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Precarious Drop

Reassessing Patterns of Female Labor Force Participation in India

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Abstract

This paper uses successive rounds of National Sample Survey Organization data from 1993–94 to 2011–12, and draws from census data. This paper (i) provides a description of nearly two decades of patterns and trends in female labor force participation in India; (ii) estimates the extent of the recent decline in female labor force participation; and (iii) examines and assesses the contribution of various demographic and socioeconomic factors in explaining the female labor force participation decision and the recent the drop. The analysis finds that female labor force participation dropped by 19.6 million women from 2004–05 to 2011–12. Participation declined by 11.4 percent, from 42.6 to 31.2 percent during 1993–94 to 2011–12. Approximately 53 percent of this drop occurred in rural India, among those ages 15 to 24 years. Factors such as educational attainment, socioeconomic status, and household composition largely contributed to the drop, although their effects were more pronounced in rural areas. Specifically, the analysis finds a U-shaped relationship between levels of educational attainment and female labor force participation. The decomposition of the contribution of these various determinants to the female labor force participation decision suggests that stability in family income, as indicated by the increasing share of regular wage earners and declining share of casual labor in the composition of family labor supply, has led female family members to choose dropping out of, rather than joining, the labor force. The findings of this paper suggest that conventional approaches to increasing female labor force participation (such as education and skills and legal provisions) will be insufficient. Policies should center on promoting the acceptability of female employment and investing in growing economic sectors that are more attractive for female employment.

Precarious Drop: Reassessing Patterns of Female Labor Force Participation in India

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1. Introduction

Jawaharlal Nehru once remarked, "I have long been convinced that a nation's progress is intimately connected with the status of its women" (Parthasarathi, 1985). In the wake of successive waves of economic liberalization, the 'condition' of India—when thought of in terms of economic and human development—has improved dramatically. Yet, while the status of women has arguably improved in both the public and private spheres, their ability to access opportunities in this newly liberalized economy remains precarious. India's female labor force participation (FLFP) rate has remained visibly low; the ILO (2013) ranks India's FLFP rate as 121 out of 131 countries, one of the lowest in the world. In 2013, India had the lowest FLFP rate in South Asia, with the exception of Pakistan. Globally, only parts of the Arab world held a lower FLFP rates than India in the same year (Table 1).

Table 1: Estimated Female Labor Force Participation Rates for All Ages (%)

	1990	1995	2000	2005	2010	2013
India	34.8	35.4	33.9	36.9	28.6	27.0
Bangladesh	61.7	58.3	54.2	55.5	56.9	57.4
Sri Lanka	36.4	36.3	37.3	34.4	34.8	35.1
Nepal	79.8	80.0	81.7	80.5	79.9	79.9
Pakistan	13.4	12.5	16.0	19.3	23.9	24.6
China	72.7	72.2	70.7	66.5	63.5	63.9
Arab World	20.8	20.5	20.9	21.4	22.7	23.3
European Union	45.7	46.3	47.8	48.8	50.2	50.8
United States	56.4	57.8	59.0	58.3	57.6	56.3

Source: ILOSTAT 2015

Moreover, the FLFP rate dropped from 49.0 percent to 37.8 percent in rural areas between 2004-05 and 2009-10 (NSSO, 2011), despite an impressive annual GDP growth rate of around 8.6 percent, and an annual population growth rate of 1.74 percent. The same pattern continued into the most recent round of the National Sample Survey (NSSO) in 2011-12. Among the Asian

economies, only China experienced a marginally higher drop in FLFP rate from 1990 to 2013. However, in comparison to India, China's FLFP rate remained considerably higher at 64 percent. Pakistan, which had lower FLFP than India in 2013, experienced a sharp rise in women's participation in the labor force during 1990-2013. Further, for the first time in recent history, estimates suggest that between 2004-05 and 2009-10, not only was there a decline in India's FLFP rate, but also a shrinking of the total female labor force.

Using several rounds of NSSO and census data in India, this paper conducts an empirical examination to better understand the socioeconomic and demographic dynamics of this downslide in FLFP during the post-liberalization era after 1991, a period marked by economic growth. This paper contributes to the existing empirical literature on FLFP in India in several key areas. First, it provides an analysis of the patterns and trends in FLFP in India using several rounds of NSS data. Second, the paper attempts to identify various cross sections of the female population—such as age cohorts, economic groups, and social groups, both in isolation and in combination—that can account for the magnitude of the drop in FLFP, thus illuminating the underlying anatomy of the phenomenon. Finally, the paper tries to identify the relative contribution of the various determinants of the FLFP decision in both urban and rural areas during the same period, and examines whether such information can provide insights into the driving factors of the recent drop in FLFP.

This paper is organized as follows. In the second section, we examine trends in FLFP in India during 1993-94 to 2011-12 and estimate the extent and magnitude of the drop. Since our calculation is based on inter-censual projections, we compare our calculated FLFP figures with those of various other authors for validation of both the projection method used and the measure of the size of the labor force. In the third section, we analyze the contributions of various age

cohorts, economic groups and social groups in the overall drop in FLFP rates, which highlights the structural transformation in the female labor supply in India and its impact on various cross sections of the population. In the fourth section, having already assessed trends in FLFP across the aforementioned determinants, we then use the Shapley decomposition technique to isolate the relative contribution of each factor in the FLFP decision, thereby exploring the extent to which each of these factors has influenced FLFP at different points in time. The fifth section summarizes the main findings and conclusions of the paper.

Our estimates show that the magnitude of the drop in FLFP from 2004-05 to 2011-12 was quite substantial, amounting to 19.6 million women and girls no longer actively participating in the labor force. In terms of rates, participation declined by 11.4 percentage points, from 42.6 to 31.2 percent during the period spanning 1993-94 to 2011-12. About 53 percent of this drop occurred in rural India, among the age group of 15 to 24 years old. Factors such as educational attainment, socio-economic status and household composition largely contribute to the drop, though their effects are more pronounced in rural areas. Specifically, we find a U-shaped relationship between levels of educational attainment and FLFP. The decomposition of the contribution of these various determinants in FLFP decision suggests that stability in family income, as indicated by the increasing share of regular wage earners and declining share of casual labor in the family labor supply composition, has led female members to choose dropping out of, rather than joining the labor force.

The realities that are presented and analyzed in this paper—low and declining FLFP rates, as well as the general reduction in the size of the total female labor force—are significant matters of concern. As India poises itself to increase economic growth and foster development, it is necessary to ensure that its labor force becomes fully inclusive of women. Doing so will require significant

efforts in the realm of policy and programming, at the local and national levels; failure to do so will merely prolong the precarious role of women in the economic life of the nation.

2. Female Labor Force Trends in Post-Liberalization India

2.1 Database and Method

Confining our analysis to the post-liberalization era in India, we consider the NSSO data sets for all rounds between Round-50 (1993-94) and the latest available, Round-68, that was collected in 2011-12. In order to calculate labor force participation trends, we utilize information on Usual Principal and Subsidiary Status (UPSS) of the activity classification provided in these data sets.[2] Total FLFP rates, as well as those for rural and urban areas are provided below in Table 2. For the purposes of this study, we consider the working age population as inclusive of those in the age group of 15 years and above.

Table 2: Female Labor Force Participation Rates, Using UPSS for Ages 15 and Above (%)

	Rural	Urban	Total
1993-94	49.0	23.7	42.6
1999-00	46.0	21.0	39.5
2004-05	49.4	24.4	42.7
2009-10	37.8	19.4	32.6
2011-12	35.8	20.5	31.2

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[2] Activity status' is the activity which a person reports for a given reference period, with regard to their participation in economic and non-economic activities. According to this, a person could be in one of the following three broad activity statuses during a reference period: (i) working or being engaged in economic activity (work) as defined above; (ii) being not engaged in economic activity (work) but either making tangible efforts to seek 'work' or being available for 'work' if 'work' is available; and (iii) being not engaged in any economic activity (work) and also not available for 'work.' The three activity statuses for each individual are accounted for separately in three different reference periods, called Usual Status (US), Current Weekly Status and Current Daily Status. In this study we only consider usual status; US consists of two activity statuses, based on the time spent on an activity during a major part of the reference period and a minor part of the reference period, respectively. The reference period is the 365 days preceding the date of survey. Usual principal status (UPS) of a person relates to the status of a person engaged in any one of the activities mentioned above for 183 days or more (a majority of time) during the reference period. Usual subsidiary status (USS) of a person relates to the activity status of that person during the minor time (183 days or less) during the reference period, if the person was engaged in work during the minor time period. But the USS of a person is recorded only if the person was engaged in that activity for at least 30 days. Usual status considering principal and subsidiary status taken together (PS +SS) is the broader definition of usual activity status, determined on the basis of the usual principal activity and usual subsidiary economic activity of a person taken together. According to the usual status (PS+SS), workers are those who are accounted for as workers by either the UPS or USS criteria. Thus, a person who is not a worker in the UPS is considered a worker according to the usual status (PS+SS) if the person pursues some subsidiary economic activity for 30 days or more during the 365 days preceding the date of survey (NSSO 2011).

