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**Conference Paper**

## Drivers of female labour force participation in urban India during India's Economic Boom

Proceedings of the German Development Economics Conference, Berlin 2011, No. 65

**Provided in Cooperation with:**

Research Committee on Development Economics (AEL), German Economic Association

*Suggested Citation:* Pieters, Janneke; Klasen, Stephan (2011) : Drivers of female labour force participation in urban India during India's Economic Boom, Proceedings of the German Development Economics Conference, Berlin 2011, No. 65, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg

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# **Drivers of female labour force participation in urban India during India's Economic Boom**

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**Preliminary version, May 2011 - Please do not cite**

## **Abstract**

In the past twenty years, India's economy has grown at increasingly faster rates and now belongs to the fastest-growing economies in the world. One would think that in such economic conditions, women are increasingly being pulled into the labour force by attractive pay and employment conditions. This paper examines trends and drivers of female labour force participation in urban India between 1987 and 2004; we do this using aggregate and unit level data and estimate econometric participation models. Our paper shows a much more nuanced picture than one might expect. While we find, as expected, that cultural and social factors strongly influence female labour force participation rates, among the somewhat unexpected findings are:

- Only in the period between 1999 and 2004 did female labour force participation rates increase in urban areas; before, rates remained flat due to offsetting trends of increases among some groups and decreases among others;
- Our results suggest that at lower levels of education, increases in female labour force participation are driven more by distress than by increasing economic opportunities;
- Only at the highest education levels do we see evidence of pull factors drawing women into the labour force at attractive employment and pay conditions; this affects, by 2004, only a small minority of India's women.

As a result, the economic boom has offered remarkably few opportunities to women in India. In fact, for all but the very well-educated, it appears that the labour market conditions have not improved at all, or even deteriorated.

## 1. Introduction

While India's economic growth has increased over the past two decades and future predictions are optimistic, female labour force participation was stagnant for a long time and started to rise only at the turn of the century. Given the positive effect female participation can have on economic growth (Esteve-Volart, 2004; Klasen and Lamanna, 2009), drawing women into the labor force can be an important source of future growth of the Indian economy. This is particularly the case as higher female participation would allow India to reap more benefits of its currently advantageous age structure of the population with a large share of working age people and relatively few dependents: this favourable demographic constellation (a result of prior fertility decline) has been referred to as the demographic dividend. Demographic dividend, coupled with high female participation rates, is alleged to have accounted for about a third of East Asia's high per capita growth rates (Bloom and Williamson, 1998). Beyond economic benefits, women's participation in the labour force can be seen as a signal of declining discrimination and increasing empowerment of women (Mammen and Paxson, 2000). However, feminization of the workforce is not necessarily a sign of improvement. It can also be a response to recession and increasing insecurity in the labour market, functioning essentially as an insurance mechanism for households (Standing, 1999; Bhalotra and Umaña-Aponte, 2010).

The aim of this paper is to determine what drives the labour force participation behaviour of women in urban India.<sup>1</sup> Table 1 summarizes the urban female employment figures for the period 1983-2005. The increase in female labour force participation rate in the period 1999 to 2004 came about after stagnation between 1983 and 1999. In absolute terms, more than five million women entered the urban labour force in the last period, with significant numbers entering self-employment, regular employment, and unemployment.<sup>2</sup>

Understanding the determinants of women's participation is necessary to be able to understand the implications for women's wellbeing and for future growth of the labour

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<sup>1</sup> The employment structure differs substantially between rural and urban areas, with rural women predominantly in self-employment and casual work, while urban women work mostly as regular employees. It is therefore likely that the determinants of women's participation differ between rural and urban areas. In the present paper we focus on urban women, and leave the analysis of rural female labour force participation for future research.

<sup>2</sup> Part of the increase in the number of working women reflects the share of women aged 20-59 in the total female population, which has increased from 46 to 54 per cent since 1983. Clearly, demographic changes have also contributed to workforce growth, augmenting the recent jump in participation rates.

force and the economy. To the best of our knowledge, this is the first study of female labour force participation in India that includes the period 1999-2004 and systematically analyses different possible explanations offered in the literature. Furthermore, we pay special attention to the differences between poorly and highly educated women, which appears as a highly relevant distinction in the context of India's economic development.

**Table 1 – Urban female population age 20-59**

	1983	1987-88	1993-94	1999-2000	2004-05
Self-employed	2649 (7)	3249 (7)	3948 (7)	4745 (7)	6675 (8)
Regular	2641 (7)	3347 (8)	4311 (8)	5364 (8)	7651 (10)
Casual	2193 (6)	2225 (5)	3000 (5)	2968 (4)	2953 (4)
Unemployed	530 (1)	785 (2)	976 (2)	909 (1)	1729 (2)
Labour force	8013 (22)	9605 (22)	12235 (22)	13985 (21)	19007 (24)
Other	29034 (78)	34715 (78)	43537 (78)	53308 (79)	61016 (76)
Total	37047(100)	44325(100)	55766(100)	67300(100)	80031(100)

Note: totals may not add up due to rounding. Numbers are in '000s, percentage of total in parentheses. Self-employed includes unpaid family workers, but excludes domestic duties. Regular employees receive salary or wages on a regular basis. Casual workers receive a wage according to the terms of the daily or periodic work contract. *Source*: NSS Employment and Unemployment Survey and Sundaram (2007).

We find that a closer look at India's economic development suggests that the recent rise in women's participation is driven by necessity rather than increased opportunities, at least for poorly educated women. An increasing share of workers is self-employed, and between 1999 and 2004 real earnings for men and women actually declined. The share of working women in agriculture and manufacturing self-employment and in domestic services increased, which are often poorly paying and highly insecure jobs. With higher education, women are more likely to work in better paying and more attractive jobs in the services sector. A unit level analysis sheds further light on the determinants of participation in paid employment. Our results show that women's decision to work is affected by social and cultural factors and by the income and underemployment of household members. An important finding is that only highly educated women are attracted to the labour market by higher expected earnings: for women with less than secondary education we find a negative effect of market wages on participation in paid employment.

The rest of this paper is organised as follows: Section 2 summarizes related literature on development and women's labour force participation and previous studies on India. In Section 3, the changes in employment and earnings in India during the recent past are described in more detail. Section 4 presents an empirical model and estimation

results for women's participation in paid employment. Finally, Section 5 summarizes the main findings and conclusions.

## **2. Determinants of female labour force participation**

The basic static labour supply model is a starting point for many models of female labour force participation (e.g. Blundell and MaCurdy, 1999). In the static labour supply model, an individual derives utility from income and from leisure. Leisure is the time left after working hours are deducted from total time available, and the opportunity cost of leisure is equal to the wage rate. For a given income level, an increase in the wage rate reduces demand for leisure as its opportunity cost rises, and labour supply will increase. If leisure is a normal good, an increase in a person's income will increase the demand for leisure and thus reduce her hours worked. These are the well-known substitution and income effects.

