. Appendix Table 1 presents these adjusted FPRs along with the observed FPRs for each state in India.

III

It is almost obvious from the equations (5), (6) and (7) above, that the adjusted female participation rate depends primarily on the age-specific FPR. It is, therefore, an interesting exercise to compare the degree of interstate variations in the age-specific FPRs in the urban and rural areas and examine whether significant correlations exist among these rates. Table 1 gives the coefficients of variation of different age-specific FPRs and their correlation with the area-specific adjusted and unadjusted FPRs.

Table 1

Inter-regional Variability of Area-Age-Specific FPR and

its Correlation with Adjusted and Observed Area-Specific

FPR. 1971

Age group	Coefficient of Variation of Age-SpecificFPR	Coefficient of correlation with Adjusted FPR	Coefficient of correlation with observed FPR
(1)	(2)	(3)	(4)
Rural Areas:			
0-14	0.7944	0.9273	0.9272
15-19	0.7163	0.9776	0.9744
20-24	0.7460	0.9926	0.9901
25-29	0.7693	0.9964	0.9944
30-39	0.7719	0.9966	0.9952
40-49	0.7862	0.9953	0.9945
50-59	0.8720	0.9886	0.9903
60 & above	1.1648	0.9244	0.9290
Adjusted FPR	0.7836	1.0000	0.9993
Observed FPR	0.8010	0.9993	

Urban Areas :

0-14

15-19

20-2

Table 1

Inter-regional Variability of Area-Age-Specific FPR and
its Correlation with Adjusted and Observed Area-Specific
FPR. 1971

Age group	Coefficient of Variation of Age-SpecificFPR	Coefficient of correlation with Adjusted FPR	Coefficient of correlation with observed FPR
(1)	(2)	(3)	(4)
Rural Areas:			
0-14	6.7944	0.9273	0.9272
15-19	0.7163	0.9776	0.9744
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25-29	0.7693	0.9964	0.9944
30-39	0.7719	0.9966	0.9952
40-49	0.7862	0.9953	0.9945
50-59	0.8720	0.9886	0.9903
60 & above	1.1648	0.9244	0.9290
Adjusted FPR	0.7836	1.0000	0.9993
Observed FPR	0.8010	0.9993	1.0000
Urban Areas :			
0-14	0.6355	0.4356	0.6470
15-19	0.5551	0.7508	0.8939
20-24	0.4279	0.8808	0.9306
25-29	0.4658	0.9344	0.9427
30-39	0.5285	0.9729	0.9880
40-49	0.5282	0.9330	0.9777
50-59	0.5829	0.9281	0.9378
60 & above	0.6160	0.7988	0.8097
Adjusted FPR	0.6451	1.0000	0.9463
Observed FPR	0.4963	0.9463	1.0000

Source : (1) Census of India 1971, Series-I, India, Paper No.3 of 1972, Economic Characteristics of Population, Registrar Central, Government of India.

(2) Appendix Table 1

The following observations can be made from the figures given in Table 1 :

1. On the whole, FPR in each of the eight age-groups in rural areas and urban areas shows a fairly high degree of interstate variation.

2. FPR in the age-groups 0-14 and 60 and above show distinctly higher degree of interstate variation than the FPR in the remaining age-groups in both rural and urabn areas.

3. Overall FPR in rural areas shows considerably higher degree of interstate variation than that in urban areas.

4. Age-specific FPR shows much greater interstate variation in rural areas than the urban areas for each of the eight age-groups.

5. There is not much of a difference between the variation revealed by the adjusted FPR and the observed or actual FPR in rural areas. This implies that the age-structure of the female population in rural areas in India is a neutral factor as far as the interstate variation in FPR is concerned. However, in urban areas, the variation revealed by the adjusted FPR in much greater than that revealed by

the observed FPR, which implies that the interstate variation is age-structure of the female population in urban areas in India plays a significant part in reducing the variability of the overall FPR in urban areas.

5. There seems to be a very high degree of complementarity between regional age-specific FPRs in rural areas, since the age-speci- FPR for each age-group shows a coefficient of correlation of $\mathbf{0.8}$ or more with every other age-group and the adjusted as well as observed FPRs.

