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Changing Trends in Female Labour Force Participation in India: An Age–Period–Cohort Analysis

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Despite rapid economic growth coupled with benefits of the demographic dividend, evidence from both the NSSO 66th and 68th Rounds reveals a decline in female labour force participation in India. This decline is difficult to explain in terms of economic variables as the country is experiencing rapid economic changes. Perhaps the age and cohort factors or educational and time period advantages might be leading to the postponement of female labour market participation. This paper attempts to explore the reasons for the decline in female labour force participation by sorting out the trends into age, period and cohort effects. In order to study these aspects, a linear regression model has been applied and the data has been drawn from various NSSO rounds. The empirical estimates suggest that age and period changes can account for a substantial decline in labour force participation. The provision of higher education and creation of employment opportunities for younger cohorts of women would help increase the labour force participation rate in the near future.

Keywords: *Age, Period, Cohort, Labour, Female*

INTRODUCTION

Demographic changes create a significant alternation in labour force participation and have had vital implications for economic changes for India in recent years. The data on employment and unemployment from the recent NSSO rounds (2010 and 2012) shows a disturbing trend with regard to the labour force participation rate (LFPR).[1] At the aggregate level, the LFPR (usual status) dropped to 40 per cent in 2009-10 from 43 per cent in 2004-05, and the decline continued in 2011-12, especially among the female labour force. Among females, the share in the labour force showed a steep fall from 29.4 per cent in 2004-05 to 23.3 per cent in 2009-10, and a still further decline to 22.5 per cent in 2011-12. Estimates show that the annual rate of decline in the participation rate of females between 2005 and 2010 was 1.72 per cent (Chandrasekhar and Ghosh, 2011). Presently, India has the tenth lowest female LFPR among 130 countries in the world, and it is much lower than that of all its South

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Asian neighbours except Pakistan (Datta and Sharma, 2013). However, the changing demographic dynamics (declining fertility and benefits of the demographic dividend), coupled with socio-economic transitions, such as the increasing level of education and structural changes in the economy taking place in India expected to contribute to favourable conditions for increasing the labour force participation of females. In spite of a GDP growth rate of 8.6 per cent, the failure of the economy to integrate females into the labour market has been quite a disturbing and unusual trend in recent years.

It is often argued that the participation of females in the labour force is critical for the growth of the economy (Esteve-Volart, 2004; Klasen and Lamanna, 2009). Thus, drawing women into the labour force is an important source of the potential growth of the country and can be seen as a signal of declining discrimination and increasing empowerment of women (Mammen and Paxson, 2000). It is imperative to understand the paradox of the decline in the female LFPR in the present scenario, that is, during the current period of socio-economic development that the country is passing through.

The release of the NSSO data for 2010 and 2012 has been followed by a big debate regarding the reasons for the declining female LFPR since 2004-05, and many scholars throw light on the reasons for this decline (Kannan and Raveendran, 2012; Rangarajan, *et al.*, 2011; Himanshu, 2011; Chandrasekhar and Ghosh, 2011; Chowdhury, 2011; Mazumdar and Neetha, 2011). Many of these studies pointed out that the undercounting of females in the labour force, which can be attributed to the use of poor investigation method, is one of the possible reasons for such decline. Besides, increasing enrolment of women in schools as well as low growth of employment further adds to it. Nevertheless, these studies explain the fluctuating trends in the female labour force in terms of either education (the age effect) or changes in the employment pattern (the period effect). At the same time, the participation behaviour of a specific age profile (cohort) as part of the aggregate participation trend also needs to be recognized. There are hardly any studies in India that attempt to understand the changing trends in the female LFPR by decomposing it into the age, period and cohort effects.

In this context, the major objective of the study is to understand the reasons for the decline in the female LFPR in India in recent years by applying the Age–Period–Cohort (APC) analysis. As part of this study, the participation rate of females has been decomposed to explore how it is influenced by: a) the age of the women; b) the prevalent macro-economic conditions; and c) the age-specific participation characteristics of the cohort. These effects on the observed participation rates are referred to, respectively, as the 'age effect', the 'period effect', and the 'cohort effect'. Contemporary factors like the change in the business cycle conditions, structure of the labour demand and government policies are usually referred to as 'period effects', which affect all the birth cohorts and influence the labour supply. While cohort effects explain the shift in the age participation profile, the age effect accounts for changes in the age-specific participation rate.

The remainder of the paper is classified as follows. The second section discusses the data and the empirical method used in the study. The third section presents trends in the female labour force participation, while the fourth section discusses the reasons for the decline in the female labour force and the factors influencing this decline. The findings from the empirical analysis have been explained in the fifth section. The final section presents the concluding remarks and their implications for future research.

DATA AND METHOD

The data for the study has been drawn from the National Sample Survey (NSS) rounds ranging over the periods 1999-2000, 2004-05, 2009-10 and 2011-12. The empirical analysis has been carried out for women in the working age group of 15-64 years wherein the oldest cohort was born during the period 1935-45 and the youngest during the period 1985-95, and the State has been taken as a unit of analysis for the empirical model. The estimation strategy for the empirical model is based on the methodology used by Anderson and Silver (1989) to investigate the effect of age, period and cohort on mortality. In this study, this strategy has been applied for the female labour force participation. The procedure for the same is described below.

The ordinary least square regression analysis has been used to investigate the effects of age, period and cohort on the labour force participation. The natural logarithms of the age-specific LFPR have been taken as the dependent variables. First, dummy variables were entered for every age group except the 25-29 year period and also the dummy period except 1999-2000. Besides the age and period dummies, the region dummy has also been taken to capture the regional effect on the participation rate. Besides, the monthly per capita expenditure (MPCE), a proxy for measuring the income level of the household has also been taken in the analysis, reflecting the fact that the economic status of the household significantly determines the participation rate.

$$\Gamma=\alpha+ A1+\ldots\ldots+A5+P1+\ldots\ldots+P5+R1+.....R6+MPCE+ \mu \quad (1)$$

In Equation (1), the notation A refers to the Age dummy, P refers to the Period dummy, R refers to the Region dummy, and MPCE indicates the monthly per capita expenditure of the household. The first OLS model has been created by using these variables. The equation thus examines the influence of age and period on the participation rate after controlling for other factors.

In the second step, the residual from the first equation has been taken as the dependent variable in a second equation, with the 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, the dummy variables were entered for each of the ten-year birth cohort born between 1935-45 and 1985-95. Each age group for a given period

has been considered as one cohort. For example, the 25-34 year age group of period one, say 1999-2000, is taken as one cohort, while the 35-44 year age group of the same period is another cohort. This procedure has been followed for all periods across all age groups to create the cohort dummies.

