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14 February 2013

Online at <https://mpra.ub.uni-muenchen.de/44373/>

MPRA Paper No. 44373, posted 14 Feb 2013 09:43 UTC

Declining Trends in Female Labour Force Participation in India: Evidence from NSSO

Sandhya rani Mahapatro

Abstract

The recent evidence from NSS reveals a decline in female labour force participation in India. The decline is difficult to explain in terms of economic variable as country is experiencing rapid economic changes. Perhaps age and cohort factors meaning that educational and time period advantages might be leading to postponement of labour market participation.

The objective of the study is to investigate the declining trends in female labour force participation by sorting out the trends into age, period and cohort effect. To study this OLS regression model is used and the data for the study drawn from NSSO rounds. The findings suggest that age and period changes can account for a substantial decline in labour force participation though the importance of cohort is not undermined. Provision of higher education and creation of employment opportunities to younger cohorts of women will increase the labour force participation rate in near future.

JEL Classification: J21, J11

Key words: Age, Period, Cohort, Labour, Female

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The Research paper is the part of the project: "Changing trends in Female Labour Force participation in India: An Age-Period-Cohort Analysis" for Population Research Centre, funded by Ministry of Health and Family Welfare, New Delhi. The Author is thankful to Prof. K.S.James, PRC, ISEC and Dr. B.P.Vani CESP, ISEC for their useful and Constructive comments on this paper.

1. Introduction

One of the unusual features of India's labour market was the labour force participation of women remain stagnant for a long time with the exception of the period 2004-05. The recent data on employment and unemployment (NSSO, 2009-10) shows a disturbing trend of labour force participation rate* which dropped to 40 percent in 2009-10 from 43 percent in 2000-05 and the decline is noticed especially among female. Female labour force participation rate show a steep fall from 29.4 percent in 2004/05 to 23 percent in 2009/10. Between the period 2004/05 and 2009/10, there has been a decline in female employment annually at the rate of 1.72 percent (Chandrasekhar, C & Ghosh, J, 2011). These results raised many questions. In the epoch of socio-economic development and demographic changes taking place in the country, the firm believe is female labour force participation will increase rather having a declining trend. The changing demographic dynamics (declining fertility and benefits of demographic dividend) coupled with socio-economic changes expected to contribute to favourable condition for increasing labour force participation of females. However, the failure of the economy to integrate females into labour market becomes quite disturbing and unusual.

The female labour force participation and its contribution to economic development has been addressed in many studies (Esteve-Volart, 2004; Klasen & Lamanna, 2009) hence, drawing women into the labour force can be an important source of future growth of the Indian economy. It has been pointed out that demographic dividend, coupled with high female participation rates, and is alleged to have accounted for about a third of East Asia's high per capita growth rates (Bloom and Williamson, 1998). Beyond economic benefits, women's participation in the labour force can be seen as a signal of declining discrimination and increasing empowerment of women (Mammen & Paxson, 2000).

Given this, the broad objective of the study is to investigate the recent decline in labour force participation of women. There are few studies (Bardhan, 1979; Dasgupta, 2005; Kingdon, 1999) focuses on behaviour of female labour supply in India and the causes of not to opt in labour forces in recent years has been addressed in some studies (Rangrajan, et. al. 2011; Indrani & Neetha, 2011). Nevertheless, these studies explain labour force participation

* Labour force participation rate is defined as the percentage of working age population which are either working (employed) or not working but looking for work (unemployed).

either through education (age effect) or through changes in employment pattern (period effect). At the same time the studies on labour supply also show that the participation behaviour of a specific age profile also influences the labour force participation trend. Thus, taking into consideration the importance of these three components, the study applies Age-Period-Cohort analysis to study the labour supply behaviour of females in India. The participation rate of females is decomposed with a view to identify whether the participation rate is influenced by a) the age of the women b) Macroeconomic condition. c) The age-specific participation characteristics of the cohort. These effects on observed participation rates are referred to, respectively, as the 'age effect' 'macroeconomic effect', and the 'cohort effect'.

The contemporary factors like business cycle conditions, change in structure of labour demand and changes to government policies are usually referred to as 'period effects' that affect all birth cohorts and influence the supply of labour. While cohort effects explain shifts in the age-participation profile, the age effect will explain how the age-specific participation rate varies over time.

With this background the remainder of the study is classified into following sections: The second section discusses the data and the empirical method used in the study. Section three presents trends in female labour force participation. Reasons for decline in the female labour force and the factors influencing it are discussed in the fourth Section. In the fifth Section, we discuss the empirical findings and describe the changes in employment rate. The study ends with concluding remarks and its implications for future research.

2. Data and Method

The data for the study is drawn from the National Sample Survey over the period 1999-00 to 2009-10. The analysis is carried out for the women of working age group 15-64. The oldest cohort was born in the period 1935-45 and youngest cohort was born in year 1985-95. The State is taken as the unit of analysis for the purpose of the study.

The estimation strategy for the empirical model based on the methodology used by Anderson and Silver (1989) to investigate the effect of age, period and cohort on mortality. In this study we applied it to labour force participation. The procedure is as follows:

The ordinary least square regression analysis has been used to investigate the effect of age, period and cohort on labour force participation. We have taken the natural logarithms of the

age-specific participation rate as the dependent variable. First, we entered dummy variables for every age group except 25-29 and also period dummy except 1999-00. Besides the age and period dummy, we have taken region dummy also to capture the regional effect on participation rate. Besides, MPCE which is used as a proxy to measure the income level of the household is also taken in the analysis as wealth of household significantly determines the participation rate.

$$\Gamma = \alpha + A_1 + \dots + A_5 + P_1 + \dots + P_5 + R_1 + \dots + R_6 + MPCE + \mu \dots \dots \dots (1)$$

The notation A refers to Age dummy, P refers to the Period dummy, R refers to Region dummy and MPCE indicates monthly per capita expenditure of the household. Using these variables the first OLS model has been run. In this equation we examined the influence of age and period on participation rate after controlling for other factors.

In the second step, we have taken residual from the first equation as the dependent variable in a second equation with dummy variables representing each birth cohort as independent variables. In other words, the cohort effect can be estimated by introducing a set of cohort dummies.

For independent variables, we entered the dummy variables for each of the ten year birth cohort born between 1935-45 to 1985-95. Each age group for a given period is considered as one cohort. For e.g. 25-34 age group of period one say 1999/00 is one cohort, 35-44 age of the same period is another cohort. This procedure has been followed in all period across all age groups to create the cohort dummies.

