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**Region and Gender Specific Labour Market Participation in
India: A Study on Inter-State Variations and Determinants**

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Region and Gender Specific Labour Market Participation in India:

A Study on Inter-State Variations and Determinants¹

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Abstract

The female participation rate is significantly lower than that among the males. The rural-urban differentials are more pronounced and the inter-state variations are sizable in the case of females, reflecting the influence of social, cultural and economic factors as well. Even in the large cities the female labour market participation is lower than that in the rural areas despite higher levels of education. The impact of infrastructure, education and health and urbanization on labour force participation of both the gender is quite distinct. While industrialization and growth in services both show a positive effect on participation, though very mildly especially in the case of urban women, economic growth shows an increasing impact for urban males only. Also, there is evidence on poverty induced participation in agricultural activities, suggesting clearly the importance of rural diversification for participation to pick up in the rural context. Women's participation improves child health significantly as noted from the beneficial effect of female labour force participation rate (from the panel data analysis) on infant mortality of girls as well as boys. Access of mothers to resources through labour market participation improves the health status of the children as their nutritional status and access to curative health care get better. On the whole, women's participation in productive activities has a double effect: first, it raises the household income and second, it contributes to wellbeing of the household. These findings are important from policy point of view because different infrastructure variables are seen to improve both participation and labour productivity. With improved infrastructure the quantum of investment is expected to shoot up and the accessibility to growth centres offering better livelihood opportunities can perk up. Infrastructure (social, physical and financial) can to certain extent break the social and cultural barriers and help women participate in the labour market and make productive contribution to the growth process. Though the

¹ This study was carried out during Arup Mitra's visit (November 2016 - March 2017) at the Graduate School of International Development, Nagoya University, Nagoya, Japan

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level of urbanization raises the urban participation rate in an inter-spatial sense, a similar pattern is not evident in the context of rural females (at least at the state level). How urbanization can be made more generative with positive spillover effects in the rural neighbourhood is, therefore, an important policy question. Increased urbanization ushering in greater concentration of non-farm activities can expand employment prospects and at the same time result in productivity gains.

1. Analytical Frame

Labour force participation rate is an important indicator of development. With increased human capital formation people are able to participate in productive activities which result in higher levels of value addition. Without human capital formation a high level of labour market participation is also evident, but that is associated with low levels of labour productivity. How labour market participation can improve with rising labour productivity is, therefore, an important research and policy question. Particularly in societies experiencing rise in life expectancy population must be engaged in productive activities so that for future years (for old age) they are able to save enough. India has witnessed a considerable decline in fertility rate with an increase in the percentage of population in the working age brackets, which is seen to be the source of demographic dividend. But such benefits can materialize and enhance economic growth only when from supply point of view there is skilled and highly employable labour force and from demand side there are enough opportunities to absorb them productively. The new technology is skill intensive and the study by Okada (2004) reveals that dynamic industrial transformations in the 1990s significantly changed the nature, content and extent of skills development as far as the domestic suppliers are concerned. However, in India a large majority of young people still continue to have limited access to education and training as the dropout rates are high despite an expansion in the capacity of educational institutions and enrollments (Okada, 2012). The skill mismatch index is huge, indicating poor employability of a large percentage of the available labour force (Mitra, 2013a). Dreze and Gandhi-Kingdon (1999) present evidence to suggest that school participation, especially among girls, responds to a wide range of variables, including parental education and motivation, social background, dependency ratios, work opportunities, village development, teacher postings, teacher regularity, midday meals and also school quality.

One of the important drivers of socio-economic transformations is urbanization. There is an economic reason to justify this view. Large human settlements emerge from concentration of activities. Large

volume of investments, indivisibilities in infrastructure and other assets and large expenditure incurred by the state naturally give rise to several external economies of scale attracting firms and business to concentrate. The agglomeration economies in other words motivate growth centres to expand which in turn attract labour to these areas as job search cost tends to decline sizably. Thus population growth takes place and cities grow in size. The external economies of scale result in higher total factor productivity growth which gets translated in terms of higher real wages. Many development indicators such as literacy and social capital formation are likely to improve significantly, as urbanization draws larger government resources for human capital formation. On the whole, it envisages upward mobility for all, both the migrants and the natives. The received theory suggests that urbanization follows as a concomitant of industrialization and at a later stage it is related to growth in services. In other words, with urbanization the decline in the share of agriculture or any other primary activity is an obvious phenomenon. Since productivity levels in the non-primary sectors, particularly in the industrial sector due to the agglomeration benefits, are higher, wage differentials also rise rapidly, which in turn raise the participation rate, particularly in the context of the developing countries. Higher levels of income per person may result in a higher dependency ratio but the counter argument can also be put forth to suggest that at higher levels of development each individual is conscious of her own identity; hence urbanization, productivity growth and wage growth may all coincide with increased participation rate. From a different angle, if urbanization occurs in response to rapid outflow of rural population who are in economically active age brackets, then naturally the participation rate is expected to pick up.

Ideally speaking urbanization is unlikely to pursue the traditional caste-based occupations which are more prevalent in the rural areas. It also envisages upward mobility for the socially backward classes particularly if we are talking about the possibility of inclusive growth and development. Quite opposite results may be expected if the modern growth process involves labour who is highly skilled. Since the low caste population did not have access to higher levels of education their absorption in modern sector does not carry a high probability. Thus, dualism in development is not an unexpected outcome – the urban areas remain populated by the advantaged classes, while their disadvantaged counterparts remain engaged in petty and low productivity jobs even when they migrate to the urban areas in the face of a tight rural labour market. However, jobs in the informal sector also attract migrants and the rural job seekers respond positively (Banerjee, 1986) instead of searching jobs exclusively in the large scale industrial sector, as many of the theoretical models made us believe (Harris and Todaro, 1970). The reservation system followed in the formal sector (particularly in the government sector) for the scheduled caste and scheduled tribe population encourages many of them to migrate to the urban areas, expected to

result in an enhanced participation rate. The private job placement cells have been recruiting many tribal women from the rural areas and engaging them in home care and other related services (Mitra, 2013b).

Among various supply and demand side factors which impinge on female labour force participation rate economic growth is seen to have a non-linear relationship (see Mathur, 1994): initially growth is found to have a negative impact on labour force participation rate but at higher levels of growth it tends to increase, thus, giving rise to a U-shaped relationship. Cagatay and Ozler (1995) also suggest the possibility of a U-shaped relationship between long-term development and women's share of the labour force. Even the historical record of the developed countries indicates such a relationship between economic development and women's labour force participation rate (Goldin, 1994)⁴. With urbanization and industrialization female-dominated home-based production is expected to decline, as it would be largely replaced by male-dominated factory production (Boserup, 1970). This falling part of the U-shape curve corroborates Boserup's analysis of women's contribution. However, with further economic development women's labour force participation rate is expected to increase as enhanced urbanization and industrialization, more education for women, commodification of domestic labour, and falling fertility rates help women workers participate in the labour market more explicitly (Oppenheimer, 1970 and Boserup, 1970). Also, as per the neoclassical approach with economic growth gender inequalities in terms of access to employment opportunities, work conditions, nature of work, and earnings tend to decline (Forsythe, Korzeniewicz and Durrant, 2000). This implies an increase in female labour participation rate since discouraged dropouts tend to decline: with improved and equal status in the job market women get encouraged to participate in the labour market (Mitra, 2005).

Some of the recent evidence also supports that higher human development index (HDI), let alone growth, does not necessarily ensure gender equality measured in terms of gender development index (GDI): in the Asia-Pacific context Japan and Korea have the highest HDI-GDI gap, while Thailand and China whose HDI and GDI are both lower in absolute terms than Japan and Korea, demonstrate lower gender gaps (Murayama, 2005). Gender norms and systems vary widely across cultures but they shape people's lives and interactions in all societies (Hayase, 2005). In general as women's educational level improves, gender inequality declines (UN, 2001). In other words, with improved levels of education labour market participation of women in high income jobs is expected to rise (Murayama, 2005; Pradhan, Singh and Mitra, 2015), though in India many educated women remain outside the labour market, implying that the

⁴Goldin (1994) found this association for women aged 45 to 59 years for cross-section of countries using GDP per capita as an index of development.

education level of women non-workers is more than that of women workers. Keeping in view a long term perspective the “Gender Kuznets Curve” and the U-shaped relationship between female labour participation rate and development are mutually consistent.

A variety of other factors have been considered as determinants of female labour force participation rate. These include opportunities for informal employment which tend to decline with development (Bharadwaj, 1989), technological and structural change (Sen, 1981)⁵, the conflict between housework (including child care) and earning opportunities in the labour market, and spouse’s income resulting in withdrawal from the labour market (rationalizing the backward sloping supply curve of female labour). While education of various types may become instrumental to labour market participation, income levels also matter. For example, activities with very low wages with a low elasticity with respect to labour productivity attract less labour. Many of the women workers are subjected to this phenomenon of ‘discouraged dropouts’ from the labour market. The neoclassical principle of marginal productivity based pricing of the factor of production is not necessarily realistic as many women workers are seen to be engaged in intense work with meagre earnings because of their docility and poor bargaining power, inability to commute and limited access to diversified social network (Mitra, 2005).

Among various socio-economic factors, fertility, cross-regional cultural norms, attitude towards manual work, the relative incidence of low caste and tribal population, the size of the agricultural sector, cultivation techniques, crop patterns, poverty and technology are some of the determinants of female labour participation rate (see Agarwal 1988). Fertility and age and marriage are inter-woven and they both influence the decision to participate in the labour market. Usually a higher fertility rate and a lower age at marriage reduce women’s labour market participation. However, in the rural context some of the socially backward classes such as scheduled tribes exhibit a higher labour participation rate among females in spite of a higher fertility rate, as the matrilineal traits are more prevalent among them. Also, there can be a positive association between labour participation rate and the percentage of workers engaged in the tertiary sector as activities in this sector provide greater employment opportunities for women and teen-age workers. However, low productivity activities are mostly concentrated in the tertiary sector, and hence, as the share of the tertiary sector in total employment increases, dropouts from the labour market are also expected to be high, thus reducing the labour participation rate.

⁵Sen (1981) in the case of Indian agriculture showed that women withdraw from the labour market as male income increases.

Rapid economic growth is definitely a determinant of employment, though it is not a sufficient condition. Mechanization of agriculture, for example, may raise production without any impact on employment. The composition of agricultural production also impinges on participation, particularly in the case of women. In rice cultivation, for example, a number of activities are to be carried out by labour for which the domestic supplies involving women are tapped. Many of the folklores, particularly in rice cultivating areas in India, are therefore pro-women, indicating clearly that even in a prevailing patriarchal milieu women's participation in the agricultural process has contributed to enhancing their status because in rice cultivating areas women have a major role in performing at every stage of the production process in so much so that without cooperation of women there can be a steady decline in agricultural production (Mohanty, 2008).

Similarly in non-farm sector rapid industrialization and faster growth in the services are likely to generate employment opportunities on a large scale which would in turn raise the labor force participation rate by augmenting labour demand. However, the adoption of capital and skill intensive technology is seen to reduce the pace of the industrialization of workforce. With adoption of capital intensive technology economic growth can take place but with no dent on employment, rather it may prompt a withdrawal from the labour market and/or lead to a residual absorption of labour in low productivity informal sector activities. Similarly high productivity services sector which are again capital and skill intensive can raise growth but cannot generate large scale employment for unskilled and semi-skilled variety of the workforce except nominally through secondary effects. From the point of view of workers' preference it is noted that women, particularly the urban based educated ones, have a natural urge to work in the services sector (Nord, 1989). This means that female labour force participation rate and growth in tertiary sector are expected to go hand in hand.

Relating to labour regulations it is believed that they tend to reduce the pace of employment generation. Besley and Burgess (2004) showed that Indian states which amended the Industrial Disputes Act in a pro-worker direction experienced lowered output, employment, investment and productivity in organized manufacturing. Bhattacharjea (2006) on the other hand criticized the widely-used index of state-level labour regulation devised by Besley and Burgess (2004), and the econometric methodology they used to establish that excessively pro-worker regulation led to poor performance in Indian manufacturing. On the whole, while there may be a case for removing labour market rigidities by discouraging the political patronization of the unions and relaxing the strict labour laws that prohibit employment growth, attention also needs to be given to the labour welfare issues.

Notwithstanding these concerns expressed by ILO the Indian labour market has been experiencing rapid contractualization. In order to keep the labour cost low it is being followed both in the rural and urban labour markets. Both agriculture and other activities in the rural areas such as construction involve a great deal of contractual labour who migrated from other areas with the help of the labour contracting firms. Similarly in the urban context manufacturing and services both in the formal sector are hiring contract labour on a large scale in order to avoid the labour market regulations. Often it is seen that the employers prefer female workers as they have a lesser bargaining strength and also as their wages are fixed at a level substantially lower than the male wages on a false belief that female workers are less productive. This has resulted in feminization in the labour market. In a number of activities the female to male worker ratio has steadily gone up over time (Banerjee, 1997). In fact, like contractualization, feminization is an arrangement pursued to reduce labour cost sizably. The other new change which is perceived in the recent years is the practice of business subcontracting from the formal to the informal sector. Though it creates work opportunities in the informal sector, the business contractors follow the payment practice based on piece rate, reducing the remuneration of the workers. As many of the home-based workers are women, they are the ones who are worst hit (Patrick, (2001).