For a person with positive labour supply (i.e., who currently works for pay), an increase in the wage rate has both a positive substitution effect and a negative income effect, since income is partly derived from working for pay such that higher wages translate into higher income. The overall effect on labour supply depends on the relative strength of the substitution and income effect, and is theoretically ambivalent. For a person not working, an increase in the wage rate only has a substitution effect, increasing the incentive to work. Besides the own wage, income consists of so-called unearned income, which includes wage income of other household members and income from non-labour sources. An increase in unearned income reduces labour supply through a negative income effect. In the case of married women, a particularly important aspect of this unearned income is the earnings of the husband.

### **2.1. Development and women's participation**

Beyond the basic labour supply model, several ideas have developed in the analysis of female labour force participation in developing countries. Probably the best known hypothesis in this literature is the "feminization U": female labour force participation first declines and then increases as an economy develops (Goldin, 1994; Mammen and Paxson, 2000). In initial stages of development, education levels rise and employment shifts from agriculture to manufacturing. But in these initial stages, men's education levels rise faster than women's and the new manufacturing jobs available are, unlike farm work, incompatible with domestic duties and existing social stigmas about women

moving about independently in public. Combined with the negative effect of rising income of male family members, female participation declines. Once women's education level rises and demand for white-collar workers increases with the expansion of the services sector, higher wages and socially acceptable types of work lead to higher female labour force participation. Though the feminization U is sometimes considered a stylized fact, the empirical evidence in support of it is mostly based on cross-country analysis, while panel analyses have produced mixed results (e.g., Çagatay and Özler, 1995; Gaddis and Klasen, 2011). But one might well hypothesize that within a country, there is a U-shape relationship between economic or educational status and women's labor force participation rates. Among the poorly educated, women are forced to work to survive and among the very highly educated, stigmas militating against female employment may be low. Between these two groups, women may face barriers to labour force participation related to both the absence of an urgent need of female employment, and the presence of social stigmas associated with female employment (see below). This would be consistent with a similar U-shape relationship in gender bias in mortality by education or income groups, where gender bias appears to be largest among the middle groups (e.g. Klasen and Wink, 2003; Dreze and Sen, 2002). In any case, the feminization U (at the country or international level) reflects several underlying forces at work, and we aim to analyse these issues separately, thereby contributing to this debate using disaggregated analysis.

Standing (1999) argues that growing labour market flexibility and diverse forms of insecurity have encouraged greater female labour force participation around the world. Technological change and increasing international competition stimulate employers to focus on a limited number of permanent core workers, while making more use of temporary workers and subcontracting. Through an increase in income and employment insecurity and women's greater willingness to work in insecure employment relationships, women are induced to work: rising female labour force participation thus reflects the erosion of men's position in the labour market, rather than an improvement in women's opportunities.

This view incorporates the theory of women's labour supply as insurance mechanism for households (Attanasio *et al.*, 2005). In a recent paper, Bhalotra and Umaña-Aponte (2010) show that in developing countries in Asia and Latin America, female labour force participation rates move counter-cyclically: women move from non-employment into paid and self-employment during recessions. In line with theory, they also find that

counter-cyclical is strongest in households with limited alternative sources of insurance against income shocks.

The role of women as caregivers and housekeepers is obviously also important when it comes to the participation decision, as this determines their value within the household. Cunningham (2001) shows that in Mexico, unmarried women without children are as likely to work as men, while labour supply of married women depends on the presence of young children and the level and stability of household income. Gong and Van Soest (2002) show, also for Mexico, that the presence of another female increases labour supply of mothers with young children. With declining fertility, one would expect female labour force participation rates to rise.<sup>3</sup>

Apart from such economic considerations, attitudes are also likely to play a role. Goldin (1994) describes the social stigma against women's participation in industrial activity, which causes a decline in participation as an economy industrializes. Attitudes of both men and women towards gender roles can be shaped by factors such as religion (Lehrer, 1995; Amin and Alam, 2008), education, mass communication, and attitudes and behaviour of previous generations (e.g., Farré and Vella, 2007).

The different views discussed here are not mutually exclusive, and can be summarized in terms of the following determinants of women's participation:

- The woman's expected market wage, positively affecting participation.
- Unearned income, including income from other sources and other household members, which has a negative effect;
- Income and employment insecurity of other household members inducing higher participation;
- Social stigma, possibly related to (husband's) education and the type of work (at home or outside, manual or non-manual work), which could depress female employment;
- Large family size as well household workload which could also depress female employment;

All of these, except the expected market wage, are determinants of the so-called reservation wage, which can be thought of as the marginal utility of non-work

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<sup>3</sup> This need not necessarily be the case, however. As shown by Priebe (2011) in the case of Indonesia, declining fertility might actually reduce female labor force participation rates among poorer parts of the population where fertility decline reduces the need to work.

(including childcare and housework): when the expected market wage exceeds the reservation wage, a woman will participate in the labour force.

## **2.2. Women's participation in India**

There has been little research on female labour force participation in India, especially concerning the recent changes, but it is generally known that the participation rate is low compared to other countries. In 1998 India's Central Statistical Organization conducted a time use survey in six states, for which household duties (household maintenance and care for children, old, and sick household members) were classified as "extended-SNA" activities. The survey showed that urban women spent about 9 hours per week on SNA activities plus 36 hours on extended-SNA activities, against three plus 41 hours weekly, respectively, for men (NCEUS, 2007). Mitra (2005) names this dual burden of conventional productive work and household duties as one of the major constraints to women's labour market choice: male household members typically decide on the location of residence, and women depend on informal networks to find paid employment in the vicinity of their homes.

Besides the double burden of work, social norms restrict women's availability and location of work such that their labour force participation is low (NCEUS, 2007). This may be reflected in the clear U-shaped relationship between women's education and labour force participation in India. Kingdon and Unni (2001) attribute the downward sloping part of this U to the process of Sanskritization: social restrictions on the lifestyles of women tend to become more rigid as households move up in the caste hierarchy (Chen and Drèze, 1992), though this portion can also be related to rising incomes of husbands. Increasing participation at the highest education levels could reflect modernising influences that increase women's aspirations, combined with higher returns to education that increase economic incentives for women to work. Bardhan (1986) argues that class, patriarchy, and social hierarchy (caste, ethnicity, and religion) all interact to shape attitudes towards gender roles. In that sense, the downward sloping part of the U reflects not just Sanskritization, but a general aspiration to upgrade social status or imitate lifestyles of higher status groups. Among higher classes, aspired status groups would be the urban educated, who have more Western lifestyles, associated with higher female labour force participation rates.

Analysing regional differences in female participation rates in the 1990s, Ahasan and Pages (2008) find that employment opportunities play an important role especially in



rural India, as female wages or expected earnings have a strong positive effect on participation. They also find some evidence for a negative income effect of men's earnings. Besides these classical income and substitution effects, however, the impact of cultural and social factors is not considered in their analysis. Based on a survey among 447 households in Delhi in 2006, Sudarshan and Bhattacharya (2009) find that besides women's household workload, lack of information and mobility and safety concerns are important constraints to her participation. The decision to work is mainly determined by the external environment (e.g., child care arrangements and safety in public spaces) and ideology of the marital household, rather than the woman's individual attributes.