$C_{ij} = 1$ if observation belong to age group i of period j , 0 other wise

$$Y = \alpha + Ch_{11} + Ch_{21} + \dots + Ch_{12} + Ch_{22} + \dots + Ch_{53} + \mu \dots \dots \dots (2)$$

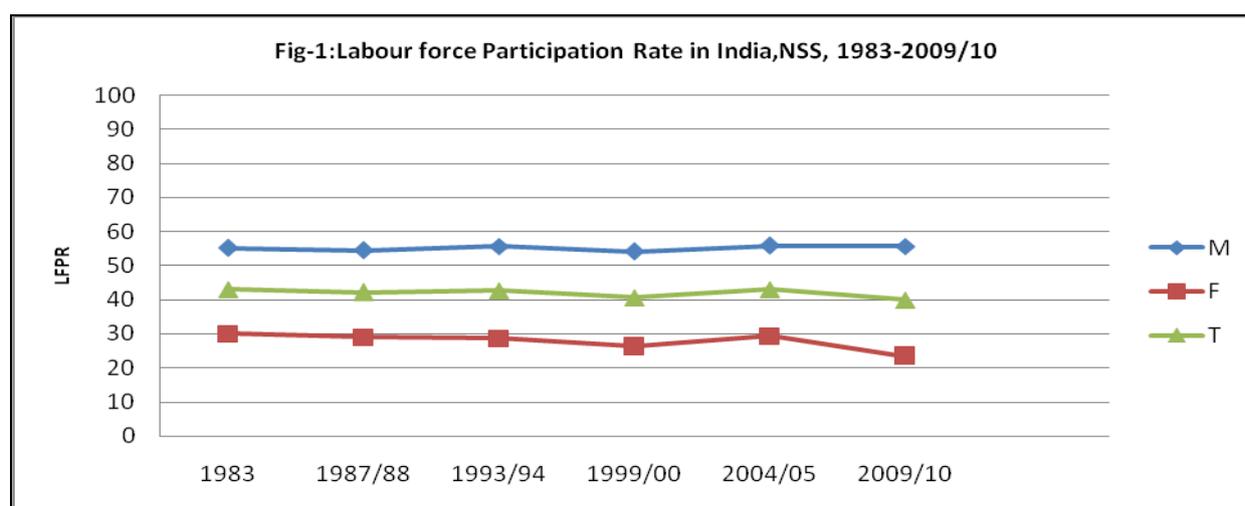
In equation (2) the first subscript indicates age group and the second one the period. Hence the cohort dummy variables run upon the residuals of age and period dummy variables to explore the cohort effect on participation rate.

3. Trends in Female Labour Force Participation Rate

Figure-1 presents the trends in female labour force participation rate in India since early 1980's. The overall labour force participation rate varies from 43 percent to 40 percent indicating stagnant growth. The figure shows that participation rate is highest for the period

1983 and 2004/05 that is 43 percent. From 1983 participation rate shows marginal decline till 1990-2000. Between 2004-05 and 2009/10 the participation rate shows a sharp increase of 2.4 percentage points. Again during 2009/10 the LFPR has declined sharply by 3 percentage points from the level of 2004-05.

Analysis of trend in labour force participation by sex indicates the decline is largely observed among females than that of males. From the figure it has been observed that the participation rate among males remains stagnant over the years.



Source: Various NSS reports

On the contrary, in the case of females there is continuous decline in participation rate except during 2004-05. Between the period 1999/00 and 2004/05 the female participation rate increases by 3.23 percentages. Again in 2009/10 there has been a sharp decline by 6.13 percentage point that is from 29.43 percent in 2004/05 to 23.3 percent in 2009/10. At the same time, the figure also shows that there exists wide gender difference in participation rate across all the NSS rounds and it is one of the lowest among developing countries.

The female labour force participation not only is lowest but is also showing a declining trend with wide variations by place of residence. Table 2 gives an idea about the differences in the rural and urban labour participation rates during 2000/10. Rural-urban difference in labour force participation rate does not show any significant variation among male. On the other hand, the participation rate among females varies widely between rural and urban area. For female the rural participation rates are more than doubled as compared to urban participation rates.

Table-1: Labour Force Participation Rate by Sex & Place of residence, 1983- 2009/10

NSS rounds	Male		Female	
	Rural	Urban	Rural	Urban
1983	55.5	54.0	34.2	15.9
1987/88	54.9	53.4	33.1	16.2
1993/94	56.1	54.3	33.0	16.5
1999/00	54	54.2	30.2	14.7
2004/05	55.5	57.1	33.3	17.8
2009/10	55.6	55.9	26.5	14.6

Source: Visaria (1998) and NSS employment and Unemployment survey reports

In 2009/10, the labour force participation rate of male in rural area is 55.6 percent and in urban area it is 55.9 percent. Unlike this among rural females 26.5 percent participated in labour force whereas it was 14.6 percent in urban area. Similar pattern is observed in all the rounds of NSS. Compared to other periods, rural women's participation is exceptionally low in 2009/10.

One of the major features that emerge from the trend analysis is that women's participation in labour market is typically low in India and wide gender difference in participation rate also persists. Only 25 to 30% of women in rural and 15 to 18% in urban areas participate in labour market whereas in the case males it is more than 50 percent. One of the reasons of low participation of women in labour force is the non-recognition of a number of women centric works as economic activities (such as cooking, collection of fuel and fodder, house and utensils cleaning etc.). Moreover, a variety of social and family related constraints compel women to confine themselves to household activities at their prime working age. Early exit of women (probably post marital age) from labour market is particularly reflected in urban areas where women face inadequate social and family support system (ministry of Labour and Employment, 2010)

Another major feature that comes out from the figure is the fact that there has been a steep decline in female labour force irrespective of rural and urban area in recent year. The decline is relatively higher especially in rural area. It has been observed from the data that 2004-05 is bit of an outlier in terms of female labour force participation rate. On the other hand, 2009-10 indicates a reversion to the longer term trend of gradual decline. It has been pointed out by the official that poor investigative method or inadequate capture of women's work in the latest round results in decline in participation rate. However, the argument put forth by

(Chandrasekhar & Ghosh, 2011) it may not be the reason for such a persistent decline of female labour force. If changing labour demand results in more demand for women in paid work, then it is more likely to be captured by the investigators. Nevertheless, there has not been any evident implying increase in demand for women in paid employment and that is a real paradox.

There are several reasons for why female opt out of labour force. Increase in educational level of female partly responsible for the recent decline in participation rate. In the period 2004-05 to 2009-10, 313 million people opted out of the labour force to study as against 267 million in the previous five years 1999-2000 to 2004-05. The rural woman overtook her urban counterpart for education, with the former growing at 3.3 percent as against 2.7% for the latter (Rangrajn, et al. 2011). But at the same time education may not be the only factor for such fluctuating trend since participation rate declines across all the age groups. There are certain other factors that also play important role which needs in-depth investigation.

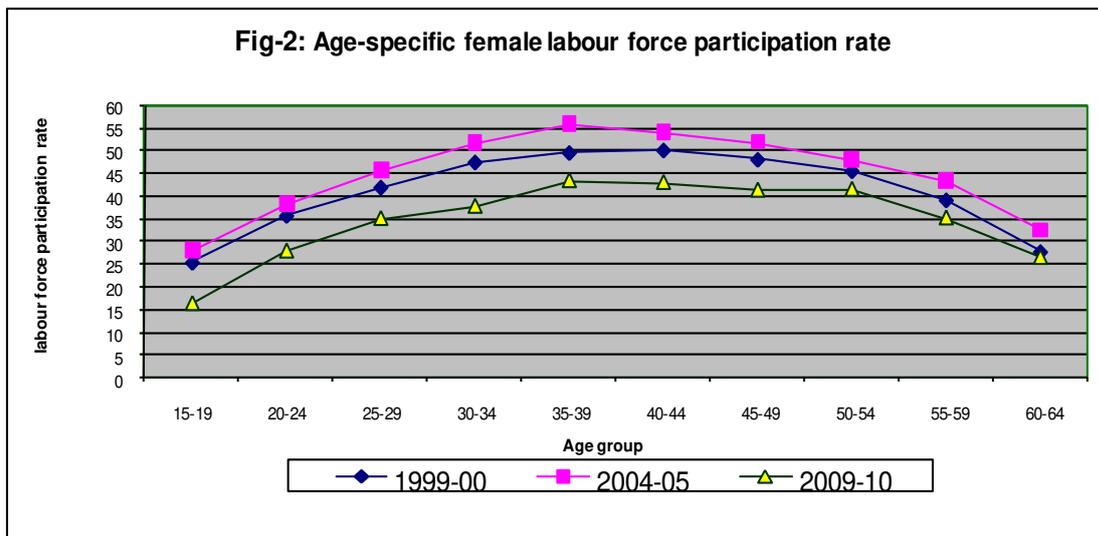
4. Reasons for the Recent Declining Trend