Poor health conditions hamper labour force participation rate, particularly in developing countries where many prime age adults are under-nourished and are in poor health (Currie and Madrian, 1999). In ageing societies more individuals keep reaching age brackets where health has the greatest impact on labour market participation (Currie and Madrian, 1999). In general poor health reduces the capacity to work and productivity levels which in turn reduce wages. The cost of accommodating a worker in poor health is passed on in the form of lower wages. Low wages dampen participation. Both from supply and demand sides poor health can reduce participation. Particularly in the case of women, those burdened with high fertility rate and poor maternal and child health are unable to participate in the labour market. Even many educated women in India let alone their uneducated counterparts, are outside the labour market partly because of the social norms reinforcing the division of labour along the lines of gender and partly because of poor health conditions. A mere increase in literacy is not able to counter the cultural practices and the social outlook which perceives women participation in the labour market as a low status phenomenon. Even among the educated lot this mindset is widely prevalent, forcing many educated and married women to withdraw from the job market (Jalan, 2000; Schultz, 1990). Household activities and domestic responsibilities involving children and the elderly are given higher priority over participation (Hirway, 2010). As the IFC (2013) report observed globally, while women's education levels have increased and

educated women earn more than their uneducated peers, gender gaps in labor-market participation and wage levels persist. In the rural areas even among the poor households the labour force participation rate remains modest possibly because of poor health conditions and health care facilities. Long and frequent absence from work can discourage employers to engage workers while poor health reduces the supply of labour hours per individual. Workers in poor health are constantly discriminated against, as the efficiency wage hypothesis would posit.

Relating to physical and financial infrastructure it has been noted extensively that the potential entrants to the labour market respond to these facilities positively. Especially women are severely constrained by physical, financial and poor sanitation facilities. With slightest support they are eager to explore earning opportunities which augment family income (Cook et. al. 2005). The micro credit provision for example is seen to have provided earning possibilities across regions despite the serious limitations associated with this option (ICDF, 2002). Many rural children with better connectivity and support for acquiring reading materials have shown greater enrolment ratio. The accessibility to road and sanitation has encouraged educational enrolment, particularly in the case of girl children. As Dreze and Khera (2015) write, the child development index fared better in the states of Kerala, Tamil Nadu and Himachal Pradesh: part of this improvement was expansion in elementary education while part of it is attributed to the constructive role of the state in providing a wide range of facilities ranging from healthcare and clean water to social security and basic infrastructure. All these have a future bearing on the labour market participation, as childhood conditions (health and education) have profound effects on future outcomes (Grossman, 1975, Wadsworth, 1986).

The rural employment guarantee act (MGNREGA) in order to enhance the livelihood security of the rural population offers hundred days of employment in a year to every household whose adult members volunteer to do unskilled jobs (Dreze and Khera, 2009). In response to this programme it has been observed that women participation has gone up extensively. Males being the primary bread earners possibly look for jobs with longer duration and hence, they may not be seeking work under MGNREGA, while women, who are mainly homemakers and/or seasonal workers in the agriculture sector or pursue economic activities as subsidiary status workers, may take the opportunity of participating in MGNREGA as it enables them to access cash income. Also, as the male members migrate out from the rural areas in search of better jobs women from the rural households remain as the primary job seekers under MGNREGA. However, the number of days of work per household being only one hundred it is unlikely to raise the female labour force participation rate as per the usual principal status which considers one hundred and eighty days as the benchmark.

Keeping in view this perspective the present study proposes to examine the labour force participation rates across regions (rural and urban) and sexes in India. The unit of analysis is both state and district. Further, we consider the participation rates at the level of cities in order to capture the impact of urbanism which can possibly be felt in large cities. The database of the study is drawn from population census (2011) as well as the annual surveys of labour force conducted by the Ministry of Labour and Employment (Labour Bureau) for the years 2009-10, 2011-12, 2012-13, 2013-14 and 2014-15. Different correlates are taken from population census as well as other sources mentioned in the text. Since the population census does not report figures on labour force (working persons and unemployed), rather on working persons only, we consider the work participation rates. Further, we focus only on the main workers leaving out those who are working on subsidiary basis called as marginal workers. However, the Labour Bureau's estimates are wide which consider the main or principal status workers, the marginal or subsidiary status workers and also those who are not working but seeking or available for work and they are termed as labour force participation rates. The rest of the paper is organized as follows. The following section examines the labour (and work) participation rates across regions and sexes, highlighting the regional variations and the gender differentials. It is argued that the gender differentials in participation are instrumental to gender subjugation; empowerment can be attained through improvement in women participation rates. Section 3 makes an attempt to identify the determinants of participation. It is attempted for regions and sexes separately: rural male, rural female, urban male and urban female as the variables are expected to generate differential impact across regions and sexes. Section 4 turns to issues related to productivity and women participation rate. Finally section 5 concludes with policy directives.

2. Broad Patterns Relating to Participation

The male work participation rates pertaining to all age groups are relatively high and are nearly 50 per cent both in the rural and in the urban areas if we consider the main or usual principal status workers (Table 1 for all-India and for states Figures 1 and 2). Secondly, the inter-state variations measured in terms of coefficient of variation are limited (17.5 and 15.5 per cent in the rural and urban areas respectively). On the other hand, the female participation rates are significantly lower than their male counterparts (Table 1 for all-India and for states Figures 1 and 2), and more so in the urban areas, implying that the rural-urban differentials in the case of women are more pronounced than in the case of males (Table 1 and Figures 3 and 4). Besides, the inter-state variations are sizable in the case of females,

reflecting the influence of economic, social and cultural factors (coefficient of variation being 53.2 and 36.0 per cent in the rural and urban areas respectively). The participation rates in the north-eastern and the southern regions for example are considerably higher than the northern states. A relatively lower magnitude of variation in the urban areas may be taken to signify the possibility of convergence (to a limited extent though), while the dominance of the social factors in the rural areas can be said to be more prominent. But the interpretation can be quite erroneous: the female work participation rates being by and large lower in the urban areas than in the rural areas indicate the limited impact of education on participation in the face of social factors. In fact, why the participation rate of Indian urban women is still so low, given that the per capita income and the educational attainment levels are higher than their rural counterparts, is an important research question. The plot of participation rates against per capita income (Figure 5) is not suggestive of any significant positive relationship in the case of females though among males such a pattern can be somewhat deciphered (Figure 6). In relation to females only a subset of the observations at the most may conform to this pattern.

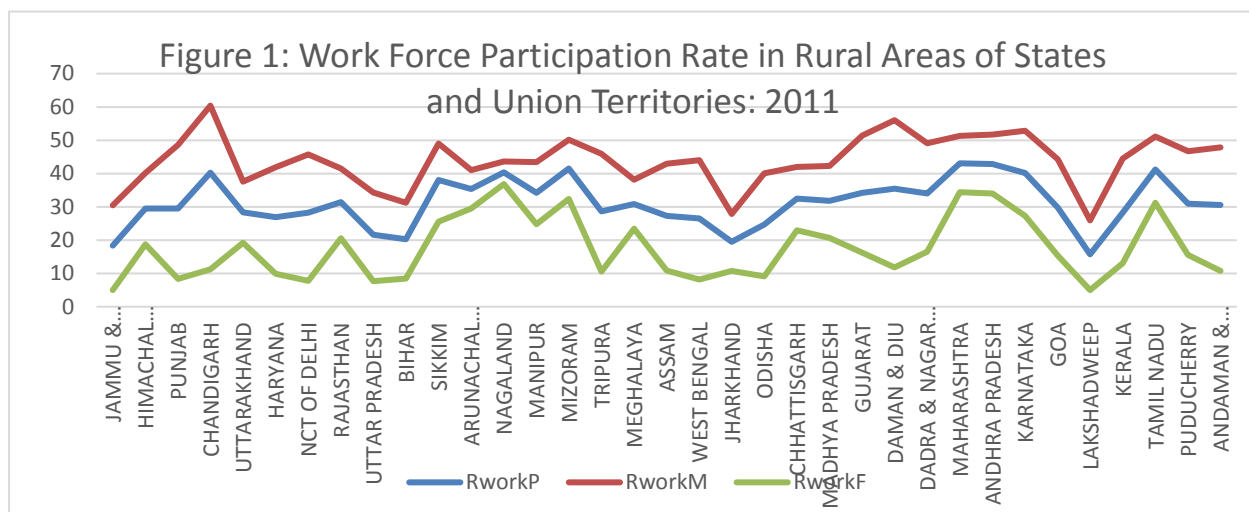
Table 1: Work Force Participation Rate (WFPR) and Labour Force Participation Rate (LFPR)

Category	WFPR (%) Population Census-2011	LFPR (%) Labour Bureau- 2011-12
Rural Male	41.6 (17.5)	79.4 (6.4)
Rural Female	16.7 (53.2)	33.9 (48.0)
Urban Male	48.7 (15.5)	73.7 (7.6)
Urban Female	11.9 (36.0)	19.1 (46.9)
Persons Rural	29.5	57.9
Persons Urban	30.9	48.0
All Males	43.8	77.9
All Females	15.2	30.0
All Persons All Areas	29.9	55.4

Note: (1) Though the Labour Bureau (LB) estimates refer to the year 2011-12 – close to the population census year, 2011 - they are not comparable with each other because the population census estimates are work participation rates for all age groups covering only the main (equivalent to the usual principal status) workers whereas the LB estimates are for age groups 15 and above and they cover all workers (usual principal and subsidiary status) and those who are unemployed.

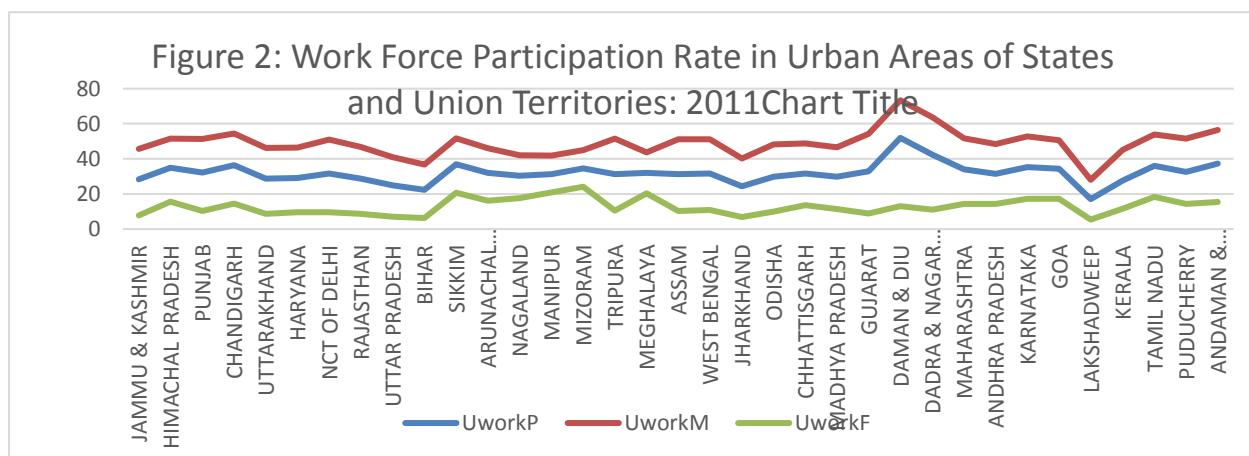
(2) Figures in parentheses are coefficient of variation based on the state level data.

Source: Population Census, 2011 and Labour Bureau, 2011-12.



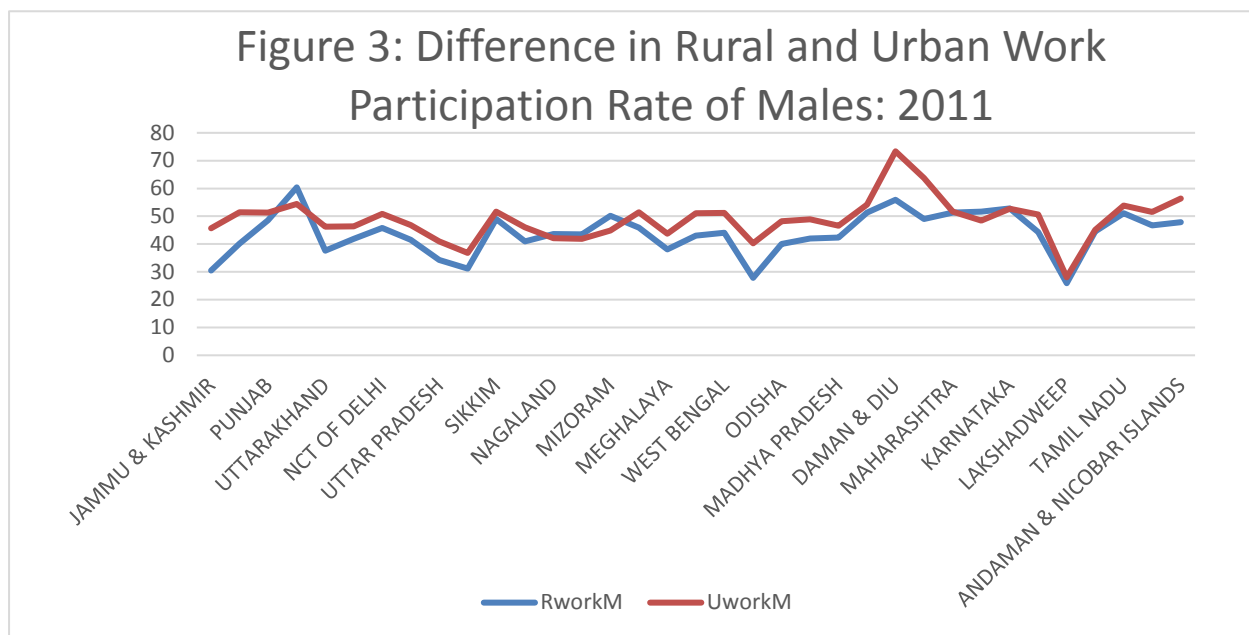
Notes: (1) F for female, M for male and P for person. (2) Only main workers are being considered.