Drawing on the categorization of activity status, many empirical studies have raised concerns about the credibility of the NSSO database in appropriately capturing women's work. Hirway (2012) argues that the NSSO surveys are incapable of capturing women's work. The author draws attention to the 'activity status' category '93' that records those who "attended domestic duties and were also engaged in (a) free collection of goods such as vegetables, roots, firewood, cattle feed, etc., and (b) sewing, tailoring, weaving, etc." The author argues that the NSSO marks category '93'as non-workers despite the fact that that they are engaged in economic activities covered under the production boundary of the United Nations-System of National Accounts. Although the Indian System of National Accounts (ISNA) considers the number of workers in category '93' too small to have any serious impact on the labor force, the author argues that extrapolation using *time use survey* data shows that the number of workers who are excluded from the labor force due to this categorization is in fact substantial. She further argues that the expansion of this category of workers as home based workers is probably the reason for the decline in FLFP rates as measured by the NSSO. Similarly, Sudarshan and Bhattacharya (2009) expressed doubts on the credibility of NSSO data, suggesting that the survey underestimates women's actual work participation. In support of their argument, they provided evidence from a separate survey done in urban Delhi, which showed higher labor force participation rates for women than the national survey. While recognizing the basis for such arguments, nonetheless NSSO data represent the strongest empirical basis for assessing female labor participation. For the rest of the paper, we adhere to the NSSO definition, since this data source is the main national database for this purpose, and it follows international protocols that are well accepted in the literature (NSSO, 2011).

As the sampling frames for the NSSO surveys are based on the decennial population census, we use population census data to approximate the actual number of women in the labor force across rounds. Since the census and NSSO survey years do not match, we first project the population figures for NSSO survey years from the census for compatibility. Population figures from the 1991, 2001 and 2011 censuses for various categories, including rural males, rural females, urban males and urban females are interpolated for the years viz. 1993, 1994, 1999, 2000, 2004, 2005, 2007, 2008, 2009, 2010, and 2012 using compound annual growth rates. Next, we take a simple average of the two years that correspond to each NSSO survey period viz., 1993-94; 1999-00; 2004-05; 2007-08; 2009-10 and 2011-12. The projected population figures are given in Table 3.

Table 3: Trend in Female Labor Force between 1993-94 and 2011-12

Round	Total female population		Female population above 15 years		FLFP (Based on UPSS)		
	Rural	Urban	Rural	Urban	Rural	Urban	Total FLFP
1993-94	317,673,031	110,054,315	202,964,444	73,677,754	99,518,541	17,432,031	116,950,573
1999-00	351,946,619	129,962,760	224,652,419	89,170,854	103,383,673	18,704,086	122,087,759
2004-05	375,871,197	150,098,317	246,782,858	107,059,771	121,870,827	26,147,004	148,017,831
2007-08	389,035,480	163,874,365	262,370,352	120,148,883	111,853,912	23,526,797	135,380,709
2009-10	398,066,826	173,753,871	274,142,334	129,531,026	103,722,684	25,164,653	128,887,337
2011-12	404,974,104	181,536,553	281,815,810	135,890,458	100,942,252	27,915,420	128,857,672

Source: Authors' own estimate based on NSSO and census data as noted below.
Note: As described earlier, we extrapolated census data from 1991, 2001 and 2011 in order to project the total female population above 15 years of age for 1993-94, 1999-00, 2004-05, 2007-08, 2009-10 and 2011-112, across rural and urban locations. We then use the FLFP rate as calculated from NSSO data for the same years to determine the total FLFP.

Our calculation from NSSO survey data across rounds suggests that FLFP rates for the age group of 15 years and above had declined from 42.6 percent in 1993-94 to 31.2 percent in 2011-12 (Table 2). The decline had been continuous during the last two decades, except for the year 2004-05, when it rose to 42.7 percent. While the FLFP rate had initially been higher in rural areas, the decline in the FLFP rate was also more severe in rural areas. As Table 2 suggests, rural areas experienced a drop of 13.2 percentage points during the period, corresponding to a drop of 3.1

percentage points in urban areas. For urban areas, there are probable signs of a turnaround with a marginal recovery; the FLFP rate increased from 19.4 percent in 2009-10 to 20.5 percent in 2011-12. Based on these participation rates calculated from NSSO data, Table 4 shows that the estimated total FLFP for the age group of 15 years and above had increased from 116.9 million in 1993-94 to 148.0 million in 2004-05. Thereafter, it dropped to 128.8 million in 2011-12.

2.2 Trend

Comparing the two periods between 1993-94 to 2004-05 and 2004-05 to 2011-12, most of the drop in FLFP is found to have occurred during the second period, and it was most pronounced in rural areas (Table 4). In terms of change, our estimation suggests that there were an additional 31 million females in the labor force during the eleven-year period between 1993-94 and 2004-05. In contrast, during the later seven-year period between 2004-05 and 2011-12, there was a significant drop in the female labor force by 19.2 million individuals (Panel II, Table 4). Of the 31 million additional female workers during 1993-94 to 2004-05, 25.9 million had joined the labor force during the period 1999-2000 to 2004-05 (Panel I, Table 4, second row, and third column). Of the 19.2 million drop, 19.13 million female workers had left the labor force during the short period of 2004-05 to 2009-10 (Panel I, Table 4, fourth row, and third column).

Table 4: Change in Male and Female Labor Force Participation Across Rounds

	Rural		Urban		Total	
Panel I	Male	Female	Male	Female	Male	Female
1993-94 to 1999-00	13,643,608	3,865,132	12,046,864	1,272,055	25,690,472	5,137,186
1999-00 to 2004-05	19,997,430	18,487,154	15,608,202	7,442,918	35,605,632	25,930,072
2004-05 to 2009-10	14,392,954	(18,148,143)	11,477,387	(982,351)	25,870,341	(19,130,494)
2009-10 t o2011-12	3,756,646	(2,780,432)	5,011,517	2,750,767	8,768,163	(29,665)
Panel II						
1993-94 to 2004-05	33,641,038	22,352,286	27,655,066	8,714,973	61,296,104	31,067,258
2004-05 to 2011-12	18,149,600	(20,928,575)	16,488,904	1,768,416	34,638,504	(1,916,0159)

Source: Authors' own estimate based on NSSO and census data. Numbers within parentheses indicate the drop in FLFP.

The addition of 25.9 million female workers during 1999-00 to 2004-05 was mainly due to a surge in FLFP in rural areas. The drop in FLFP during the later period of 2004-05 to 2009-10 was also mainly due to the withdrawal of rural females. There was a decline of 0.98 million workers in urban areas between 2004-05 and 2009-10, while 2.7 million joined the labor force during the period of 2009-10 to 2011-12, leading to an absolute decline of 19.16 million during the period of 2004-05 to 2011-12.

2.3 Comparison of Estimates of FLFP with Prior Studies

Over the past few years, several papers have examined the puzzle of this unprecedented drop in FLFP during 2004-05 and 2011-12 in India. To begin, we first discuss prior estimates of FLFP in India and then compare our estimates with those of previous studies. We use various '*Employment-Unemployment*' rounds of the NSSO as the principal data source for estimating trends in FLFP. From prior studies based on Usual Principal and Subsidiary Status (UPSS), participation is understood to have increased by 27.0 million female workers between 1999-2000 and 2004-05 (Rangarajan et al., 2011). Estimates by Himanshu (2011) and Abraham (2013) closely follow the above figure at 26.7 million and 26.5 million, respectively. Our own estimates follow suit, suggesting an increase of 25.9 million. In the following period, 2004-05 to 2009-10, female labor participation was reported to have declined to the extent of 21 to 22 million workers (Rangarajan et al., 2011; Himanshu, 2011; Kannan and Raveendran, 2012). Overall, there is consensus among various studies that there was a relatively large rise in labor participation — to the tune of about 26 million to 27 million during the period of 1999-2000 to 2004-05 — followed by a considerable decline during the period of 2004-05 to 2009-10 (Table 5). These studies corroborate our estimates in Table 4, of the rise and drop in FLFP between 1993-94 and 2004-05 & 2004-05 and 2011-12, respectively.

Table 5: Comparison of the Estimates of Female Labor Force (millions)

Panel I: Female Labor Force (millions)	Himanshu (2011)		Abraham (2013)		Kannan and Reveendran (2012)	
	Male	Female	Male	Female	Male	Female
1999-00	280.9	125.9	279.5	125.4		
2004-05	316.5	152.6	314.7	151.9	315.94	150.84
2009-10	339.2	130.6	339.0	130.2	340.46	129.9
2011-12			351.3	132.4		
Panel II: Change in Female Labor Force (millions)						
99-00 to 04-05	35.6	26.7	35.2	26.5		
04-05 to 09-10	22.7	-22.0	24.3	-21.7	24.52	-20.94
09-10 to 11-12			12.3	2.2		

Source: Estimates adapted from Himanshu (2011), Abraham (2013) and Kannan and Raveendran (2012).

In terms of gender, these studies show that the size of the male labor force increased by 35.2 million workers during 1999-2000 to 2004-05, while the female labor force increased by 26.5 million during the same period (Abraham, 2013). Yet, during the later period of 2004-05 to 2009-10, when the size of the male labor force increased further by about 24.3 million, the size of the female labor force dropped by around 21.7 million. During the entire decade spanning 1999-2000 to 2009-10, when male participation increased by 59.7 million, female participation increased by only 5 million. In the following period of 2009-10 to 2011-12, there was only a marginal addition of 2 million female workers, while the male labor force increased by 12.3 million.

In summary, prior studies report that between 2004-05 and 2009-10, there was a drop in FLFP between the range of 20.94 million (Kannan and Raveendran, 2012) to 22 million (Himanshu, 2011). Abraham (2013) suggests a drop of 19.7 million between 2004-05 and 2011-12. Our estimates in Table 4 closely follow the figures provided by other studies, particularly by Abraham (2013). When focusing on the working age group population of 15 years and above, we find that there was a drop in FLFP by approximately 19.16 million workers between 2004-05 and 2011-12.