7. The correlation between age-specific FPR and the adjusted FPR
is very high (nearly perfect in some cases) for almost all age-
groups in rural areas, the value of the coefficient of correlation
ranging from 0.9244 to 0.9966, the corresponding figures for the
observed FPR being 0.9272 to 0.9952. However, the situation
is somewhat different in urban areas. Here, the first two and
the last age-groups show the coefficient of correlation (between
ago-specific FPR and the adjusted and observed FPRs in urban
areas) steadily improves from the first ago-group (0-14) to the
fifthe age-group (30-39) and than again declines steadily.
Moreover, the age-specific FPR shows greater correlation with
the observed FPR than with the adjusted FPR in urban areas, the
difference being quite significant in the case of the first
two age-groups.

Moreover, it is also interesting to note that the correlation between
the overall adjusted FPR in all areas and the adjusted FPR in rural areas
(r=0.6962). The correlation between the overall observed FPR in all
areas and the observed FPR in rural areas (r=0.9964) is also significently
high as compared to that in urban areas (r = 0.7005). Moreover, the
correlation between the adjusted FPR in rural areas and the adjusted
FPR in urban areas (r = 0.6442) is quite low as compared to the
correlation between the observed FPR in rural areas and the observed
FPR in urban areas (r = 0.7065). This probably implies that the

structural factors in the urban and rural areas play a significant part
in increasing the degree of complementarity between the FPRs in urban
and rural areas. However, if we examine the correlation between the
adjusted FPR and the observed FPR in all areas (r = 0.9927), rural
areas (r = 0.9993) and urban areas (r = 0.9453), we find that the
structural factors have on an average very little influence on the
interstate variations in the FPR.

IV

In the previous section, we found that, on an average, the interstate
variation in the basic work force tendency, rather than that in the
structural factors, explains a large part of the interstate variation
in the observed female participation rate in India. The relative
contributions of the two sets of factors in explaining the overall
variation in FPR may, however, differ from one state to another. In
this section, we, therefore, examine the case of each individual state.

On the basis of the observed overall FPR and the adjusted overall
FPR, we can find out the contribution of the basic work force tendency
vis-a-vis the structural factors and residual (or cross effect of the two
factors) in the deviation of the observed FPR from the national average
in the case of each state. Table 2 gives these contributions along with
the observed and adjusted overall FPR for each of the twenty states.

Table 2

Contribution of Structural Factors and Socio-economic

and Socio-economic & Cultural Factors to Observed

Interstate Variation in FPR. 1971

| State | Female Participation Rate | | Deviations of FPR from th national average | | |
	Observed	Adjusted (for Structural differences in Female Population)	Observed	Due to socio-economic & cultural factors	Due to structural factors*
(1)	(2)	(3)	(4)	(5)	(6)
1) Andhra Pradesh	24.16	23.6	+12.31	+11.84	+ 0.47
2) Assam**	7.34	7.70	− 4.51	− 4.15	− 0.36
3) Bihar	8.88	8.30	− 2.97	− 3.55	+ 0.58
4) Gujarat	10.26	10.89	− 1.59	− 0.96	− 8.63
5) Haryana	2.41	2.53	− 9.44	− 9.32	− 0.12
6) Himachal Pradesh	20.79	18.66	+ 8.94	+ 6.81	+ 2.13
7) Jammu & Kashmir	3.83	3.91	− 7.99	− 7.94	− 0.05
8) Kerala	13.49	13.13	+ 1.64	+ 1.28	+ 0.36
9) Madhya Pradesh	18.65	18.51	+ 6.80	+ 6.66	+ 0.14
10) Maharashtra	19.70	21.33	+ 7.85	+ 9.48	− 1.63
11) Manipur	23.62	24.99	+11.77	+13.14	− 1.37
12) Mysore	14.20	14.79	+ 2.35	+ 2.94	− 0.59
13) Nagaland	45.24	39.63	+33.39	+27.78	+ 5.61
14) Orissa	6.81	6.78	− 5.04	− 5.07	+ 0.03
15) Punjab	1.18	1.11	−10.67	−10.74	+ 0.07
16) Rajasthan	8.34	8.38	− 3.51	− 3.47	− 0.04
17) Tamil Nadu	15.09	14.93	+ 3.24	+ 3.08	+ 0.16
18) Tripura	8.43	5.13	− 3.42	− 6.72	+ 3.30
19) Uttar Pradesh	6.71	6.39	− 5.14	− 5.46	+ 0.32
20) West Bengal	4.43	4.70	− 7.42	− 7.15	− 0.27
All India	11.85	11.85	0.00	0.00	0.00

* Includes the residual
** Includes Meghaleya.

Source: Appendix Table 1.

The following observations can be made from the figures given in Table 2:

1. Nine states out of twenty states have observed FPR above the national average; and the same nine states also have adjusted FPR above the rational average.