Regarding the recent increase in participation rates, there is some evidence for rural India that women's labour market entry between 1999 and 2004 was distress-driven: self-employment increased most among the poorest households, real wage growth stagnated, and the workforce feminization was greatest in the farm sector in districts with agricultural distress (Abraham, 2009). The story for urban India may be less gloomy, as job opportunities are likely to be quite different: especially services sector employment is concentrated in urban India. The next section gives a more detailed description of changes in the Indian urban labour market over the past decades.

### **3. Women's employment and earnings in urban India**

Data on employment and earnings used in this paper are from the four most recent 'thick' rounds of the National Sample Survey (NSS) on Employment and Unemployment, the official source of employment and earnings data used by the Government of India. They are for the years 1987-88, 1993-94, 1999-00, and 2004-5.<sup>4</sup>

#### **3.1. Employment**

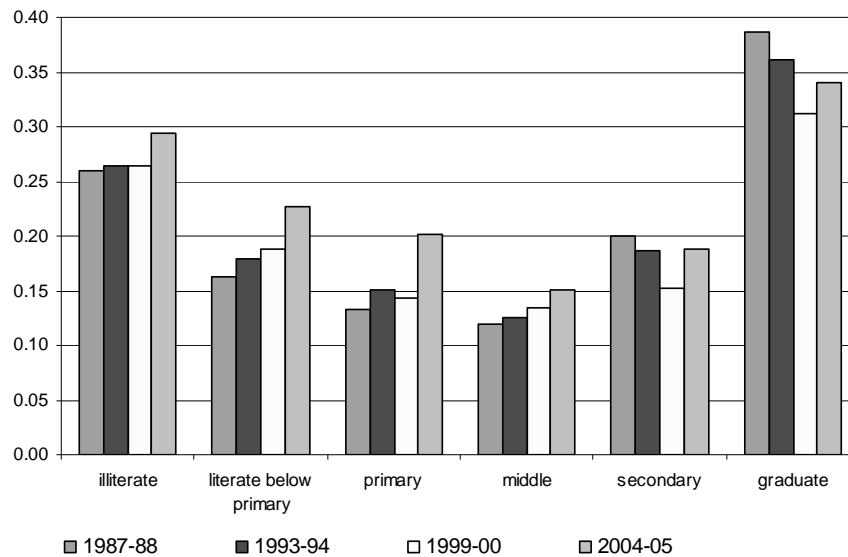
Figure 1 shows the labour force participation rate of women at different education levels, throughout the period 1987-2004. It shows the clear U-shape of female participation by educational levels which is visible in each of the years; the low point is always among those with middle educational achievement. As far as time trends are

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<sup>4</sup> All figures in this paper are based on principal usual status activities. Usual status is based on a reference period of one year, in which principal activity is the activity in which the respondent spent the majority of time. Subsidiary activity is not taken into account in the present paper, as it affects less than five percent of the adult urban female population, and comparability over time is questionable: before the 2004-05 survey, there was no lower bound on the number of hours spent on a particular activity to be considered as subsidiary activity, but in 2004-05 the minimum was set at 30 days of the reference year.

concerned, between 1987 and 1999 the urban female labour force participation rate increased somewhat for women below secondary education, while participation among highly educated women declined. In the period 1999-2004, participation rates increased substantially at all educational levels. Further inspection of the data (not shown) indicates that participation rates in this last period increased most for the age group 20 to 44, while there was relatively little change among older women.

**Figure 1 – Urban female labour force participation rate (age 20-59)**



Source: NSS Employment and Unemployment Survey

One needs to note that the population shares of the different educational groups changed considerably, which, given different levels of participation among the groups, could partly account for the overall trends reported in Table 1. Between 1987 and 2004, the share of illiterate women declined from 42 to 27 per cent, while the share of women with secondary or graduate level education increased from 15 to 23 per cent and from 8 to 15 per cent, respectively. The population shares of the other groups changed relatively little. Since there was, on aggregate, a shift from one high-participation group (illiterate) to two other high-participation groups (secondary and graduate), these population shifts hardly affected the overall female participation rate.

Table 2 shows the distribution of women with low and high education across different types of work and industries. One notes that below secondary education, female employment is distributed widely across sectors and type of employment (regular and casual); for highly educated women, the vast majority is employed as regular

employees in the service sector. Also noticeable is a high share of women self-employed across all sectors, suggesting considerable informal sector activities (including home-based work) of these urban women.

**Table 2 - Urban female population (age 20-59)**

Below secondary education		1987-88	1993-94	1999-00	2004-05
Agriculture	Self-employed	870 (2.5)	876 (2.2)	744 (1.7)	1265 (2.5)
	Regular	35 (0.1)	37 (0.1)	56 (0.1)	73 (0.1)
	Casual	861 (2.5)	1173 (2.9)	1124 (2.6)	1080 (2.1)
Manufacturing	Self-employed	1024 (3.0)	1137 (2.9)	1383 (3.1)	2004 (4.0)
	Regular	362 (1.1)	312 (0.8)	517 (1.2)	641 (1.3)
	Casual	508 (1.5)	570 (1.4)	316 (0.7)	430 (0.9)
Other industry	Self-employed	12 (0.0)	16 (0.0)	11 (0.0)	11 (0.0)
	Regular	58 (0.2)	58 (0.1)	51 (0.1)	48 (0.1)
	Casual	393 (1.2)	567 (1.4)	683 (1.6)	757 (1.5)
Services	Self-employed	1046 (3.1)	1388 (3.5)	1802 (4.1)	1896 (3.8)
	Regular	1054 (3.1)	1274 (3.2)	1432 (3.3)	2450 (4.9)
	Casual	431 (1.3)	617 (1.5)	760 (1.7)	620 (1.2)
Total workforce		6654(19.4)	8023(20.1)	8879(20.2)	11273(22.4)
Unemployed		285 (0.8)	207 (0.5)	158 (0.4)	362 (0.7)
Other		27364(79.8)	31612(79.4)	34926(79.4)	38672(76.9)
Total (20-59)		34304(100)	39838(100)	43965(100)	50308(100)