C_{ij}= 1 if the observation belongs to age group i of period j, 0 otherwise

$$\Upsilon = +Ch_{11}+Ch_{21}+\ldots\ldots\ldots\ldots +Ch_{12}+Ch_{22}+\ldots\ldots\ldots\ldots\ldots\ldots +Ch_{53}+\mu \quad (2)$$

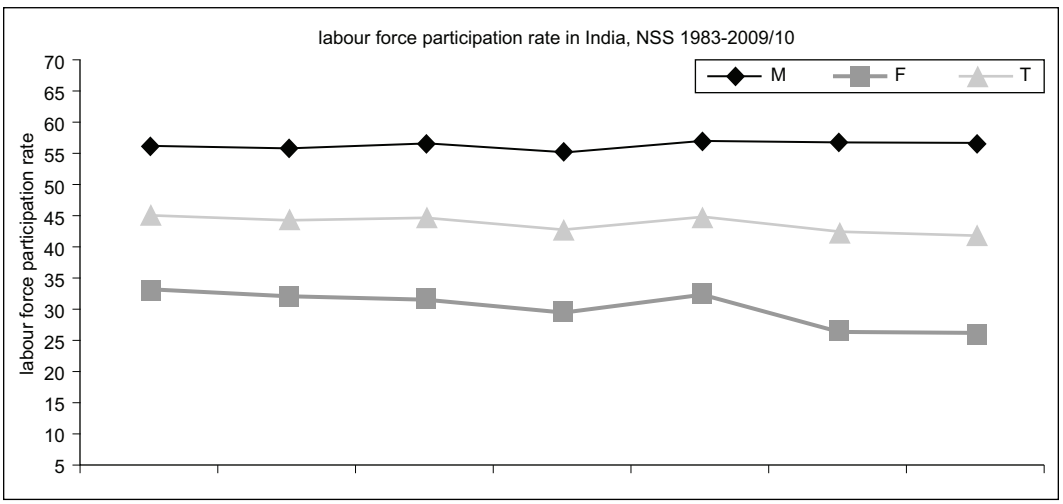
In Equation (2), the first subscript indicates the age group while the second one indicates the period. Hence, the cohort dummy variables run upon the residuals of the age and period dummy variables for the purpose of exploring the cohort effects on the participation rate.

TRENDS IN THE FEMALE LABOUR FORCE PARTICIPATION RATE

An examination of the trends in the female LFPR not only shows the magnitude of the decline but also throws some insight into the possible causes of variations in the participation rate. Figure 1 presents the trends in the participation rate based on the NSSO over the period 1983-2012.

The overall LFPR varies from 43 per cent to 40 per cent during the period indicating the declining growth. The participation rate is highest for the periods 1983 and 2004-05, at 43 per cent. Over the last seven years, there has been a decline in the participation rate from 43 per cent in 2004-05 to 39.5 per cent in 2011-12, and the decline has been more perceptible among females. The disaggregation of labour force participation by sex

Figure 1
Labour Force Participation Rate by Sex, 1983 to 2011-12



Source: Various NSS reports.

indicates that the participation rate among males has remained stagnant over the years while it has shown a continuous decline except during the year 2004-05.

The female participation rate declined by 6.13 percentage points during the period under study, that is, from 29.43 per cent in 2004-05 to 23.3 per cent in 2009-10 and further to 22.5 per cent in 2011-12. As regards the possible causes of the decline in the female LFPR, it may be observed that along with the various socio-economic and cultural factors inhibiting the participation rate, the demographic components that vary over time can also be expected to influence the participation rate through age-structure changes. Thus, in order to eliminate the effect of these age-structure changes on the LFPR, the age-standardized rate for the age group 15-64 years has been estimated for the periods 2004-05 and 2011-12. The age-standardized rates estimated for these two periods are presented in Appendix 1. The estimates show that for the years 2004-05 and 2011-12, the age-adjusted participation rate is 46.2 per cent and 34.1 per cent, respectively, for the 15-64 year age group. On the other hand, the crude participation rate is 45 per cent and 33 per cent for the respective age groups, suggesting that for both the periods, the standardized LFPR is higher than the crude participation rate. However, the age-adjustment rate for both the periods shows a decline in the participation rate similar to the crude participation rate. Hence, the subsequent discussion follows this line of argument while attempting to explore the reasons for the decline in the female LFPR, which also shows wide variations by place of residence. Table 1 presents the figures pertaining to the differences in the rural and urban labour participation rates during the period 2000-2010.

Among males, no significant differences can be observed between the LFPRs for rural and urban areas whereas among females, the rural LFPRs are more than double of the urban LFPRs. For instance for the period 2011-12, the LFPR for males was 55.3 per cent in rural areas and 56.3 per cent in urban areas. In contrast, the corresponding figures for females were 25.3 per cent in rural areas and as low as 15.5 per cent in urban areas. A similar pattern has been observed for all the rounds of the NSSO.

Table 1
Labour Force Participation Rate by Sex and Place of Residence, 1983 to 2011-12

	Male		*Female*	
NSS Rounds	*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
1999-2000	54.0	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
2011-12	55.3	56.3	25.3	15.5

Source: NSS Employment and Unemployment Survey reports.

One of the major features that emerge from an analysis of the trends is that there has been a steep decline in the female labour force in recent years, irrespective of whether the areas concerned are rural or urban though the decline has been relatively higher in rural areas. It has been observed from the data that the year 2004-05 is a bit of an outlier in terms of the female LFPR. There has been a continuous fall in the rural participation rate after 2004-05. The female LFPR in urban areas in 2004-05 was 17.8 per cent, which fell in 2009-10 to 14.6 per cent though a marginal increase to 15.5 per cent was noticed in 2011-12, but the level of increase was also lower than that seen in 2004-05.

One possible reason for the lower female LFPR in rural areas, as stated by Datta and Sharma, 2013, is that the poorer economic condition of females in rural areas forces them to engage in part-time economic activities along with their domestic duties, which are not counted by the statistical surveys and hence result in lower reporting of the labour force participation. A survey conducted in 36 villages in Bihar by the Institute for Human Development (IHD) in 2009-10 shows even lower estimates of the female LFPR by 6 per cent as compared to the NSSO figures. Besides the differences in the use of the survey tools and approach, it has also been pointed out that the possibility of undercounting of women's work by the NSSO could be one of the significant factors responsible for recording the lower female participation. However, Chandrasekhar and Ghosh (2011) argue that this may not be the reason for such a persistent decline in the female labour force. If the changing labour demand results in greater demand for women in paid work, then it is more likely to be captured by the investigators.

In this context, another possible reason for the decline in the female LFPR might be the increasing level of education among younger cohorts of women. Interestingly, rural women have overtaken their urban counterparts as far as education is concerned, with the former registering an increase of 3.3 per cent as against a corresponding figure of 2.7 per cent for the latter (Rangarajan, *et al.*, 2011). However, education may not be the only factor responsible for such a fluctuating trend since the decline in LFPR has been observed across all the age groups. Certain other factors thus also play an important role in leading to this decline, which necessitates a proper investigation of the reasons for the decline.

REASONS FOR THE RECENT DECLINE IN THE FEMALE LFPR

As discussed above, the declining participation of females in the labour force may be attributed to many reasons such as the lack of technical skills among the older cohort of women, their household responsibilities, and increasing level of education among the younger generation of women. Besides, macro level economic changes are also expected to have a significant influence in this regard. For instance, the decline in the demand for female labour due to the mechanization of agriculture affects the female participation rate in a major way as a large number of females are engaged in agriculture. In this regard Bhutani (2004) states that the mechanization of agriculture marginalizes women's livelihood. In addition, the slowdown in the overall job creation, that is, the jobless growth of the economy may also have a deceleration effect on the rate of female labour

force participation. All these factors that influence the trends of female participation in the labour force in India may be examined through a holistic APC analysis.