The main problems for declining participation of female in labour force could be attributed to many causes like lack of technical skills of older cohort of women, household responsibilities, higher level of participation in education of the younger generation etc. Besides, the macro level economic changes also play a significant role in this regard. For instance, due to mechanisation of agriculture the requirement of manual labour goes down and hence affect female participation rate as female are mostly engaged in agriculture. Besides, the slowdown in overall job creation that is jobless growth of the economy may also have deceleration effect on the rate of labour force participation of female. All these potential influences that bring changes in trend of female labour force in India can be examined through a holistic approach of Age-Period-Cohort analysis. The age, period and cohort are merely indicators of other variables which actually cause the observed variation in dependent variable under study (Clogg, 1982). Age effect in this study can be understood through life cycle decisions like education, marriage, household size etc. Period effect includes cyclical effects like structural change, policy changes etc that bring change in employment pattern. Cohort effect may be interpreted as societal changes in terms of social norm, attitude towards paid employment influence behaviour of different generations differently and brings variation in participation rate of different cohort differently.

4.1. Age-Specific Female Labour force Participation Rate

To capture the effect of age, changes in labour force participation rate is understood through changes in age specific participation rate. Age effect measure the extent to which, within each

cohort, the participation rate of women changes as they move through the life course (Austen & Seyomour, 2006). A number of studies show that labour force participation typically changes substantially over the life course tracing a well-known overall inverted u-shape profile of participation rates that peaks around the prime working age (Baller et al, 2009). The participation behaviour and the factors influencing it vary in different age groups and this in turn influences aggregate participation rate.

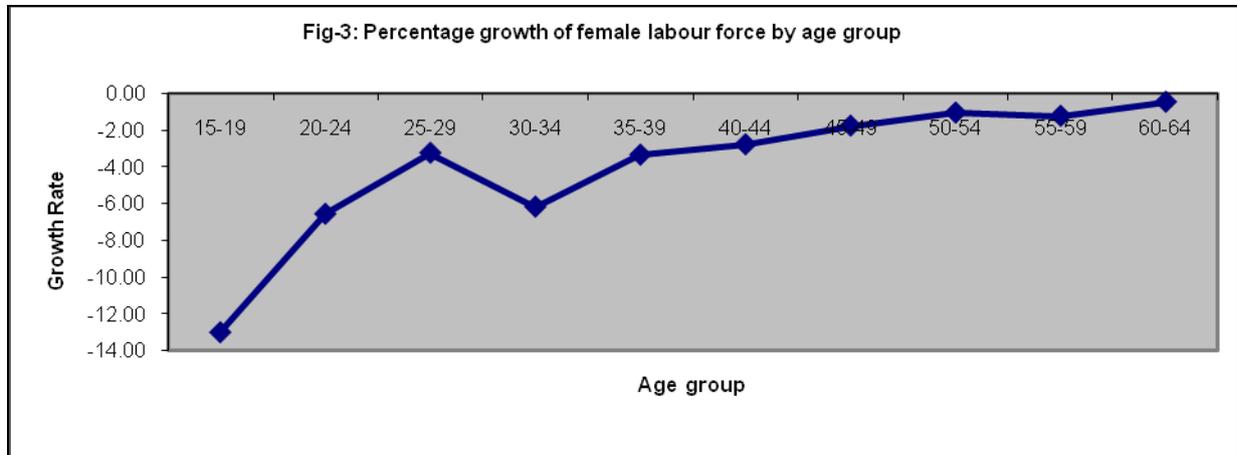


Source: Calculated from NSS Unit level data, 1999/00-2009/10

From figure-2 it is observed that the participation rate of young (below 25) cohort and old (50 above) cohort remains low, whereas substantially higher participation rates for those in the peak age group have relatively flat profile between 35 to 50 age cohorts. The participation rate and its determinants vary systematically by age of the female. The low participation of younger age groups may be due to increasing enrolment in education. But one has to search explanation for increasing LFPR among the adult cohorts. The recent NSS estimates show around 313 million people withdraw from labour force to study. It has been argued by Mahendra Dev & Venkatanarayana (2011) that the loss of income due to withdrawal of younger cohorts while attending education has been compensated by increasing participation of adults. Therefore, the participation of 35 + age group is higher. Moreover, in poor households female's responsibility to take care of children and family is higher. To provide basic needs and to invest in schooling of children female in the middle age group participate more in the labour force (Khan, et.al.2009).

From the above figure it has been observed that the age profile of women has shifted downwards (a larger shift-down for women) in 2009-10; however, the patterns changed very little over time. Relative to other periods, the labour force participation of women is lower in 2009/10 irrespective of age groups. Though it can be said that the shift-down at the young

age groups is due to longer years of schooling; however, the decline is noticed in all age groups. The growth rate in labour force participation of women in the entire age groups declines over the period (Fig-3), though the rate of change is different for different age groups.



Source: Calculated from NSS Unit level data, 2009/10

The participation rate by age of the female shows that, there is negative growth across all the age groups; however, the steady decline in participation rate is observed in the younger age groups. From the figure it has been seen that on an average 14 percent decline in participation rate is observed annually among 15-24 age group followed by 20-24 age group. Compared to these age groups 25-29 further a slow incremental decline is noticed by 3 percent. However, in 30-34 age groups, a further decline is noticed as equal as 20-24 age groups. As the female moves towards higher ages decline in participation rate is getting slow. The possible causes for the variation in participation rate in different age groups are attributable to following reasons:

Teenagers and young adults, in recent years, are remaining in school longer and are reducing their labour force attachment. Since schooling is an important activity for young people, the changing pattern of school enrollment is an obvious potential source of change in the labour force attachment of youth (Aaronson, et.al. 2006). As the data presented in Table-2 show, over the time, there is an increase in proportion of female belonging to 15-19 and 20-24 age groups reporting attending educational institution as their usual status. In rural area for 15-19 years aged females it raises from 25.8 percent in 1999-00 to 47.1 in 2009/10. Similarly, in urban area it has risen from about 52 percent in 1999/00 to 68 percent in 2009/10. Similar trend is observed for 20-24 year old women also. As compared to 2004/05, there is a steady increase observed in 2009/10. For e.g. between 1999/00 and 2004/05, proportion of female in the 15-19 age group attending educational institutions increases by 6 percentage point while

between 2004/05 and 2009/10 it increases steadily by 14.4 percent. This pattern is observed in urban area as well as for 20-24 age group women. Thus, a decline in female employment in 2009/10 may be largely attributable to the increasing trend of education of younger cohorts.