Secondary education or higher		1987-88	1993-94	1999-00	2004-05
Agriculture	Self-employed	25 (0.3)	32 (0.2)	21 (0.1)	78 (0.3)
	Regular	2 (0.0)	1 (0.0)	3 (0.0)	5 (0.0)
	Casual	5 (0.0)	14 (0.1)	12 (0.1)	12 (0.0)
Manufacturing	Self-employed	98 (1.0)	111 (0.7)	168 (0.7)	437 (1.5)
	Regular	138 (1.4)	203 (1.3)	263 (1.1)	410 (1.4)
	Casual	4 (0.0)	22 (0.1)	27 (0.1)	29 (0.1)
Other industry	Self-employed	5 (0.1)	6 (0.0)	9 (0.0)	14 (0.0)
	Regular	29 (0.3)	41 (0.3)	35 (0.1)	74 (0.2)
	Casual	6 (0.1)	5 (0.0)	12 (0.1)	3 (0.0)
Services	Self-employed	154 (1.5)	363 (2.3)	609 (2.6)	971 (3.3)
	Regular	1654(16.5)	2361(14.8)	3008(12.9)	3952(13.3)
	Casual	9 (0.1)	13 (0.1)	36 (0.2)	24 (0.1)
Total workforce		2130(21.3)	3173(19.9)	4201(18.0)	6009(20.2)
Unemployed		498(5.0)	769(4.8)	754(3.2)	1364(4.6)
Other		7392 (73.8)	11984(75.2)	18381(78.8)	22349(75.2)
Total		10020(100)	15928 (100)	23335 (100)	29724(100)

Note: Numbers are in thousands, the percentage of total is given in parentheses. Agriculture includes forestry and fishing. Other industry includes mining, construction, and utilities. Self-employment includes own account workers, home workers, employers, and unpaid family workers. Regular employees receive salary or wages on a regular basis. Casual workers receive a wage according to the terms of the daily or periodic work contract. "Other" includes all non-labour force and a small number of women who work but do not report their industry.

Below secondary education level, the participation rate was roughly constant prior to 1999, but employment did shift from agriculture and manufacturing to the services sector. After 1999 the participation rate increased and the growing importance of

services continued, but there was also a slight increase in agriculture's share and a rise in the share of manufacturing from 5 to 6.2 per cent. The participation rate among women with secondary or higher education declined between 1987 and 1999, when especially the share of women active in the services sector declined. Between 1999 and 2004 the share of services increased again, while manufacturing became more important as well.

The most recent two NSS surveys, in 1999-2000 and 2004-05, include details on workers' enterprise type and location, union presence and membership, and whether a person's employment is of permanent or temporary nature. Interestingly, self-employment is considered permanent, while regular employment is increasingly of temporary nature and union presence and membership decline. These data support the view that women's employment opportunities did not improve since the turn of the century.

A closer look at the growth of female employment in manufacturing and services reveals some interesting patterns. First of all, the rising share of both lowly and highly educated women in manufacturing after 1999 is driven by an increase in self-employment in this sector, which is very much concentrated in the wearing apparel industry. According to a study of the industry in Tiruppur, a city in South India, and in Delhi, the boom in garment exports in the 1990s attracted many women, who remain concentrated in the lowest paying activities and occupy a highly invisible part of the value chain. Home-based workers are paid a piece-rate and constitute an important buffer for demand fluctuations, thus facing huge income variations (Singh and Sapra, 2007). This description of workforce informalization is in line with Standing (1999), who argues it pushes rather than pulls women into the labour force.

Among the lowly educated women with regular employment in the services sector, the share working in private households (maids, cooks, babysitters, etc.) increased from 44 to 62 per cent between 1999 and 2004. That is, almost one million women joined the labour force as domestic servants, which is a group of legally and socially vulnerable workers, as they are not covered by existing legislation and are easy victims of exploitations due to their invisibility, lack of education and, often, migration background (Ramirez-Machado, 2003; NCEUS, 2007).

Among the highly educated women in the services sector, the share in public administration declined from 16 to 11 per cent during 1999-2004, while the share of both domestic servants and software consultants increased from less than half percent

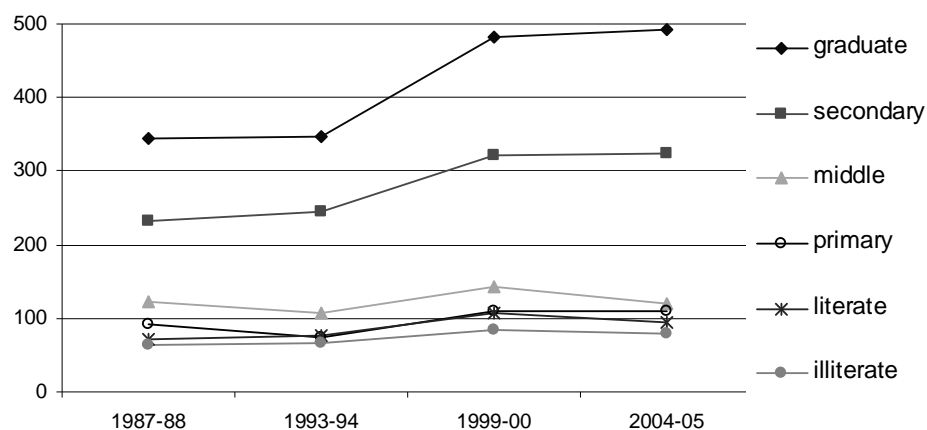
to over two per cent each. Among the highly educated self-employed women in services, the share in retail declined from 31 to 18 per cent, while the largest increases were in ‘adult and other education’ (15 to 20 per cent) and ‘other services’ (7 to 11 per cent).

All in all, the picture looks different for lowly versus highly educated women. The latter seem to have reasonable employment opportunities, mainly in private and public services, while the former increasingly work as domestic servants and home workers in the garments industries, and thereby constitute a very vulnerable group with low earnings and little security.

### 3.2. Earnings

One shortcoming of the NSS data is the fact that it does not record earnings data for self-employed workers. The average weekly earnings reported here are therefore based on employees only.<sup>5</sup> Figure 2 shows women’s real weekly earnings by education level for the four survey years. Real weekly earnings increased in the period 1993-1999 but stagnated or even declined afterwards, except for workers with graduate or higher education. The level of earnings is substantially higher for men (not shown), but the pattern of change is similar.

**Figure 2 – Average real weekly earnings, urban females (20-59)**



Source: NSS Employment and Unemployment Survey

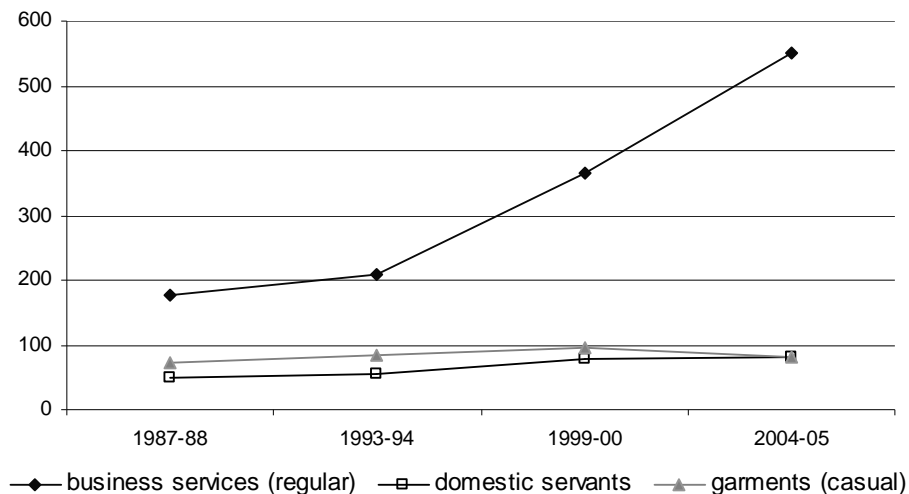
How is this picture of real wage changes reconcilable with the rosy picture of India’s economic growth? Several studies have indicated that India’s current growth pattern,