Source: Population Census, 2011

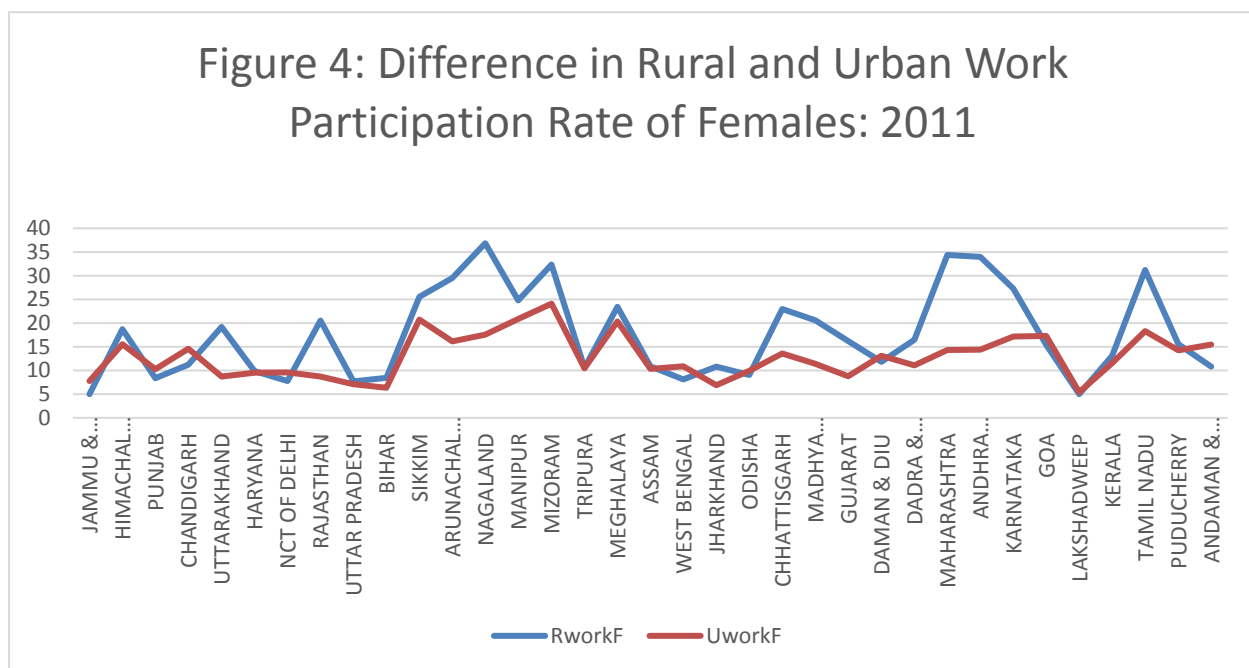


Note: See notes to Figure 1.

Source: Same as Figure 1.

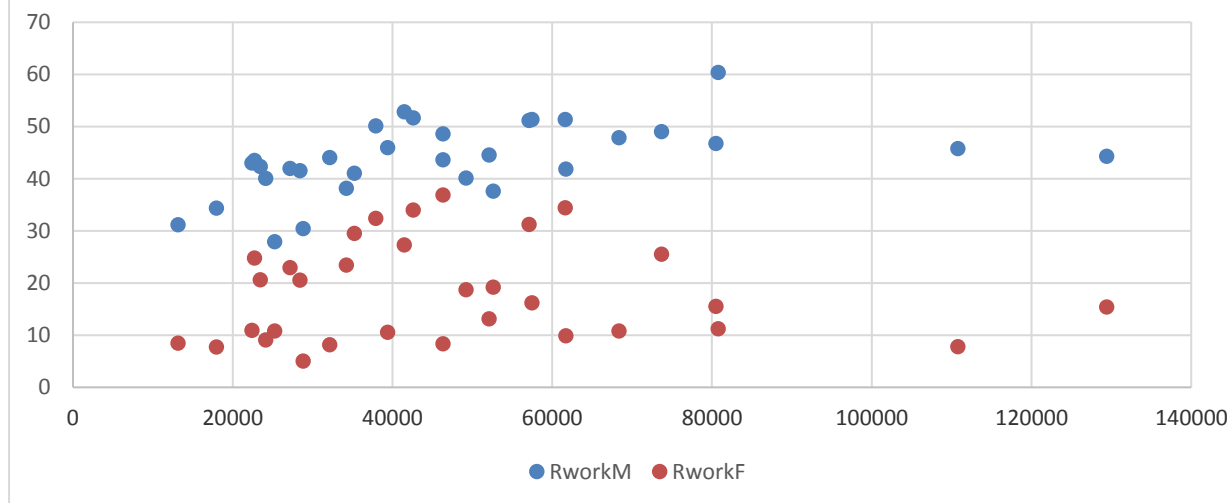


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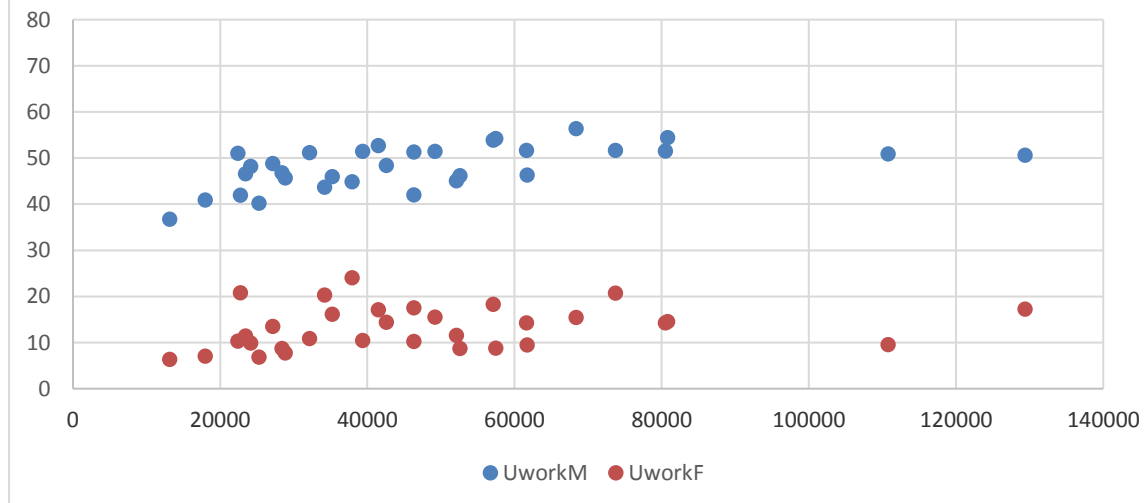
Source: Same as Figure 1.

Figure 5: Per Capita Income (2011-12) and Rural Work Participation Rate (2011)



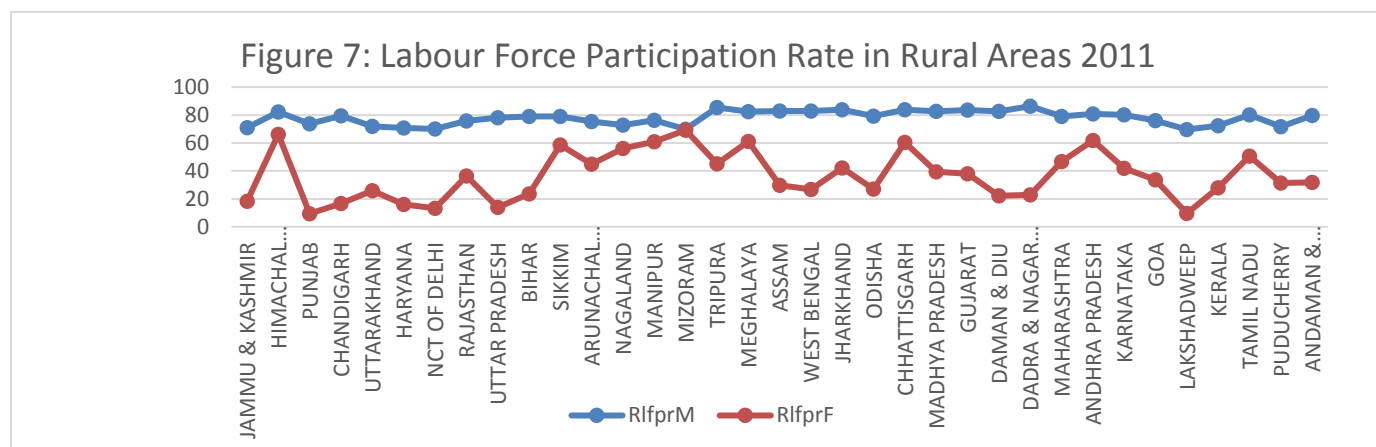
Source: Data book for Planning Commission, Govt. of India and Population Census, 2011.

Figure 6: Per Capita Income (2011-12) and Urban Work Participation Rate (2011)



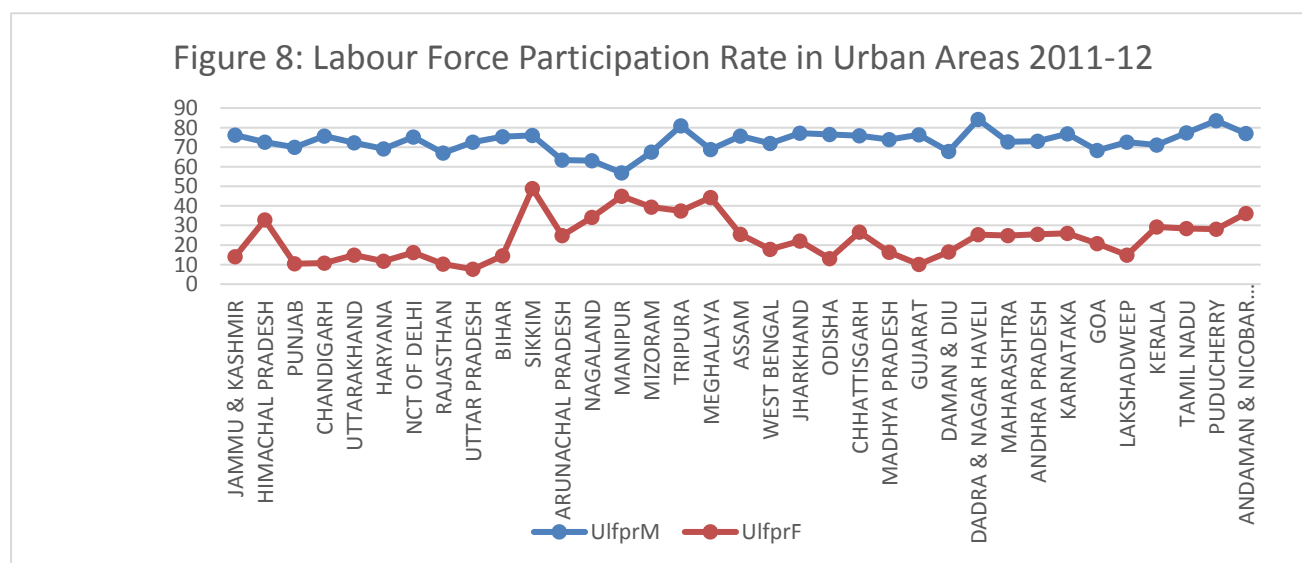
Source: Same as Figure 5.

Labour Bureau has been collecting information since 2009-10 on yearly basis (except 2010-11). Based on the estimates of labour force participation rate for the year 2011-12, corresponding to the age groups 15 and above, again similar differences across gender are evident (Figures 7 and 8). The coefficient of variation is much higher among the rural and urban females than among the males, indicating wide inter-spatial differences (Table 1).



Note: All workers based on usual principal-cum-subsidary status.

Source: Labour Bureau, 2011-12, Ministry of Labour and Employment, Govt. of India.

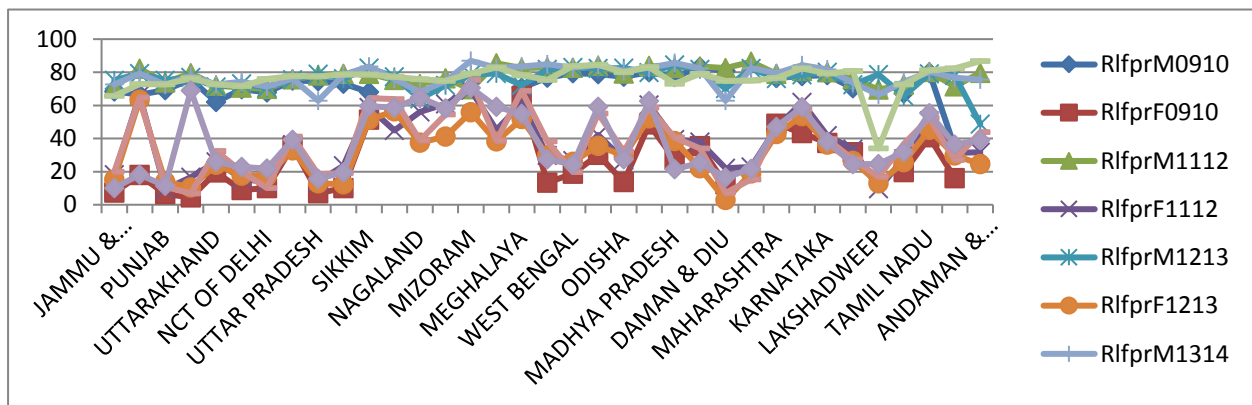


Note and Source: Same as Figure 7.