2. The basic work force tendency among females determined by the socio—economic and cultural factors turns out to be the major source of deviation of the observed FPR from the national average in the case of each and every state without exception. Thus, what has been found to be true on an average for the twenty states taken together in the preceding section, in fact, turns out to be true for each state.

3. The influence of structural factors including the residual turns out to be negligible in almost all states except Gujarat and Tripura where it explains a sizeable proportion of the observed deviation of FPR from the national average .

4. The absolute contribution of socio—economic and cultural factors varies from—10.74 percentage points in Punjab to as high as + 27.78 percentage points in Nagaland; whereas the absolute contribution of the structural factors (including the residual) varies from—1.63 percentage points in Maharashtra to + 5.61 percentage points in Nagaland.

5. On the basis of the figures in Table 2, we can classify different states into four categories depending on whether the structural factors are favourable or not, and whether the all other factors taken together are favourable or not.

The classification of states into these four categories is

presented below:

	Favourable socio-economic and cultural factors	Unfavourable socio-economic and cultural factors
Favourable Structural Factors (including the Residual	Andhra Pradesh, Himachal Praesh, Kerala, Madhya Pradesh, Nagaland, Tamil Nadu	Bihar, Orissa, Punjab, Tripure, Uttar Pradesh
Unfavourable Structural factors (including the Residual)	Maharashtra, Manipur, Mysore	Assam, Gujarat, Haryana, Jamu and Kashmir, Rajesthan, West Bengal

From the classification, we can see that there are six states where
both the factors are favourable, while there are six other states where
both the factors are unfavourable. Thus, there are in all eight states
where one of the two sets of factors is favourable and the other is
unfavourable.

6. It can be seen that, whereas favourable socio-economic and
   cultural factors governing the basic work force tendency among
   females necessarily imply an above average FPR and the same
   factors being unfavourable necessarily implies a below average
   FPR, the same is not true in the case of structural factors,
   because favourable structural factors do not necessarily imply
   an above average FPR, nor do unfavourable structural factors
   imply a below average FPR.

Thus, the above analysis strongly reinforces the conclusion of
the preceding   section that the basic work force tendency among females
is the major explanatory factor for the interstate variations in the
observed FPR. In what follows, we have , therefore, made an attempt
to examine some of the possible factors that can explain the interstate

variations in the basic work force tendency among females as revealed by the series of adjusted FPR usir the technique of multiple regression.

V

On the basis of the hypothesis that the basic tendency on the part of females to join the labour force is governed primarily by the economic, social and cultural factors specific to different regions, we may postulate the following funtional relationship to explain the interstate variations in the adjusted FPR:

$$AFPR = F(X_1, X_2, X_3, X_4, X_5, X_6)$$

where, $AFPR$ = ratio of female workers to female population adjusted for the structural differences in female population;

X_1 = per capita state income at current prices;[3]

X_2 = Average value of total assets per household;[4]

X_3 = Structure of total employment as indicated by the ratio of total workers engaged in agriculture and allied activities to total working force in a given state;

X_4 = Sex ratio measured as the number of females per 100 males in given state;

X_5 = Average size of households measured as the total population divided by the total number of household in a given state;

X_6 = Literacy rate measured as the proportion of literates in the total population of a given state.

Before we turn to the empirical estimation and testing of the above funtional relation, we may examine briefly the pattern of expected relationship between the dependent variable AFPR and each of the six explanatory variables specified aboce.

Per Capita Income (X_1) : Per capita income in a given state reflect the current level of economic development of the state. In the early stages of growth, economic development would tend to depress the participation rate among females in as much as they constitute the marginal group in the working force.[5] Thus, we may expect an inverse relation between AFPR and per capita income.

Value of Assets per Household (X_2) : Value of total assets owned by a household is clearly an important indicator of both the economic as well as the social status of the household. In the case of households with a high value as assets, females are not required to provide any additional economic support to the family. Moreover in the case of females, non-participation in economic activity is generally treated as a mark of status specially rural areas. We may, therefore, expect an inverse relation between AFPR and average value of assets per household.

Structure of Employment (X_3) : Expansion of the non-agricultural sector leads to major shifts in the pattern of employment towards more organised and disciplined jobs in modern industries. The requirements of relatively skilled labour in the modern industrial sector and relatively low wages offered by the employers for unskilled labour are likely to reduce the scope of employment for females, and thereby

induce the withdrawal of females from such areas of employment. We may, therefore, expect a direct relationship between AFPR and the traditional pattern of employment as reflected in the share of Agricultural sector in total working force.