3. Anatomy of the Drop

3.1 Age Group and Female Labor Force Participation (FLFP)

Looking at the drop in FLFP across age groups during the period 2004-05 to 2011-12, we find that approximately 53 percent of the 19.16 million drop had occurred solely within the younger cohort, among the age group of 15 to 24 years old (Table 6). Among the rest of the population, 32 percent of this drop occurred within the age group of 25-34 years, and about 15.6 percent in the age group of 35 years and above.
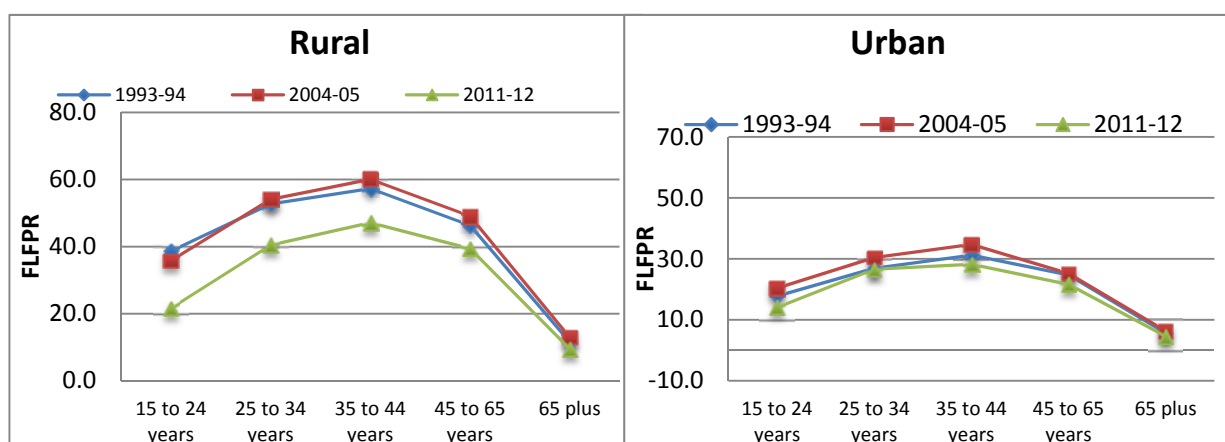
Table 6: Distribution of Drop in FLFP Across Age Group During 2004-05 to 2011-12

Age group	Rural	Urban	Total
Between 15 and 24 years	(9,364,994)	(790,695)	(10,155,689)
Between 25 and 34 years	(7,362,792)	1,226,678	(6,136,114)
Between 35 and 44 years	(2,790,808)	525,240	(2,265,568)
Between 45 and 65 years	(1,189,800)	855,174	(334,627)
Above 65 years	(220,181)	(47,982)	(268,162)
Total	(20,928,575)	1,768,415	(19,160,160)

Source: Authors' own estimate based on NSSO and census data.

The FLFP rate across different age groups displays an inverted U shape for all years, as expected, in both rural and urban areas (Figure 1). The FLFP rate peaked in the age group of 35 to 44 years. In terms of change, between 1993-94 and 2004-05, there were only marginal variations in age-specific FLFP rates for both rural and urban areas. However, between 2004-05 to 2011-12, the FLFP rate had declined across all age groups, in both rural and urban areas. This decline was most pronounced in rural areas, and held more or less similar for the age groups of 15 to 24, 25 to 34, and 35 to 44 years of age. Beyond these age groups, the FLFP rate converged with that of 2004-05. In urban areas too, the trends are similar, though the decline in the FLFP rate between 2004-05 and 2011-12 across age groups had been far more narrow than in rural areas.

Figure 1: Female Labor Force Participation Rates by Age Groups: Rural and Urban Areas

While the above figure traces the trend in FLFP across age-groups over time, the following Table 7 quantifies the intertemporal change for each group. It suggests that the largest decline in the FLFP rate for rural areas occurred among the youngest age group, 15 to 24 years, by 17.1 percentage points during 1993-94 to 2011-12 (Table 7). As we proceed through the age groups, the decline in the FLFP rate appears to decrease, with the lowest decline being 2.1 percentage points for the age group of 65 years and above. In urban areas, however, the association between age groups and the decline in the FLFP rate over the years is similar, but more modest.

Table 7: Change in FLFP Rate in Rural and Urban India, by Age Group

	Change in Rural FLFP Rate			Change in Urban FLFP Rate			Difference in Differences		
Age	1993-05	2005-12	1993-12	1993-05	2005-12	1993-12	1993-05	2005-12	1993-12
15 to 24	-2.9	-14.2	-17.1	2.6	-6.3	-3.7	-5.5	-7.9	-13.4
25 to 34	1.4	-13.6	-12.3	3.5	-3.8	-0.3	-2.1	-9.8	-11.9
35 to 44	2.8	-12.9	-10.1	3.5	-6.5	-3.0	-0.7	-6.4	-7.1
45 to 65	2.8	-9.7	-6.9	0.5	-3.5	-3.1	2.3	-6.1	-3.8
65 plus	1.4	-3.5	-2.1	0.7	-1.7	-1.0	0.7	-1.7	-1.0

Historically in India, the education of female children, especially at the secondary and higher levels, was conventionally discouraged due to the perceived social role of females as caregivers. This social role was equally applicable for before and after marriage— leading to gender

discrimination in educational attainment (Kingdon, 1998; Drez and Kingdon, 2001; Zimmerman, 2011, to name a few). One plausible explanation for the recent drop in FLFP, therefore, is that with the recent expansion of secondary education (due to sustained efforts by the central and state governments), as well as rapidly changing social norms in India, more working age young females (15-24 years) are opting to continue their education rather than join the labor force early.[3]

If this argument is valid, it implies that the reduction in FLFP should at least be compensated by an increase in educational enrollment for young women. In other words, the sum of the 'percentage loss' of working age females from the labor force and the 'percentage gain' in schools should at least be the same or rising over the same period. We call this '*sum*' the combined participation rate (CPR). To calculate the combined participation rates, we add up the labor force participation rates and educational participation rates as provided in Table 8.[4]

Table 8: Female Labor Force Participation and School Attendance

	FLFP Rate (%) (1)		% Young Females (15-24) in Schools (2)		Combined Participation Rate (%) (CPR) (1+2)	
	Rural (R1)	Urban (U1)	Rural (R2)	Urban (U2)	Rural (R1+R2)	Urban (U1+U2)
Panel I: Young Cohort (15-24)						
1993-94	42.0	18.3	10.7	31.0	52.7	49.2
2004-05	38.2	19.7	17.8	35.2	56.1	54.9
2011-12	22.7	14.5	32.8	45.7	55.5	60.2
Panel II: All (15 & above)						
1993-94	49.0	23.7	3.3	9.7	52.3	33.4
2004-05	49.4	24.4	4.9	9.9	54.3	34.3
2011-12	35.8	20.5	8.5	12.0	44.4	32.6

Source: Authors' own estimate based on NSSO data.

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[3]Several recent studies have provided evidence for this hypothesis. Rangarajan et al. (2011) estimated that 44 percent of the share of women who withdrew from the labor force during 2004-05 to 2009-10 were those who chose to engage in education. Neff et al. (2012) also argue that the decline in FLFP in rural areas during the period of 2004-05 to 2009-10 is partly due to the effect of education, wherein nearly a quarter of the working age group, consisting of young females (15 to 24 years) have moved into higher education. Kannan and Raveendran (2012) estimated that within the total drop in FLFP during the same period, about 27 percent of this drop may be accounted for by additional enrollment in education. Abraham (2013) also finds that FLFP among women in the age group of 16 to 25 years had declined during 2004-05 to 2009-10, mainly due to rising educational attendance. Similarly, Thomas (2012) observed that a rise in educational enrollment was the primary reason for the decline in FLFP among the younger age groups during 2004-05 to 2009-10.

[4] We calculate combined participation rates for two sets of age groups: 15 to 24, and 15 years of age and above.

During 1993-94, the rural CPR for the age group of 15 to 24 years was 52.7 percent, a figure which increased to 55.5 percent during 2011-12 (Table 8). Moreover, the FLFP rate for this age group declined by 19.3 percent (from 42 percent to 22.7 percent) by 2011-12, and during this period the decline was more than compensated by a gain of 22.1 percent in educational participation among working age females. Similarly, in urban areas, the CPR increased by 11 percent (from 49.2 to 60.2 percent), despite a decline in the FLFP rate by only 3.8 percent (from 18.3 to 14.5 percent) during 1993-94 to 2011-12. These figures support the argument that the decline in the FLFP rate for females between 15 to 24 years of age was to a large extent (or may be completely) due to an increase in female enrollment in education.

While evidence from the latest NSSO data corroborates this fact for the age group of 15-24 years (Panel I in Table 8), it falls short to explain the overall drop which occurred for the entire working age female population (Panel II). In terms of change, during 1993-94 to 2011-12, the rural CPR declined by 7.9 percentage points and the urban CPR declined by 0.8 percentage points (Table 8). In rural areas, the decline in CPR was caused by a 13.2 percentage point decline in the FLFP rate, which outweighed a 5.2 percentage point rise in educational attendance. This suggests that the decline in the total FLFP rate during 1993-94 to 2011-12 across all age groups was not in fact due to a rise in educational attendance. To be specific, 62 percent of the total drop in the FLFP rate which occurred in rural areas during 1993-94 to 2011-12 was due to reasons other than increased attendance in educational institutions. In urban areas, only 28 percent of the total drop in FLFP was due to reasons other than attending educational institutions.