Table-2: Percentage of Persons Reporting Attending Educational Institutions as their Usual Status

	Rural		Urban	
15-19 Age	Male	Female	Male	Female
1999/00	41.3	25.8	58.5	51.7
2004/05	43.6	31.5	58.7	56.7
2009/10	57.3	47.1	70.1	68.2
20-24 Age				
1999/00	8.6	2.9	21.8	15.8
2004/05	9.1	3.9	21.5	14.9
2009/10	16.6	7.5	29.7	23.4

Source: Key Indicators of Employment and Unemployment in India, 2009-10” and NSS report of Employment and Unemployment, various issues.

2. Figure-3 also reveals that the declining growth in 30-34 age groups is also high and found to be similar as 20-24 age groups. The larger decline in participation rate in these age group women is attributable to marriage and mother hood. In particular, over time, women have increasingly tended to delay marriage and child bearing, which, by itself, might be expected to have depressed participation rates among women in their thirties and early forties (Aaronson, et.al.2006). Thus, for taking care of children, female may withdraw themselves from labour force for certain period which is evident from spurt decline in 30-34 age group of women.

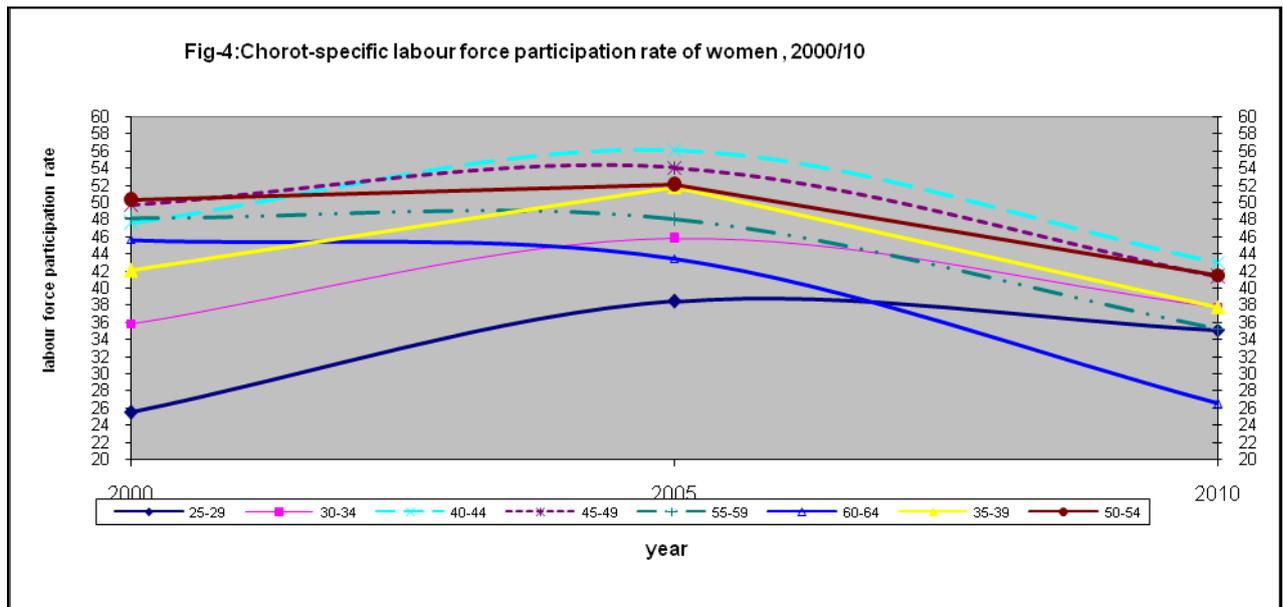
3. The lower decline in participation rate in 35+ age cohort, as stated earlier, may be due to economic vulnerability of the households to invest in children’s education compelling females joining the labour force or even work in low paid jobs. At the same time, the other reason for low decline in participation of older age groups that is females of age group 40 and above may be having school age children in the households. Compared to infants, the school age children need less time with their mothers and this may provide ample time to women to work outside their homes. This may be the one of the reasons for higher participation of women in late 30’s and above.

Overall, the age profile of both males and females followed less an inverse U shape curve. From the above analysis it is clearly observed that not only participation rate varies across the age cohorts but also there is decline in participation rate in all the age between 2004/05 and 2009/10. The decline in participation rate could be due increasing proportion of female in younger age groups opt for education rather than entering the labour force, in recent years. Nevertheless, there may be some other causal factors that also impact changes in age specific participation rate. This is because of the occurrence of a negative shift in the entire age profile in recent years. Hence, it can be said that time period plays an important role in labour participation rate of all age groups are. This can be captured through the economic indicators. Besides this, the behavioural changes also play an important role in influencing participation rate. In this regard, Johnson (2002) states that behavioural factors play a greater role in determining age-and sex-specific participation rates. It has been argued in studies that changes in age-specific rates may be caused by individual factors as well as institutional and macroeconomic variations which include shifts in the demand as well as supply of labour (e.g., economic swings, delayed labour market entry due to prolonged education, early retirement exits etc).

4.2. Cohort Effect on Female Participation Rate

The changing attitude of female towards employment due to increasing education, prevailing social norms during that particular period or some historical events may influence labour participation behaviour of a particular age cohort differently from other age cohorts which in turn brings variation in the labour participation rate.

Fig-4 presents the cohort wise participation rate between the period 2000/10. The cohort effect shows whether and to what extent, women born in late 20th century have lowest participation in each age and within each macroeconomic environment compared to women belonging to older cohorts.



