

The puzzling decline of female labor force participation in India and its prospects: an Age-Period-Cohort approach

It is often argued that female labour force participation is crucial for economic growth of the country. The participation of women in labour market is a significant source of the potential economic growth of the country and can be understood as a significant indication of declining gender discrimination and increasing women empowerment (Mammen and Paxson, 2000). Despite the rapid increment in female education and decline in fertility rate, the female labour force participation is at a consistent decline and reached a very low level (17.5 percent) in 2017-18. Few studies suggested that this decline results from the rapid increment of household income and a higher enrolment of women in secondary and higher education (Rangarajan et al., 2011; Verick, 2018). The concurrent preview of literature examines the determinants of female labour force participation in India and suggested that conservative gender and social norms, patriarchy, lack of skills, and household status are major constraints in women's participation in the labour market. A major gap in the empirical literature on FLPR in India has been in research on the dynamics of FLPR. However, there is a lack of research on the assessment of the cohort behaviour of female labour force participation with age and period effects.

It is known that the same generation is more likely to behave in a similar way in getting an education, employment opportunity and in demographic events that occurred in their life course. In this context, it is essential to explore and decompose (1) the age effect of women, (2) macro-economic effect (period effect), and (3) the age-specific characteristics of women (cohort effect) on female labour force participation rate. Moreover, Age effect accounts for changes in age-specific participation and include life cycle decisions such as the timing of education, childbearing, and retirement. The period effect may consist of business cycle effects or the effect of policy changes on the female labour force participation and accounts for the difference in business cycle condition such as labour demand and supply structure, which affect all the birth cohorts. The study of period effects may help to observe the economic sectors with cyclical employment patterns affected by historical changes, environmental changes, economic expansions and contractions, pandemics and epidemics, public health interventions, and technical breakouts. Further, the period effect also tests the “added worker effect” and “discouraged worker effect” theories. Finally, cohort effects may include improved educational attainment and lower fertility rates of younger cohorts, and changed social norms. The cohort effect observes the dynamic changes across groups of individuals who experience an initial event, such as birth or graduation, at the same time. A birth cohort moves through life and experiences the same period effects at the same age. Therefore, different birth cohorts, who experience different historical, political, environmental, technical, economic and social time events at a different stage in life, have diverse exposure to their life-course (Yang and Land, 2013a).

In India, the low female labour force participation rate is well established. However, previous studies only assessed FLPR relationship with education, fertility decline, and gender inequality etc and partially explain lower FLPR which is at continuous decline. Thus, there is need to understand the life cycle behaviour of female work by assessing the age-period-cohort effects.

Innovative aspects

The continuous decline in female labour force participation in India has become a paradox. And existing literature partially explain this puzzling decline in female labour force participation. There is no study in India who assess the life cycle behaviour of women work capturing age-period-cohort effect. In this proposed study, first, we tried to assess the life cycle behaviour of the women in context of labour force participation and second, we tried to assess the prospect of future female labour force participation in India.

Data and Methods:

Data source

We have used micro level data from Employment-Unemployment survey of National Sample Survey Organisation (1993/94, 1999/2000, 2004/05, 2009/10, 2011/12) and Periodic labour force survey (2017-18). The above-mentioned rounds to obtain a pooled cross-section data set for individual aged 15-64 years. This pooled data set is not panel data set because it does not follow the same individual over time. However, we can track cohorts of individuals with cohorts defines according to year of birth. We constructed synthetic cohort by categorising using their age-period identifiers. Since each cross-section survey is representative of the population, we can track about changes in behaviour by examining the participation rate of successive cohorts at the same phase in their life cycle.

Modelling approach

Age-Period-Cohort (APC) Model:

We used age-period-cohort model given by Yang and Land (2013a) to understand the life-course behaviour of female labour force participation.

The regression model for female labour force participation, by individual i aged a , belonging to a synthetic cohort c in period p can be written as:

$$Y_{iapc} = \alpha_a A_{ap} + \beta_p P_p + \gamma_c C_c + \varepsilon_{iapc}$$

Where, $a = 1, \dots, n$; $p=1, \dots, m$; $c=1, \dots, (p-a)$ where A , P , and C denote dummies for age, period, and cohort.