The above analysis on CPR dismisses the hypothesis that the overall drop in FLFP of working age females is the result of higher school attendance among the younger cohort, especially in rural

areas. This finding calls for an analysis of the drop in FLFP in terms of other factors, such as level of education, marital status, socio-economic status and spatial heterogeneity.

3.2 Level of Education and Female Labor Force Participation

To better understand the effect of educational attainment on FLFP rates, we consider two aspects. First, we assess the changes in demographic profile by level of education (Figure 2), and second, we look at patterns in the relationship between the FLFP rate and levels of educational attainment (Table 9). In terms of education, the composition of the working age female population has undergone vast changes during the period between 1993-94 to 2011-12, with increasing proportions of secondary and higher secondary educated women, who in turn have a lower propensity to participate in the labor force. In general, the share of illiterates among the female population have decreased, while the share of women with higher education, especially in urban areas, has increased substantially (Figure 2).

**Figure 2: Level of Education of Working Age Females in India**
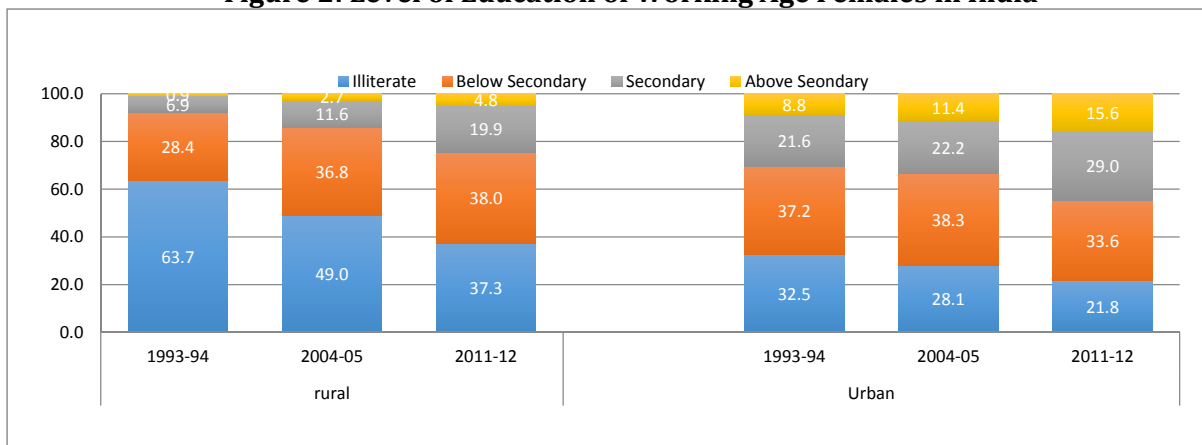
Source: Authors' calculation from NSSO data.

Now, turning to the relationship between the FLFP rate and levels of educational attainment, posessing secondary and higher secondary levels of education were not found to be an incentive for women to participate in the labor market in India (Figure 3). The lowest incidence of FLFP

rates is among those who had attained secondary and post-secondary (10+2) levels of education, followed by those with levels of education below the secondary level, across years in both rural and urban areas. The FLFP rate is highest among illiterates and college graduates in both areas. This creates a U-shaped relationship between level of education and FLFP in India, across all rounds of NSSO survey data during the post liberalization period.

Figure 3: FLFP Rate by Level of Education
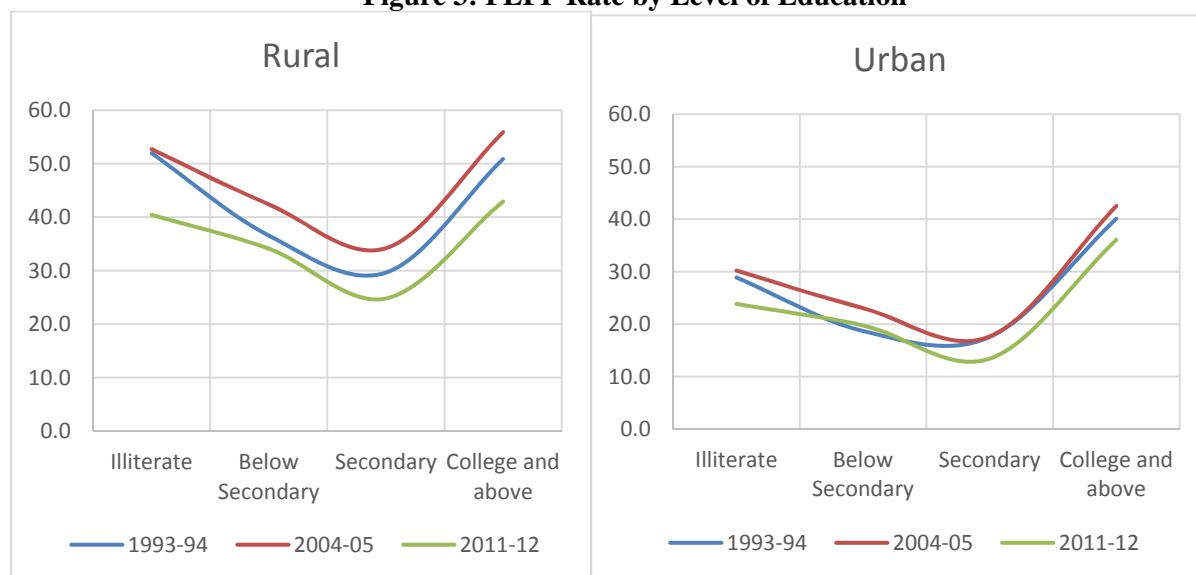
Source: Authors' own estimate based on NSSO data.

Klasen and Peters (2013) also find a U-shaped relationship between education and FLFP in urban India. They argue that illiterate women and women with very low levels of education tend to participate more in the labor market, while women with intermediate levels of education seem to withdraw from the labor market. Women with very high levels of education do enter the labor market in order to seek better paid work. Sudarshan and Bhattacharya (2009), in their study on the Delhi labor market, argue that the relationship between education and FLFP only becomes significant when considering levels of education at the college level or higher.

In terms of change in the FLFP rate, however, there is a drop in FLFP in recent years across all educational categories, in both rural and urban areas. This indicates that irrespective of one's educational attainment, the incentive for females to participate in the labor force has declined over the period. The FLFP rate had declined across all levels of education, from illiterates to college graduates, during 1993-94 to 2011-12. These two groups, illiterates and those with a college education, who initially held the highest participation rates, are also the groups that experienced the largest drops in FLFP rate during this period. In rural areas, there was an 11.5 percentage point decline in the FLFP rate among illiterate females, and for college educated females the decline was 8.0 percentage points (Table 9). In urban areas, there was a decline of 5.0 percentage points and 4.0 percentage points, respectively.

Table 9: Change in FLFP Rate According to Level of Education

	Rural (%)		Urban (%)	
	93-94 to 11-12	04-05 to 11-12	93-94 to 11-12	04-05 to 11-12
Illiterate	-11.5	-12.3	-5.0	-6.4
Below Secondary	-2.4	-8.3	1.1	-3.3
Secondary & HS	-4.8	-9.4	-4.1	-4.2
College & Higher	-8.0	-13.0	-4.0	-6.5

Source: Authors' own estimate based on NSSO data.

Here we have an intriguing situation, wherein both educational attendance and attainment are associated with declining FLFP. This apparent decline in the FLFP rate, which occurs in the presence of an increase in educational attainment up to a given level, calls for much more detailed analysis. The decline in the FLFP rate for all educational categories and the particularly poor performance of those with secondary (10) and higher secondary (10+2) levels of education need to be explored in detail. In understanding this phenomenon, one potential point of consideration is the link between the marriage market, social status and educational attainment. Another possible explanation could be poor demand side conditions for educated women.

3.3 Marital Status and Female Labor Force Participation

Marriage has been highlighted in the literature as a marker for one's status as a labor market participant. Marital status affects FLFP in two key ways. First, after marriage, women typically take on the role of care-giver in the family, which significantly alters the allocation of their time. Second, marriage broadly changes a woman's social position and status; a married women joins the labor force only when social norms and the stigma attached to paid labor conforms with family restrictions.

The distribution of working age women by marital status suggests that the share of currently married women is higher in rural areas (at 71.2 percent in 2011-12) than in urban areas (66.6 percent in the same year) (Figure 4). The share of currently married women was largely stable during the period between 1993-94 and 2011-12, with 71.2 to 73.5 percent of women in rural areas being married, and 65.3 to 66.6 percent of women being married in urban areas. Therefore, any change in FLFP by marital status can be considered as the direct effect of change in status rather than a relative change in composition.

Figure 4: Marital Status of All Working Age Females
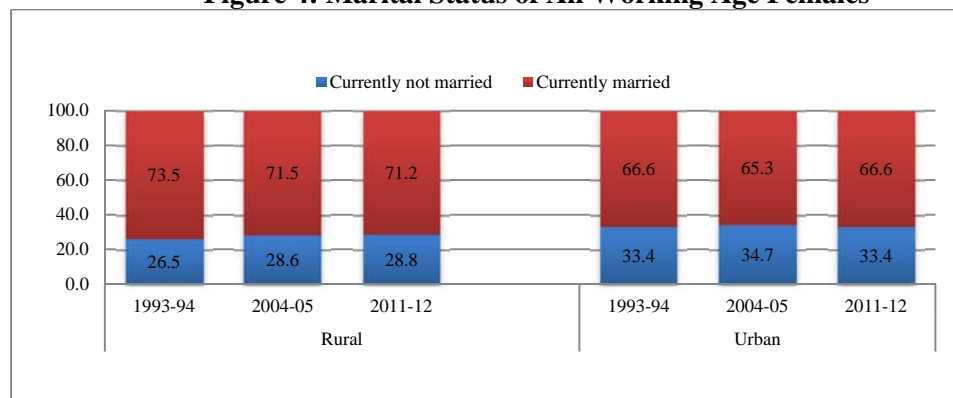
Source: Authors' own estimate based on NSSO data.