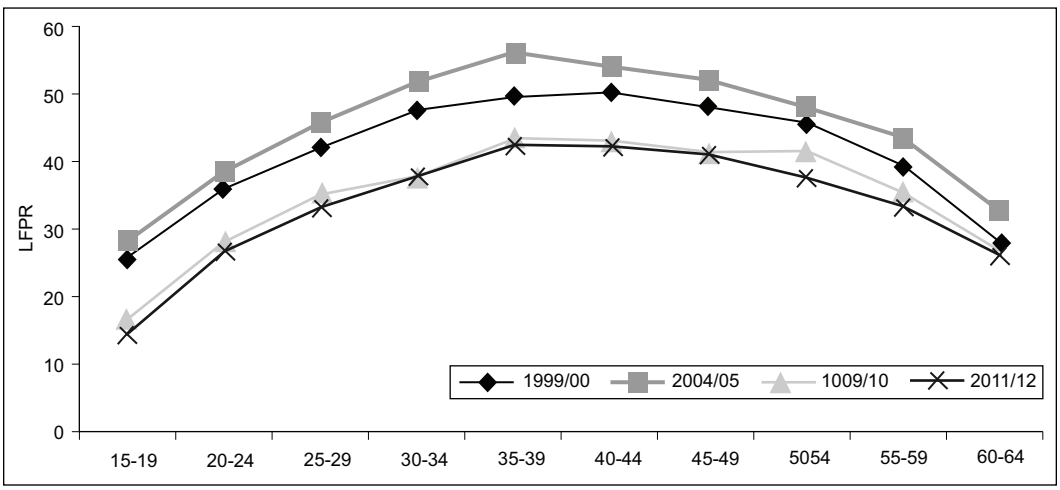
The age, period and cohort are merely indicators of the other variables, which actually cause the observed variation in the dependent variables under study (Clogg, 1982). The age effect in this study can be understood in terms of life-cycle decisions like education, marriage, and household size, among others. The period effect includes cyclical effects like structural and policy changes that lead to a change in the employment pattern. The cohort effect may be interpreted in terms of societal changes or changes in the social norms, as the attitudes towards paid employment influence the behaviour of different generations differently and cause differing variations in the participation rates of different cohorts.

Age-specific Female LFPR (The Age Effect)

In order to capture the effect of age, changes in the LFPR have been understood through changes in the age-specific participation rate. The age effect measures the extent to which the participation rate of women changes within each cohort as they move through the life course (Austen and Seymour, 2006). A number of studies show that the labour force participation changes substantially over the life course, tracing a well-known overall inverted U-shape profile, which peaks during the prime working age (Baller, *et al.*, 2009). The participation behaviour and the factors influencing it vary across different age groups, which, in turn, influence the aggregate participation rate.

Figure 2 shows that the age profile of women has shifted downwards since 2004-05 onwards across all age groups during both the periods, 2009-10 and 2011-12. Although

Figure 2
Age-specific Participation Rate among Females, 2000-2012

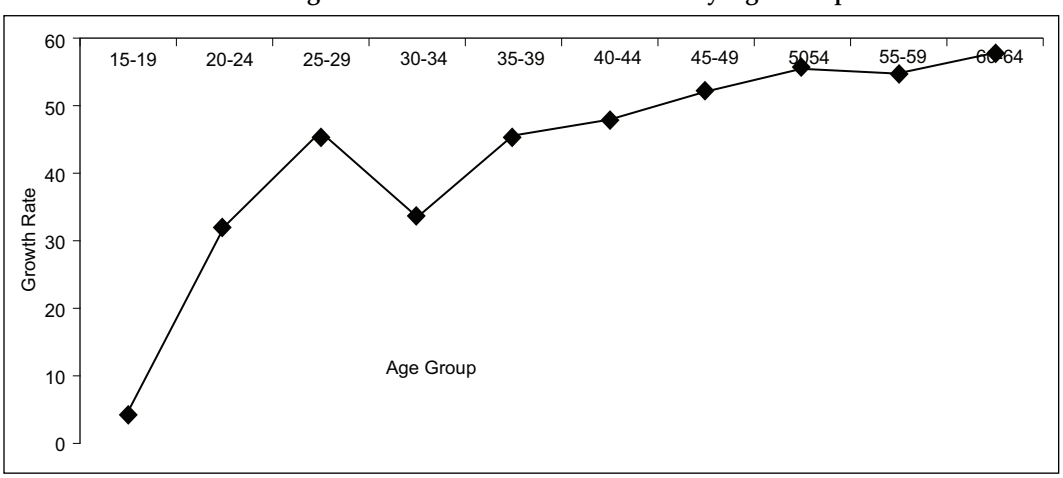


Source: Estimated from NSSO unit level data.

this downward shift may be partly explained in terms of the increasing enrolment in education among members of the younger age group, what is difficult to explain is that the decline has been noticed in all the age groups. In this context, while examining the profile of the missing labour force, Kannan and Raveendran (2012) point out that an increase in the level of education does not adequately explain the fall in the female labour force because the decline has been observed for all ages, specifically the 30-34 year age group, and mostly in rural areas. This indicates that apart from women's education there are other reasons for withdrawal of women from the labour force. The figure also reveals that there were no significant differences in the age-specific participation rate between 2010 and 2012 except that the 50-54 year age group showed a lower participation rate in 2012 as compared to that in 2010.

In the figure, the shape of the age-specific LFPR curve is an inverted 'U', indicating that the participation rate of the young (below the age of 25 years) cohort and the old (above the age of 50 years) cohort remains low, whereas the participation rate is relatively high for the cohort during the peak age group, that is, 35-50 years. This is because the determinates influencing females to participate in the labour market vary systematically by the age of the female. The NSSO (2010) estimates show that around 313 million people withdraw from the labour force for acquiring higher education and hence the participation of females in the age group of 15-24 years is lower. It has been argued by Dev and Venkatanarayana, 2011 that the loss of income due to the withdrawal of younger cohorts for the purpose of acquiring education has been compensated by the increasing participation of adults. Therefore, the participation of the 35 + age group in the labour force is higher than that of the other cohorts. This can be further understood from an analysis of Figure 3, which shows that females aged 35 years

Figure 3
Percentage Growth of Female Labour Force by Age Group



Source: Calculated from NSSO unit level data, 2009-10.

and above exhibit a lower decline in the participation rate as compared to females in the age group of below 35 years.

The participation rate by the age of the female shows that there is negative growth across all the age groups; however, a steady decline in the participation rate has been observed among the younger age groups, that is, 15-24 years and 30-34 years. After these cohorts, the level of the decline reduces, indicating that as the female workers move towards the higher ages, there is a slow decline in the LFPR. The possible causes for the variation in the LFPRs in different age groups are discussed below.

The increasing enrolment of teenagers in schools and the longer duration of their stay in schooling in recent years have also led to a decline in their participation in the labour force. Since schooling is an important activity for young people, the changing pattern of school enrolment is an obvious potential source of change in the labour force participation of the youth (Aaronson, *et al.*, 2006).

The data presented in Table 2 show that females in the age group of 15-24 years report attending educational institutions as their usual status increases over time for both rural and urban areas, with it being higher in the rural areas. In the rural areas, the enrolment of females in the age group of 15-19 years in educational institutions more than doubled from 25.8 per cent in 1999-2000 to 55 per cent in 2011-12. A corresponding increase has also been noticed in urban areas for women in the age group of 20-24 years. In this context, it can thus be inferred that the increasing enrolment of females in education leads to a decline in employment for the younger cohort of women.