Source: Calculated from NSS Unit level data, 1999/00-2009/10

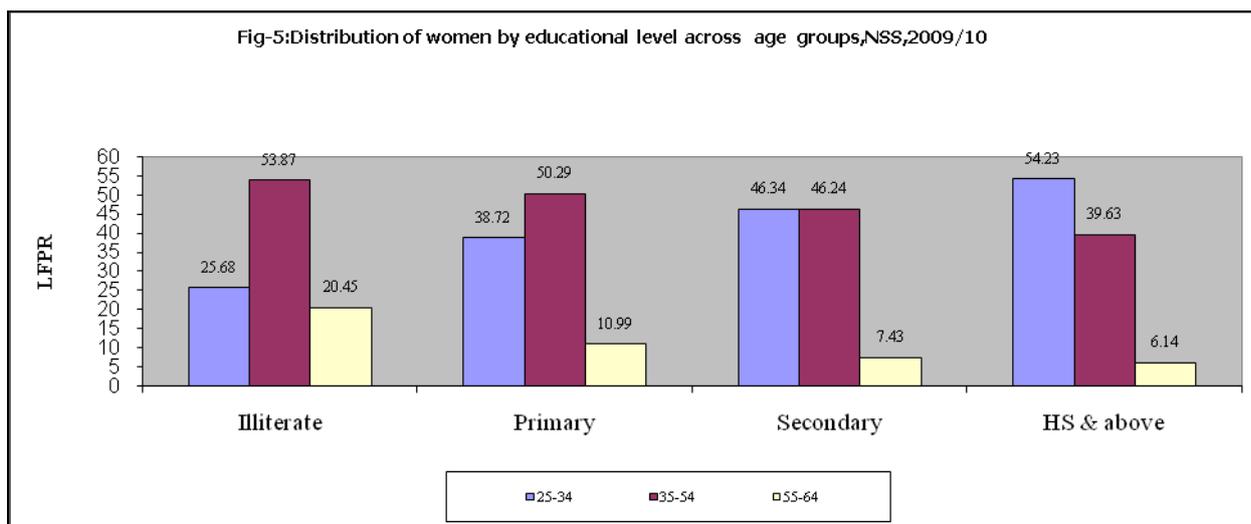
The participation rate of most of the age cohort followed inverted U-shape pattern. It can be seen from the figure that the participation rate is higher for women in age group 40-54 when the cohort born in between the years 1955-1970. The participation of these cohorts of women is higher than the other cohort who were born earlier and later of this period. For e.g. the age cohorts 25-29 followed by 30-34 and 35-39 have lowest participation rate in 2000 as compared to other age cohorts. This signifies that women born in late 70's and early 80's have lowest participation than that of other cohorts of women born in 50's and 60's in the year 2000. The oldest cohort 60-64 followed by 55-59 and the youngest cohort 25-34 in 2009-10 whose birth year probably was in between 1945-55 and 1975-85, respectively, have lowest participation rate as compared to other cohorts. Similarly, the 40-44 age cohort followed by 45-49 age group born in between 1955-65 recorded highest participation in 2005. All these signify that women born before 1970's have almost higher participation rate in all the period whereas those women born in late 70's and early 1980's have lowest participation rate. Likewise women born in late 1940's and early 50's have also lowest participation rate. For the period 2000 and 2005, the participation rate is lower in 25-29 age groups whereas in recent years the lowest participation is noticed in the oldest age cohort. In all the time periods participation rate generally tends to be high in 40-54 age cohort i.e. women whose birth year was in between late 1950's and early 70's. This pattern indicates the participation behaviour of a particular birth cohort persisting over time.

The participation rate of women belonging to each cohort varies in many dimensions. Two major features noticed among the cohorts with respect to their participation rate.

1. Participation rate of older cohorts is higher than that of younger cohorts. One of the important reasons for such a difference is educational achievement of different cohorts. The lower participation of younger age cohorts may be explained in terms of education, since attitude of younger generation towards education is being changed over time. In order to get higher economic returns from education in the long run, most of the females in younger age groups move towards education. This will be one of the important factors for lower participation by younger age cohorts. Along with education, increase in family income may deduce the participation rate of female (Aaronson, et.al. 2006). On the contrary, higher participation of women in ages 40-54 among the cohort born between the period 1955-70 mainly works out of economic needs. It is widely acknowledged in the literature that a woman is more likely to enter the labour market if she belongs to poor socio-economic households. In order to cope with poverty of households females in their prime working ages join labour force. Beyond the stresses of poverty there are many factors like larger family size, poor educational attainment etc that influence their participation rate and all these factors are inter-related. This can be further understood through distribution of females into different educational categories by their age. The educational level of women by their age is presented in fig-5.

It has been observed from the figure that, women having little or no education are higher in 35-54 age groups where as higher proportion of females belonging to 25-34 age group are found in higher level of education. Hence it can be said that higher participation of the older cohort of women are mostly in unskilled and low paid jobs and driven by poverty as most of them have low level of education. To reduce the economic vulnerability of the family and to provide quality education to their children, female belongs to 35-54 age cohort participate more in labour force.

2. Another major feature that emerges is a decline in participation rate across all the cohorts. Though for younger generation, it can be explained in terms of education, for older cohorts the reasons may be economic or other social changes. Studies shows that the amount of family resources in terms of husband's earning tend to lead to influence participation rate among female (Lee,1997). Increasing wage rate of male coupled with changing technologies in recent years may probably reduce the participation rate of female. Improvements in wages and improvement in agricultural incomes may tend to reduce the participation of female in labour force (Rangrajan, et al, 2011).



Source: Calculated from NSS Unit level data, 2009/10

Between the period 2000 and 2005, participation rate increases across all the cohorts (except 55 to 59 age where participation remains constant). The increase in participation is found to be high in younger (25-29) age cohort where participation increases from 26 percent to 38.5 percent. On the contrary, between 2005 and 2010 the evolution of participation rate across the cohorts reveals a decline in participation. As it has been noticed from the figure that participation rate has declined across all the cohorts in recent years (2009/10) as compared to (2004/05), though the degree of variation is different for different cohorts. The rate of labour force participation of 60-64 cohort declined from 46 percent in 2000 to 27 percent in 2010. The cohort shows a steady decline by 16 percent from 2005 to 2010. On the other hand, the decline is lower for the younger cohorts from 38.5 percent in 2005 to 35 percent in 2010. In relation to younger cohort, participation rate of older cohort declined steadily by 12 to 14 percent. This pattern suggests that the economic changes in terms of introduction of new technology, changing occupational structure etc withdraw female from labour force as they possess low skill which does not suit the employment opportunities created in recent years.

In this context, it can be said that period effects were operating as female labour force participation declined for all age groups in recent times, though the rate of change is different for different age cohorts.

4.3. Economic Changes and Female Labour Force Participation (Period effect)

In this section the impact of various changes in economic environment on female labour force participation has been explained. The paradox of declining female employment in the process of high economic development is explained in the literature through a U shape relation. In many studies it is hypothesised that there exists a 'U' shape relation between economic

development and labour force participation of females. According to this hypothesis, in the early stages of development, when society is primarily agrarian, increased demand of female labour leads to higher workforce participation among women. Industrialization gives rise to greater demand for skilled labour, and as a consequence involves displacement of women labour and its substitution by male labour. This trend is often reversed in later stages of development, when the increased demand for labour in modern industry counterbalances the contraction in traditional sectors (Durand,1975, Boserup:1970).