The figures below (Figures 9 and 10) provide Labour Bureau's estimates of gender specific labour participation rate based on panel data, i.e., for each of the years since 2009-10 (except 2010-11) in the

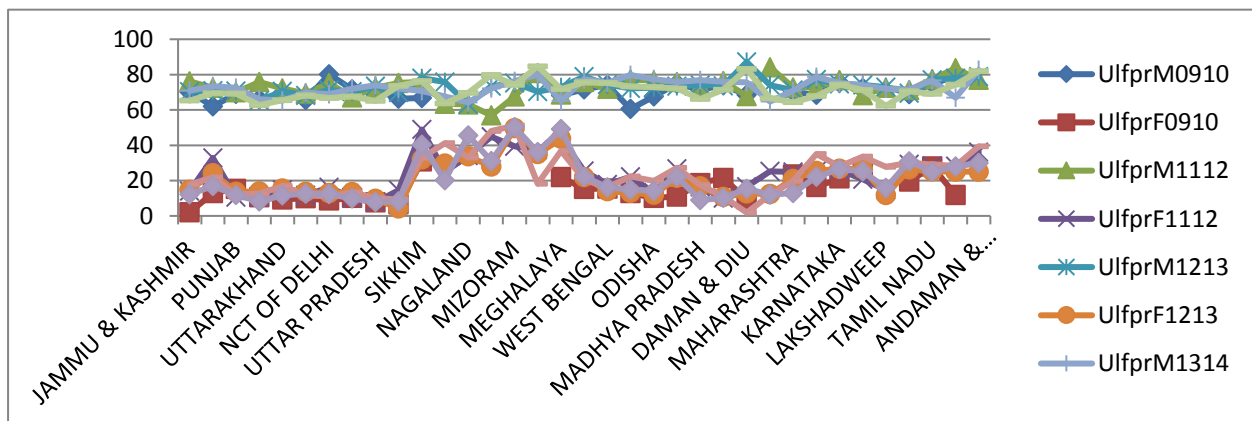
rural and the urban areas of the states and union territories. The estimates for a given category seem to have been consistent over time and the gender differences in the estimates are pertinent for each of the years. The inter-state variations in the rate of a given category and the rural-urban differences in the female rate particularly (Figure 11), also seem to have remained stable over time, thus confirming the time invariance in the female participation rate which not only hovers around a low magnitude but also varies widely across space. Though the time frame is too short to expect any significant change in the participation rate, the complete invariance in the female participation rate suggests that the gender concerns need to be addressed more seriously.

Figure 9: Rural Labour Force Participation Rate: Panel Data



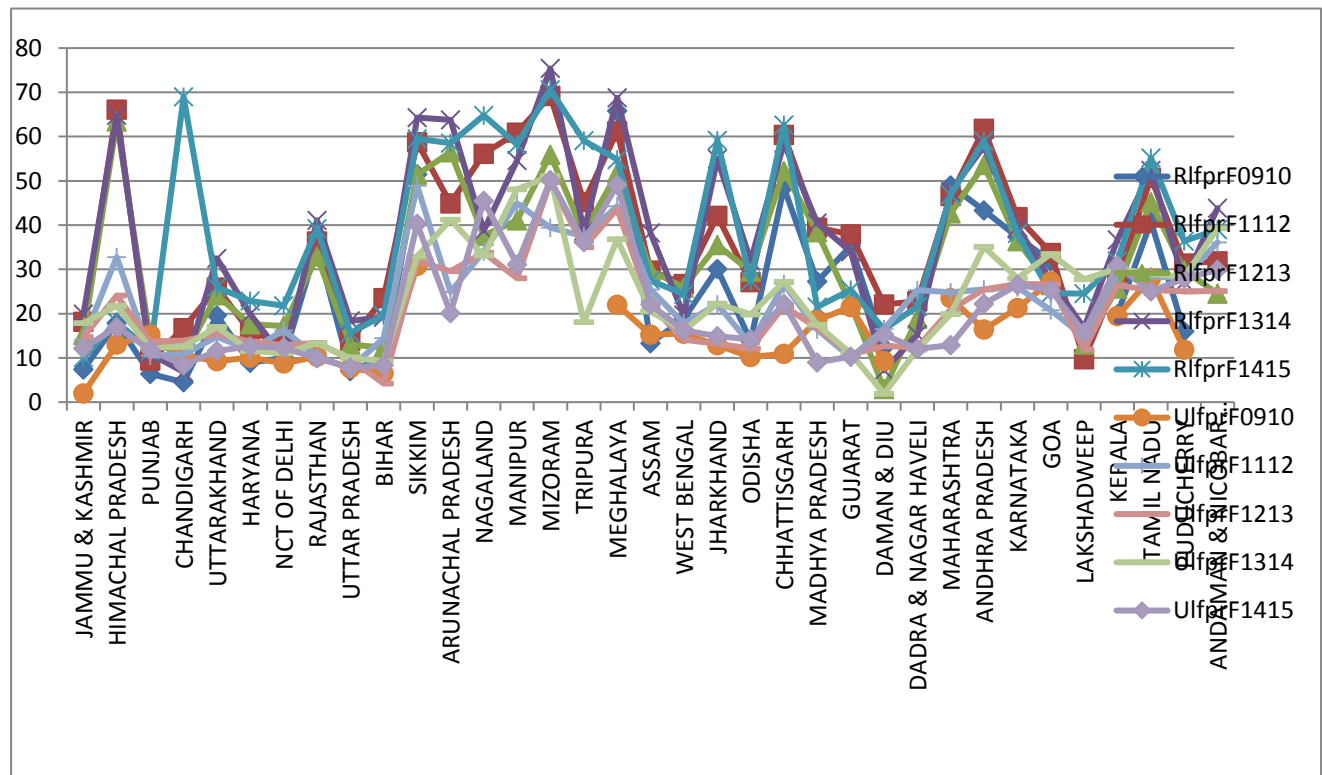
Note and Source: Same as Figure 7.

Figure 10: Urban Labour Force Participation Rate: Panel Data



Note and Source: Same as Figure 7.

Figure 11: Rural-Urban Differences in the Female Participation Rate: Panel Data



Note and Source: Same as Figure 7.

The Platform for Action adopted at the United Nations Fourth World Conference on Women (Beijing, 1995) highlighted the concept of bringing gender issues into the mainstream of society. It is a necessity to ensure gender equality in all areas of social and economic development. Suggestions were made to make the concerns and experiences of women as well as of men an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally, and inequality is not perpetuated.⁶

One of the major suggestions in the gender studies literature is that women can be engaged directly in the development process and the benefits of growth can be distributed equitably by generating

⁶International Labour Organization (ILO). Gender Equality Tool. Definition of Gender Mainstreaming. <http://www.ilo.org/public/english/bureau/gender/newsite2002/about/defin.htm> Accessed Dec 2, 2016.

increasingly productive employment opportunities for women (Behrman and Zhang 1995). This can raise the degree of women's empowerment, as with increased resources they will be able to participate in the decision making process, both within the household and outside the household. In other words, labour market participation would have positive spillover effects on various other aspects of wellbeing such as health, education and the overall attitude towards female sexuality. Employment aspect plays a pivotal role in relation to other capabilities of women such as health care and nutrition, self-respect and autonomy and full political functioning (Nussbaum and Glover 1995). Biases against girls/women lead to their inaccessibility to education and health which results in poor human capital formation and a low labour force participation rate. This in turn adversely affects the future human capital formation, female labour productivity, individual welfare, health and participation in the decision-making process and also the overall economic growth (United Nations 2007). However, other than skill differences between females and males, biases of employers against women employees also restrict their accessibility to high-income jobs. Patriarchy's gendered division of labour often does not allow women to participate in the labour market on a full-time basis, which in turn adversely affects their job market experience and bargaining power (Mitra 2005). As an outcome of a wide range of constraints impacting both from demand and supply sides on female labour market participation, the rates are indeed low and the gender differences are glaring irrespective of which source of data we use.

There are other alternative ways of empowering women instead of taking the labour market participation route. But the model of human capital formation and productive employment enhances the individual capabilities and, more importantly, empowers women to take part in the decision-making process. In the context of women employment, extensive citation has been made of the fact that arise in work accessibility of women improves the accessibility of children, particularly that of the girl children, to education and nutritious diet. Critics may find fault with the employment approach being a basic means of human development and generating pro-poor growth if women are largely employed in low productivity activities in the informal sector. Therefore, while pursuing the labour market participation approach we explicitly highlight the concept of productive employment, which can contribute to human development and curb inequalities not only in economic terms but also in other respects. The participation rates which we are analyzing are, however, too aggregative in nature and cannot throw much light on the quality of employment. Only as a rough measure of engagement in the growth process these rates are examined in order to initiate the work.

3. Quantitative Analysis

Cross-sectional Results

In this section we turn to the determinants of work and labour force participation (WFPR and LFPR) in the backdrop of the analytical frame presented in Section 1. The variables which are chosen are as follows: household size (HHSZ), literacy rate (LIT), child-woman ratio (CHILD), female-male ratio in the population (F/M), urbanization level (URBN), percentage of scheduled caste (SC) and scheduled tribe population (ST), per capita net state domestic product (PCNSDP), percentage of agriculture, industry and services in total gross state domestic product (AG, IND and SER), state wise road length (in km.) in relation to 100,000 population (ROAD), per capita consumption of electricity (ELEC), credit-deposit ratio of scheduled commercial banks (CRE-DEP), percentage of households with access to safe drinking water (WATER), infant mortality rate (IMR), fertility rate (FR) and gross enrolment rate in classes 1 to 8 (ENROL). As these variables have been gathered from various sources they do not refer to one specific year. The appendix table gives the years for which the variables are available along with their sources. Secondly, while some of the variables are available for rural and urban areas and males and females separately some other like infrastructure, growth and composition of growth and urbanization are aggregative in nature. IMR and enrolment are reported among girls and boys separately without any reference to area while accessibility to safe drinking water is given for rural and urban areas.

Since the analysis is carried out at the state, district and city levels we first discuss the results in detail with a view to highlighting the commonality at a later stage.

Some of these variables are self-explanatory. But some others need elaboration. For example, the female-male ratio is taken to represent visibility of women: with larger number of women in a region the participation rate is likely to increase as solidarity and bargaining power of women may rise. A balanced sex ratio may mean less violence against women, which may motivate and provide a conducive environment to participate in the labour market. IMR is taken to represent the overall health condition of the population and so is the case with the access to safe drinking water. TFR or child-woman ratio (a broad indicator of fertility), covers the demographic pressure and the dependency on women. The overall household size is another indicator of dependency keeping in view that in India the joint family system is still prevalent in many regions. ROAD and ELECT represent physical infrastructure while CRE-DEP is an indicator of financial infrastructure.

The factor analysis has been carried out for males and females and for rural and urban areas separately. In relation to work participation rate among rural females (Table 2), four factors are seen to be statistically significant. Corresponding to the most important factor i.e., Factor 1, women work participation rate does not have a significant factor loading. In Factor 2, however, it enters with a factor loading of 0.74. It has a strong positive relationship with the incidence of scheduled tribe women population confirming the view that among the scheduled tribe population women are earners in addition to their household responsibilities. On the other hand, the incidence of scheduled caste population reduces the women work participation rate. In the rural situation where caste system is more prevalent it is possibly more difficult for scheduled caste women to find jobs. Poverty-induced participation is evident and women being engaged largely in agriculture sector is also noticeable. What is most striking is the effect of physical infrastructure on women work participation. Other studies confirmed increased female enrolment in schools in response to improved infrastructure (Dreze and Gandhi-Kingdon, 1999), and here we notice the positive influence of road network on female work participation. Literacy is also seen to have a mild positive association with work participation while infant mortality rate shows a negative one. The positive relationship between female-male ratio and participation is distinct, more so in Factor 3. Urbanization level is, however, not seen to raise women work participation rate in the rural areas. In other words, states with higher levels of urbanization are though expected to have positive spillover effects in the rural areas are somehow not seen to have experienced so, at least in terms of women work participation rate. Large household size and child women ratio affect women work participation adversely, as observed in Factor 3.

Table 2: Factor Analysis: Rural Female Work Participation Rate

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(R)	0.2939	-0.0283	0.6949	0.0121
CHILD®	0.1180	0.1025	0.8878	0.1790
WPR(F,R)	0.0471	0.7419	-0.2058	0.1516
LIT(F,R)	-0.4945	0.1145	-0.5993	-0.4374
SC(F,R)	0.1186	-0.5926	-0.1541	-0.0253
ST(F,R)	0.0944	0.8396	0.2463	0.1134
F/M®	0.2869	0.1144	-0.5349	0.2783
URBAN	-0.8406	-0.0632	-0.0043	-0.2637
MPCE®	-0.5091	-0.0018	-0.1649	-0.7339
POV®	0.2633	0.2332	0.1563	0.7146
ELEC	-0.3281	-0.2369	-0.1902	-0.1206
ROAD	0.1431	0.7807	-0.1776	-0.0959
CR-DP	-0.2545	-0.2080	-0.0626	-0.0743
WATER®	-0.0572	-0.3597	-0.0518	-0.1071

IMR(F)	0.5907	-0.1382	0.4447	0.3198
%AGDP	0.7818	0.2717	0.2601	0.1715
Eigen Value	5.39	3.04	1.62	1.12
% Explained	0.42	0.24	0.13	0.09

N=32

Instead of work if we consider the labour force participation rate, in Factor 1 itself some of these findings are discernable (Table 3). Scheduled caste incidence reduces the labour participation while among the tribes women join the labour market extensively. Poverty induced participation, requirement of female labour more in the agriculture sector, the positive effect of health and education and a strong impact of physical infrastructure on labour market participation and the lack of urbanization's spillover effect on rural women labour participation are also evident. That the demographic pressure reduces labour market participation is brought out by Factor 3. The positive association between the increased presence of women, measured in terms of female-male population, and the labour market participation is also verifiable across all the three statistically significant factors (Table 3).