Sex Ratio (X_4): The argument of dependency indicates sex ratio as a possible factor influencing the incidence of labour foce participation among females. If the proportion of males in total population is high, the females may not be required to perform the economic funtion on a large scale. Hence, we may expect that AFPR will have a tendency to vary directly with the sex ratio .

Average Size of Households (X_5): Relatively large size of households can have several implications. For instance, it may imply a greater incidence of the joint family system, or on an average more children per female, or more than one earning male member in the family. All these factors may, in turn, tend to restrict either the scope or ability or necessity for females to participate in economic activity. We may, therefore, expect AFPR to have an inverse relation with the average size of households.

Literacy Rate (X_6): The incidence of female labour participation depends to a considerable extent on the cultural norms and theso-called 'conservative' vis-a-vis 'forward' outlook to the status of females in the society. It seems quite plausible to take the overall literacy rate as a proxy for these cultural attributes of the population in a given region. If we postulate that the relative degree of permissivenes.

and cultural flexibility tends to vary directly with the proportion of literates in total population, we can expect a direct relationship between AFPR and the overall literacy rate.

For the purpose of analysis, we can classify the six explanatory variables specified above into two broad categories:

a) The first three variables, viz., per capita income, assets per household and structure of employment, can be regarded as the economic factors governing female labour force participation rate; and

b) the last three variables, viz., sex ratio, average size of households and literacy rate can be regarded as the proxy for the social and cultural factors influencing female labour force participation rate.

This classification of the explanatory variables is not to be regarded as an exhaustive and mutually exclusive classification of the variety of factors that may have a direct or indirect influence on AFPR. It can, however, be regarded as representative of the dominating influences operating on AFPR that can be quantified in terms of the directly measurable variables.

The results of the multiple regression analysis of AFPR are presented in Table 3. They are based on the assumption that the funtional relationship between AFPR and the six explanatory variables specified above is linear in double logarithmic form. This implies that the estimated regression coefficients of different explanatory

Table 3

Results of the Multiple Regression Analysis of The Adjusted Female Labour Force Participation Rate.

1971

Equa-tion Number	Constant Term	Per Capital Income (X1)	Assets per Household (X2)	Structure of Employ-ment (X3)	Sex-Ratio (X4)	Average size of Household (X5)	Literary Rate (X6)	Coefficient of Determina-tion (R²)	Adjusted Coefficient of Deter-mination (R̄²)	F.Ratio
				Regression Coefficients						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I	6.0814 (0.2524)	-2.2141** (2.1870)	0.8484 (0.7245)	0.6127 (0.3259)	1.6845 (0.4381)	-5.9715** (2.3204)	1.6511 (1.6426)	0.6722**	0.4958	4.4139
II	18.7062 (1.3181)	-1.3048 (1.2084)	-0.5833 (1.1392)	-0.6463 (0.2860)	-	-	-	0.3437	0.1796	2.7928
III	-18.2412 (1.0935)	-	-	-	6.6508 (1.8810)	-5.7047** (2.7867)	0.0587 (0.1002)	0.5129*	0.3912	5.6168
IV	19.4407* (5.0530)	-2.0741* (3.3238)	-	-	-	-5.0116** (2.8645)	1.3687** (2.6671)	0.6481*	0.5602	9.8242

Figures in brackets indicate the corresponding t-Ratios.

* Statistically Significant at 1% level of Significance.
** Statistically Significant at 5% level of Significance.

Source: Appendix Table 2

variables indicate the elasticities of AFPR respect to the corresponding explanatory variables.

To examine the effect of different types of factors on AFPR, we have estimated four alternative equations. The first equation examines the influence of all the six variables taken together on the interstate variation in the adjusted female labour force participation rate in India. The second equation assumes AFPR to be a function of only the socio-cultural factors. The forth equation combines the more dominating factors by selecting the crucial variables from each of the two broad categories of factors.

It can be readily seen from <u>Table 3</u> that the set of six explanatory variables under consideration shows a fairly satisfactory explanatory power in as much as they account for a little more than two-thirds of the observed interstate variation in AFPR. However, among the individual factors, per capita income and average size of households are the only two variables whose regression coefficients turn out to be statietically significant, both having the expected sign. Out of the remaining four variables, the relative degree of precision (as indicated by the value of the- ratio) is found to be distinctly higher in the case of literacy rate, which also shows the expected sign, than in the case of the other three variables.