<sup>5</sup> Earnings are spatially deflated and in 1987-88 Rupees, based on the Labour Bureau Consumer Price Index for Industrial Workers and Deaton (2003). No adjustment is made for hours worked.

dominated by skill-intensive services and lacking growth in low-skilled intensive manufacturing, does not generate employment for the large low-skilled labour force (Bosworth *et al.*, 2007; Krueger, 2007; Pieters, 2010). Informalization of the workforce may make it easier for low-skilled population to find remunerative work, but also means that job security is extremely poor and wages are low and volatile. This is in stark contrast with the fast-rising wages for high-skilled workers in the services sector (see, e.g., Kijima, 2006). A much telling illustration is given in Figure 3, showing real weekly earnings of regular employees in business services, domestic servants, and casual workers in the garments industry. Since 1993-94, the gap between the first and the two latter groups has widened enormously.

As the education level of women and their spouses are correlated, lowly educated women face a double impact of declining real wages: the decline in unearned income works as a ‘push-factor’, inducing her to work, while the decline in her own market wage reduces her incentive to work. With rising participation rates, it seems that push-factors dominate the decision of lowly educated women to work.

**Figure 3 – Average real weekly earnings selected industries, urban females (20-59)**



Source: NSS Employment and Unemployment Survey

On the other hand, more attractive employment opportunities exist for highly educated women, who face higher market wages and are less likely to face declining unearned income. All in all, it is unlikely that rising participation in both groups is reflecting the same underlying process.

#### 4. Empirical model and estimation results

In light of the employment structure and changes in real earnings for different levels of education and in different industries, the main question is whether participation of women is induced by negative income effects and some sort of insurance mechanism to cope with increasing insecurity in the labour market. We hypothesize that lowly educated women's participation is indeed driven by such factors, whereas highly educated women respond more to opportunities reflected in market wages and the availability of attractive jobs.

##### 4.1. Women's participation probability

We analyse women's participation decision at the individual level, based on a sample of urban women age 20 to 44, excluding women who are enrolled in education or unable to work due to disability, and women who are head of their household. Self-employed women are dropped from the sample due to the non-availability of self-employment earnings data: the expected market wage can only be estimated for employees.<sup>6</sup>

We estimate the probability of woman  $i$  in year  $t$  being employed using a binary probit model, which is estimated separately for each year and for women below secondary education and women with secondary or higher education.

$$p_{it} = F(\alpha_{rt} + \beta_t \ln \hat{w}_{it} + \gamma_t Z_{it}), \quad (1)$$

where  $F$  is the standard normal cumulative distribution function. The model includes a region fixed effect  $\alpha_{rt}$ , which controls for region level unobservable participation determinants, the log expected market wage  $\ln \hat{w}_{it}$ , and a vector  $Z_{it}$  consisting of:

- Unearned income per capita (other household members' real weekly earnings, divided by household size)
- Employment and income security (the number of other household members working as a regular employee)
- Underemployment of male adult household members
- Marital status
- The number of children in the household
- Social group (whether a person belongs to a scheduled caste or tribe, *SCST*)

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<sup>6</sup> Clearly, some valuable information is lost by excluding this segment of the labour market, but fortunately the changes in paid employment participation are very similar to the overall female labour force participation changes.

- Religion
- Education level of the household head

The expected market wage is predicted for all women in the sample, based on a standard wage equation with Heckman selection bias correction (Heckman, 1979). Real weekly earnings are regressed on age, its square, and education level:

$$\ln W_{it} = b_{0t} + b_{1t} Age_{it} + b_{2t} Age_{it}^2 + b_{3jt} Edu_{jit} + b_{4t} \lambda_{it} + u_{it}, \quad (2)$$

where  $W_i$  is real weekly earnings,  $Edu_{ji}$  is a vector of dummy variables for education level, and  $\lambda_i$  is the inverse Mills ratio. The latter is obtained from a probit model for participation, equal to equation (1), except that the expected market wage is replaced by its determinants:

$$p_{it} = F(a_{it} + b_{1t} Age_{it} + b_{2t} Age_{it}^2 + b_{3t} Edu_{it} + c_t Z_{it}). \quad (3)$$

The wage model is identified on the vector  $Z_{it}$ , which affects the probability of participation but has no effect on earnings. Estimation results for equation (2) are given in Appendix table A.1.

To measure unearned income, the earnings of self-employed household members are imputed based on the earnings of employees. It appears this imputation serves the purpose of measuring unearned income per capita, as the results are very similar when households with one or more self-employed adults are excluded from the samples. In the final estimation we rely on the imputed earnings in order to retain as many observations as possible.

As a proxy for employment and income security we include the number of other household members with regular employment (*Nreg*), with categories zero, one, and two or more. This is based on the notion that regular employment provides more stable and secure income than other types of work. Additionally, in the surveys for 1999-2000 and 2004-05, working persons report for how many months during the reference year they were without work. This is used to measure underemployment, as an indicator variable which is equal to one if at least one working male household member reports one or more months without work.<sup>7</sup>

Marital status and the number of children are included to capture family obligations which are likely to negatively affect female labour force participation. Social group and religion are proxies for attitudes towards women's work. Members of a scheduled caste or tribe (*SCST*) are expected to be more likely to work, as these are the lowest social

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<sup>7</sup> Data on this subject in 1987-88 are not comparable with the more recent survey rounds.



classes in India, in which there is no economic room to withdraw women from the labour force and to emulate higher classes (Bardhan, 1986). Religiosity in general has been related to more traditional views of women's role (Jaeger, 2010; Seguino, 2011), but previous studies have found that Muslim women in India have lower participation rates than women of other religions (Das and Desai, 2003). Finally, we control for household head's education, which could capture social effects, but also proxies for household wealth (in addition to unearned income, which includes only current weekly earnings of other household members).