Table 3: Factor Analysis: Rural Female Labour Participation Rate

Variables	Factor 1	Factor 2	Factor 3
HHSZ(R)	-0.0174	0.2898	0.7006
CHILD®	0.1650	0.1133	0.8865
LFPR(F,R)	0.6955	0.1650	-0.2695
LIT(F,R)	0.1521	-0.4966	-0.6012
SC(F,R)	-0.6691	0.1162	-0.1428
ST(F,R)	0.9021	0.1001	0.2282
F/M®	0.1208	0.2895	-0.5208
URBAN	-0.1004	-0.8603	-0.0109
MPCE®	-0.0377	-0.5262	-0.1740
POV®	0.2463	0.2733	0.1571
ELEC	-0.2930	-0.3237	-0.1929
ROAD	0.7616	0.1448	-0.1999
CR-DP	-0.3097	-0.2702	-0.0690
WATER®	-0.4586	-0.0466	-0.0550
IMR(F)	-0.1171	0.5873	0.4615
%AGDP	0.2824	0.7781	0.2583
Eigen Value	5.49	3.09	1.65
% Explained	0.43	0.25	0.13

N=32

Turning to rural male work participation, it has the highest factor loading in Factor 4 compared to the other three (Table 4). The overall growth in the rural areas measured in terms of rural consumption expenditure per capita, the financial infrastructure (credit deposit ratio) and the overall urbanization in the state are seen to raise the male participation. Rural diversification has a positive effect as the percentage of agriculture in gross state domestic product is negatively associated with participation. From Factor 2 in which the male work participation takes a moderate factor loading, the positive impact of literacy and the adverse effect of demographic variables are noticed evidently. Many of these findings are, however, not confirmed as we shift to labour force participation (Table 5). There is rather evidence on poverty induced participation in agricultural activities, i.e., Factor 3. Besides, large household size tends to raise the male labour market participation which could be because of economic compulsions. Urbanization reduces the rural male participation possibly because the economically active ones migrate out from the rural areas.

Table 4: Factor Analysis: Rural Male Work Participation Rate

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(R)	0.0330	0.6608	-0.1955	-0.4429
CHILD®	0.1667	0.8944	-0.0210	-0.1266
WPR(M,R)	0.1223	-0.3631	0.2436	0.7715
LIT(M,R)	-0.0167	-0.7136	0.4474	0.0453
SC(M,R)	-0.7406	-0.1154	-0.1616	0.1574
ST(M,R)	0.8717	0.2447	-0.1139	-0.0359
URBAN	-0.0779	-0.0618	0.7492	0.4175
MPCE®	0.0157	-0.2332	0.3917	0.1548
POV®	0.2492	0.1958	-0.1864	-0.1303
ELEC	-0.3349	-0.2067	0.3194	0.1085
ROAD	0.8194	-0.1957	-0.2352	-0.0641
CR-DP	-0.4352	-0.0159	0.1661	0.7797
WATER®	-0.5049	-0.0691	0.0348	0.1278
IMR(M)	-0.1916	0.5284	-0.4633	-0.0723
%AGDP	0.2765	0.3100	-0.7619	-0.1629
Eigen Value	5.86358	2.6534	1.14647	1.0349
% Explained	0.4983	0.2255	0.0974	0.0880

N=32

Table 5: Factor Analysis: Rural Male Labour Participation Rate

Variables	Factor 1	Factor 2	Factor 3
HHSZ(R)	-0.0090	0.6996	0.2745
CHILD®	-0.1940	0.8925	0.0336
LFPR(M,R)	0.0708	-0.0471	0.2205

LIT(M,R)	0.0343	-0.7322	-0.4432
SC(M,R)	0.7560	-0.1205	0.1340
ST(M,R)	-0.8766	0.2387	0.1291
URBAN	0.0793	-0.1316	-0.8239
MPCE®	-0.0136	-0.2923	-0.4591
POV®	-0.2530	0.2236	0.2695
ELEC	0.3627	-0.2141	-0.3339
ROAD	-0.7887	-0.2147	0.2669
CR-DP	0.4184	-0.0781	-0.3324
WATER®	0.5668	-0.0701	-0.0593
IMR(M)	0.1827	0.5730	0.4718
%AGDP	-0.2644	0.3210	0.8005
Eigen Value	5.52720	2.62514	1.38563
% Explained	0.4885	0.2320	0.1225

N=32

In the urban context the female work participation with the highest factor loading in Factor 2 among all the three factors, unravels the positive effect of literacy and road infrastructure (Table 6). The female-male ratio is also positively associated with participation. Again, the positive relationship with the incidence of scheduled tribe population and a negative one with scheduled caste population come out sharply. High demographic pressure and poor health reduce participation. Urbanization, industrialization and growth in services all three show positive effect on participation, very mildly though (Factors 1 and 4 in Table 7).

In relation to the labour force participation rate by and large similar findings are obtained if we consider the most important factor and the one in which the female labour force participation takes the highest factor loading: Factor 1 and Factor 3 respectively (Tables 8a and 8b). In Factor 1 (Table 8b) in fact, all the infrastructure variables are positively associated with urban female labour force participation. Financial infrastructure possibly allows women to set up small businesses which enable them to earn.

Table 6: Factor Analysis: Urban Female Work Participation Rate

Variables	Factor 1	Factor 2	Factor 3
HHSZ(U)	0.9053	-0.0611	-0.0909
CHILD(U)	0.9209	0.1570	-0.0126
WPR(F,U)	-0.4124	0.7570	0.0628
LIT(F,U)	-0.7754	0.3486	0.2176
SC(F,U)	-0.0728	-0.6424	0.0407

ST(F,U)	0.1053	0.9281	-0.0677
F/M(U)	-0.4064	0.2027	-0.0116
URBAN	-0.1199	0.0129	0.8717
ELEC	-0.1466	-0.2226	0.1497
ROAD	-0.2336	0.5771	-0.1607
CR-DP	-0.0858	-0.2531	0.4220
WATER(U)	-0.0058	-0.2040	0.0362
IMR(F)	0.4215	-0.0980	-0.4984
%SERDP	-0.0491	-0.0869	0.9008
Eigen Value	3.71607	3.37977	1.50656
% Explained	0.3547	0.3226	0.1438

N=32

Table 7: Factor Analysis: Urban Female Work Participation Rate with Some Different Variables

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	-0.9030	-0.0450	0.0396	-0.1403
CHILD(U)	-0.9166	0.1641	0.0786	-0.0510
WPR(F,U)	0.4143	0.7508	-0.0647	0.1126
LIT(F,U)	0.7927	0.3489	0.1367	0.1034
SC(F,U)	0.0701	-0.6593	0.0525	0.0218
ST(F,U)	-0.0992	0.9309	0.0122	-0.1092
F/M(U)	0.4107	0.2090	-0.0233	-0.0431
URBAN	0.1508	0.0068	0.4923	0.7884
ELEC	0.1349	-0.2506	-0.2774	0.6585
ROAD	0.2288	0.5634	-0.0108	-0.2043
CR-DP	0.0984	-0.2541	0.2756	0.3193
WATER(U)	0.0003	-0.2113	-0.0891	0.1901
IMR(F)	-0.4346	-0.0866	-0.2023	-0.5051
%SERDP	0.1070	-0.0676	0.9061	0.3427
%INDP	0.1464	-0.0255	-0.9301	0.1194
Eigen Value	3.72865	3.42559	2.17373	1.07259
% Explained	0.3186	0.2927	0.1858	0.0917

N=32

Table 8a: Factor Analysis: Urban Female Labour Participation Rate

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	0.2164	0.1944	-0.8739	-0.1184
CHILD(U)	-0.6172	0.2057	-0.5705	-0.1398
LFP(F,U)	0.2368	0.3743	0.5380	-0.0800
LIT(F,U)	0.2453	0.3402	0.7402	0.2769
SC(F,U)	0.1708	-0.6624	0.0005	-0.0894
ST(F,U)	0.0754	0.9108	-0.0294	0.0369
F/M(U)	0.8898	0.0960	0.1297	-0.0209

URBAN	-0.2073	0.0443	0.0732	0.8383
ELEC	-0.8908	-0.0374	0.1646	0.1847
ROAD	0.2092	0.4625	0.2989	-0.1619
CR-DP	0.1267	-0.4581	0.0349	0.2096
WATER(U)	-0.3161	-0.4819	0.0653	-0.0968
IMR(F)	-0.0475	-0.0135	-0.3521	-0.7285
Eigen Value	3.32991	2.37299	2.15265	1.10843
% Explained	0.3544	0.2526	0.2291	0.1180

N=35

Table 8b: Factor Analysis: Urban Female Labour Participation Rate with Some Different Variables

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	-0.9059	-0.0010	0.0139	-0.1253
CHILD(U)	-0.9050	0.0547	0.2164	-0.0524
LFPR(F,U)	0.5110	-0.1942	0.5526	-0.3422
LIT(F,U)	0.8061	0.1602	0.3405	0.0230
SC(F,U)	0.0511	0.0606	-0.6668	0.0751
ST(F,U)	-0.0565	-0.0116	0.9413	-0.1072
F/M(U)	0.4237	-0.0304	0.1849	-0.1366
URBAN	0.1462	0.6537	-0.0173	0.5601
ELEC	0.1214	-0.1157	-0.2612	0.8142
ROAD	0.2401	-0.0697	0.5684	-0.2188
CR-DP	0.0893	0.3629	-0.3486	0.2801
WATER(U)	-0.0079	-0.0430	-0.2161	0.2637
IMR(F)	-0.4234	-0.2888	-0.0458	-0.2299
%SERDP	0.0934	0.9616	-0.0833	0.1045
%INDP	0.1579	-0.8785	-0.0244	0.2866
Eigen Value	3.83221	3.44993	2.18838	1.00253
% Explained	0.3238	0.2915	0.1849	0.0847

N=32

Among males in the urban areas the demographic pressure is seen to reduce participation quite contrary to the belief that large family size or a large number of children forces men to participate in the labour market (Table 9). In low income households large family size and participation in petty activities coexist. But the male respondents often do not consider those activities as proper jobs and hence, they claim to be outside the workforce. Growth shows a positive impact on participation. At very high levels of income, participation is expected to decline but India being one of the low income countries it is unrealistic to expect a negative association between them. Similarly literacy and better health conditions tend to improve participation, irrespective of whether we use work or labour force participation rate (Table 10). Usually literacy or enrolment is expected to cause withdrawal from the labour market but our findings

based on the cross sectional data suggests that though in certain age groups it occurs in the short run, in the long run regions with better human capital formation reveal higher participation rates.

Table 9: Factor Analysis: Urban Male Work Participation Rate

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	-0.9019	-0.1639	0.0154	0.0408
CHILD(U)	-0.8910	-0.0729	-0.1879	0.0751
WPR(M,U)	0.7119	0.2945	0.2085	0.0227
LIT(M,U)	0.8691	0.2175	-0.2488	0.0201
SC(M,U)	0.0658	-0.0781	0.6973	0.0814
ST(M,U)	-0.0958	-0.0844	-0.8909	0.0174
URBAN	0.1422	0.7768	0.0559	0.4533
ELEC	0.1055	0.6646	0.3121	-0.3174
ROAD	0.2629	-0.1446	-0.6956	0.0019
CR-DP	0.1232	0.2019	0.3758	0.2758
WATER(U)	-0.0181	0.2178	0.2496	-0.0934
IMR(M)	-0.4138	-0.5361	0.0999	-0.1980
PCNSDP	0.3378	0.8770	0.0116	0.0968
%INDP	0.1434	0.0878	0.0641	-0.9468
%SERDP	0.0838	0.3889	0.1023	0.8801
Eigen Value	4.70756	2.82700	2.29885	1.23276
% Explained	0.3892	0.2337	0.1900	0.1019

N=32

Table 10: Factor Analysis: Urban Male Labour Participation Rate

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	0.9059	-0.1819	-0.0097	0.0372
CHILD(U)	0.8851	-0.0891	-0.2157	0.0744
LFPR(M,U)	-0.2125	0.0616	0.5107	-0.0454
LIT(M,U)	-0.8651	0.2163	-0.2280	0.0211
SC(M,U)	-0.0456	-0.0695	0.6811	0.0827
ST(M,U)	0.0636	-0.0964	-0.8884	0.0163
URBAN	-0.1305	0.7738	0.0579	0.4674
ELEC	-0.0627	0.6900	0.3074	-0.3173
ROAD	-0.3030	-0.1534	-0.6958	-0.0015
CR-DP	-0.0825	0.2208	0.3746	0.2822
WATER(U)	0.0634	0.2759	0.2890	-0.1088
IMR(M)	0.4398	-0.5322	0.0889	-0.2089
PCNSDP	-0.3209	0.8867	0.0222	0.1019
%INDP	-0.1388	0.1007	0.0727	-0.9432
%SERDP	-0.0744	0.3851	0.0997	0.8840
Eigen Value	4.18816	2.93519	2.31019	1.22377
% Explained	0.3653	0.2560	0.2015	0.1067

District level Analysis

At the district level a couple of new variables have been introduced such as sex ratio among children (CHILDSR), shares of agricultural labour (AGLAB), cultivators (CUL), household manufacturing (MFGHH) and other activities (OTHER) in the total workforce. The child sex ratio may represent the extent of gender discrimination at young age brackets. Districts with low levels of child sex ratio would mean a high degree of gender discrimination. The employment composition is taken to assess how dynamic an area is.