We find that the association between marital status and FLFP did vary across location. In rural areas, the FLFP rate of married women was distinctly above that of unmarried women in all time

periods. For instance, in 2011-12, the FLFP rate of married women was 38.4 percent, while that of currently unmarried women was 26.7 percent (Table 10). An inverse trend is seen in urban areas, where the participation rates of unmarried women were higher than that of married women.

Over time, however, the labor force participation gap between married and unmarried females held relatively consistent in both rural and urban areas. In rural areas, a decline in the FLFP rate was evident among both married and unmarried females. In urban areas, it was stagnant at low levels, irrespective of marital status. Between 1993-94 and 2004-05, the FLFP rate of married women in rural areas increased marginally by 1.6 percentage points, and in the period of 2004-05 to 2011-12, it dropped drastically by 12.4 percentage points. These trends account for a total decline of 10.8 points in the FLFP rate during the entire period of 1993-94 to 2011-12. The FLFP rate for rural unmarried women fell all throughout, leading to an overall fall of similar magnitude (10.6 percentage points). This occurred in spite of the fact that rural unmarried women experienced a smaller drop in their FLFP rate than that of married women in the second period. After an increase in the FLFP rate for both married and unmarried groups in urban areas during 1993-94 to 2004-05, participation rates then dropped between 2004-05 and 2011-12, leading to an overall drop in the FLFP rate for both married and unmarried women. Thus, while marital status did have an impact on the participation rates of women in the labor market, it does not help explain the aforementioned drop that occurred during 1993-94 to 2011-12.

Table 10: FLFP Rate by Marital Status in Working Age Population

| | Rural | | Urban | |
	Currently not married	Currently married	Currently not married	Currently married
1993-94	37.3	49.2	25.2	22.8
1999-00	33.7	46.7	22.4	20.3
2004-05	37.0	50.8	28.2	24.9
2009-10	28.6	38.5	22.4	18.9
2011-12	26.7	38.4	24.0	20.0

3.4 Social Groups and Female Labor Force Participation

It is evident that membership in certain social groups affects a woman's ability to participate in the labor force. Households belonging to marginalized communities are known to have lower levels of income compared to others, thus producing a negative income effect on women's participation. Moreover, the literature indicates that women in households belonging to upper caste groups are discouraged from engaging in paid work due to the long-standing stigma attached to women's paid work (Boserup, 2008). To analyze the effect of social groups on the FLFP rate in India, we must first look at the demographic composition of the female population, searching for any effect on the FLFP rate that occurs due to demographic changes in the composition of social groups. The composition of various social groups was largely stable during the period of 1993-94 to 2011-12 (Figure 5). Scheduled castes (SC) and tribes (ST)[5] had jointly comprised approximately 30 percent of the population in rural areas, and about 20 percent in urban areas (Figure 5).

Figure 5: Composition of Social Groups in Female Population
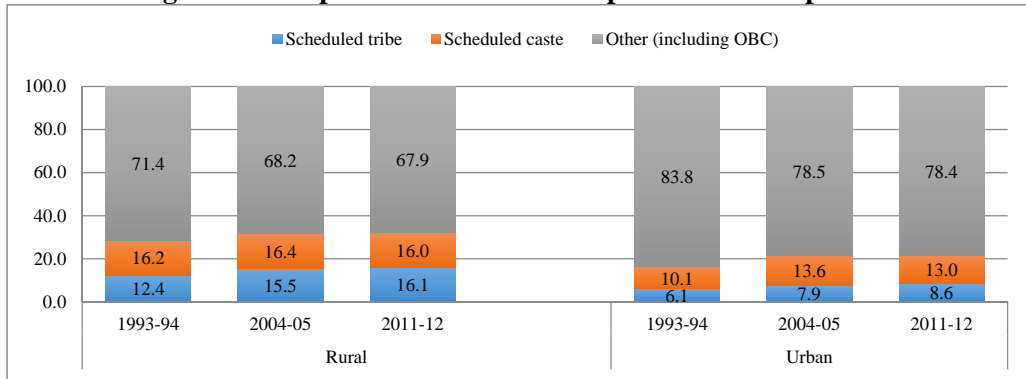
Source: Authors' own estimate based on NSSO data.

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[5] Through constitutional provisions, the Government of India specifically recognizes a number of historically marginalized social groups, including those from various caste and tribal communities. These groups are referred to as scheduled castes (SC) and scheduled tribes (ST). In addition, the Government of India recognizes certain groups belonging to other specially defined socially and educationally backward classes, also known as Other Backward Classes (OBC).

Looking across social groups, the FLFP rate is highest among the ST communities, both in rural and urban areas, throughout the period between 1993-94 and 2011-12. This is followed by the participation rates of the SC, Other Backward Classes (OBCs) and others, in that order, in both rural and urban areas. In terms of change, the rural FLFP rate declined during the period of 1993-94 to 2011-12 for all social groups (Table 11). Even the urban FLFP rate declined during this period for all social groups, but the decline was far less pronounced than in rural areas.

Table 11: FLFP Rate by Social Group

	Rural FLFPR				Urban FLFPR			
	ST	SC	OBC	UC	ST	SC	OBC	UC
1993-94	66.0	51.5	--	41.3	36.6	31.7	--	21.7
1999-00	62.7	48.8	43.6	32.2	34.5	27.2	24.4	16.0
2004-05	62.5	49.0	46.4	38.1	37.5	30.7	28.8	20.1
2007-08	54.6	44.1	40.7	30.7	33.1	23.5	21.0	15.7
2009-10	46.4	38.0	35.6	28.1	31.7	25.8	20.9	15.4
2011-12	47.4	37.3	33.4	28.9	31.1	24.7	21.8	17.8

Source: Authors' own estimate based on NSSO data. Note: OBC category was created after 1993-94.

Although the FLFP rate was highest among the ST, they experienced the largest drop in FLFP rate in rural areas, a drop of 18.6 percentage points during 1993-94 to 2011-12. Of this 18.6 point drop, 15 percentage points of the decline occurred during 2004-05 to 2011-12. Upper caste females experienced the lowest drop (12.4 percentage points). The following figure suggests that the drop which occurred between 2004-05 and 2011-12 was almost three times that of the period between 1993-94 and 2004-05. On the contrary, the largest drop in urban areas was for the SC, by 7 percentage points. For the most part, the drop that was recorded among urban social groups was also concentrated in the period of 2004-05 to 2011-12.

Figure 6: Change in FLFP Rate Over Time Across Social Groups
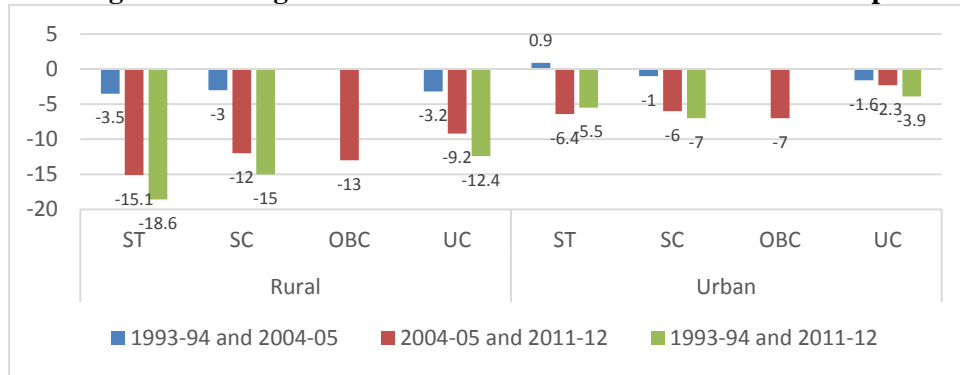
Source: Authors' own estimate based on NSSO data.

3.5 Household Income and Female Labor Force Participation

A comparision across income deciles suggests that during the period between 1993-94 to 2004-05, there was a rise in the FLFP rate across almost all deciles, in both rural and urban areas. However, the drop is more for the lower deciles, and it is the large drop in the FLFP rate which occurred in the second period (2004-05 to 2011-12) that led to an overall decline in the total FLFP rate across the entire period.[6] The drop is more pronounced at the lower strata of the consumption decile, and it gradually declined with increases in per capita consumption during the second period—a trend that is not visible during the first period.

As can also be seen from Table 12, the change in the FLFP rate during 1993-94 to 2011-12 was brought about largely by a change in the FLFP rate in rural areas, rather than in urban areas. In all deciles, the contribution of the decline in the rural FLFP rate is larger than that of urban areas. Drawing from the above analysis, it is reasonable to state that the large drop in the FLFP rate during 1993-94 to 2011-12 was mainly due to the drop which occurred in rural areas during the

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[6] There was in fact a drop in FLFP across all deciles between 1993-94 and 1999-00. Since then, the FLFP rate rose between 1999-00 and 2004-05, and subsequently began to decline again after 2004-05. Hence, the decline in FLFP occurred from 1993-94 to 1999-2000, and then from 2004-05 to 2011-12. Since we are considering two periods—the first between 1993-94 and 2004-05, and the second between 2004-05 and 2011-12—the fluctuations in between are thus covered, and the overall change is reported.

period of 2004-05 to 2011-12. It is also interesing to note that between 1994 and 2005, there was a significant 5 to 7 percentage point increase in urban areas that was ultimately undone during 2005-12. In contrast, very little change occurred in rural areas between 1994-2005.