Projection of female labour force participation

Cohort methods

Cohort method for forecasting female labour force participation rates rely on measures of exit from and entry to the labour market as cohort's age. The most straightforward method for incorporating cohort effects into labour supply projections is to take account of the shape of the lifetime labour participation profile for each successive cohort and to extrapolate on that basis.

Preliminary findings:

Age-Period-Cohort characteristics:

The preliminary findings reveal a consistent decline of female labour force participation during 1993-2017 except 2005 at all ages. Female labour force participation was higher in 2005 across all age-group among selected period. Women have higher participation in labour market at their prime age (15-44 years) over the periods. Women at ages 15-19 years and 60-64 years have least labour force participation which has consistently declined during 1993-2017. Further, results show that in 2017, FLPR are very low across all cohorts, and recent cohort groups have very low participation rate in labour market compared to previous cohorts (Figure 1& 2). Rural area experience consistent decline in FLPR except 2005 while in urban area FLPR is constant. Rural area show about 50 percent decline in FLPR during 1993-2017. Further, findings portray a constant FLPR in urban area while rural area experienced consistent decline FLPR across all cohorts. However, recent cohorts show equal participation in labour market in both areas, and those women who born after 1990s have low and similar labour force participation irrespective of their place of residence (Figure 3& 4). Education is an important explanatory factors contribution most in FLPR; however, it's showing contradictory relationship in India. Findings reveal that illiterate women were participation more in labour market compared educated. Women with secondary and middle level of education have very low participation in each period. However, women with graduate and above degrees have higher participation in labour market which has been increased in recent periods. Again, results show that FLPR has declined across all cohorts irrespective to education. However, recent cohorts with graduate and above degrees show the increasing trends of FLPR (Figure 5& 6). Caste (social status) is most important contributory factor

which is neglected by most of the labour economist. In India, Caste is mostly based on occupation, and work is often influenced by individual caste. Scheduled castes/tribes (SC/ST) women have higher labour force participation as compared non-SC/ST over the period. The participation gap in labour market between SC/ST and non-SC/ST was higher across all cohorts; however, this gap became negligible in recent cohorts (Figure 7 & 8). Furthermore, we found huge labour force participation gap between never-married and ever-married women in each period. Ever-married women have higher participation rate at never-married, and FLPR gap is constant between both during the period. Labour force participation among never-married women show fluctuating trend across cohort, however, FLPR among ever married show consistent decline from old to recent cohort (Figure 9 & 10). Muslim women have low labour force participation during 1993-2017 while Christian women are highest participation rate in labour market. Over the period, FLPR has declined in all religion however, most of the FLPR decline has been found among Sikh. Across all the cohort similar trend of FLPR decline has been seen (Figure 11 & 12).

Prospects of Female labour force participation (FLPR):

In our preliminary analysis, the findings show that FLPR will be consistently decline across all age group in future. Rural area will be experience huge drop in FLPR at all ages while FLPR in urban area will be experience very low decline in near future. It indicates that female labour force participation rate will be constant in near future (Figure 13, 14 & 15). However, entry-exit method of projection is not showing accurate prospects because of assumption of constant entry and exit rate. So we will try to apply simulation or multistate projection model to obtain accurate picture of FLPR in India.

Age-Period-Cohort characteristics:

Figure (1) age-period characteristics

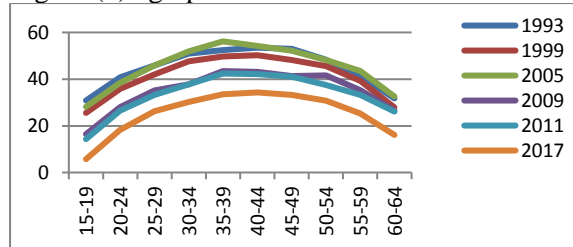


Figure (2) period-cohort characteristics

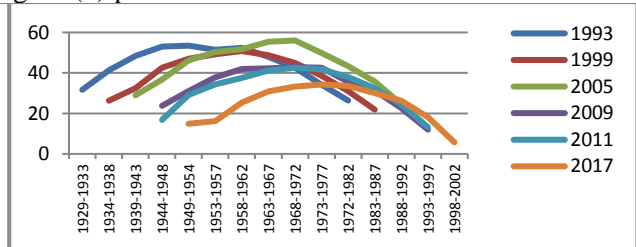


Figure (3) period characteristics by urban/rural

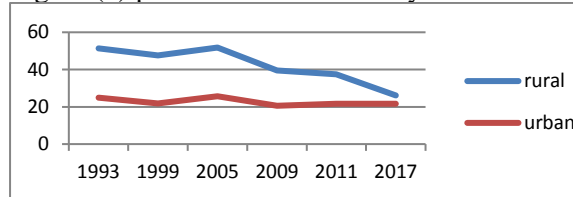


Figure (4) cohort characteristics by urban/rural

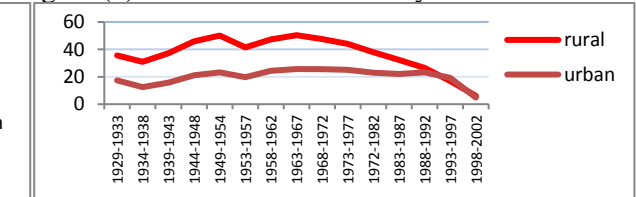


Figure (5) period characteristics by education

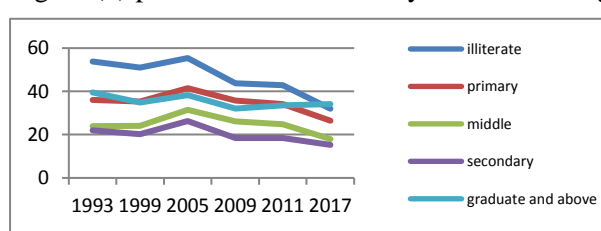


Figure (6) cohort characteristics by education

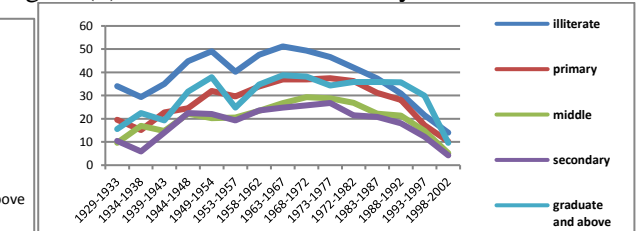


Figure (7) period characteristics by social status

Figure (8) cohort characteristics by social status

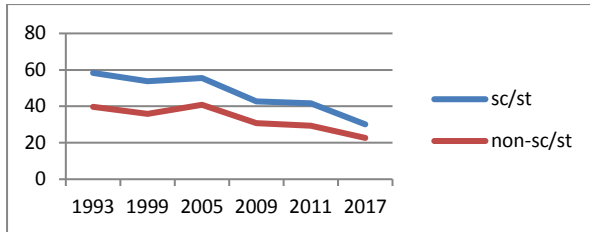


Figure (9) period characteristics by marital status

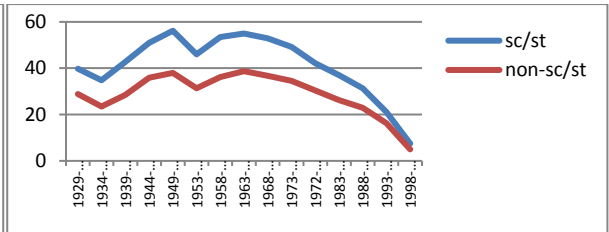


Figure (10) cohort characteristics by marital status

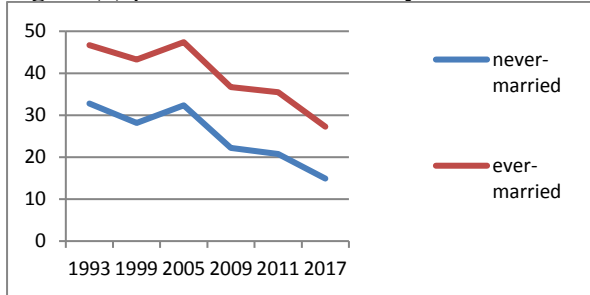