The negative effect of fertility and household size on rural female work participation comes out sharply from Factor 1 (Table 11). Greater domestic burdens in large households do not allow women to participate in the workforce. Literacy raises participation (Factor 1) though there are other districts forming a separate group in which literacy reduces participation (Factor 2) possibly because enrolment of girls leads to labour market withdrawal. The positive association between tribal population and participation and the negative effect of low caste population on participation are evident.

The visibility of women and urbanization level seems to be enhancing women participation in the rural areas. With increased level of urbanization the rural-urban dis-continuum tends to decline which brings in work opportunities even for rural women who do not migrate out. There is a cluster of districts which is indicative of women workers being engaged primarily as agricultural labour or cultivators (Factor 2) though there are some other districts which tend to show increased participation with improvement in activities other than agriculture and household manufacturing. The non-household manufacturing and the services sector offer possibilities of better earnings, encouraging women, particularly the literate ones, to join the workforce. Also, some of the jobs in the health sector, for example, are meant specifically for literate women. Unfortunately rural diversification has been very sluggish in the Indian context with its limited impact on women work participation rate which can be seen from the low magnitude of the factor loading for the share of workers in non-household manufacturing and services in Factor 1. Gender discrimination at early ages is reflective of its continuation even in the later years: an improvement in the gender ratio among children improves the work participation to a very limited extent.

Table 11: Factor Analysis: Rural Female Work Participation Rate at the District Level

Variables	Factor 1	Factor 2	Factor 3	Factor 4
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HHSZ(R)	-0.6820	-0.0478	0.2315	-0.1173
CHILD(R)	-0.8783	0.1008	0.0717	0.1659
WPR(F,R)	0.4626	0.5607	-0.0051	0.2973
LIT(F,R)	0.7067	-0.3227	0.1442	-0.0066
SC(F,R)	0.1048	-0.0205	-0.2099	-0.7008
ST(F,R)	-0.0695	0.2442	0.2478	0.7081
F/M(R)	0.4101	0.1304	-0.0642	0.1631
URBAN	0.3592	-0.2852	-0.0290	0.0236
AGLAB(F,R)	0.0185	0.2679	-0.9526	-0.1024
CUL(F,R)	-0.1301	0.6514	0.6790	0.1662
MFGHH(F,R)	-0.0726	-0.1470	0.0037	-0.0821
OTHER(F,R)	0.1467	-0.9531	0.2402	-0.0518
CHILDSR(R)	0.0967	0.1167	-0.1530	0.4789
Eigen Value	2.91318	2.49798	1.78244	1.05884
% Explained	0.3283	0.2815	0.2009	0.1193

N=631

Among the rural males the positive effect of urbanization on participation is evident (Table 12). Literacy raises the work participation rate while demographic pressure reduces it. Large families with a large number of children are not able to generate better human capital formation which in turn reduces the possibility of being absorbed in high productivity activities. Activities other than household manufacturing and agriculture have a positive effect on participation, suggesting the importance of rural diversification.

Table 12: Factor Analysis: Rural Male Work Participation Rate at the District Level

Variables	Factor 1	Factor 2	Factor 3
HHSZ(R)	-0.7141	-0.1482	0.1723
CHILD(R)	-0.8742	-0.2242	-0.0524
WPR(M,R)	0.6612	-0.0179	-0.0679
LIT(M,R)	0.5956	0.2986	0.2413
SC(M,R)	0.1588	-0.0013	-0.2127
ST(M,R)	-0.0818	-0.2575	0.1938
URBAN	0.2565	0.3895	0.1347
AGLAB(M,R)	0.0228	0.0286	-0.9928
CUL(M,R)	-0.1644	-0.9483	0.2152
MFGHH(M,R)	-0.0853	0.1331	-0.0280
OTHER(M,R)	0.1338	0.8054	0.5778
CHILDSR(R)	0.1189	-0.0092	-0.1499
Eigen Value	3.19995	1.97325	1.73938
% Explained	0.3785	0.2334	0.2057

N=631

Among the urban females the findings are again quite similar to those for rural females except in relation to gender ratio which does not have a positive effect on participation in the urban areas (Table 13). This is mainly because many educated women living in the urban areas remain confined to the domestic activities. Even when the gender ratio rises due to migration of women after marriage – the biggest reason of female migration in India (Mitra and Murayama, 2008) – women do not necessarily participate in the labour market. Besides, women who accompany their husbands while migrating from the rural to the urban areas are not able to find employment in the urban labour market. At times there is skill mismatch and at times the labour demand for women is limited and transient. For example, in the construction sector demand for women labour is highly sporadic and when there is a decline in labour demand, the women workers are the first ones to be retrenched. So the discrimination issue is much wide and deep-rooted, it can exist even when at the time of birth it is not prevalent in the form of gender selective feticide. As Table 13 shows the child sex ratio has a positive association with work participation but the overall gender ratio has a much stronger negative relationship with female work participation rate. With accessibility of women to job opportunities female feticide seems to have declined but rise in the women to men ratio has not resulted in enhanced participation due to cultural barriers.

Table 13: Factor Analysis: Urban Female Work Participation Rate at the District Level

Variables	Factor 1	Factor 2	Factor 3	Factor 4
HHSZ(U)	-0.7893	-0.0272	0.0657	0.0318
CHILD(U)	-0.8262	0.1174	0.2322	0.1146
WPR(F,U)	0.6137	0.1048	0.2320	0.4184
LIT(F,U)	0.7600	-0.2329	-0.0343	0.1495
SC(F,U)	0.1254	0.0876	-0.1199	-0.6222
ST(F,U)	0.0176	-0.0951	0.4184	0.7240
F/M(U)	-0.8262	0.1174	0.2322	0.1146
URBAN	0.3041	-0.1769	-0.1508	-0.0241
AGLAB(F,U)	-0.0445	0.9978	0.0138	-0.0404
CUL(F,U)	-0.0879	0.0914	0.9793	0.1661
MFGHH(F,U)	-0.1243	0.0239	-0.0724	-0.0562
OTHER(F,U)	0.1470	-0.6715	-0.4819	-0.0296
CHILDSR(U)	0.2846	0.1268	0.0424	0.5288
Eigen Value	3.14689	2.37446	1.73720	1.01386
% Explained	0.3584	0.2705	0.1979	0.1155

N=637

Among the males the findings are again not different from what we noted in the rural context. However, the association between the share of activities comprising non-household manufacturing and services and the work participation rate is highly significant. Higher levels of urbanization are seen to raise the

participation confirming the agglomeration effects. With greater concentration of infrastructure and activities labour demand seems to have raised the participation rate.

Table 14: Factor Analysis: Urban Male Work Participation Rate at the District Level

Variables	Factor 1	Factor 2	Factor 3
HHSZ(U)	-0.7569	0.0513	0.1070
CHILD(U)	-0.8366	0.1671	0.2077
WPR(M,U)	0.6008	-0.1819	-0.2105
LIT(M,U)	0.7096	-0.3451	-0.0913
SC(M,U)	0.1605	0.0831	-0.0248
ST(M,U)	-0.0642	-0.1414	0.2994
URBAN	0.2488	-0.1746	-0.1904
AGLAB(M,U)	-0.1520	0.9731	0.1671
CUL(M,U)	-0.1462	0.1956	0.9631
MFGHH(M,U)	-0.1539	0.0851	0.0186
OTHER(M,U)	0.2178	-0.6645	-0.6270
CHILDSR(M,U)	0.2600	0.1206	0.0630
Eigen Value	3.94216	1.67724	1.27130
% Explained	0.4961	0.2111	0.1600

At the Level of Cities

Since cities are considered to be the dynamic centers of growth compared to other medium sized and small towns we have undertaken the analysis separately for the class 1 cities each with a population of 100,000 and above. As mentioned above these cities comprise more than 60 per cent of the urban population. The association between the overall gender ratio and the female work participation is positive and quite strong unlike at the level of all urban areas which means that women in relatively large cities are better off as far as the labour market outcome is concerned (Table 15). With their greater presence women are able to participate in the labour market as the social restrictions are relatively less in large cities whereas in smaller urban locations the effect of larger presence gets neutralized by the cultural barriers. The demonstration effect of relatively advanced households on the rest is a strong possibility in large cities which comprise more heterogeneous households compared to the homogeneous habitation of the small towns. Also, large cities because of scale effects are able to conduct greater economic activities, generating larger demand for labour, while many of the activities in the services sector prefer women workers, specifically. Besides, women from low income households in large cities are often forced to participate because of higher cost of living.

The findings for males in cities (Table 16) are not different from what was observed at the state or district level. The effect of city size on both male and female participation is noteworthy, suggesting that even within the set of large cities the participation of males and females both tend to improve as the city size increases. Very large cities naturally offer better prospects for employment; and the social restrictions which are more prevalent in the case of women tend to get dissipated.

Table 15: Factor Analysis: Urban Female Work Participation Rate at the City Level

Variables	Factor 1	Factor 2
HHSZ(C)	-0.8032	0.1592
CHILD(C)	-0.8085	0.1752
WPR(F,C)	0.6377	0.3242
LIT(F,C)	0.6840	-0.3685
SC(F,C)	0.0849	0.0099
ST(F,C)	0.0781	-0.1276
F/M(C)	0.4687	0.1003
CTYSZ	0.1482	-0.1181
MFGHH(F,C)	-0.0507	0.8753
OTHER(F,C)	0.1828	-0.8652
CHILDSR(C)	0.3361	0.1900
Eigen Value	3.24645	2.01018
% Explained	0.5628	0.3485

N=467

Table 16: Factor Analysis: Urban Male Work Participation Rate at the City Level

Variables	Factor 1	Factor 2
HHSZ(C)	-0.8671	-0.2156
CHILD(C)	-0.6653	-0.1376
WPR(M,C)	0.7959	0.1823
LIT(M,C)	0.4724	0.3683
SC(M,C)	0.0222	0.0062
ST(M,C)	0.0438	0.1237
CTYSZ	0.1404	0.1180
MFGHH(M,C)	-0.1258	-0.8155
OTHER(M,C)	0.2558	0.8420
CHILDSR(M,C)	0.4167	-0.1573
Eigen Value	3.28815	1.08844
% Explained	0.7008	0.2320

N=467

Panel Data Analysis

Since Labour Bureau has supplied data for five time points corresponding to each of the states and union territories we have tried to carry out the panel data analysis as well. But in this exercise only a limited number of variables such as per capita income, the sectoral shares in gross state domestic product and the infant mortality rate could be included.

The results from Table 17 indicate that the female participation rate in the rural areas is influenced by industrialization. The rural diversification possibly creates more opportunities in which women workers can step into. The service sector on the other hand reduces participation refuting some of the popular views which suggest about women's preference to work in this sector. The residual activities carried out in this sector with meager earnings can discourage women from participating in the labour market ('discouraged dropouts'). However, the female health condition measured in terms of infant mortality rate is a strong determinant of their participation both in the rural and in the urban areas (Table 17).

For rural males none of the variables turns out to be significant though in the fixed effect model (FE) the overall growth index is statistically significant (Table 18). The positive effect of industry and services are evident in the case of urban males, across all the three models (classical OLS, Fixed Effect and Random Effect).

Keeping in view the literature, suggesting the beneficial effect of women's access to income and its positive effect on nutrition, education and health of the children, we have turned the causality from participation to IMR after controlling for growth. Both female participation and economic growth are seen to reduce infant mortality rate among girls as well as boys. And this beneficial effect of female participation is evident across both rural and urban areas as can be seen from all the three models (classical OLS, FE and RE; Tables 19 and 20). However, the participation definitely has a beneficial effect on children's health, particularly that of a girl child: with an increase in female labour force participation the infant mortality rate among girls both in the rural and the urban areas tends to decline.