It is interesting to see that equation II turns out to be statistically insignificant. Its overall explanatory power is quite low and all the regression coefficients as well as the

coefficieht of determination (R^2) are found to be statistically
insignificant. This obviously implies that the economic factors
alone taken separately fail to explain a significant proportion of the
interstate variation in the basic work force tendencies among females
as indicated by AFPR. As against this, the estimate of equation III
turns out to be relatively more satisfactory, though it also can not
be regarded as a very good fit. It shows a statistically significant
coefficient of determination, but so far as the regression coefficients
are concerned, only one of them—that of average size of householde—
turns out to be statistically significant. However, on the whole
this implies that the socio-cultural factors, which explain a little
more than half of the total variation in AFPR, are relatively more
important than the purely economic factors in explaining the observed
interstate variation in AFPR.

The outcome that none of the individual variables is significant
in equation II and only one of the variables in equation III is
statistically significant seems to be due at least partly to the problem
of multi-collinearity among the explanatory variables appearing
in each equation. To improve the overall fit, it is necessary,
therefore, to consider only those combinations of the explanatory
variables which are free from any serious degree of multi-collinearity.
The combination which turns out to be the best among such
combinations is shown in equation IV, shich postualates AFPR as a
function of per capita income, average size of households and
literacy rate. It can be readily seen that all the three variables

are found to be statistically significant and all of them have the expected sign. The overall explanatory power of these three variables taken together is about 65%, which can be regarded as fairly satisfactory for a dependent variable like AFPR.

It may be noted that considering the six explanatory variables specified above, e quation IV represents the best overall fit in · as much as it shows the highest value of R^2 and f-ratio, and also relatively high values of t-ratios for all the variables which make each of the estimated regression coefficients statistically significant. Thus, it appears from the above analysis that per capita income, average size of households and the overall literacy rate are the main factors which explain the interstate variation in the basic work force tendency among females as measured by AFPR.

VI

Finally, we may summarize the conclusions that can be drawn from the above analysis of the female labour force participation rate in India. The main findings of thepresent study are:

1. The structural differences in female population among different regions do not contribute significantly to the observed interstate variation in the female labour force participation rate. The basic work force tendency among females as indicated by the adjusted FPR turns out to be the major source of deviation of

the observed FPR from the national average in each state.

2. Age-specific FPR shows much greater interstate variation in rural areas in relation to that observed in urban areas. Moreover, there is a very high degree of complementarity between the age-specific FPRs in rural areas in different states.

3. Economic factors as measured by per capita income, average value of assets per household and structure of employment, and socio-cultural factors as indicated by the overall literacy rate, average size of households and sex ratio, taken together explain about two-thirds of the observed interstate variation in the adjusted FPR.

4. Per capita income, average size of households and the overall literacy rate appear to be the main factors influencing the interstate variation in the basic work force tendency among females as indicated by the female labour force participation rate adjusted for the structural differences in female population.

NOTES AND REFERENCES

(The authors are greateful to Mr. Bipin D. Patel for
providing valuable computational assistance)

1   Female labour force participation rate, generally denoted as FPR, is

defined as the ratio of total female workers to total female

population in a given region.

2   See, for instance, (i) Ravirfra H. Dholakia: "District Worker Rates

in Gujarat - A Factor Analysis", Journal of the Gujarat Research

Society, Vol. 37, No.3, July 1975;

(ii) Bakul H. Dholakia and Ravindra H. Dholakia: "Worker Rate Differe-

ntials Among States," Economic Times. Vol.15 No.299, January 3, 1976;

(iii) Bakul H. Dholakia and Sudha B. Dholakia: "Factors Influencing

the Inter-state Differentials in Female Participation Rate",

Vishleshan, Vol. II, No.3, September 1976.

3   We have used the comparable estimates of per capita state income

prepared by the Central Statistical Organisation for each of the

twenty states c rered by the present study. Since 1969-70 is the

latest year for which the required set of comparable and consistent

estimates for all the states under study is available, we have used

the same in the regression analysis of AFPR relating to the year 1971.

4   The required data on average value of assets per household have

been obtained from All India Debt and Investment Survey 1971-72,

Vol. I, published by the Reserve Bank of India in April 1975. The

data relate to the assets of rural households as on 30th June

1971.

5   Cf. J.N. Sinha: <u>The Indian Working Force: Its Growth And Composition,</u>
<u>Monograph No. 11, Census of India 1961</u> (Chapter II), Office of the
Registrar General , overnment of India.