As observed in the 15-24 year age group, the rate of decline in labour force participation is also high for the age group of 30-34 years (see Figure 3), which is mostly at-

Table 2
Percentage of Persons Reporting Attending Educational Institutions as Their Usual Status, by Age, Sex and Place of Residence

	Rural		*Urban*	
	Male	*Female*	*Male*	*Female*
15-19 Year Age Group				
1999-2000	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
2011-12	65.8	54.9	73.2	70.7
20-24 Year Age Group				
1999-2000	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
2011-12	21.3	9.9	33.1	24.7

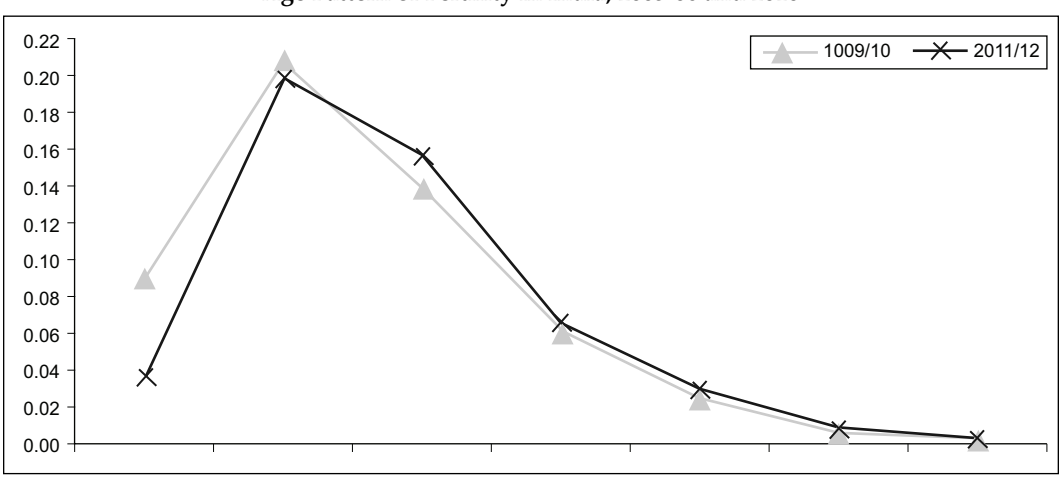
Source: NSS reports and estimates from unit level data.

tributable to marriage and motherhood. Further, with increasing levels of education, women are increasingly delaying their marriages and the consequent low fertility levels may also account for the depressed LFPRs among women in their thirties and early forties (Aaronson, *et al.*, 2006). Thus, in order to complete their family sizes and fulfil their roles as care-givers, female may withdraw themselves from the labour force for a certain period, which is evident from the increasing decline in LFPR in the age group of 30-34 years among women. This is further confirmed by the lower decline in the participation rate of women in the age group of 35 years and above. It is well-recognized that the age-specific fertility rate (ASFR) declines with an increase in the age of women. The age pattern of fertility estimated from the demographic national health and family survey data (2005-06) shows that the ASFR of women is highest within the prime age group of 20-24 years, that is, 0.21, and that it declines with an increase in age.

A similar pattern can also be observed in the SRS 2010. This gives the impression that the lower fertility rate of women in the age group of 35 years and above results in their higher participation in the labour market. Various studies also show that with a decline in fertility, the burden of bearing and rearing children also reduces, and consequently, the labour force participation of women increases (Mazumdar and Guruswamy, 2006; Klasen and Pieters, 2012).

Another possible explanation for the lower decline in the LFPR in the age cohort of 35+ years could also be due to the poorer economic condition of the household and the role of women as care-givers, compelling them to join the labour force or even to work in low-paid jobs. Studies show that in poor households, the central role of the females is to take care of the children and to provide for their basic needs. Thus, it is for this purpose of investing in the schooling of their children that women in the mid-

Figure 4
Age Pattern of Fertility in India, 2005-06 and 2010



Source: NFHS-3, 2005-06 and Sample registration System, 2010.

dle age group increase their participation in the labour force (Khan, and Khan, 2009). Overall, the age profile of females follows less of an inverse U-shaped curve. From the above analysis, it can be clearly observed that not only does the participation rate vary across the age cohorts but that there was also a decline in the LFPR across all age groups between the periods 2004-05 and 2009-10. It is also clear that this decline in the female LFPR can be accounted for not only by factors like the higher enrolment of women in education and fertility but also by a host of other factors. In this context, it can be argued that the 'time period' plays an important role in bringing about a change in the LFPR. This can be captured through the economic indicators. Besides these factors, behavioural changes also play an important role in influencing the LFPR. Johnson (2002) states that behavioural factors play a greater role than other indicators in determining the age-and sex-specific participation rates. Various other studies have also argued that changes in the age-specific rates may be caused by individual factors as well as by institutional and macroeconomic variations, including shifts in the demand as well as supply of labour (for example, economic swings, delayed labour market entry due to prolonged education, and early retirement exits, among other factors). The following two sub-sections focus on these aspects, that is, the cohort effect and the period effect.

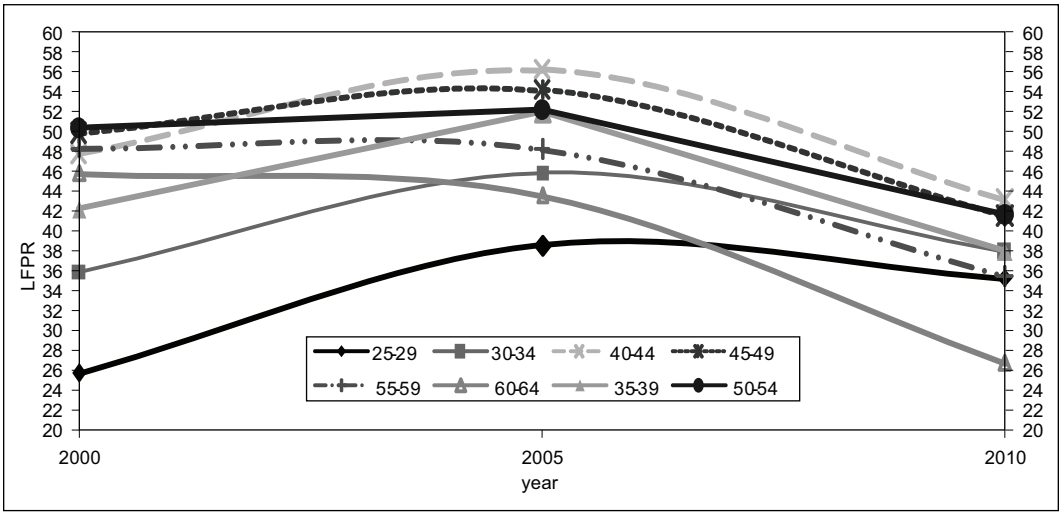
The Cohort Effect on the Female LFPR

The changing attitudes of females towards employment due to some specific reasons such as increasing education, the prevalent social norms during that particular period or some historical events may also influence the labour participation behaviour of a particular age cohort differently from the other age cohorts, which in turn, causes a variation in the LFPR. The cohort effect shows whether and to what extent women born in the late twentieth century have the lowest participation rate in each age group and within each macroeconomic environment as compared to women belonging to the older age cohorts.

The cohort-wise participation rates presented in Figure 5 follow the inverted U-shape pattern. The LFPR is higher for women in the age group of 40-54 years, that is, members of the cohort born between the years 1955 and 1970, than the corresponding figures for members of the other cohorts who were born earlier or later than this period. For example, members of the age cohort 25-39 years, that is, women born in the late 1970s and early 1980s, exhibit the lowest participation rate in 2000 as compared to those of the other age cohorts.