Table 17: Regression Results for Labour Force Participation Rate: Panel Data Analysis (OLS Results)

Variables	Dep var: LFPR(F, R) (OLS)	Dep var: LFPR(M,R) (OLS)	Dep var: LFPR(F,U) (OLS)	Dep var: LFPR(M,U) (OLS)	Dep var: LFPR(F,R) (OLS)	Dep var: LFPR(F,U) (OLS)
PCNSDP	-0.00002 (-0.28)	-0.0001 (-1.84)	0.0001 (2.22)*	-0.00005 (-1.70)	-0.0002 (-1.81)	-0.00002 (-0.39)

%INDP	0.5 (3.54)*	0.069 (1.29)	-0.29 (-1.39)	0.24 (2.62)*	0.69 (4.73)*	-0.22 (-1.09)
%SERDP			0.40 (-1.97)*	0.19 (2.17)*		-0.41 (-2.07)*
%AGDP	0.25 (0.80)	-0.073 (-0.61)			0.35 (1.08)	
IMR among girls					-0.43 (-3.61)*	-0.42 (-5.96)*
Constant	17.93 (1.69)	78.78 (19.56)	45.67 (3.13)*	56.81 (8.95)*	34.40 (2.70)*	68.25 (4.66)*
Adj R2	0.09	0.02	0.19	0.04	0.23	0.24
N	154	154	154	154	122	122

Table 18: Regression Results for Labour Force Participation Rate: Panel Data Analysis (Fixed Effect and Random Effect Models)

Variables	Dep var: LFPR(F,R) (FE)	Dep var: LFPR(F,R) (RE)	Dep var: LFPR(M,R) (FE)	Dep var: LFPR(M,R) (RE)	Dep var: LFPR(F,U) (FE)	Dep var: LFPR(F,U) (FE)	Dep var: LFPR(M, U) (FE)	Dep var: LFPR(M, U) (RE)
PCNSDP	-0.0001 (-0.95)	-0.0002 (-1.7)	0.0002 (3.32)*	-0.00001 (-0.22)	0.0001 (0.80)	5.98e-06 (0.07)	-0.0006 (-1.04)	-0.00005 (-1.54)
%INDP	0.37 (1.28)	0.57 (2.83)*	-0.47 (-1.15)	0.06 (0.81)	0.25 (0.49)	-0.26 (-0.93)	1.26 (4.16)*	0.34 (2.63)*
%SERDP					0.49 (0.92)	-0.32 (-1.18)	1.11 (3.72)*	0.28 (2.23)*
%AGDP	-0.24 (-0.35)	0.34 (0.83)	-0.11 (-0.63)	0.03 (0.20)				
IMR among girls	-0.69 (-4.51)*	-0.67 (-5.43)*			-0.18 (-1.51)	-0.35 (-3.98)*		
Constant	61.35 (3.47)*	48.21 (3.39)*	74.69 (6.58)*	74.74 (13.86)*	-9.18 (-0.21)	60.56 (2.90)*	-22.80 (-0.96)	49.70 (5.48)*
R2	0.06	0.19	0.03	0.03	0.01	0.07	0.02	0.04
N	122	122	154	154	122	122	154	154

Table 19: Impact of Female LFPR in Rural Areas on IMR (Panel Data Results)

	IMR(Girls) OLS	IMR(Girls) FE	IMR(Girls) RE	IMR(Boys) OLS	IMR(Boys) FE	IMR(Boys) RE
PCNSDP	-0.0004 (-9.36)*	-0.0005 (-5.18)*	-0.0004 (-7.16)*	-0.0004 (-9.55)*	-0.0004 (-4.43)*	-0.0004 (-6.62)*
LFPR(F,R)	-0.18 (-2.86)*	-0.31 (-4.81)*	-0.28 (-5.07)*	-0.18 (-2.87)*	-0.27 (-4.28)*	(-0.25) (-4.50)*
Constant	64.37 (19.47)*	70.16 (17.31)*	68.5 (17.89)*	61.43 (18.36)*	61.96 (15.59)*	62.11 (16.23)*
Adj. R2	0.42	0.42	0.41	0.44	0.42	0.43
N	122	122	122	122	122	122

Table 20: Impact of Female LFPR in Urban Areas on IMR (Panel Data Results)

	IMR(Girls) OLS	IMR(Girls) FE	IMR(Girls) RE	IMR(Boys) OLS	IMR(Boys) FE	IMR(Boys) RE
PCNSDP	-0.0004 (-9.27)*	-0.0005 (-5.07)*	-0.0004 (-6.72)*	-0.0004 (-9.49)*	-0.0004 (-4.49)*	-0.0004 (-6.44)*
LFPR(F,U)	-0.514 (-5.64)*	-0.20 (-2.10)*	-0.30 (-3.54)	-0.53 (-5.70)*	-0.13 (-1.44)*	-0.24 (-2.88)*
Constant	67.60 (24.75)*	65.6 (15.24)*	64.03 (18.04)*	64.76 (23.47)*	57.48 (13.74)*	58.27 (16.39)*
Adj. R2	0.51	0.46	0.49	0.52	0.46	0.49
N	122	122	122	122	122	122

4. Productivity and Female Participation

In this section we assess if female labour participation raises labour productivity as well. However, there are certain practical difficulties in doing this. A highly capital intensive technology which reduces the pace of labour absorption without reducing value added would mean higher labour productivity. Hence, there is difficulty in assessing the impact of labour force participation rate on labour productivity as lower employment levels would always mean higher labour productivity. So this needs to be interpreted very carefully. Secondly, labour productivity is defined as value added per labour. But no information is available on how much of value added is contributed by the male and the female workers separately. Hence, it becomes difficult to assess the association between female labour force participation and female labour productivity. Again, the information on rural and urban labour productivity is missing because value added figures are given sector wise. So what is doable is as follows. We can only investigate whether there is a positive relationship between female labour force participation and overall labour productivity.

On a priori basis the relationship between the variables can go in either direction - positive or negative. In aging societies as labour supply shrinks, the shortages can be mitigated by raising the female labour force participation. Also, given the fact that female labour is docile and sincere, labour productivity can actually rise with increased participation of women in the labour market. Besides, female wages being lower than the male wages the substitution of female labour for male labour can reduce the wage share (or labour cost) in value added. In other words, wage to labour productivity ratio can decline which means

increased efficiency of the unit from the point of view of the employer. This can then contribute to overall growth.

However, from another angle, particularly in a typical neoclassical frame, female wages are lower because female productivity is believed to be lower than the male productivity: the rationalisation is derived from the proposition that each of the factors of production gets paid according to its marginal productivity under perfect competition. This postulation has led to the concern that increased participation of females in the labour market can actually reduce labour productivity and growth.

Further, as we say low productivity means low wages which in turn raise labour demand, there is the possibility of a causal relationship running from productivity to participation as well. Or to put in plainly lower productivity would mean more manpower to complete the job. So the bi-directionality issue is quite important. In addition, productivity cannot be measured as a function of participation only. Other relevant variables representing technology, skill, production structure, to cite a few, need to be controlled for. However, given the paucity of information and the lack of possibility of carrying out a rigorous quantitative exercise we simply take overall labour productivity as a function of certain variables on which information are readily available. This is pursued basically to address the importance of certain policy options. For example, economic necessity may compel women to participate in the labour market and without adequate education and skill they may pursue petty activities. This sort of a situation will lead to increased participation but with low levels of productivity. On the other hand, with higher levels education and skill when women participate in the labour market their productivity can be much higher. But with higher levels of education women necessarily cannot participate in the labour market as the social factors may pose major hindrances. Hence, based on the observed association between productivity and participation certain broad inferences can only be drawn regarding the quality of jobs that women get absorbed into and accordingly suggestions can be made in favour of strategies which can help attain the twin objectives of productivity growth and increased participation.

Table 21: Effect of Female Participation on Labour Productivity

Variables	Dep var: Lab Prod (OLS)	Dep var: Lab Prod (OLS)	Dep var: WORK(F,R) (OLS)	Dep var: WORK(F, U) (OLS)	Dep var: LFPR (F,R) (OLS)	Dep var: LFPR (F,U) (OSLS)	Dep var: Lab Prod (2SLS)	Dep var: Lab Prod (2SLS)
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WORK(F,R)	474.98 (-0.21)						-26709.8 (-0.26)	
WORK(F,U)	-185178.5 (-1.84)	-9					-385561.6 (-1.35)	
LFPR(F,R)		-185115.6 (0-.57)						- 103884. 6 (-2.0)
LFPR(F,U)		- 0.36783.7 (-0.76)						- 190538. 2 (-1.84)
SERDP	75500.8 (1.82)	80466.8 (1.71)					68489.8 (1.54)	64334.9 (1.55)
URBAN	78042.7 (3.43)*	62162.9 (2.52)*					100857 (3.14)*	92146.9 (3.59)*
ROAD		150.1 (0.16)	0.013 (3.99)*	0.005 (2.96)*	0.017 (2.71)*	0.009 (2.05)	1817.1 (1.23)	3335.0 (2.05)*
CR-DP			0.180 (3.95)*	0.05 (2.26)*	0.19 (2.13)*	-0.02 (-0.35)		
ENROL of girls	44694.7 (2.57)*	40649.1 (2.07)*	0.136 (2.30)*	0.107 (3.61)*	0.389 (3.46)*	0.26 (3.52)*	59537 (2.31)*	109144. 9 (3.21)*
IMR(F)				-0.12 (-2.62)*		0.28 (-2.47)*		
F/M			32.33 (1.78)		77.59 (2.24)*			
Constant	-8386365 (-2.89)*	-8751124 (-2.65)*	-43.35 (-2.42)*	0.51 (0.13)	96.22 (-2.81)*	2.58 (0.27)	-8347673 (-2.69)*	- 1.10+e0 7 (-3.56)*
Adj R2	0.64	0.66	0.55	0.48	0.47	0.50	0.59	0.64
N	32	32	35	35	35	35	32	32

When we take labour productivity as a function of participation rate, the endogeneity problem arises because participation itself is an endogenous outcome which is determined in terms of certain variables. We have, therefore, presented two sets of results below (Table 21). One set gives the OLS results while the other set corrects for endogeneity by considering an appropriate instrument for participation. The instrument is generated by estimating the participation equation first and then considering the predicted value. The results tend to indicate that the female participation rate is statistically insignificant in most of the equations with labour productivity as the dependent variable. It has a negative sign but it can be primarily because many women workers are engaged in petty activities in the informal sector, both in the rural and the urban areas.

What is striking from Table 21 is that given participation, women's education (captured through enrolment), urbanization and infrastructure availability are some of the most important determinants of

productivity. Also, the social infrastructure covering health and education specific variables, and physical and financial infrastructure impact on women participation in the labour market significantly. Poor health conditions measured in terms of higher infant mortality rate reduce the participation. The panel data analysis also confirms that poor health reduces women participation. These findings are important from policy point of view because different infrastructure variables are seen to improve both women participation and labour productivity. Infrastructure (social, physical and financial) can to certain extent help break the social and cultural barriers and help women participate in the labour market and make productive contribution. For voicing the women's need, overcoming the social constraints and enhancing their bargaining power their physical presence is essential as indicated by a positive association between female-male ratio and women participation, particularly in the rural areas where the social barriers are strong.

We also noted in the previous section the beneficial effect of female labour force participation rate (from the panel data analysis) on infant mortality of girls as well as boys after controlling for growth indicator which also has a very strong effect on infant mortality rate. Access of mothers to resources through labour market participation improves the health status of the children as their nutritional status also improves. Also, greater volume of resources is required for enhancing the provision of health care facilities which can be met through higher levels of growth.

Elsewhere it has been shown based on data from a number of Asia Pacific countries that decline in gender inequality in labour market through improvement in female labour force participation reduces inequality in many other spheres, and eventually it leads to greater participation of women in the decision making process both within the households and at the macro level (Mitra, 2009). Particularly when it comes to fertility decisions the working women are able to voice their preference better compared to the housewives. Similarly the working women could vouch for gender budgeting and participate in the political process as well. Refuting the view that increased participation of females in the labour market would reduce growth the study also casted evidence in favour of economic growth responding positively to a rise in female participation. The poor levels of skill resulting from gender discrimination, limited scope to undergo on the job training, information asymmetry aggravated by the inadequate access of women to job market information, inability to pursue job search on a full time basis due to domestic responsibilities, unavailability of productive jobs with flexible hours and weak bargaining power result in lower wages for women workers than their male counterparts. And this wage discrepancy has sent a wrong message about women being less productive.

Table 22: Dependent Variable: Regression Equation for Weekly Wage (in Rs per person)

Variables	Coefficient.	t ratio
Age	-1.98	-0.58
Agesq	0.39	8.98*
hhhold_size	-10.28	-4.57*
Gedu2	18.63	0.24
Gedu3	201.06	13.44*
Gedu4	831.28	46.45*
Gedu5	2028.29	95.56*
Tedu2	2756.52	47.92*
Tedu3	690.78	20.12*
Tedu4	903.45	19.08*
vtrn1	-766.49	-24.02*
vtrn2	-124.35	-3.89*
vtrn3	-77.98	-3.59*
mst1	-8.88	-0.29
mst2	193.45	7.68*
gender1	371.49	27.14*
reldum1	-184.97	-10.26*
reldum2	-155.69	-6.42*
Socdum1	26.93	1.56
Socdum2	-101.55	-7.4*
occ1	-700.31	-16.03*
occ3	-412.47	-9.3*
occ4	-586.32	-13.42*

occ5	-750.70	-16.42*
occ6	-323.05	-7.09*
occ7	101.45	2.34*
Secdum1	-258.73	-22.27*

Note: Number of obs = 75518, $F(27, 75490) = 1914.54$, Adj R-square = 0.41; Age: age of the earner, Agesq: age square, hhhhold_size: household size, Gedu2: literate without formal schooling, Gedu3: primary and middle level, Gedu4: secondary and higher secondary, Gedu5: graduation and post graduation, Tedu2: technical degree in agriculture/ engineering/ technology/ medicine, etc. , Tedu3: diploma or certificate (below graduate level) in: agriculture, engineering/ technology, medicine, crafts, other subjects, Tedu4: diploma or certificate (graduate and above level) in: agriculture, engineering/ technology, medicine, crafts, other subjects, vtrn1: receiving formal vocational training, vtrn2: received vocational training: formal, vtrn3: received non-formal: hereditary, self-learning, learning on the job, others; mst1: never married, mst2: currently married, gender1: male, reldum1: Hindu, reldum2: Islam, Socdum1: schedule tribe, Socdum2: schedule caste, occ1: agriculture, hunting, forestry, fishing, occ3: manufacturing, electricity, gas and water supply, occ4: construction, occ5: wholesale and retail trade, hotel and restaurant, occ6: transport, storage and communication, occ7: other services including financing etc., secdum1: rural dummy (1 for rural and 0 for urban areas).

Source: Based on NSS unit level data (66th Round, 2009-10).