**Table 3 – Average values, low education sample**

	1987-88		1999-00		2004-05	
	mean	st.dev.	mean	st.dev.	mean	st.dev.
Employee	0.09	0.29	0.10	0.30	0.13	0.33
ln(wage)	3.69	0.17	4.07	0.12	4.04	0.10
ln(y_unearned)	3.45	0.99	3.69	1.06	3.64	1.02
Nreg 0	0.52	0.50	0.58	0.49	0.60	0.49
Nreg 1	0.38	0.49	0.34	0.47	0.31	0.46
Nreg >1	0.10	0.30	0.08	0.27	0.08	0.28
Underemployment			0.16	0.37	0.19	0.39
Age	30.07	6.83	31.11	6.78	31.20	6.88
Illiterate	0.48	0.50	0.43	0.49	0.40	0.49
Literate below prim.	0.13	0.34	0.12	0.33	0.13	0.33
Primary school	0.21	0.41	0.19	0.39	0.20	0.40
Middle school	0.18	0.38	0.26	0.44	0.27	0.44
Married	0.92	0.27	0.92	0.27	0.92	0.28
Children 0-4	0.85	1.00	0.69	0.95	0.68	0.94
Children 5-14	1.57	1.42	1.51	1.44	1.40	1.37
SCST	0.17	0.38	0.22	0.42	0.24	0.43
Hindu	0.74	0.44	0.73	0.44	0.75	0.43
Muslim	0.21	0.40	0.22	0.41	0.20	0.40
Christian	0.02	0.13	0.02	0.13	0.02	0.13
Other religion	0.03	0.18	0.03	0.18	0.03	0.17
Illiterate hh	0.26	0.44	0.28	0.45	0.28	0.45
Literate hh	0.16	0.36	0.14	0.35	0.15	0.35
Primary hh	0.20	0.40	0.15	0.36	0.18	0.38
Middle hh	0.16	0.37	0.19	0.39	0.19	0.39
Secondary hh	0.17	0.37	0.20	0.40	0.17	0.37
Graduate hh	0.05	0.22	0.05	0.21	0.04	0.19
N	22222		19391		17801	

Source: NSS Employment and Unemployment Survey.

**Table 4 – Average values, high education sample**

	1987-88		1999-00		2004-05	
	mean	st.dev.	mean	st.dev.	mean	st.dev.
Employee	0.19	0.39	0.14	0.35	0.16	0.37
ln(wage)	5.13	0.41	5.22	0.44	5.15	0.48
ln(y_unearned)	4.21	1.11	4.38	1.23	4.39	1.20
Nreg 0	0.34	0.47	0.44	0.50	0.46	0.50
Nreg 1	0.50	0.50	0.45	0.50	0.43	0.50
Nreg >1	0.16	0.36	0.11	0.31	0.10	0.30
Underemployment			0.06	0.24	0.06	0.24
Age	29.62	6.47	30.53	6.62	30.50	6.64
Secondary school	0.64	0.48	0.63	0.48	0.64	0.48
Graduate or higher	0.36	0.48	0.37	0.48	0.36	0.48
Married	0.85	0.36	0.87	0.34	0.86	0.34
Children 0-4	0.64	0.87	0.54	0.80	0.58	0.80
Children 5-14	1.08	1.20	1.03	1.19	0.97	1.11
SCST	0.04	0.20	0.07	0.26	0.09	0.29
Hindu	0.82	0.38	0.81	0.39	0.81	0.39
Muslim	0.07	0.25	0.09	0.29	0.09	0.29
Christian	0.04	0.19	0.04	0.18	0.03	0.17
Other religion	0.07	0.26	0.06	0.24	0.07	0.25
Below secondary hh	0.25	0.44	0.24	0.43	0.28	0.45
Secondary hh	0.37	0.48	0.38	0.48	0.39	0.49
Graduate hh	0.37	0.48	0.38	0.48	0.32	0.47
N	8329		12261		9884	

Source: NSS Employment and Unemployment Survey.

Tables 3 and 4 summarize the data for the final samples, which include only regular and casual employees and women out of the labour force.<sup>8</sup> In both samples, the predicted market wage (that is, the fitted value based on equation 2) is lower in 2004-05 than in 1999-000. In the low education sample there is also a decline in unearned income and an increase in underemployment, while these variables are constant during the last period in the high education sample. An increasing share of women has no other household member with regular employment.

Educational attainment is increasing in the low education sample, but stable over time within the high education sample. Interestingly, we see that the education of the household head declines between 1999-00 and 2004-05 among the highly educated women: a sign of progress in women's educational attainment relative to men's.

<sup>8</sup> Unemployed women are excluded, but results are very similar when included in the sample. In India, as in other developing countries, the difference between unemployed (who are in the labor force) and non-workers (who are out of the labor force) bears little empirical relevance.

The number of children per household declines over time and is, in each year, lower among highly education women (though the difference is not statistically significant). Scheduled castes and tribes (SCST) and Muslims are relatively overrepresented in the low education sample, and while the SCST share rises over time, the religious composition of both samples has hardly changed.

#### **4.2. Estimation results**

Tables 5 shows the average estimated marginal effects for the low and high education samples, indicating the change in the probability of being employed due to a unit change in the explanatory variable. Corresponding probit coefficient estimates can be found in Appendix Tables A.2 and A.3.

The most important result is the marginal effect of the predicted market wage: it is negative for lowly educated women and positive for the highly educated. When interpreting the wage effect, one should note that education may not only determine a woman's expected market wage, but also her reservation wage. As discussed earlier in this paper, there is a clear U-shaped relationship between education and female labour force participation, which reaches its bottom at the middle school level. While education raises the expected market wage, it is likely to raise the reservation wage in the low-education sample, reflecting changing attitudes towards women's work as the status or wealth of households increases (the Sanskritization effect). The market wage and reservation wage effects of education are not separately identifiable, but the latter rising faster than the former can explain the negative wage effect for women with less than secondary education.<sup>9</sup> The positive wage effect in the high education sample is a clear sign that, once women have at least secondary education, higher earnings potential increases the probability of participation. This effect is declining over time, however, indicating that expected earnings have become less important as a determinant of labour force participation.

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<sup>9</sup> See Blau and Kahn (2007) for a discussion of the own wage effect on hours of labor when own education level is not controlled for separately.