Appendix Table 1

Adjusted and Observed FPR in Different States, 1971

(Figures in per cent)

| States | FPR Adjusted for Structural Differences in Female Population | | | Observed FPR | | |
	All Areas	Rural Areas	Urabn Areas	All Areas	Rural Areas	Urban Areas
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1) Andhra Pr adesh	23.69	26.82	10.43	24.16	27.37	10.54
2) Assam & Meghalaya	7.70	8.25	5.35	7.34	7.56	4.97
3) Bihar	8.30	9.17	4.63	8.88	9.31	4.54
4) Gujarat	10.89	12.17	5.46	10.26	12.07	5.48
5) Haryana	2.53	2.39	3.17	2.41	2.29	3.00
6) Himachal Pradesh	18.66	21.44	6.87	20.79	21.69	7.06
7) Jammu & Kashmir	3.91	4.23	2.55	3.86	4.17	2.47
8) Kerala	13.13	13.80	10.27	13.49	14.08	10.42
9) Medhya Pradesh	18.51	21.11	7.52	18.65	20.75	7.26
10) Maharashtra	21.33	24.43	8.15	19.7	24.39	8.31
11) Manipur	24.99	25.47	22.98	23.62	24.95	14.87
12) Mysore	14.79	16.08	9.34	14.2	15.77	9.16
13) Nagaland	39.63	46.45	10.68	45.24	47.9	9.11
14) Orissa	6.78	6.81	6.67	6.81	6.83	6.56
15) Punjab	1.11	0.74	2.69	1.18	0.72	2.66
16) Rajasthan	8.38	9.42	4.00	8.34	9.27	5.86
17) Tamil Nadu	14.93	16.40	8.72	15.09	12.62	9.14
18) Tripura	5.13	5.01	5.67	4.83	4.76	5.43
19) Uttar Pradesh	6.39	7.14	3.22	6.71	7.27	3.10
20) West Bengal	4.70	4.89	3.87	4.43	4.58	3.90

Source: Census of India 1971, Series-I, India, Paper No.3 of 1972, Economic Characteristics of Population. Registrar General, Government of India (For the Methodology of derivation of

Appendix Table 21

Female Labour Force Participation Rates and Some Explanatory Variables

States	Observed FPR (in per cent)	Adjusted FPR (in per cent)	State Per Capita Income* (in Rs.)	Average value of Assets per Household (in Rs.)	Sex-Ratio (in per cent)	Average size of Households (in per cent)	Literacy Rate (in per cent)	Share of Agriculture and Allied activities in total working force (in percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1) Andhra Pradesh	24.16	23.69	554	8080	97.7	4.99	24.57	73.40
2) Assam**	7.34	7.70	554	7681	90.0	5.87	28.72	77.40
3) Bihar	8.88	8.30	404	12828	95.4	5.99	19.94	83.22
4) Gujarat	10.26	10.89	701	12874	93.4	5.75	35.79	67.59
5) Haryana	2.41	2.53	921	27139	86.7	6.46	26.89	66.65
6) Himachal Pradesh	20.79	18.66	610	22673	95.8	5.22	31.96	77.51
7) Jammu and Kashmir	3.86	3.91	459	15260	87.8	6.20	18.58	71.50
8) Kerala	13.49	13.13	607	11615	101.6	.20	60.42	55.49
9) Madhya Pradesh	18.65	18.51	476	10520	94.1	5.38	22.14	81.11
10) Maharashtra	19.70	21.33	720	11682	93.0	5.51	39.18	66.48
11) Manipur	23.62	24.99	423	7296	98.0	5.85	32.91	71.27
12) Mysore	14.20	14.79	591	10762	95.7	5.76	31.52	70.83
13) Megaland	45.24	39.63	416	6018	87.1	4.88	27.40	79.43
14) Orissa	6.81	6.78	514	6023	98.8	5.21	26.18	79.59
15) Punjab	1.18	1.11	992	31833	86.5	5.96	33.67	63.62
16) Rajasthan	8.34	8.38	465	12754	91.1	5.70	19.07	76.28
17) Tamil Nadu	15.09	14.93	591	6827	97.8	4.88	39.46	64.45
18) Tripura	4.83	5.13	493	6475	94.3	5.69	30.98	76.59
19) Uttar Pradesh	6.71	6.39	495	13531	87.9	5.73	21.70	77.99
20) West Bengal	4.43	4.70	685	7331	89.1	5.77	33.20	61.37

* Relates to the Year 1969-70
** Includes Meghalaya