Figure (11) period characteristics by religion

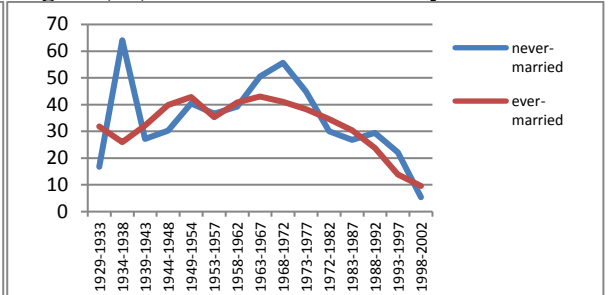
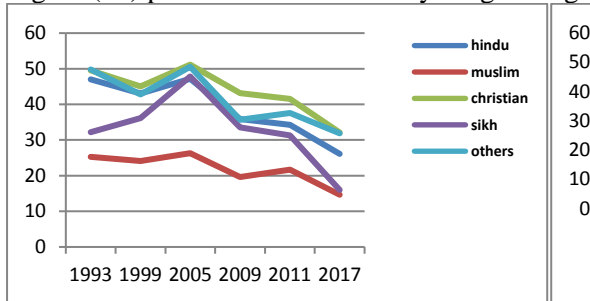


Figure (12) cohort characteristics by religion



Prospects of female labour force participation (FLPR):

Figure (13) future prospects of female labour force participation rate by age-group at national level

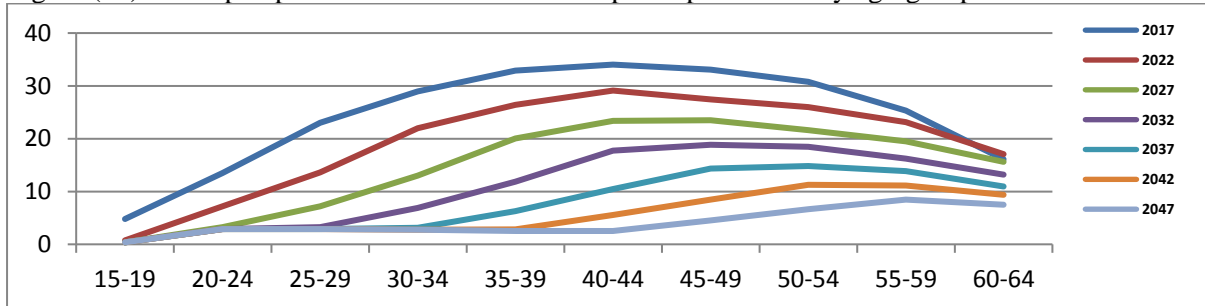
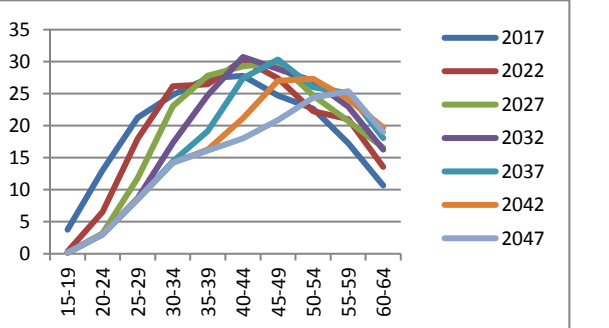
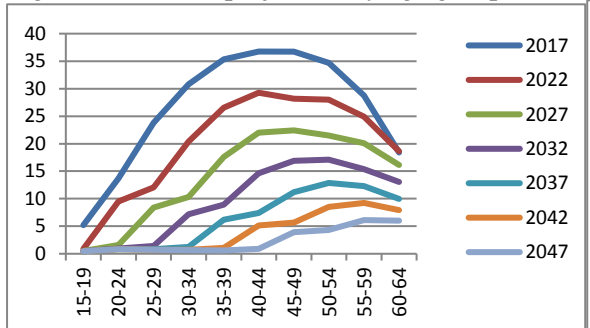


Figure (14) FLPR projection by age group (rural)

Figure (15) FLPR projection by age group (urban)



References:

Mammen, K. and M. Paxson (2000): "Women's Work and Economic Development," Journal of Economic Perspectives, Vol. 14, No 4: 141-164.
 Yang, Y. and K. C. Land (2013a): Age-period-cohort analysis: new models, methods, and empirical applications. CRC Press.