In 2009-10, women in the oldest cohort and the youngest cohort, that is, those born during the periods 1945-55 and 1975-85, respectively, exhibit the lowest participation rate as compared to other cohorts. On the other hand, women in the 40-44 year age cohort, followed by those in the 45-49 year age cohort, or those born during the period 1955-65, recorded the highest participation in 2005. This signifies that women born before the 1970s record higher participation rates during all the periods whereas those

Figure 5
Cohort wise Female Labour Force Participation Rate, NSSO, 2000-10



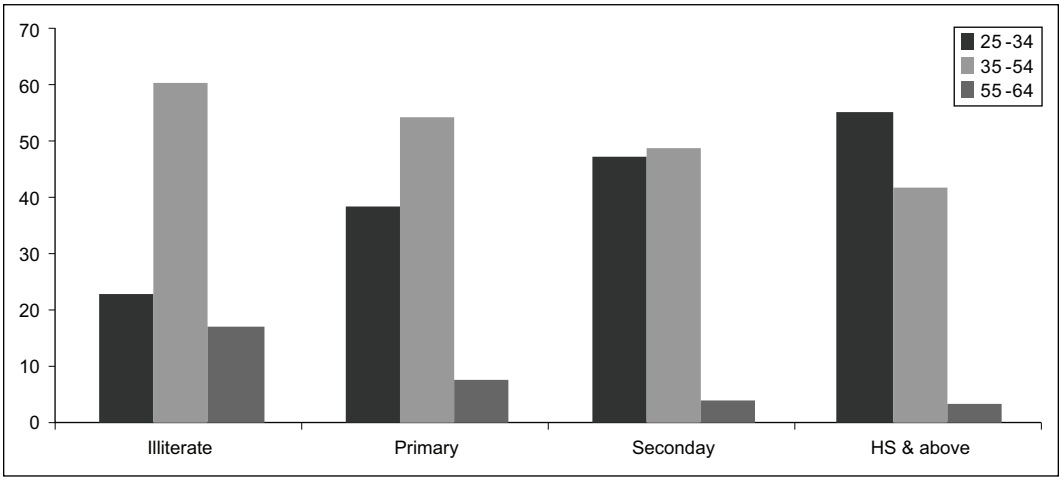
Source: Calculated from NSS unit level data.

born in the late 1970s and early 1980s, as also those born in the late 1940s and early 1950s, record the lowest participation rate. While the participation rate among the 25-29 year age groups was lower during the period 2000-05, in recent years the lowest participation has been noticed among women in the oldest age cohort. During all the time periods, the participation rate generally tends to be high among women in the 40-54 year age cohort, that is, women born between the late 1950s and early 1970s. This pattern highlights the persistence of the participation behaviour of a particular birth cohort over time.

The participation rate of women belonging to each cohort varies in accordance with many dimensions. The following two major features have been noticed among the cohorts with respect to their individual LFPRs:

1. The LFPR of the older cohorts is higher than that of the younger cohorts. One of the important reasons for this difference is the variation in the educational achievements of different cohorts. The lower participation rate among the younger age cohorts may be explained in terms of education, since women of the younger generation are devoting more time to the acquisition of higher education as opposed to participating in the workforce, especially with a view to augmenting their economic returns from education in the long run. Along with the rise in the number of women opting for higher education, an increase in the family income may also be responsible for the lower workforce participation among women (Aaronson, *et al.*, 2006). In contrast, the higher LFPR of

Figure 6
Distribution of Female Labour by Level of Education



Source: Calculated from the NSSO unit level data, 2011-12.

women aged 40-54 years can mainly be attributed to economic needs and consequently the necessity to work rather than merely a desire to do so. It has been widely acknowledged in the extant literature that a woman is more likely to enter the labour market if she belongs to a poor socio-economic household, that is, women largely join the labour force during their prime working ages mainly to cope with poverty in their households. The other factors that motivate, or even compel, women to join the workforce are a large family size, and poor educational attainments among them. These factors are also inter-related. This can be further understood through an analysis of the distribution of female labour into different educational categories by their age (Figure 6).

The data presented in Figure 6 reveals that the number of women with little or no education is higher in the 35-54 year age group while the a proportion of females belonging to the 25-34 year is found to have acquired higher levels of education. This suggests that a major part of the participation of older cohort of women is in the unskilled and low-paid jobs, and that it is primarily driven by poverty. Thus, women in the age cohort of 35-54 years participate in the labour force in order to reduce the economic vulnerability of their respective families and to provide quality education to their children.

2. Another major feature that emerges from the data is a decline in the participation rate across all the cohorts. This can be explained in terms of the acquisition of higher education among women of the younger generation, while

for older cohorts of women, the reasons may be economic or other social changes. Studies show that the amount of family resources available in terms of the husband's income also tends to influence the LFPR among female (Lee, 1997). It has also been suggested that the increasing wage rates of male family members, coupled with the advent of changing technologies in recent years, has probably led to a reduction in the workforce participation of females (Rangarajan, *et al.*, 2011).

During the period 2000-05, the LFPR for women increased across all the cohorts (except in the age group of 55-59 years, wherein the female workforce participation remained constant). The increase in the LFPR was particularly high for the younger age cohort (25-29 years), which went up from 26 per cent to 38.5 per cent during this period. In contrast, during the period 2005-10, the female LFPR across all the cohorts showed a decline, though the degree of the decline varied for different cohorts. The LFPR of the older age cohort declined steadily by 12-14 per cent relative to the younger age cohort. This pattern suggests that the advent of economic changes including the introduction of new technology, changing occupational structures and the implementation of new policy measures, among other things, may be responsible for the withdrawal of women from the labour force as they possess low levels of skills, which do not match with the quality of employment opportunities created in recent years. In this context, it may be inferred that period effects accounted for the decline in the LFPR of all age cohorts in recent times.

Economic Changes and Female Labour Force Participation (The Period Effect)

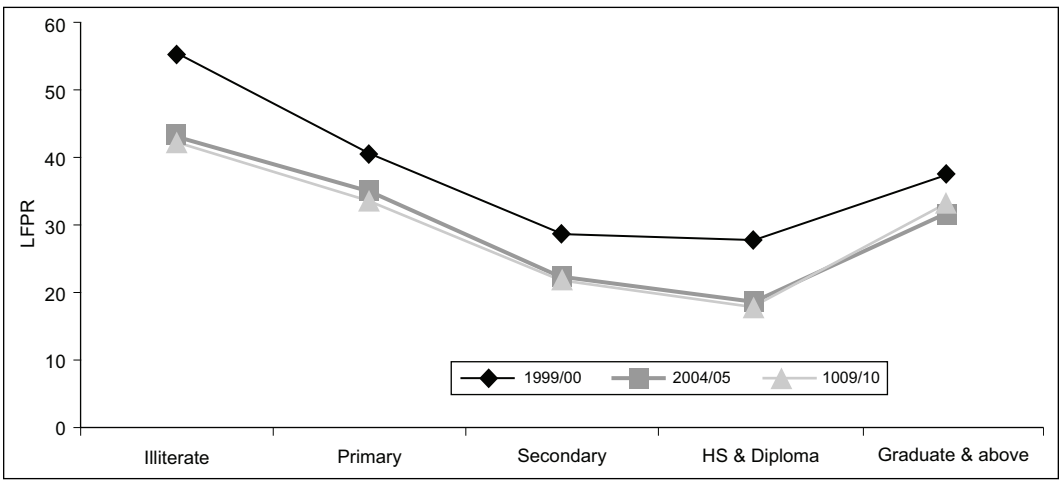
This section delineates the impact of economic changes on the female LFPR. Many studies have hypothesized a 'U' shaped relation between economic development and the LFPR of females. According to this hypothesis, during the early stages of development, when the society is primarily agrarian, the increased demand for female labour leads to higher workforce participation among women. Industrialization, on the other hand, gives rise to a greater demand for skilled labour, and consequently involves the displacement of female labour. This trend is often reversed during the later stages of development, when the increased demand for labour in the modern industry counterbalances the contraction in the traditional sectors (Durand, 1975; Boserup, 1970). Further, with increasing access to education for women and the rise in the demand for white collar jobs or socially more acceptable jobs as a consequence of the expansion of the services sector, the LFPR among women increases again.