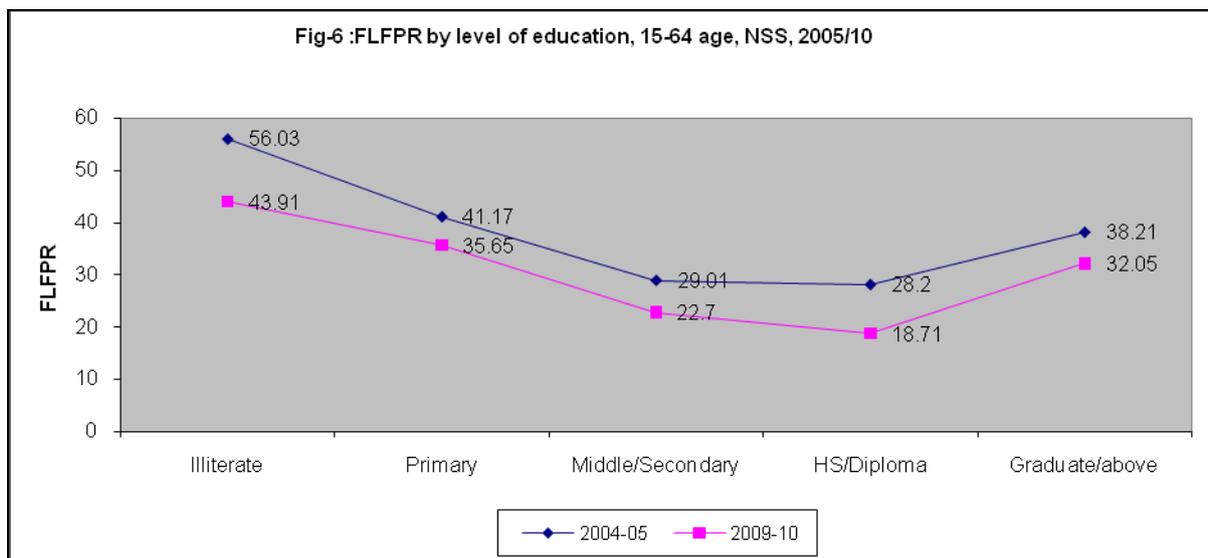
As education of women increases and demand for white collar jobs increases with increase in service sector, the participation rate increases among female as more socially acceptable jobs will be created. The studies by found a 'U' shape relation between female labour force participation and per capita income which is used as an indicator of development is found in some studies (Goldin, 1995; Mammen Paxon,2000). Studies shows that in the short run industrialisation process reduces participation rate but the long run effect of industrialisation may be to raise the overall participation rate (Weller, 1968). A district level analysis carried out by Mathur (1994) using census data found a U shaped relation between female work participation and development especially in rural areas. At low level of development, labour force participation rate of women is relatively high. In most cases they are working as unpaid workers in family farms and non-farming activities. As the economy moves towards development, employment in the agricultural and in the manufacturing sector tends to fall and employment in the services sector tends to increase in more developed countries. As a result, more women tend to enter the labour market because these jobs are experienced as more acceptable forms of employment as far as women are concerned (Choudhery, M.T,2010).

In this study the 'U' shape relation between female labour force participation and development can be examined by their level of education. Figure 6 shows the labour force participation rate of women at different education levels. In fact, it takes a U form – with high labour force participation by illiterate and women having low education, falling to the lowest with middle and higher secondary education and rising again with graduation and above, though in right portion of the U curve the increment is not substantial.

In any case, the feminization U reflects several underlying forces at work. Higher participation among the poorly educated signifies that women are forced to work to survive. As the level of education increases, social restrictions, availability of suitable opportunities etc keep their participation rate low. Kingdon and Unni (2001) attribute the downward sloping part of this U to the process of Sanskritization: social restrictions on the lifestyles of

women tend to become more rigid as households move up in the caste hierarchy (Chen and Drèze, 1992), though this portion can also be related to rising incomes of husbands.

The figure reveals participation rate again shows upward trend at highest educational level although the proportion is relatively less compared to illiterate. Women’s aspiration to improve the quality of life combined with higher returns to education increase economic incentives for women to work. But from the figure it is observed that the participation rate of female declines across all levels of education in recent years. A closer look at India’s economic development suggests that the declining participation across all levels of education can be understood through the changing composition of employment.



Source: Calculated from NSS Unit level data, 1999/00-2009/10

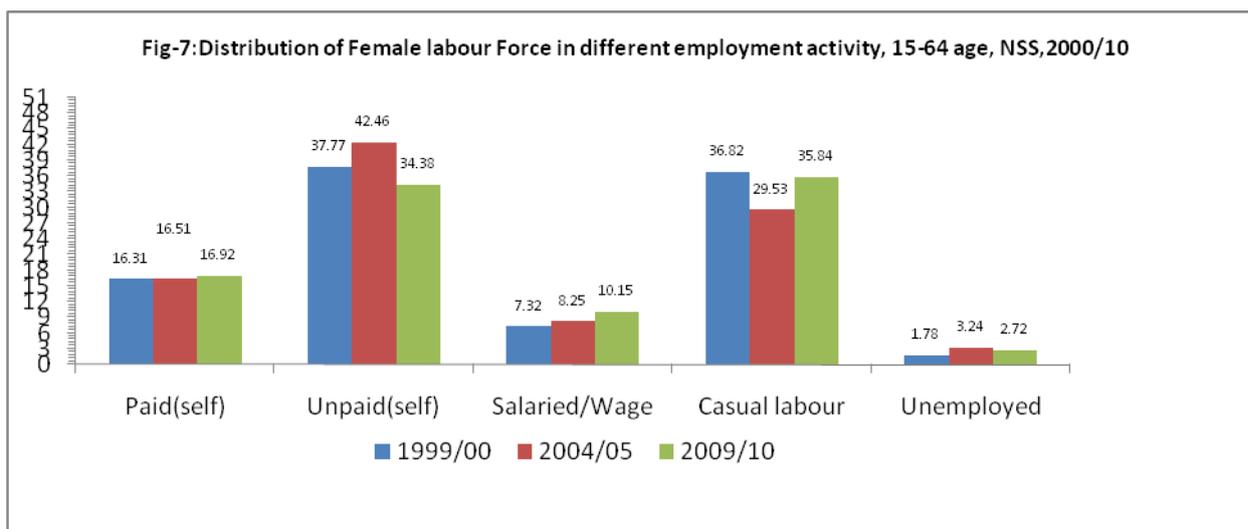
The changing structure of employment during the development process shifted the labour force from agriculture towards non agricultural activities and hence, reduces participation rates. In rural area female are largely unpaid family workers or mostly working in agriculture sector. The recent evidence shows that between 2004/05 and 2009/10 there is a steady decline in the share of female workers in agriculture sector by 20.2 million followed by manufacturing sector (Chandrasekhar & Ghosh, 2011). The possible explanations are: Introduction of new labour displacing machineries and shift in cropping patterns, low wage rate, reduced demand for labour etc. All these factors forced females to shift from agriculture to non-agriculture activities.

Declining participation at middle level or higher secondary education mostly attributed to increasing level of education. This implies that instead of shifting to labour market, females may stay some more periods in education, with the realisation that the returns to education are high and increasing. At the same time, the declining participation at higher level of

education also needs to be understood. Though in literature it has been suggested that the cultural norms may restrict participation of educated women but, at the same time, lack of labour market opportunities also hinders their participation rate (Kingdom & Unni, 1997). With higher education, women are more likely to work in better paying and more attractive jobs in the services sector. But the recent evidence shows that the growth rate of non-agricultural sectors is very low especially among females. Compared to 1999/00 and 2004/05 where the growth rate was 5.76 percent in 2004/05 and 2009/10 it increased at 0.76 percent. The proportion entering into modern industrial jobs is not enough to compensate for the decline at lower levels; hence there is a net decline in the rate of women workers. Since educated women are usually married to educated men and are likely to have some financial resources, instead of accepting poorly paid jobs they stay out of the labour force (Das, 2006). In this context, it can be said that the fall in employment opportunities or jobless growth syndrome is also responsible for withdrawal of females from labour force (Chowdhury, S. 2011).