Table 12: Change in FLFP Rate

Consumption Deciles	Change in Rural FLFP Rate				Change in Urban FLFP Rate			
	Base Year FLFP rate (1993-94)	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2011-12	Base Year FLFP rate (1993-94)	1993-94 to 2004-05	2004-05 to 2011-12	1993-94 to 2011-12
1	52.6	-1.1	-14.5	-15.6	36.8	-4.9	-8.4	-13.3
2	49.4	0.1	-13.9	-13.8	30.6	1.3	-7.5	-6.2
3	48.7	0.6	-13.8	-13.2	25.2	7.1	-7.5	-0.4
4	47.3	1.0	-13.1	-12.1	26.4	2.2	-5.0	-2.8
5	45.7	1.1	-10.3	-9.2	23.2	6.5	-8.0	-1.5
6	45.2	1.8	-12.5	-10.7	21.4	6.5	-6.2	0.3
7	44.4	1.5	-11.5	-10.0	19.2	7.0	-6.4	0.6
8	43.2	1.7	-10.7	-9.1	19.2	5.1	-5.3	-0.2
9	43.0	-1.1	-9.3	-10.4	19.6	1.2	-0.8	0.4
10	40.7	-2.0	-5.6	-7.5	21.8	1.2	-2.2	-1.0

Source: Authors' own estimate based on NSSO data.

In summary, we observe two broad changes: first, a significant drop in FLFP is observed between 2004-05 and 2011-12, which wiped out any increase between 1993-94 and 2004-05. This phenomenon is distinctly visible across all age groups, socio-economic groups and across groups with different levels of educational attainment. Second, the phenomenon is more pronounced in rural than in urban areas. In other words, the drop is more pronounced across all of these socio-economic groups in rural areas than across their respective counterparts in urban areas.

When we delve deeper within each group, we find that this rural-urban difference in the FLFP rate varies over time across subgroups. For example, rural-urban differences in the FLFP rate are more pronounced at the lower strata of consumption deciles and gradually decline with increases in per capita consumption (Figure 1). The rural-urban difference in the FLFP rate over time is also more

pronounced for younger women, and it gradually wanes as age increases. We find similar patterns of rural-urban differences across marital status, social groups, and levels of educational attainment.

Now, having separately considered the effect of various individual and household factors on the decline in the FLFP rate, we now address the question of how they influence FLFP together in combination. In the following section, we examine the combined effects of all social, economic and demographic factors across rural and urban areas. To capture the nuances of these combined effects, we explore the dynamics of the FLFP rate over time, across various groups. Analyzing the groups' specific participation rates— irrespecitve of the socioeconomic levels or which subgroup they belonged to— we observe an overall decline in the FLFP rate during 1993-94 to 2011-12 (Table 13).

We find that during the period of 1993-94 to 2004-05, there were only marginal differences between subgroups in rural and urban areas. Yet, between 2004-05 and 2011-12, rural areas experienced a larger overall drop in the FLFP rate across all subgroups. The largest drop in the FLFP rate during the second period was for currently unmarried young women from rural areas, belonging to the lower economic stratum. Females within this group experienced a drop of 19.5 percentage points, with their LFP rate decreasing from 40.3 to 20.8 percent (Table 13). In urban areas, the corresponding decline for the same subgroup was only 6.6 percentage points. The next largest drop, with a magnitude of 18.2 percentage points, was noted for currently married older women belonging to the lower economic stratum in rural areas. During the same time period, the FLFP rate of this group dropped by only 4.5 percentage points (from 38.9 to 34.4 percent) in urban areas.

Within subgroups, the participation rates in rural areas were highest for married women in the age range of 25 to 65 years, irrespective of their income class. Moreover, trends in the FLFP rate of richer and poorer households are very similar. The participation rates of the youngest age group (15 to 24 years) were low in comparison to older groups, however, their decline was sharper during the period of 1993-94 to 2011-12 than that of the older groups. The participation rate of unmarried young women declined the sharpest during this period, for those in both the lower and upper income categories. In conclusion, we observe that the locational difference, or specifically, the rural-urban difference, accounts for the largest drop. More interestingly, the same socio-economic and demographic factors play differential roles across location.

Table 13: Group Specific FLFP Rate

Location	Economic Status	Age Group	Marital Status	1993-94	1999-00	2004-05	2009-10	2011-12
Rural	Bottom 40%	Between 15-24	Not married	43.5	38.3	40.3	24.7	20.8
			Married	45.1	43.3	42.6	30.5	29.3
		Between 25-65	Not married	43.1	38.9	42.7	40.8	35.5
			Married	55.9	55.8	59.6	42.7	41.4
	Top 60%	Between 15-24	Not married	34.4	26.9	30.4	19.7	17.1
			Married	44.3	36.2	39.6	28.0	26.0
		Between 25-65	Not married	43.2	40.3	43.7	43.2	40.5
			Married	52.2	47.2	52.2	41.8	40.3
Urban	Bottom 40%	Between 15-24	Not married	25.6	19.1	27.5	19.7	20.9
			Married	21.9	18.3	20.8	13.7	10.4
		Between 25-65	Not married	36.9	33.6	38.9	33.3	34.4
			Married	32.0	30.1	34.2	22.9	23.9
	Top 60%	Between 15-24	Not married	16.1	15.4	19.3	13.6	14.1
			Married	13.3	13.0	16.7	12.0	12.7
		Between 25-65	Not married	31.1	29.9	31.9	28.9	31.3
			Married	19.8	19.3	22.6	18.5	19.5

Source: Authors' own estimate based on NSSO data.
Note: 'Married' refers to currently married females and 'not married' refers to females who are currently not married (e.g., never married, widowed, etc.).

This multidimensional dissection of the data on women's labor force participation in India leads us to several important conclusions. First, there has been a national decline in FLFP, and the bulk of this drop occurred in rural areas. Second, an increase in educational enrollment can successfully

account for the drop in FLFP among the younger cohort, but not for the overall drop. Third, as evidenced by the data, the drop in FLFP is visible in all dimensions, irrespective of age group, relative income group, social group and marital status. Now, the question still remains with regard to the underlying factors that have most contributed towards the drop in FLFP. In other words, it is necessary to identify the relative weights of various determining factors in the female labor force participation decision. In the following section, we thus include the changes in structural adjustments in occupational composition in households. We premise that the reasons behind female labor force participation can also be motivated by this factor.

4. Assessment of the Relative Contributions of Determinants of Female Labor Force Participation: Shapley Decomposition

Having broadly considered changes in female labor force participation across numerous determinants, including age group, educational attainment, marital status, as well as social and income groups, it is now necessary to understand the extent to which each of these determinants has influenced FLFP during different periods of time. Hence, in this section, we use the Shapley decomposition technique to assess the relative contribution of each factor in female labor force participation decision, separately for rural and urban locations.

Apart from the socio-demographic factors discussed in the previous sections, we include several additional factors that play a role in the household labor force participation decision, in order to explain individual labor force behavior. Since the decision of women to participate in the labor force can be conceived as a residual decision that occurs in response to the labor allocation of the rest of the household (Dessing, 2002; Bardhan, 1979), we include household level variables (such

as the share of self-employed, casual labor and regular wage earners in the total working age population of the household) as proxies for labor allocation within the household.

How a certain amount of output (or costs) should be allocated among a set of (say, 'i') contributors is the classic question of cooperative game theory, and the Shapley value (Shapley, 1953) provides a popular answer to this question. The solution proposed by Shorrocks (2013) to the general decomposition problem turns out to be formally equivalent to the Shapley value, and is therefore referred to as the Shapley decomposition. Broadly speaking, the Shapley decomposition, as proposed by Shorrocks (2013), considers the marginal effects of 'i' contributory factors on some 'output' by eliminating each of them in sequence, and then assigning the average of the respective contributor's marginal contributions to each factor in all possible elimination sequences. This procedure yields an exact additive decomposition of the 'output' into 'i' contributions. According to Shorrocks (2013), the procedure can be employed in all areas of applied economics whenever one wishes to assess the relative importance of the explanatory variables.

For expositional purposes, we club the different identifying factors into ten explanatory groups, ranging from age and marital composition in the household to state-level unobserved factors. As we observed in the previous section, age, educational attainment, income and membership in certain social groups play crucial roles in female labor force participation decision. We also found that marital status plays a crucial role in labor force participation decision, however the marital status of other women in the household has an impact on labor substitution possibilities. To identify the effects of marriage on other women within the household, we include various measures of marital status in our analysis, such as the proportions of women who are married, never married

and those with unstable marriages[7] in the family as a separate group of determinants. We hypothesize that while it is highly likely that a married woman will refrain from joining the labor market due to social stigma, females with unstable marriages are likely to join the labor force. In the literature on FLFP, it has been argued that the status building role of women, which involves attendance to family responsibilities as per prevailing social norms, leads to reduced participation in the labor force (Abraham, 2009). We include individual marital status, as well as the number of children in a given woman's family, as being representative of family responsibility. From the angle of household production models, the optimal allocation of time is based on the relative weights of these two components in the total income pool, which ultimately affects FLFP decisions at the household level.