The 'U'-shaped relation between the female LFPR and per capita income, which is an indicator of development, has also been noted in some studies (Goldin, 1995; Mammen and Paxson, 2000). A district level analysis carried out by Mathur (1994), using Census data, found a U-shaped relation between development and the female work participation, especially in rural areas. The participation rate of women is rela-

tively high as compared to that for their male counterparts, at a low level of development. In most cases, the women are observed to be working as unpaid workers in the family farms and in non-farming activities. As the economy moves towards higher development, employment in the agricultural and manufacturing sectors tends to fall while it increases in the services sector. Consequently, more women enter the labour market because the jobs now available symbolize more acceptable forms of employment as far as women are concerned (Choudhery, 2010).

For the purpose of understanding the 'U'-shaped relation between the female LFPR and development, education has been taken as an indicator in this paper. Figure 7 shows the LFPRs of women at different levels of education. The participation rate assumes a U form, with a high labour force participation being observed among illiterate women and women with low levels of education, which falls to the lowest level among those with middle and higher secondary levels of education, and rising again with those who have acquired education up to the graduate level and above, though in the right portion of the U curve, the increase in the LFPR is not substantial. In any case, it reflects several underlying forces at work. The higher participation among the poorly educated indicates that women are forced to work for sustenance. However, with an increase in the level of education, social restrictions and the lack of suitable opportunities keeps their participation rate low. A study by Kingdon and Unni (2001) attributes the downward sloping part of this U to the process of 'Sanskritization' or the fact that 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 decline in the female LFPR can also be related to the rising incomes of husbands.

Figure 7
FLFPR by Level of Education, 15-64 Year Age Group, NSS), 2005-12



Source: Calculated from NSS unit level data, 2005-12.

Further, the participation rate shows an upward trend at the highest educational level though the proportion of the decline in this category is relatively lower that that seen among the illiterate. The aspiration to improve the quality of life, combined with higher returns to education, increases the economic incentives for women to work. Figure 7 shows that the participation rate of females has declined across all levels of education in recent years. A closer look at India's economic development suggests that this trend can be understood in terms of the changing composition of employment.

The changing structure of employment during the process of development shifts the labour force from agriculture to non-agricultural activities, thereby leading to a decline in the LFPRs. In rural areas, females are largely working as unpaid family workers or agricultural labourers. Recent evidence shows that between the periods 2004-05 and 2009-10, there was a whopping decline in the share of female workers in the agriculture sector by 20.2 million, followed by a huge decline in the manufacturing sector too (Chandrasekhar and Ghosh, 2011). The reasons for the low demand for wage labour during this period could be the introduction of new labour-displacing machineries and shift in cropping patterns, as also low wage rates. All these factors forced women to shift from agriculture to non-agricultural activities.

The LFPRs of women with middle or higher secondary levels of education also show a decline, indicating the longer duration of stay of women in education instead of shifting to the labour market, as higher education brings in higher returns. At the same time, the declining participation of women at higher levels of education also needs to be understood. Although it has been suggested in literature that cultural norms may restrict the participation of educated women, yet at the same time, the lack of labour market opportunities also hinders their participation rate (Kingdon and Unni, 1997). With higher levels of education, women are more likely to work in better-paying and more attractive jobs in the services sector. However, the recent evidence shows that the growth rate of the non-agricultural sectors is very low especially with regard to employment opportunities among females. The growth rate, which was 5.76 per cent in 2000-05 increased by only 0.76 per cent during the period 2005-10. The proportion of women taking up modern industrial jobs was not compensated by the decline in LFPR at lower levels, which led to a net decline in the number of women workers. Since educated women are usually married to educated men and possess some financial resources, instead of accepting poorly paid jobs, they prefer to stay out of the labour force (Das, 2006). In this context, it can be said that the fall in employment opportunities or the 'jobless growth syndrome' is also responsible for the withdrawal of females from the labour force (Chowdhury, 2011).

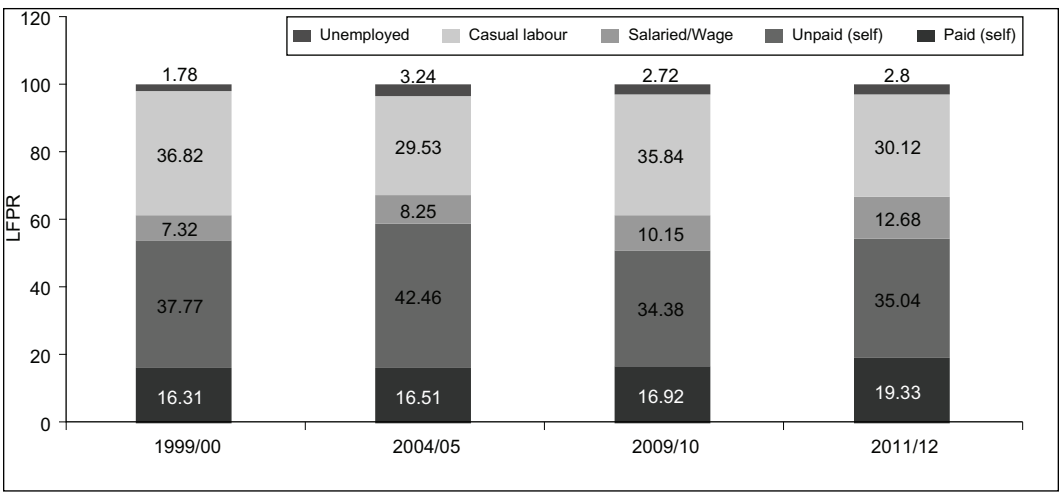
The changing trends in the female LFPR can also be examined in relation to the change and composition of the labour force by employment category in terms of the self-employed, regular wage and salaried workers, and casual wage earners and the unemployed. Figure 8 presents the occupational distribution of females in different types of employment and its change over time. From the figure, it can be observed that there has been a sharp decline in the number of females working as unpaid family

workers as a sub-category of self-employment, which also influences the aggregate participation rate. The status of women as unpaid family labour constituted 42.5 per cent of the total workforce in 2004-05, which declined to 35 per cent in 2011-12. One possible explanation for this reduction is an increase in education levels. Rather than working in the family farms or in non-farm activities, women prefer to acquire higher education. As regards the possible causes of the decline in the number of women as unpaid labourers, Kannan and Raveendran (2012) state that the advent of the National Rural Employment Guarantee Act (NREGA) in rural areas has caused men to lose their self-employment activities, which, in turn, leads to a reduction in the status of female as unpaid labourers as the women assist their male counterparts instead of taking up independent employment.

However, between 2009-10 and 2011-12, a change was noticed in the employment pattern with regard to casual labour and paid self-employed workers. While the share of women as paid self-employed workers increased from 16 per cent in 2009-10 to 19 per cent in 2011-12, the number of female casual labourers declined from 35 per cent in 2009-10 to 30 per cent in 2011-12.

The above discussion shows that because of the changing nature of the economic structure, the demand for female labour in the primary sector declines, and this decline has not been offset by a rise in employment in the secondary and services sectors. The net result has been a decline in the participation of females. Various reports warn that limited skills and training pose a major bottleneck to continuing growth (Papola, 2008). In this regard, it can be said that a clear U-shape form does not hold true. Rather, the recent trends indicate that women's economic participation along the course of

Figure 8
Distribution of Female Labour in Different Types of Employment, NSSO, 2000-12



Source: Calculated from the NSS unit level data, 1999-2000 to 2009-10.

development could be reasonably expected to have a relatively wide flatter portion. Das and Desai (2003) point out 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. In the long run, the provision of higher education and the creation of skilled employment in the services sector can be expected to give a clear U-shaped pattern to female labour force participation.