An important way of showing the relevance of skill in the job market is to calculate the returns to skill and the differences in the returns across various levels of skills. One of the convenient ways of conceptualizing the returns is to estimate an earning function with dummies representing different educational levels. The weekly wage function estimated on the basis of the NSS unit level data from the 66th round (2009-10) shows that the male wages are substantially higher than the female earnings (Table 22). Education dummies (the general and technical both) tend to enhance earnings. Those who have general education receive higher earnings in comparison to the illiterates. In fact, most of the education dummies have positive coefficients and are significant except Gedu2 which represents literates without formal schooling. Similarly technical education dummies are statistically significant. But those who have acquired vocational training are not better off in comparison to those who do not have it. Scheduled

castes receive a lower wage compared to the general-cum-OBCs. Large households are also worse off in terms of earnings, suggesting lower productivity levels and poor quality of labour. Though age, taken to be a proxy for job market experience, is not significant, age-square is and it has a positive coefficient. All this tends to suggest that skill formation and experience do contribute to higher levels of earnings. The sector specific dummies are mostly negative suggesting lower earnings in most of the sectors in relation to the comparison group which is mining and quarrying. However, the occ7 representing 'other services' including financing etc. has a positive coefficient indicating higher earnings in this sector.

5. Conclusion and Policy Issues

This study on labour (and work) force participation rate has been pursued gender-wise, at three spatial levels: state district and city. Further, the state and district specific rates have been studied at the rural and urban areas separately. Among the cities and towns the relatively large ones, i.e., each with a population of 100,000 and above, have been considered in order to assess the effects of agglomeration economies and the cultural factors which are supposedly more advanced in the large cities.

Based on the population census data the study noted that the female participation rates are significantly lower than those among the males. The inter-state variations in the male specific rates are rather limited. On the other hand, the rural-urban differentials are more pronounced and the inter-state variations are sizable in the case of females, reflecting the influence of social, cultural and economic factors. There does not seem to be any significant positive relationship between per capita income and participation rate in the case of females (except in a subset of states) though among males such a pattern is somewhat distinguishable. This finding brings out the inadequacy of growth to usher in gender equality.

The Labour Bureau's panel estimates of gender specific labour participation rate have been consistent over time and the gender differences in the estimates are again pertinent for each of the years. Though the time frame (2009-10 through 2014-15) is too short to expect any significant change in the participation rate, the rigidity in the female participation rate does raise concerns to be addressed in a larger ambit covering social, economic, political and cultural arena. On the whole, the female participation is considerably low. Even in the urban areas and the relatively large cities the social factors and the practice of gender-based division of labour are so prevalent that the female labour market participation is lower than its rural counterpart despite higher levels of education.

In terms of determinants the study clearly brings out the importance of infrastructure, education and health and urbanization on labour force participation of both the gender. This in turn points to three types

of factors which are instrumental in resulting enhanced participation rate. The first set refers to creation of greater volume of jobs motivating participation, the second enhances the ability of the individuals to participate and the third, the most important one, facilitates the accessibility of the capable ones to the locations where jobs are available. Hence, strategies for creating clusters with greater employment potentials (which in turn is cost-effective in making pro-poor growth happen), consecrated efforts for human capital formation and investments to remove barriers between jobs and their seekers need to be pursued aggressively.

The negative impact of fertility and household size on rural female work participation comes out sharply: greater domestic burdens in large households do not allow women to participate explicitly in the labour market. Though the urbanization level does not show a positive effect on rural women participation at the state level the beneficial effects are evident at the district level for both the gender. On the other hand, in the urban context, the participation rates of both females and males vary positively with the level of urbanization. In other words, the urban areas in states and districts with higher levels of urbanization unravel higher levels of participation both for females and males in comparison to the states or districts with lower levels of urbanization, revealing the agglomeration effects. With greater concentration of infrastructure and activities labour demand tends to increase. Further evidence in this regard is brought out from the city level data which confirm the positive effect of city size on both male and female participation. The urban specific rates, particularly for females, may be lower than the rural rates, showing the persistence of cultural backwardness but within the urban context there is a positive impact of urban settlement, i.e., the relatively large settlements are associated with better outcomes.

While industrialization and growth in services both show a positive effect on participation, though very mildly especially in the case of urban women, growth shows a rising impact only in the case of urban males. Also, there is evidence on poverty induced participation in agricultural activities, suggesting clearly the importance of rural diversification for participation to pick up in the rural context.

The positive relationship between the female-male ratio and the female participation is striking in both the rural and urban areas, at least at the state level. Greater presence of women in the society is a precondition to their participation in the labour market though there is evidence, particularly from the urban district level data that it is not a sufficient condition. In fact, many educated women remain confined to domestic activities not being able to participate in the labour market. However, the association between the gender ratio and the female work participation rate is positive and quite strong in large cities compared to all urban areas which comprise medium sized and small towns. The social

restrictions are relatively less in large cities enabling more women to participate in the labour market. The demonstration effect of relatively advanced households on the rest is also a possibility. Besides, large cities because of scale effects are able to conduct greater economic activities, generating larger demand for labour. Many of the activities in the services sector specifically prefer to have women workers, motivating the potential entrants to join the job market. This, however, does not rule out the possibility of women from low incomes households being residually absorbed in low productivity services in the face of a high cost of living.

Women's participation does not reduce productivity. On the contrary, it improves child health significantly as noted from the beneficial effect of female labour force participation rate (from the panel data analysis) on infant mortality of girls as well as boys after controlling for growth, which too has a strong effect on infant mortality. Access of mothers to resources through labour market participation improves the health status of the children as their nutritional status and access to curative health care get better.

Regarding the negative effect of female labour force participation on labour productivity and economic growth the study clears up the misgivings, suggesting that the negative sign is statistically not significant and secondly it arises because of women's residual absorption in petty activities in the informal sector, both in the rural and the urban areas. Further, the female-male wage differences are due to skill differences, and not because males are more productive than females in relation to a given task. The results suggest that given participation, women's education (captured through enrolment), urbanization and infrastructure availability are some of the most important determinants of productivity. Further, as mentioned above, the social infrastructure (covering health and education specific variables) and physical and financial infrastructure impact on women participation as well.

On the whole, based on these results, it may be inferred that women participation in productive activities has a double effect: first, it raises the household income and second, it contributes to wellbeing of the household as the health status of the children improves. A mere increase in participation without ensuring productive absorption may not be beneficial as it would only raise the burden on the women members. Also, institutional support to discourage the practice of gender based discriminatory wages is instrumental to the beneficial effects of women participation in the labour market.

These findings are important from policy point of view because different infrastructure variables are seen to improve both participation and labour productivity. With improved infrastructure the quantum of investment is expected to shoot up and the accessibility to growth centres offering better livelihood

opportunities can get better. Infrastructure (social, physical and financial) can to certain extent break the social and cultural barriers and help women participate in the labour market and make productive contribution to the growth process. Though the level of urbanization raises the urban participation rate in an inter-spatial sense, a similar pattern is not evident in the context of rural females (at least at the state level). How urbanization can be made more generative with positive spillover effects in the rural neighbourhood is, therefore, an important policy question. Increased urbanization ushering in greater concentration of non-farm activities can expand employment prospects and at the same time result in productivity gains.

Higher fertility rate harms maternal health, reducing women's ability to work in the labour market. For voicing the women's need, overcoming the social constraints and enhancing their bargaining power their physical presence is essential as indicated by a positive association between the female-male ratio and the women participation, particularly in the rural areas where the social barriers are strong. Ban on sex selective termination of pregnancy requires greater enforceability. That despite higher levels of education women average participation rate in the urban areas is lower in comparison to the rural areas calls for introducing more effective strategies for encouraging women to participate in the labour market. Rural women workers are mostly engaged in agriculture, and rural poverty forces many women to pick up marginal activities outside agriculture. How productivity of these workers can be enhanced is, therefore, another key policy concern.

The age structure shift in the Indian context, i.e., a relatively large percentage of population in working age brackets, can prove to be beneficial only when their accessibility to productive jobs develops. The improvement in the job market participation of both females and males and their absorption in productive activities would be possible when economic growth, human capital formation and social progress take place simultaneously. For all this to happen, strategic action is required. With enhanced equality between males and females in terms of work opportunities and labour market attributes, several positive outcomes in terms of economic, social, political, educational and health related equality may take place in a significant way. All this would subsequently enhance the overall social status of women and their participation in the decision-making process. Going a step ahead, one may argue that with specific interventions enhanced labour market participation of women can result in higher productivity and growth as well, which will indeed be sustainable in the long-run. Since women labour has remained unutilised in remunerative and economic activities to a large extent, higher female labour force participation, particularly in ageing societies, can mitigate the shortage of labour and contribute to pro-poor growth.

The government's effort to introduce the new manufacturing policy, urban policy with a thrust to create smart cities, 'skill India' programme to improve the employability of the labour force and 'make in India' programme to raise labour demand and production simultaneously are expected to have positive impact on both female and male labour force participation rates. Specifically for women, a series of measures which include maternity benefits, provision of child care leave, equal remuneration for both male and female workers, prevention of domestic violence and workplace harassment, are there which may encourage participation. A scheme on gender budgeting was introduced in 2007 to build capacity so that a gender perspective is retained at all levels of planning, budget formulation and implementation stages.⁷ However, as we have noted based on our analysis, more effective strategies need to be evolved to improve the labour force participation rate, especially among women. Shifting workers of both the gender from low to high productivity activities has been a major challenge. On top of that if the participation rate has to improve, both demand and supply side factors will have to be considered.

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⁷ Besides there are literacy mission (Sakshar Bharat abhiyan), sanitation scheme, mid-day meal schemes in school and save the girl child (Beti Bachao, Beti Padhao: BBBP) programme. National rural Health Mission and National Urban Mission and High Level Expert Group on Universal Health Coverage aim at improving the access to health services for women, girls and other vulnerable genders, going beyond maternal and child health. The scheme relating to hostels for working women intends to promote mobility among women in the labour market by providing safe and cheap accommodation to those from the lower income households and living away from home. Provision and improvement of sanitation facilities in educational institutions is expected to improve enrolment among girl children. There are other women development programmes too (Swyam Sidha programme, Swa-Shakti programme and Rashtriya Mahila Kosh programmes). The National Rural Employment Guarantee Programme (MNREGA), the Right to Free and Compulsory Education, National Rural Health Mission, National Rural Livelihood Mission and National Skill Development Mission aim at improving the ability to access better livelihood opportunities.

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Appendix

Variables, year of availability and source:

WPR: Workforce e participation rate among females and males in rural and urban areas: Population Census, 2011
LFPR: Labour force participation rate among females and males in rural and urban areas, 2011-12 in cross-sectional study and from 2009-10 through 2014-15 except 2010-11 in the panel data analysis, Labour Bureau, Ministry of Labour and Employment, Government of India.
AGDP: Share of agriculture in gross state domestic product, 2011-12
INDP: Share of Industry in gross state domestic product, 2011-12
SERDP: Share of services in total gross state domestic product, 2011-12
URBAN: % of population residing in urban areas, 2011
ROAD: State-wise road length in relation to population, 2011, Ministry of Road Transport and Highways
ELEC: State-wise annual per capita consumption of electricity in kWh, 2012-13, Ministry of Power.
CR-DP: Credit-deposit ratio, 2010, Data Book for Planning Commission, 2014
ENROL: Gross enrolment in classes I-VIII, 2010-11; Data Book for Planning Commission, 2014.
LIT: Literacy rate among females and males in rural and urban areas, Population Census, 2011
IMR: Infant mortality rate, boys and girls: for cross-section study 2011 and for panel 2006, 2010, 2011 and 2012 Sample Registration System 46, 47 and 48, Office of Registrar General, Ministry of Home Affairs.
WATER: % OF Households with access to safe drinking water, rural and urban, 2011;Data Book for Planning Commission, 2014
F/M: Female per thousand male, Population Census, 2011
PCNSDP: Per capita net state domestic product in Rs, 2011-12; for panel data analysis 2008-09, 2009-10, 2010-11, 2011-12 and 2012-13 are taken in 2004-05 prices, Data Book for Planning Commission, 2014. .
AGDP: Share of agriculture in gross state domestic product, 2011-12; for panel data analysis 2008-09, 2009-10, 2010-11, 2011-12 and 2012-13 are taken in 2004-05 prices, Data Book for Planning Commission, 2014.
INDP: Share of Industry in gross state domestic product, 2011-12; for panel data analysis 2008-09, 2009-10, 2010-11, 2011-12 and 2012-13 are taken in 2004-05 prices; Data Book for Planning Commission, 2014. .
SERDP: Share of services in total gross state domestic product, 2011-12; for panel data analysis 2008-09, 2009-10, 2010-11, 2011-12 and 2012-13 are taken in 2004-05 prices; Data Book for Planning Commission, 2014.
Lab Prod: Labour productivity in Rs. 2011-12 calculated by the author from state domestic product and workers reported by population census.
SC: Percentage of scheduled castes among females and males in rural and urban areas, Population Census, 2011

ST: Percentage of scheduled tribes among females and males in rural and urban areas, Population Census, 2011
CTYSZ: City Size in log terms, Population Census, 2011
AGLAB: Share of agriculture labour in total workforce, male and female, Population Census, 2011
CUL: Share of cultivators in total workforce, male and female, Population Census, 2011
MFGHH: Share of household manufacturing in total workforce, females and males in rural and urban areas: Population Census, 2011
OTHER: Share of non-household manufacturing and services in total workforce, female and male and rural and urban areas, Population Census, 2011
CHILDSR: Child sex ratio (age bracket: up to 4 years): Population Census, 2011
CHILD: Children (up to 4 years) to women ratio, Population Census, 2011.
HHSZ: Average household size, Population Census, 2011.
TFR: Total fertility rate for 2009 (since 2010 figures are not available for a number of states); Data Book for Planning Commission, 2014.
MPCE: Monthly mean per capita consumption expenditure in Rs, in rural and urban areas, 2011-12, Data Book for Planning Commission, 2014
POV: Incidence of poverty in rural and urban areas, 2011-12, Data Book for Planning Commission, 2014