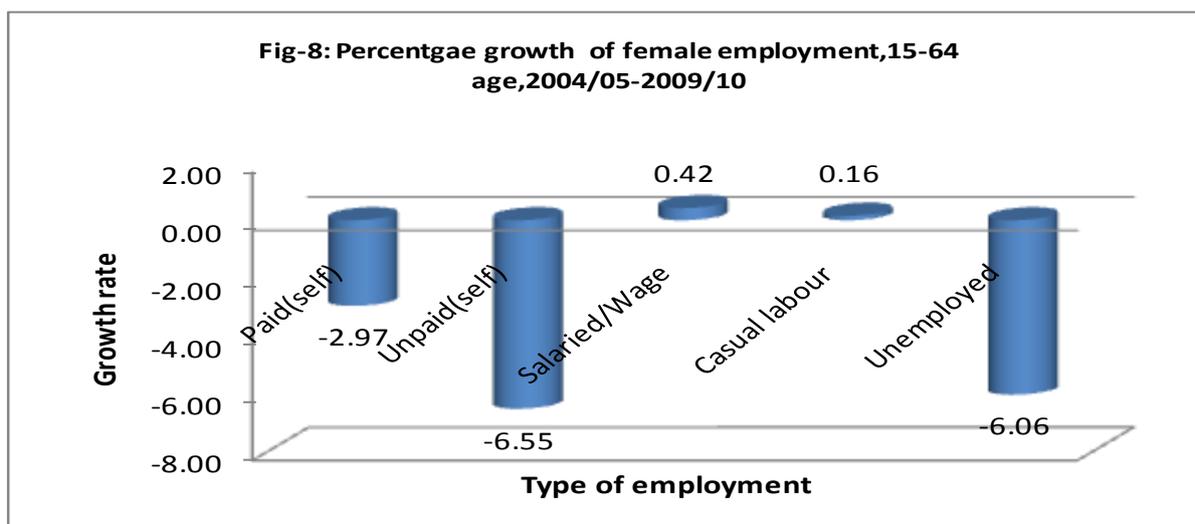
Another aspect of examining the changing trend in female labour force participation is to understand the change and composition of labour force by employment category in terms of self-employed, regular wage and salaried workers and casual wage earners and the unemployed.

Fig-7 presents the occupational distribution of females in different types of employment and its change over the time. From the figure it is observed that there is a sharp decline in unpaid family workers by women as a sub category of self-employment. The decline in female employment has occurred for unpaid workers from 42.5 percent in 2005 to 34.4 percent in 2010. The figure also show that the increase in participation rate of female in 2004-05 is basically because of increase this category of female employment only. The table clearly shows that share of female worker as unpaid labour increased when the female labour force rose and it declined with declining labour force.



Source: Calculated from NSS Unit level data, 1999/00-2009/10

The decline in unpaid worker is compensated by increase in employment in casual labourers. Female engaged in salaried/wage earning class increases from 8.25 percent in 2004-05 to 10.15 percent in 2009-10. Similarly, the percentage of female working as casual labourer also shows a steady increase from 29.5 percent in 2004-05 to 36 percent in 2009-10. The growth rate of different types of employment (Fig-8) signifies that service sector employment shows marginal growth followed by women working as casual labourers mostly. On the other hand, number of female working as self-employed and looking for job (unemployment) is reduced. One possible explanation for declining participation of females as unpaid labourers is the increasing level of education. Rather than working in family farm and non-farm activities they prefer to stay in education. This signifies the right to education most effectively working now days. The increasing growth in salaried class indicates that as development takes place, there is an increase in proportion of jobs in modern sector. At the same time casual labourers also shows a slight increased at 0.16 growths, perhaps because of the impact of NREGA. All these changes signify that there has been significant economic marginalization of women during the process of development of the country. The growth curve also reveals that number of female unemployment also reduced over the time. This signifies that in comparison to 2004/05, less number of females opting themselves to take up jobs.



Source: Calculated from NSS Unit level data, 2004/05-2009/10

Because of longer stay in education of the younger cohort, the unemployment rate may fall temporarily. Another way to explain the declining unemployment rate could be “discouraged-worker” effect. Discouraged workers are those who do not search for work because they view their chances of finding a suitable job as too low. Discouraged workers are more likely to be high in the period of recession/ depression. Studies show that financial crisis of 2008 has hit hardly the export industries where women have been working in large numbers. As a result, these women lost their jobs and perhaps could not be re-absorbed in the labour market (Chowdhury, 2011).

The above discussion shows that the changing nature of economic structure has reduced demand for female labour and the losses in primary sector have not been offset by secondary and service sector. The net result is there is decline in female’s participation. Lack of skill and knowledge about new techniques restricting females to shift of employment from agriculture and home based works to industry and services sector. Various recent reports warn that limited skills and training are a major bottleneck for continuing growth (Dutz, 2007; Papola, 2008). In this regard it can be said that a clear U-shape form does not hold true. Rather the recent trends indicate women’s economic participation along the course of development, can be reasonably expected to have a relatively wide flatter portion. It has been stated that Indian women have remained “at the bottom of the U” in terms of labour force participation over several decades, in spite of steady economic growth (Das & Desai, 2003). In the long run provision of more and more education and creation of skilled employment in the service sector may expected to give a clear U shape pattern of female labour force participation.

As far as the recent decline in participation rate is concerned, it can be said that the changing occupational structure, cyclical fluctuation of the economy and the jobless growth syndrome etc. make females convinced that probability to get acceptable job is very low in current business cycle condition. Although women displaced from agriculture and household industry, the growth of service sector has not been able to absorb the redundant labour fully. All these economic changes result in withdrawal of large number of women from labour force.

5. Empirical findings

In this study we used the approach followed by Anderson and Silver (1989) to examine the separate roles played by the macroeconomic, age and cohort effect on labour force participation rate. The unit of analysis of the study here is taken as the state. 10-year age group has been taken starting from 15 to 64 ages. The procedure is as follows:

Table- 3: Estimated age and period effects on logged age-specific female labour force participation rate, 2000-10

FLFPR	B-value	Std. Error	t-value
MPCE	1.58E-07	1.06E-06	0.15
25-34®			
15-24	-0.40***	0.09	-4.73
35-44	0.15***	0.08	1.81
45-54	0.07	0.09	0.74
55-64	-0.27***	0.10	-2.54
T0 ®			
T1	0.03	0.09	0.30
T2	-0.20***	0.08	-2.48
South ®			
West	0.10***	0.04	2.41
Central	-0.01	0.03	-0.15
East	-0.14***	0.03	-4.38
North	0.07	0.02	0.44
Northeast	-0.05***	0.02	-3.11
Constant	3.88***	0.10	39.26
R square	0.33		
F statistics	16.91***		
Root MSE	0.48		
N	255		

***<= 1% level of significance,

Source: Estimated by author, NSS, 1999/00-2009/10

The ordinary least square regression analysis has been used to investigate the effect of age, period and cohort on female labour force participation. We have taken the natural logarithms of the age-specific labour force participation rate as the dependent variable.

Along with the explanatory variables like age and period dummies we have taken other control variables like region dummies and monthly per capita expenditure of the households to examine the influence of these factors on participation rate. After running the regression, residual from first equation are taken as the dependent variable in a second equation, with dummy variables representing each birth cohort used as independent variable.