Moreover, the changing occupational structure, cyclical fluctuation of the economy and the jobless growth syndrome also keep the women's LFPR low. The growth of the services sector has not been able to fully absorb the redundant labour displaced from the primary sector. All these economic changes result in the withdrawal of women from the labour force.

EMPIRICAL FINDINGS

The LFPR of females by age and even by educational levels presented above shows that there is no significant difference in the participation rate between 2009-10 and 2011-12. Since the time differences are also the same for all the three rounds of NSSO, the period 2000-10 has been taken for the empirical analysis.

The empirical analysis of the paper used the approach followed by Anderson and Silver (1989) to examine the separate roles played by the macroeconomic, age and cohort effects on the female LFPR. The state level analysis has been conducted by using the 10-year age group starting from the age of 15 years to that of 64 years. The detailed procedure has been discussed below.

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

Along with the explanatory variables like age and period dummies, other control variables like region dummies and MPCE of the household have been taken to examine the influence of these factors on the participation rate. After running the regression, the residual from the first equation has been taken as the dependent variable in a second equation, with the dummy variables representing each birth cohort used as an independent variable.

The estimated results presented in Table 3 comprise the regression coefficients for the age and period dummies. It has been widely stated in the literature that females belonging to low economic classes participate more than those belonging to higher economic groups to meet their household needs. The household economic status, as approximated by the MPCE of the household, has been used as a continuous variable in the equations. In order to capture the cultural diversity of the female participation rate, the region dummy has also been used as a control variable. For this purpose, the data were divided into six regions, that is, the North, South, West, East, Central and North-east regions. The states are classified into these six regions on the basis of the NFHS classification. The reference region in the reported equations is the southern

Table 3
Estimated Age and Period Effects on the Logged Age-specific Female LFPR, 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
North-east	-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		

Note: ***<= 1% level of significance,

Source: Estimated by the author; NSS, 1999-2000 to 2009-10.

region. The region dummy has been introduced to capture both the cultural as well as economic differences in the participation rate.

It has been observed that age has a significant impact on the female LFPR and that women in the age groups of 15-24 years and 55-64 years show a reduction in the LFPR while those in the age group of 35-44 years, who are mostly married and have completed their families, positively influence the participation rate. The needs of the household in terms of children's education, healthcare, and fulfilment of the economic needs of their other dependents may also force the women to join the labour force. A number of studies have pointed out that the participation of women in the labour force substantially changes in terms of the life-cycle. While the involvement in the labour force of women in their late twenties and early thirties would be high, there would be a fall in their participation over the period when they have responsibilities towards

rearing young children, followed by an increase when women are in their late thirties and early forties; and a fall again over the years until the women attain the age of 65 years. The problems of old age and the onset of diseases reduces the participation rate of women in the older age groups (55-64 years). Besides, women generally work as secondary breadwinners in the family. When, they have accumulated a certain amount of wealth and when their children have reached 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 plays a highly significant role in influencing the workforce participation rates of females. As compared to the period 1999-2000, the more recent period, that is, 2009-10, has registered a negative impact on the female participation rate. Along with increasing levels of education, the changing structure of the economy, and low growth of employment opportunities have also discouraged females from entering the labour force. The types of employment generated in the modern industrial sectors does not match the skills possessed by the women in the older age groups. Consequently, women belonging to these age cohorts withdraw themselves from the labour force. This signifies that economic changes play a vital role in altering the labour force participation of women across all age groups.

The importance of region in determining the women's labour force participation decision is also noteworthy. Not only are some regions more open in their norms with regard to women's employment, mobility, and acceptance of women's visibility in public spaces, but a strong structural dimension has also been playing out in regional variations (Das, 2006). The results show a fair amount of diversity in the participation rate across regions.

After controlling for other factors, the results of regression show that the eastern and north-eastern regions are negatively contributing to the labour force participation of women. As compared to the southern region, the cultural norms, which restrict female participation, are stronger in the east. At the same time, the lack of employment opportunities in these regions may also reduce their participation rates. Hence, it is very difficult to separate the effects of stricter gender norms from the effects of poor employment opportunities across regions. In contrast, the western states are industrially developed and offer a large number of opportunities to women, which boosts their LFPRs.

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

Table 4
Estimated Cohort Effects on the Logged Age-specific Female LFPR, 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			

Note: ***<= 1 per cent level of significance.

Source: Estimated by the author, NSS, 1999-2000 to 2009-10.

dummy variables, the first subscript refers to the age group while the second subscript refers to the year.

The reference dummy is taken as a female born during the period 1970-80, that is, one who would be in the age group of 25-34 years in 2005. The results, which are presented in Table 4, reveal that as compared to the cohort of women born between 1970 and 1980, those born before and after this period, that is, between 1950 and 1970, and between 1985 and 1995, respectively, have negatively contributed to the participation rate. In other words, the labour force participation of the younger cohort of women is different and higher than that of the older cohort. Low social development in terms of women's status, education and cultural attitude towards work has also been seen to restrict the participation in the labour market of females born between 1950 and 1970. It is a common observation that after marriage, family responsibilities, including the raising of children and managing of household chores, are considered to be important for married women. This responsibility may limit the participation capacity of the

older cohort in terms of the time and energy available to them for participating in the labour force. Similarly, women born in the 1980s and 1990s show increasing enrolment in education and also enjoy a higher social status than their counterparts in other age cohorts, with the country concomitantly showing a transformation to a higher level of socio-economic development. Besides, instead of entering low-paid jobs, women in this cohort are likely to stay for a longer period in education in order to obtain higher economic returns in the long run. Besides, the negative impact of the older cohorts on the LFPR signifies that economic changes also negatively affect the older cohort of women more than the changing behaviour of women.

SUMMARY OF THE FINDINGS

This paper is an attempt to understand the important sources of decline in the female LFPR in India through the Age–Period–Cohort model. The econometric results suggest that the age and period effects can explain a substantial part of the decline in the LFPR of females. The labour force participation of females has been declining across all age groups and for all educational groups. Although a prolonged stay in education reduces the participation of the younger cohorts of women, declining participation during all ages also signifies that time period changes play a very crucial role in this respect. The changing pattern of employment has limited the opportunities for females across all levels of education. On one hand, technological changes restrict the participation of poorly educated females in the labour force while the creation of jobs in the formal sector has been falling behind the rising labour participation of new entrants in the market. All these changes in the employment pattern signify the rapid pace of change in the socio-economic structure, remain ahead of the changes occurring in women's employment and lead to a declining participation rate.

The cohort effects are particularly relevant for women, especially among those born in the 1950s and 1960s, who are less likely to participate in the workforce as compared to those born in the late 1960s and early 1970s. The prevalent socio-cultural system during the period, constituting strong social norms, low status of women, and lack of education, affect the careers of women and reduce their participation rates. Successive generations of Indian women have, however, increased their involvement in the 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 education and skill levels. Likewise, the cohort of women born in the late 1980s is also less likely to participate in the labour market. This signifies that the increasing level of education among the younger cohorts would increase their labour force participation in the near future when they move towards their prime working ages. The acquisition of higher education would expose them to new technologies, which would enhance their participation rate. Besides, the findings also suggest that the cultural milieus of different regions could signify an important factor responsible for the variation in the female LFPR.

Poor economic and social development of a particular region also has a negative impact on the female participation rate.

In a nutshell, the findings of this study indicate that the provision of higher education to the younger cohort of women and the creation of more skilled and better employment opportunities would help to substantially increase the women's LFPR in the future.