**Table 5 – Probit average marginal effects**

Pr(employee)	Below secondary education			Secondary or higher education		
	1987-88	1999-00	2004-05	1987-88	1999-00	2004-05
ln(wage)	-0.06*** [0.02]	-0.20*** [0.03]	-0.20*** [0.04]	0.27*** [0.01]	0.21*** [0.01]	0.17*** [0.01]
ln(y_unearned)	-0.03*** [0.00]	-0.02*** [0.00]	-0.04*** [0.00]	-0.03*** [0.00]	-0.02*** [0.00]	-0.03*** [0.00]
Nreg 1	0.01 [0.01]	0 [0.01]	0.01 [0.01]	0.11*** [0.01]	0.09*** [0.01]	0.08*** [0.01]
Nreg >1	0.04*** [0.01]	0.03*** [0.01]	0.05*** [0.01]	0.15*** [0.02]	0.13*** [0.02]	0.13*** [0.01]
Underemployed		0.03*** [0.01]	0.03*** [0.01]		0.04** [0.02]	0.00 [0.01]
Married	-0.06*** [0.01]	-0.07*** [0.01]	-0.10*** [0.01]	-0.22*** [0.01]	-0.20*** [0.01]	-0.23*** [0.01]
Children0-4	-0.02*** [0.00]	-0.03*** [0.00]	-0.04*** [0.01]	-0.03*** [0.00]	-0.01* [0.00]	-0.03*** [0.01]
Children 5-14	-0.00* [0.00]	0 [0.00]	0.01* [0.00]	-0.03*** [0.01]	-0.02*** [0.00]	-0.01** [0.00]
SCST	0.07*** [0.01]	0.06*** [0.01]	0.05*** [0.01]	0.05 [0.03]	0.05*** [0.01]	0.04* [0.02]
Muslim	-0.04*** [0.01]	-0.08*** [0.01]	-0.10*** [0.01]	-0.03 [0.02]	-0.01 [0.02]	-0.04** [0.01]
Christian	0.04** [0.01]	0 [0.02]	-0.01 [0.02]	0.12*** [0.04]	0.07* [0.03]	0.09* [0.04]
Other non-Hindu	-0.01 [0.01]	-0.04** [0.02]	-0.03 [0.02]	-0.04* [0.02]	-0.01 [0.01]	-0.01 [0.03]
Illiterate hh	0.12*** [0.01]	0.11*** [0.01]	0.11*** [0.01]			
Literate hh	0.06*** [0.01]	0.06*** [0.01]	0.06*** [0.01]			
Primary hh	0.05*** [0.01]	0.05*** [0.01]	0.06*** [0.01]			
Middle hh	0.03*** [0.01]	0.03*** [0.01]	0.04*** [0.01]	-0.01 [0.01]	0.01 [0.01]	0.02* [0.01]
Secondary hh	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Graduate hh	0.04** [0.01]	0.04* [0.02]	0.03 [0.02]	-0.01 [0.01]	0.01 [0.01]	0.03*** [0.01]
N	22222	19391	17801	8329	12261	9884
Pseudo R-sq	0.22	0.22	0.21	0.2	0.19	0.23

Note: In the high education sample, the category *Middle* for household head education includes all levels below secondary education. Region dummies are included in the estimation. Standard errors between brackets, significance levels: \*p<.10; \*\*p<.05; \*\*\*p<.01. Marginal effects are calculated using Stata's -margins- command.

As expected, unearned income reduces women's participation. Its effect is the same in both samples, though one would expect it to be stronger in the low-education sample, where the average level of income is lower. A plausible explanation for these results is that unearned income measures only weekly earnings, and the more permanent component of household income (including wealth) is captured by the household head's education level. Head's education has a negative effect on participation in the low-education sample, at least up to secondary education. Graduate or higher education of the household head increases the probability of participation again. Our results thus confirm the importance of households' economic and social status as determinants of women's labour force participation, and are in line with the U-shape and Sanskritization process (Chen and Drèze, 1992; Kingdon and Unni, 2001).

The presence, in the household, of other regular employees increases participation, especially among highly educated women. This contrasts with the idea that women are less likely to work if their unearned income is more secure. A possible explanation is that regular employment of household members provides the necessary network or information for women to find work. It could also reduce entry barriers to paid employment through familiarity with employers, reducing families' safety concerns (Sudarshan and Bhattacharya, 2009). Moreover, as discussed in Section 3.1, regular employment has become of more temporary nature between the last two survey rounds and may thus be a poor measure of employment security.<sup>10</sup> Underemployment of male household members, an alternative proxy for employment insecurity facing the household, does increase the probability of women's participation: for a given level of unearned income, if a male household member is without work for at least one month of the year, a woman is three to four percentage points more likely to work. The effect disappears, however, in the last year in the high education sample.

Turning to household composition variables, unmarried women are more likely to work, especially among highly educated women. Having young children reduces participation in both samples, while older children only reduce participation in the high-education sample: possibly, only highly educated women can afford to stay at home with older children, but the effect of older children is declining over time.

Women belonging to a Scheduled Caste or Tribe are more likely to work for pay. Religion matters in both samples, but to different degrees. Muslim women are less

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<sup>10</sup> The nature of employment (temporary or permanent) is recorded only in the 1999-00 and 2004-05 survey rounds.

likely to work, which is in line with previous studies (e.g., Das and Desai, 2003) but we clearly see that education mitigates the difference between Muslim and non-Muslim women. Christian women are more likely to work only among the highly educated women.

All in all, both groups of women respond to unearned income and underemployment of household members, and these effects are not substantially different between lowly and highly educated women. The marginal effect of the expected market wage, however, is a clear sign that highly educated women are drawn into the labour force by higher wages, whereas lowly educated women are not. Furthermore, the education level of the household head has a strong impact among the lowly educated women: their participation probability declines with higher education of the household head, up to secondary schooling. Women in graduate-headed households are again more likely to work. The importance of household wealth and status for female labour force participation is thus confirmed by our results.

## **5. Summary and conclusions**

While India's economy has grown at increasingly faster rates over the past decades, the female labour force participation rate has increased only since the start of the 21<sup>st</sup> century, when at all levels of education the share of women in the labour force increased. This paper examines trends and drivers of female labour force participation in urban India between 1987 and 2004, paying special attention to differences between lowly and highly educated women.

Changes in the structure of employment and real earnings in urban India suggest that women's increased participation was driven by necessity rather than improved opportunities, at least for women with less than secondary schooling. After 1999, the share of lowly educated women working as domestic servant and in agriculture and manufacturing self-employment increased, the latter concentrated in the garments industry. Domestic servants and home workers in the garments industry have been characterized by their invisibility, vulnerability, and meagre and highly volatile earnings (NCEUS, 2007; Singh and Sapra, 2007). Coinciding with substantial growth in these types of employment, workers with less than secondary education, both male and female, experienced a decline in their real earnings. And at all education levels, a shift from regular employment to self-employment took place, while regular employment itself became of more temporary and informal nature.

For the lowly educated urban population, therefore, the labour market developments are in line with the view of Standing (1999), who argues that rising female labour force participation reflects the erosion of men's position in the labour market, rather than an improvement in women's opportunities: workers face more insecurity as the economy liberalizes and becomes more globally integrated.

Real earnings of highly educated men and women did still rise after 1999, though at a slower rate than before. Among highly educated women, self-employment in manufacturing and services became more important, but regular employment in services increased as well. These women appear to have access to more attractive jobs in terms of visibility, security, and earnings. Given India's structure of growth, which is in large part driven by skill-intensive services, it should hardly be surprising to find that rising participation in the low- and high-education groups is reflecting different underlying processes.

To further analyse the determinants of women's participation in paid employment, we estimate a probit model using individual data from the NSS Employment and Unemployment Survey of 1987-88, 1999-2000, and 2004-05. We find that highly educated women are drawn into the labour force by higher wages, whereas the expected market wage negatively affects participation of lowly educated women, which is the main difference between the two groups. For both groups, lower unearned income and underemployment of male household members increase the probability of participation. Our analysis also confirms the importance of social and cultural factors, in line with previous studies (Mammen and Paxson, 2000; Kingdon and Unni, 2001; Sudarshan and Bhattacharya, 2009).