The estimated results presented in the table-3 are the regression coefficients for the age and period dummy. It has been widely stated in the literature that females belonging to low economic class participate in a greater manner to meet the household needs. Household economic status, as approximated by the Monthly Per Capita Expenditure (MPCE) of the household, is used as a continuous variable in the equations. To capture the cultural diversity on female participation rate, region dummy is used as a control variable also. For the purpose of these equations, the data were divided into six regions; i.e, North, South, West East, Central and North East. The states are classified into these six regions on the basis of NFHS classification. The reference region in the reported equations is the Southern Region. To capture the cultural as well as economic differences in participation rate, region dummy is introduced.

It has been observed that age has a significant impact on female labour force participation rate. 15-24 ages and 55-64 ages of women are reducing participation rate where as 35-44 age groups are positively influencing participation rate. Women of 35-44 age groups mostly are married and also completed their family size. Needs of household in terms of children's education, health, fulfilling the economic needs of other dependents may force them to join labour force. A number of studies have identified that the women's participation in the labour force substantially changes over the life course. Women's involvement in labour force will be high in their late 20's and early 30's, fall over the period when they have responsibilities for younger children, increase when women are in their late thirties and early forties; and fall again over the years until women reach 65. This signifies that life cycle needs bring changes in participation rate of females. Unlike this, the lower participation of 15-24 age groups reflects the importance of education in withdrawing females from labour force. Higher economic benefits of education, keeps women to stay a longer period in education. The old

age problems like diseases, illness etc reduces the participation rate of old age groups (55-64 ages). Besides, women generally worked as secondary bread winner in the family. When, they accumulated certain amount of wealth and when their children reach their prime working ages, then the number of earning members in the family increases. This may also reduce women's labour participation rate.

The results reveal that time will play a very significant role in influencing participation rate of female. Compared to 1999-00, the recent period that is 2009-10 has negative impact on participation rate. Along with increasing level of education, the changing structure of the economy, low growth of employment opportunities etc discouraged females not to enter labour force. The type of employment generated in modern industrial sectors does not match with the skills possessed by the women of old age groups. As a result of this, women belonging to these age cohorts withdraw themselves from labour force. This signifies economic changes play a vital role in bringing change in labour force participation of women and this affects all age groups.

The importance of region in determining women's labour force participation decision is also noteworthy. Not only are some regions more open in their norms about women's employment, mobility, acceptance of women's visibility in public spaces, but there is also a strong structural dimension that plays out in regional variations (Das,2006). Results show a fair amount of diversity in participation rate across regions also. After controlling for other factors, the results of regression show that eastern and north eastern region are negatively contributing to labour force participation of women. Compared to southern region, the cultural norms are stronger in east, hence, restricting female participation. This may be the probable cause of low participation of women. At the same time, lack of employment opportunities in these regions also may reduce their participation rate. Hence, it is very difficult to separate the effects of stricter gender norms from the effects of poor employment opportunities across regions. On the contrary, Western states are industrially developed and have large number of opportunities for women for which participation seems to be high.

Table- 4: Estimated cohort effects on logged age-specific female labour force participation rate, 2000-10

FLFPR	B-value	Std. Error	t-value
ch ₁₀	-0.076	0.148	-0.51
ch ₂₀	-0.141	0.110	-1.28
ch ₃₀	-0.081	0.147	-0.55
ch ₄₀	-0.084	0.182	-0.46

ch ₅₀	0.042	0.177	0.24
ch ₁₁	0.008	0.041	0.18
Ch ₂₁ [®]			
ch ₃₁	-0.048**	0.021	-2.32
ch ₄₁	-0.071**	0.029	-2.46
ch ₅₁	-0.227	0.182	-1.24
ch ₁₂	-0.135**	0.060	-2.25
ch ₂₂	-0.063	0.060	-1.04
ch ₃₂	-0.074**	0.032	-2.32
ch ₄₂	-0.049	0.048	-1.03
ch ₅₂	-0.019	0.045	-0.42
constant	0.068	0.061	1.12
R square	0.018		
F	77.21***		
Root MSE	0.483		
N			

***<= 1% level of significance

Source: Estimated by author, NSS, 1999/00-2009/10

As it has been mentioned in the methodology, the second step of analysis is to discover the effect of cohort on participation rate. The dependent variable in the second equation is the residual from initial OLS regression of natural log of age specific labour force participation rate on age, period and other controlled dummy variables. In other words, the dependent variable is the difference between the reported and estimated natural log of age specific FLFPR based on first equation. For independent variables, we enter dummy variables for each 10 year age group for different periods. For example, 15-24 age group of a particular period say 2000 is taken as one dummy and so on. For all cohort dummy variables, first subscript refers to the age group and second subscript refers to the year.

The reference dummy is taken as female born in the period 1970-80 that is who were in 25-34 age in 2005. The results presented in the table-4 reveals that compared to the cohort of female born between 1970 and 1980, female born before and after this period between 1950-70 and 1985-95 have negatively contributed to participation rate. In other words, the labour force participation of younger cohort of women is different and higher than older cohort. Low social development in terms of women's status, education and cultural attitude towards work etc. restrict the participation in labour market for female born in between 1950-70. It is a common observation that after marriage family responsibilities including raising children and managing household chores are considered most important for married women. This responsibility may limit the participation capacity of the older cohort in terms of time and energy to participate in labour force. Similarly, female born in 80's and 90's are born in a

period where the country is transforming to high socio-economic development where there is increasing enrolment of female in education, status of women is high. Besides, rather than entering to low paid jobs, females of this cohort are likely to stay for a longer period in education to get higher economic returns in long run. Besides, the negative impact of older cohorts on participation rate signifies that the economic changes taking place in the economy may negatively affect the older cohort of women rather than the changing behaviour of women.

6. Summary of Findings

This study is an attempt to understand important sources of decline in female labour force through Age-Period-Cohort model. The econometric results suggest that age and period effect can explain a substantial part of decline in labour force participation of females. The labour force participation of females is declining across all age groups and for all educational groups. Though prolonged stay in education reduces the participation of younger cohorts of women, but declining participation in all ages signifies that time period plays a very crucial in this respect. The negative impact of recent economic changes on participation rate is quite remarkable. Changing pattern of employment limited the opportunities for females across all the level of education. On one hand, technological changes restrict the participation among poorly educated females and the creation of jobs in the formal sector is falling behind the rising labour participation of new entrants in the market. All these changes in employment pattern in the process of development lead to declining participation of females in the labour market. Cohort effects are particularly relevant for women, with those born in the 1950s and 1960s are less likely to participate when compared to those born in the late 1960s and early 1970s. The prevailing socio-cultural system during the period like strong social norms, low status of women, lack of education etc. affects the careers of women and reduces their participation rate. Successive generations of Indian women, have increased their involvement in labour force at each stage of the life cycle relative to their predecessors. An obvious reason for such a pattern would be the increase in level of education and skill. Likewise, the cohort born in late 80's also is less likely to participate in labour market. This signifies that increasing level of education of younger cohorts will increase the labour force participation in near future when they move to prime working age. By obtaining more education, they will be exposed to new technologies which further enhances their participation rate. Besides, the findings also suggest that cultural milieu of different regions could be an important factor for

variation in female labour force participation. Poor economic and social development of the region has negative impact on female participation rate.

The findings of the present study has the implication that the provision of higher education to the recent cohort and creation of more skilled and better employment opportunities will substantially increase the women's labour force participation rate in future. At the same time the increase in status of women also seems to be a major perceptive factor to increase the labour force participation rate.

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