We also include the composition of labor supply at the household level in order to explain the individual decisions of women to join the labor force. While the proportion of regular wage earners and casual labors indicates the relative importance of market oriented paid work, the proportion of self-employed individuals in the family represents the relative weight of household oriented production. Another important factor that arises from this diversification of household labor is the importance of stability in family earnings. Eswaran et al. (2011) find evidence that with rising household income levels, women in rural India withdraw from paid labor and engage in status production[8] at home. The reverse is true as well. Under economically vulnerable conditions, working age members of the household (even children in some instances) try to ensure basic subsistence income for all members of the household, and thus enter the paid labor market

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[7]By 'unstable marriage' we refer to short lived marriages, due to the divorce or death of partners.

[8] Eswaran et al. (2011) refer to definitions of 'status production' by Hanna Papanek and Randall Collins. Papanek (1979) describes status production rather simply: "Particular kinds of work that I call *family status production* maintain and enhance the family's social standing, although they do not necessarily enhance the woman's status within that unit." Common examples of status production work include the upkeep of suitable work clothes, provision of food at the workplace, entertainment of colleagues and feeding hired hands and co-workers (Papanek, 1979).

temporarily (Dessing, 2002). Hence, in poor households with insufficient income, there should be an influx of females into the labor market, and vice versa. In order to examine the role of labor diversification at the household level, we assessed the proportion of self-employed, regular wage earners and casual labors in a given household's total working age population. The reference group consists of working age household members who are out of the labor force.

We identify the relative shares of each group of variables separately for both rural and urban contexts. The reason for this is straight forward; as we found in our previous analysis, the same set of indicators (including level of educational attainment, age, marital status and membership in certain social groups) exert different influences on FLFP decision across rural and urban locations. Last but not least, we control for state fixed effects in order to capture the spatial heterogeneity in our model.

Table 14 presents the Shapley value decomposition of the female labor force participation decision for each of the groups stated above. The table provides both spatial (rural-urban) as well as inter-temporal (three rounds between 1993 and 2012) variations in the relative shares of each group. To start with, we find that the relative share of four age groups together in total variation has increased steadily in both rural and urban areas from 1993-94 to 2011-12. Additionally, two observations regarding the relative contribution of age are readily apparent. First, the rate of growth in the relative share of age in total explained variation is greater in rural than in urban areas over time. Second, relative shares of age in rural areas were less than that of urban areas in 1993-94, but they later superseded their urban counterpart in following periods. This could be attributed to the increased enrollment of the younger age cohorts in educational institutions, which occurred at a higher pace in rural areas.

Table 14: Shapley Value Decomposition of FLFP Decision in Rural and Urban Areas in India

	Shapley value						Percentage share					
	(1993-94)		(2004-05)		(2011-12)		(1993-94)		(2004-05)		(2011-12)	
	Rural	urban	Rural	urban	Rural	urban	Rural	urban	Rural	urban	Rural	urban
Group 1	0.015	0.021	0.023	0.023	0.031	0.030	4.24%	5.66%	6.60%	6.21%	9.14%	7.50%
Group 2	0.008	0.016	0.009	0.018	0.012	0.020	2.36%	4.44%	2.43%	4.85%	3.53%	4.97%
Group 3	0.004	0.004	0.005	0.005	0.006	0.007	1.15%	1.09%	1.55%	1.36%	1.69%	1.73%
Group 4	0.104	0.102	0.132	0.118	0.115	0.114	29.73%	27.44%	37.59%	31.53%	34.33%	28.60%
Group 5	0.015	0.075	0.021	0.094	0.032	0.119	4.23%	20.10%	5.86%	25.13%	9.60%	29.99%
Group 6	0.101	0.096	0.084	0.077	0.072	0.067	28.63%	25.96%	23.93%	20.71%	21.55%	16.73%
Group 7	0.015	0.007	0.012	0.005	0.008	0.004	4.17%	1.83%	3.43%	1.34%	2.27%	0.99%
Group 8	0.016	0.028	0.013	0.018	0.011	0.016	4.53%	7.42%	3.78%	4.75%	3.39%	3.99%
Group 9	0.002	0.009	0.002	0.006	0.001	0.003	0.66%	2.55%	0.48%	1.50%	0.29%	0.70%
Group 10	0.063	0.010	0.037	0.010	0.030	0.010	17.79%	2.71%	10.60%	2.55%	8.98%	2.51%
Total Explained variation	0.35	0.371	0.35	0.373	0.34	0.398	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Observations	105,669	63,662	123,905	66,590	92,822	60,226						

Group 1: Four age groups (15-18; 18-25; 26-45 and 46-65 years).
Group 2: Marital composition within the household (proportion of married, unmarried and unstable married females in the family).
Group 3: Status building role (marital status of the individual and the number of children in the family).
Group 4: Proportion of self-employed persons in the family.
Group 5: Proportion of regular wage earners in the family.
Group 6: Proportion of casual labor and unemployed in the family
Group 7: Social status (ST, SC and Others).
Group 8: Educational Attainment (illiterate; below secondary; secondary and HS; college and above).
Group 9: Income groups (five income quintiles).
Group 10: All 35 States and UTs.
*Regression estimates underlying the Shapley decomposition are presented in the annex.
Source: Authors' own estimate based on NSSO data.

Our narrower definition of the status building role of women, as indicated by individual marital status and the number of children in the household, plays no significant part in explaining individual FLFP decision. However, the overall marital composition of women within the household, as compared to individual marital status including child care responsibility, contributes more than twice towards women's labor force participation decisions.

Perhaps the most important finding of this analysis is that it highlights the preeminent role of household level labor diversification on the individual labor force participation of women. Estimation of the relative contributions of employment composition in a family explains more than 60 percent of the variation in FLFP decisions— both spatially and inter-temporally. As mentioned earlier, we consider three major components of employment in our analysis— the proportion of

self-employed, regular wage earners and casual laborers in the family. The proportion captures both male and female members of a family.

Another key finding is that the relative share of the weight of those who are self-employed is quite large in magnitude: it increased by 7.86 percentage points (from 29.73 to 37.59 percent) in rural areas between 1993-94 and 2004-05, but experienced a decline of 3.26 percentage points (37.59 to 34.33 percent) by 2011-12. A similar pattern is observed in urban areas, although the change was relatively modest. Considering the importance of self-employment in India's female labor force, and its responsiveness to household income stability, the rise and fall in relative shares of the self-employed serves to explain the increase and subsequent decrease in FLFP between 1993-94 and 2004-05 & 2004-05 and 2011-12.

Two points stand out with regard to the spatial and inter-temporal dynamics of relative contributions of household income stability on female labor force participation decisions. First, as expected, the relative contribution of the proportion of regular wage earners in urban households to individual FLFP decision claims a significantly larger share than its rural counterpart, across years. Given that regular wage earners are found more readily in urban areas, this explains to a large extent why the level of FLFP is low in urban areas when compared to rural areas. Second, the relative contribution of the proportion of regular wage earners in the household has increased substantially in both rural and urban areas (5th row in Table 14), contributing to a decline in FLFP. The first point indicates that as household income sources become more stable (as in the case of urban areas), the less likely it is for a woman to join the labor force, while the second indicates that the intertemporal increase in the contribution of the stability in income in rural areas is leading to a drop in FLFP. Complementary to an increase in the relative contributions of regular wage earners, our results also show that the relative contribution of casual labors in an average family

declined steadily over time in both rural and urban areas (6th row in Table 14). The direction of change in the relative contributions of regular wage earners and casual labors indicates the same conclusion: increases in household income stability create a lower incentive for women to participate in the labor force. The results from the above analysis support the Dessing (2002) argument that in poor households, secondary workers (usually females) enter the paid labor market 'temporarily' to smooth family income, and vice versa. As previously noted, Eswaran et. al. (2011) also found that with rising household income levels, women in rural India withdraw from paid labor and engage in higher status production work at home.

Among other factors, we find that the relative contribution of social status, level of educational attainment and level of income have declined steadily over time in both rural and urban areas. However, the relative contribution of social status in explaining variation in FLFP decisions is more significant in rural than in urban areas. On the contrary, the relative importance of income status is more decisive in urban areas. The relative contribution of education in explaining FLFP is significantly larger than other factors such as social status, income or family responsibility. In terms of location, it is a more significant factor in urban areas. In summary, we find that the FLFP decision is largely influenced by economic stability at home, rather than the traditionally held notions of social norms, educational attainment and age.

5. Conclusion

This study was undertaken to both understand, and to explain, the alarmingly low and continually declining FLFP in India. Our estimates show that for working age women, participation dropped by 19.16 million during the period of 2004-05 to 2011-12. In terms of participation rate, the FLFP rate for working age women declined from 42.6 percent to 31.2 percent during 1993-94 to 2011-

12. We estimate that this drop in FLFP has occurred mainly due to the withdrawal of rural females. Most importantly, approximately 53 percent of the total drop transpired among rural women within the age group of 15 to 24 years.

The trends suggest that the drop in the FLFP rate has occurred across all socioeconomic and demographic groups. Patterns and trends in the relationship with consumption expenditure deciles indicate the existence of a negative association between the FLFP rate and income levels, although the decline in the FLFP rate over the years was higher for the less affluent. Analysis of the combined participation rates (CPR) shows that within the age group of 15 to 24 years, the decline in FLFP can be fully accounted for by a rise in educational participation. This full compensation results from that fact that there has been a larger response to income changes among the poor, rather than the wealthy, by sending children to school. For working age women as a whole, in the age group of 15 years and above, educational participation only partially accounted for the decline.