All in all, our analysis indicates that the impressive economic performance of the Indian economy is, if anything, only creating attractive labour market opportunities for highly educated women. The labour market for lowly educated women (and men) appears to have become more insecure, and there is no evidence that increased participation among them is a positive reflection of India's fast economic growth. It always remains debatable whether increased participation in low-paying and informal jobs should be seen as improvements compared to non-participation. For whatever reason women decide to work, it does allow them to contribute to household income. One could surely also argue that home workers in the garments industry, for example, contribute to India's economic success. As Bhalotra and Umaña-Aponte (2010) argue,

however, distress-driven participation in a highly flexible labour market is unlikely to contribute to women's emancipation.

If attractive employment opportunities and "modern" attitudes towards women's work are confined to the highly educated population, women's labour force participation may contribute substantially to household inequality in India. Several studies have shown that returns to education are high and increasing, resulting in ever higher earnings inequality (Chamrbagwala, 2006; Kijima, 2006). Spouses' education levels are positively correlated, so while participation and earnings of women at the bottom of the education (and earnings) distribution may mitigate the inequality in male earnings, rising participation at the top will only aggravate it.



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## Appendix

**Table A.1 – Wage equation, estimation results**

<i>lnW</i>	Below secondary education			Secondary or higher education		
	1987-88	1999-00	2004-05	1987-88	1999-00	2004-05
Age	-0.005 [0.026]	-0.002 [0.026]	0.006 [0.021]	0.240*** [0.027]	0.182*** [0.032]	0.086* [0.034]
Age sq.	0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.003*** [0.000]	-0.002*** [0.001]	-0.001 [0.001]
Illiterate	Ref.					
Literate	0.099 [0.057]	0.138* [0.055]	0.117** [0.044]			
Primary	0.106 [0.055]	0.148** [0.051]	0.101* [0.041]			
Middle	0.395*** [0.069]	0.256*** [0.052]	0.194*** [0.041]			
Secondary				Ref.	Ref.	Ref.
Graduate				0.505*** [0.040]	0.530*** [0.049]	0.646*** [0.051]
Constant	3.428*** [0.399]	3.841*** [0.398]	3.694*** [0.330]	0.742 [0.414]	1.494** [0.503]	2.787*** [0.515]
Lambda	0.187*** [0.039]	0.150*** [0.036]	0.113*** [0.030]	0.139** [0.044]	0.165** [0.051]	0.168*** [0.049]
N	1762	1721	2083	1492	1696	1522
N total	22235	19704	17843	8404	12291	9929

Note: Dependent variable is log real weekly earnings. Lambda is the sample selection bias correction term (see Heckman, 1979). Standard errors are in brackets, significance levels: \*p<.10; \*\*p<.05; \*\*\*p<.01

**Table A.2 – Probit model coefficients, low education sample**

<i>Pr(employee)</i>	1987-88	1999-00	2004-05
ln(w)	-0.440*** [0.125]	-1.404*** [0.199]	-1.183*** [0.241]
ln(y_unearned)	-0.215*** [0.022]	-0.171*** [0.015]	-0.225*** [0.017]
Nreg 1	0.06 [0.052]	-0.009 [0.049]	0.089 [0.047]
Nreg >1	0.300*** [0.071]	0.179*** [0.051]	0.256*** [0.072]
Underemployed		0.173*** [0.044]	0.175*** [0.030]
Married	-0.477*** [0.085]	-0.527*** [0.073]	-0.595*** [0.056]
Children0-4	-0.162*** [0.016]	-0.240*** [0.020]	-0.229*** [0.032]
Children 5-14	-0.023* [0.010]	-0.015 [0.013]	0.031* [0.014]
SCST	0.474*** [0.059]	0.394*** [0.057]	0.293*** [0.038]
Muslim	-0.352*** [0.061]	-0.662*** [0.072]	-0.715*** [0.069]
Christian	0.229** [0.077]	0.009 [0.099]	-0.035 [0.128]
Other non-Hindu	-0.084 [0.113]	-0.319* [0.137]	-0.151 [0.131]
Illiterate hh	0.950*** [0.088]	0.812*** [0.047]	0.691*** [0.063]
Literate hh	0.590*** [0.097]	0.534*** [0.059]	0.407*** [0.073]
Primary hh	0.493*** [0.079]	0.442*** [0.059]	0.437*** [0.068]
Middle hh	0.321*** [0.090]	0.266*** [0.056]	0.302*** [0.065]
Secondary hh			
Graduate hh	0.482*** [0.106]	0.382** [0.126]	0.207 [0.115]
Constant	0.63 [0.515]	5.129*** [0.783]	4.484*** [0.967]
N	22222	19391	17801
R-sq.	0.22	0.22	0.21

Note: Region dummies are included but not reported. Region cluster-robust standard errors are reported in brackets. Significance levels: \*p<.1; \*\*p<.05; \*\*\*p<.01.

**Table A.3 – Probit model coefficients, high education sample**

<i>Pr(employee)</i>	1987-88	1999-00	2004-05
ln(wage)	1.286*** [0.074]	1.123*** [0.049]	0.882*** [0.050]
ln(y_unearned)	-0.160*** [0.016]	-0.087*** [0.017]	-0.140*** [0.020]
Nreg 1	0.574*** [0.056]	0.496*** [0.039]	0.470*** [0.041]
Nreg >1	0.740*** [0.076]	0.680*** [0.073]	0.686*** [0.064]
Underemployed		0.202** [0.077]	0.026 [0.065]
Married	-1.021*** [0.065]	-1.075*** [0.059]	-1.224*** [0.050]
Children0-4	-0.139*** [0.023]	-0.066* [0.027]	-0.136*** [0.036]
Children 5-14	-0.124*** [0.025]	-0.095*** [0.016]	-0.046** [0.017]
SCST	0.222 [0.116]	0.250*** [0.059]	0.189* [0.078]
Muslim	-0.15 [0.103]	-0.056 [0.090]	-0.242** [0.087]
Christian	0.479*** [0.128]	0.345* [0.138]	0.425** [0.149]
Other non-Hindu	-0.222* [0.103]	-0.067 [0.084]	-0.057 [0.173]
Below secondary hh	-0.054 [0.042]	0.072 [0.052]	0.085* [0.043]
Secondary hh			
Graduate hh	-0.03 [0.041]	0.044 [0.041]	0.145*** [0.044]
Constant	-6.151*** [0.353]	-6.012*** [0.254]	-3.994*** [0.294]
N	8329	12261	9884
R-sq.	0.20	0.19	0.23

Note: Region dummies are included but not reported. Region cluster-robust standard errors are reported in brackets. Significance levels: \*p<.1; \*\*p<.05; \*\*\*p<.01.