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Appendix 1

1	*2*	*3*	*4*	*5*	*6*
		2004/05		*2011/12*	
Age Group (Years)	*Standard Population*	*ASFPR*	*Expected Population*	*ASFPR*	*Expected Population*
15-19	3,35,64,069	28.12	94,36,61,947	14.30	47,99,66,437
20-24	7,74,16,393	38.48	297,87,08,423	26.52	205,30,61,712
25-29	7,16,26,469	45.79	327,99,34,575	33.25	238,13,32,395
30-34	6,27,43,821	51.86	325,41,27,534	37.81	237,24,83,615
35-39	5,98,30,060	56.14	335,89,07,345	42.38	253,53,86,461
40-44	4,91,41,379	54.09	265,78,85,684	42.09	206,83,88,709
45-49	4,24,23,227	52.08	220,95,66,102	41.05	174,15,71,085
50-54	3,28,97,461	48.11	158,26,58,061	37.50	123,35,28,107
55-59	2,66,04,805	43.49	115,70,92,791	33.27	88,50,36,473
60-64	2,57,94,354	32.58	84,03,25,993	26.17	67,51,31,669
	48,20,42,039		222,628,68,456		164,258,86,663
Age-stdardized participation rate	Σ[Col(2)* Col(3)]/ Σ Col(2)	46.18		34.08	
Crude age-specific participation rate		44.8		32.75	

Note: Standard population is the mid-year population as per the 2001 and 2011 Censuses.

** Expected population= Standard population* ASLFPR.

Sources: Estimated by the author, Censuses 2001 and 2011.

NOTE

1. Labour force participation rate is defined as the percentage of the working age population, comprising persons who are either working (employed) or not working but looking for work (unemployed).

REFERENCES

Aaronson, S., B. Fallick, A. Figura, J. Pingle, and W. Wascher, (2006). "The Recent Decline in the Labor Force Participation Rate and Its Implications for Potential Labor Supply." Brookings Papers on Economic Activity, 0(1), pp. 69-134.

Anderson, B.A. and B.D. Silver (1989). "Pattern of Cohort Mortality in the Soviet Population", *Population and Development Review*, Vol. 15, No. 3, pp. 471-500.

Annual Report to the People on Employment (2010). Ministry of Labour and Employment, Government of India, New Delhi.

Austen, Siobhan and Richard Seymour (2006**).** "The Evolution of the Female Labour Force Participation Rate in Australia, 1984-1999", *Australian Journal of Labour Economics*, Vol. 9, No. 3, pp. 305-20.

Baller, A., R. Gomez-Salvador and J. Turunen (2009). "Labour Force Participation in the Euro Area: A Cohort-based Analysis", *Working Paper No. 1049*, European Central Bank.

Bhutani, Shalini (2004). "Food Sovereinty and Agriculture, *Business Line*, 25 May, 2004, New Delhi.

Boserup, Easterlin (1970). *Women's Role in Economic Development*, St. Martin Press, New York

Chandrasekhar, C.P. and J. Ghosh (2011). "Latest Employment Trends from the NSSO", *Business Line*, 12 July.

Chen, M. and J. Drèze (1992). "Widows and Health in Rural North India", *Economic and*

Political Weekly, 27(43-44), pp. 24-31.

Choudhery, Misabh Tanveer (2010), "Demographic Transition, Economic Growth and Labour Market Dynamics", PhD. Thesis, University of Groningen, Groningen, The Netherlands.

Chowdhury, Subhanil (2011). "Employment in India: What Does the Latest Data Show?", *Economic and Political Weekly*, Vol. XLVI, No. 32. pp. 23-26

Clogg, Clifford (1982). "Cohort Analysis of Recent Trends in Labour Force Participation", *Demography*, Vol. 19, No. 4, pp. 459-80.

Colombino, Ugo and Bianca De Stavola (1985). "A Model of Female Labour Supply in Italy Using Cohort Data", *Journal of Labour Economics*, Vol. 3, No.1, pp. 275-92.

Das, Maitreyi Bordia (2006). "Do Traditional Axes of Exclusion Affect Labour Market Outcomes in India?", *South Asia Series No. 97*, Social Development Papers, The World Bank, Washington, DC.

Das, Maitreyi Bordia and Sonalde Desai (2003). "Are Educated Women Less Likely to be Employed in India?", *Social Protection Discussion Paper No. 313*, World Bank, Washington DC.

Datta, A. and A.N. Sharma (2013). "Are Women Losing out on Employment in India?", *The Financial Express*, October 22, 2013.

Dev, M and M. Venkatanarayana (2011). " Youth Employment and Unemployment in India", *Working Paper, No. 009*, Indira Gandhi Institute of Development Research, Mumbai.

Durand, J.D. (1975). *The Labor Force in Economic Development*, Princeton University Press, United States.

Esteve-Volart, B. (2004). "Gender Discrimination and Growth: Theory and Evidence from India", *STICERD Discussion Papers DEDPS42*, London School of Economics and Political Science, London.

Goldin, C. (1995). "The U-shaped Female Labour Force Functions in Economic Development and Economic History", in T.P. Schultz (eds), *Investment in Women's Human Capital*, University Press, Chicago, pp. 61-90.

Himanshu (2011). "Employment Trends in India: A Re-examination", *Economic and Political Weekly*, Vol. 46, No. 37, pp. 43-59.

Kannan, K.P and G. Raveendran (2012) "Counting and Profiling the Missing Labour Force", *Economic and Political Weekly*, Vol. XLVII, No. 6, pp. 77-80.

Khan, R.E. and Khan, T. (2009). "Labor Force Participation of Married Women in Punjab (Pakistan)", *Journal of Economic and Social Research*, Vol.11, No. 2, pp. 77-106.

Kingdon, Geeta Gandhi and Jeemol Unni (1997). "How Much Does Education Affect Women's Labour Market Outcomes in India?: An Analysis Using NSS Household Data", *Working Paper No. 92*, Gujarat Institute of Development Research (GIDR), Ahmedabad.

——— (2001). "Education and Women's Labour Market Outcomes in India", *Education Economics*, Vol. 9, No. 2, pp. 173-95.

Klasen, S. and F. Lamanna (2009). "The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries", *Feminist Economics*, Vol. 15, No. 3, pp. 91-132.

Klasen, S. and J. Pieters (2012). "Push or Pull? Drivers of Female Labour Force Participation during India's Economic Boom", The Institute for Study of Labour (IZA), *Discussion Paper No. 6395*. Bonn.

Lee, Mijeong (1997). "Why Do Some Women Participate in the Labour Force While Others Stay at Home?", *Korea Journal of Population and Development*, Vol. 26, No. 2, pp. 33-54.

Mammen, K. and C. Paxson (2000). "Women's Work and Economic Development", *The Journal of Economic Perspectives*, Vol. 14, No. 4, pp. 141-64.

Mathur (1994). "Work Participation, Gender and Economic Development: A Quantitative Anatomy of the Indian Scenario", *The Journal of Development Studies*, Vol. 30, No. 2, pp. 466-504.

Mazumdar, S. and M. Guruswamy (2006). "Female Labour Force Participation in Kerala: Problems and Prospects", Paper presented at Population Association of America Conference, 30 March-1 April, California.

Mazumdar, Indrani and Neetha, N. (2011). "Gender Dimensions: Employment Trends in India, 1993-94 to 2009-10", *Economic and Political Weekly*, Vol. XLVI, No. 43. pp. 118-26.

Papola, T.S. (2008). "Employment Challenge and Strategies in India", *ILO Asia-Pacific Working Paper Series*, ILO Sub-regional Office for South Africa, New Delhi.

Rangarajan, C., Padma Iyer Kaul and Seema (2011). "Where Is the Missing Labour Force", *Economic and Political Weekly*, Vol. XLVI, No. 39, pp.68-72.