When considering the effects of marital status and membership in certain social groups on the FLFP rate, it is interesting to note that irrespecitve of their social status (SC, ST, OBC or general), the FLFP rate of married females is higher than unmarried females in rural areas. Marital status has differential effects across rural and urban settings. In comparison to currently unmarried women, the participation rate of married women is visibly higher in rural areas, while it is lower in urban areas. In terms of a combined effect, we find that rural married young women have dropped out of the labor force proportionately more than their urban counterparts. However, among unmarried women, such differences are not observed across age groups.

Overall, the labor force participation rate among all social groups dropped between 2004-05 and 2011-12. However, the drop in FLFP rates across all social groups is significantly more

pronounced in rural areas than in urban areas. The participation rate is highest among the STs, and is followed by the SCs and OBCs. It is important to note that despite higher participation rates among the STs, they experienced the largest drop among social groups. Similar patterns of participation are observed across rural and urban areas. In short, the above patterns reveal that India's recent drop in FLFP is primarily accounted for by the rural female labor force. The rural location plays a significant role in amplifying other socioeconomic and demographic deterrents. Additionally, there has been a considerable increase in educational enrollment among younger cohorts residing in these areas. Further, the expansion of a secondary and postsecondary educated labor force has contributed to a drop in FLFP, probably due to a lack of appropriate jobs in rural areas, or the existence of a higher reservation wage among these education groups. More systematic analysis of both the supply and demand sides of the segmented rural labor market should be undertaken to illuminate this matter.[9]

In order to better understand the extent to which each of the aforementioned determinants (including age group, educational attainment, marital status, as well as social and income groups) influenced FLFP during different periods of time, we utilized the Shapley decomposition technique to isolate the relative contribution of each factor in FLFP decision, separately for rural and urban locations. We find that the relative contribution of four age groups (together) has increased steadily in both rural and urban areas, from 1993-94 to 2011-12, with higher relative growth in rural areas. We find no marked contribution of family responsibility, measured in terms of marital status and

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[9] Chatterjee et al. (2015) argue that a traditional supply-side interpretation is insufficient to account for the decline in female participation rates, and the transformation of the demand for labor at local levels needs to be taken into account as well. A salient trait of this period is the collapse in the number of farming jobs without a parallel emergence of other employment opportunities considered suitable for women. Their results show that the place of residence along the rural-urban gradation loses relevance as an explanation of female labor force participation once local job opportunities are taken into account.

the number of children in a given family, in explaining the FLFP decision among female members. Also, we find that the relative shares of social status and level of income have declined steadily over time in both rural and urban areas.

However, the major findings of our Shapley decomposition are the extent and importance of change in employment composition within the family on FLFP decisions. We consider the proportion of self-employed, regular wage earners and casual labor in the family, in order to identify the relative importance of change in employment composition on the FLFP decision over time. We find that the relative contributions of these indicators account for more than 60 percent of the explained variation in FLFP decisions, both spatially and inter-temporally.

Our findings suggest that the relative share of self-employed workers moved in tandem with the rise and fall in the FLFP rate between 1993-2004 and 2005-2012, particularly in rural areas. An increase in the relative contribution of regular wage earners and the corresponding decline in casual laborers indicates stability in family income. Thus, if stable family income is any indicator of the leisure choice of an individual, our finding explains the drop in FLFP to a large extent. Improved stability in family income can be understood as a disincentive for female household members to join the labor force. This largely resonates with the existing literature, which suggests that with rising household income levels, women in rural India withdraw from paid labor and engage in status production at home. Thus, the evidence points us to conclude that increased income stability, resulting from a structural transformation in occupational choice, plays a more crucial role than social and demographic factors in explaining the drop in FLFP in India.

The findings of this paper raise important policy questions if India is to maximize economic growth and benefit from both men's and women's potential labor market contributions – particularly in

rural areas. Consistent with other studies, the results presented here suggest that increasing women's access to education and skills, which is important in its own right, will not necessarily lead to a rise in FLFP. Gains will not be realized unless social norms around women's (and men's) work also change, and/or unless rural labor markets offer forms of employment that are acceptable and attractive for women and their families. Thus, programs such as the MGNREGS and the NLRM, which may be effective in reaching poorer women, may also have limited impact in terms of increasing FLFP. Policies should center both on promoting the acceptability of female employment and investing in economic sectors in rural areas that are more attractive in terms of female employment. Moreover, strategies to communicate the importance of women's work should take into account the roles of women, husbands and in-laws in decisions related to FLFP.

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Annex

Table A1: Discrete choice models

VARIABLES	(1) Rural (1993-94)	(2) Rural (2004-05)	(3) Rural (2011-12)	(4) Urban (1993-94)	(5) Urban (2004-05)	(6) Urban (2011-12)
Ager group 15-18	-0.175***	-0.398***	-0.714***	-0.638***	-0.650***	-0.903***
	(0.0227)	(0.0279)	(0.0499)	(0.0437)	(0.0556)	(0.0719)
Age group 18-25	0.0449**	-0.138***	-0.212***	-0.263***	-0.232***	-0.303***
	(0.0179)	(0.0206)	(0.0327)	(0.0336)	(0.0407)	(0.0459)
Age group 26-45	0.403***	0.354***	0.278***	0.245***	0.338***	0.405***
	(0.0164)	(0.0177)	(0.0262)	(0.0301)	(0.0331)	(0.0350)
Proportion of married females in the family	-0.0890***	-0.0759***	-0.0685***	-0.0139	0.0154	-0.0240
	(0.00803)	(0.00909)	(0.0150)	(0.0169)	(0.0187)	(0.0208)
Proportion of unmarried females in the family	0.234***	0.278***	0.337***	0.274***	0.287***	0.350***
	(0.0109)	(0.0106)	(0.0159)	(0.0132)	(0.0167)	(0.0200)
Proportion of females with unstable marriages in the family	0.234***	0.208***	0.295***	0.266***	0.157***	0.231***
	(0.0164)	(0.0187)	(0.0299)	(0.0241)	(0.0298)	(0.0342)
Marital status of the individual	0.241***	0.265***	0.168***	-0.218***	-0.318***	-0.349***
	(0.0212)	(0.0236)	(0.0362)	(0.0311)	(0.0378)	(0.0413)
No. of children in the family	-0.00873**	-0.00689	0.00101	-0.0387***	-0.0529***	-0.0611***
	(0.00374)	(0.00452)	(0.00760)	(0.00684)	(0.0102)	(0.0114)
Proportion of self employed in family	3.364***	3.615***	3.702***	4.251***	4.390***	4.688***
	(0.0305)	(0.0346)	(0.0533)	(0.0558)	(0.0704)	(0.0841)
Proportion of regular wage earners in family	2.908***	3.005***	3.469***	4.065***	4.501***	4.654***
	(0.0517)	(0.0546)	(0.0754)	(0.0601)	(0.0769)	(0.0847)
Proportion of casual labor in family	3.457***	3.618***	3.595***	4.460***	4.486***	4.669***
	(0.0312)	(0.0367)	(0.0549)	(0.0629)	(0.0814)	(0.0953)
Proportion of unemployed	0.776***	0.322***	0.537***	0.910***	0.654***	0.975***
	(0.107)	(0.0894)	(0.163)	(0.111)	(0.141)	(0.177)
Income group 1: Bottom 20	0.0228	-0.0496*	-0.0153	0.406***	0.385***	0.229***
	(0.0266)	(0.0277)	(0.0406)	(0.0398)	(0.0486)	(0.0522)
Income group 2 Bottom 20-40%	0.0102	-0.0298	-0.00181	0.255***	0.273***	0.222***
	(0.0256)	(0.0265)	(0.0386)	(0.0320)	(0.0437)	(0.0449)
Income group 3: Middle 40-60%	-0.0143	-0.0854***	-0.0434	0.146***	0.145***	0.102**
	(0.0258)	(0.0259)	(0.0378)	(0.0278)	(0.0380)	(0.0404)
Income group 4: Top 60-80%	-0.0231	-0.0264	-0.0303	0.0705***	0.0347	-0.00181
	(0.0267)	(0.0260)	(0.0377)	(0.0263)	(0.0358)	(0.0346)
social1: ST	0.386***	0.320***	0.281***	0.284***	0.179***	0.193***
	(0.0214)	(0.0222)	(0.0315)	(0.0527)	(0.0656)	(0.0701)
social2: SC	0.137***	0.0878***	0.0977***	0.142***	0.0353	0.0748**
	(0.0153)	(0.0173)	(0.0244)	(0.0288)	(0.0328)	(0.0353)
educ1: Illiterate	0.204***	0.475***	0.454***	-0.278***	-0.0620	-0.0723*
	(0.0767)	(0.0356)	(0.0394)	(0.0369)	(0.0422)	(0.0436)
educ2: Below secondary	-0.0183	0.292***	0.297***	-0.424***	-0.174***	-0.126***
	(0.0766)	(0.0345)	(0.0366)	(0.0352)	(0.0353)	(0.0343)
Secondary and HS	-0.204**	0.0753*	0.0938**	-0.404***	-0.275***	-0.287***
	(0.0797)	(0.0399)	(0.0427)	(0.0356)	(0.0461)	(0.0412)
Technical education	0.243***	0.445***	0.495***	0.708***	0.652***	0.542***
	(0.0827)	(0.0711)	(0.0925)	(0.0532)	(0.0647)	(0.0666)
State fixed effects	YES	YES	YES	YES	YES	YES
Constant	-2.931***	-3.118***	-3.318***	-2.841***	-3.063***	-3.362***
	(0.0854)	(0.0618)	(0.0721)	(0.0666)	(0.0845)	(0.0875)
Observations	105,669	123,905	92,822	63,662	66,590	60,226

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1