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The Puzzling Decline in Rural Women's Labor Force Participation in India: A Reexamination

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The Puzzling Decline in Rural Women's Labor Force Participation in India: A Reexamination

Daniel Neff, Kunal Sen and Veronika Kling

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The Puzzling Decline in Rural Women's Labor Force Participation in India: A Reexamination

Abstract

Between 2004/2005 and 2009/2010 there was a sharp fall in female labor force participation (LFP) in rural India. Why did this occur? We look at the four standard explanations: that more women in rural areas are now pursuing higher education and are therefore not available for work (education effect), that household incomes are rising quickly enough that there is a tendency for women to withdraw from the labor force to attend to domestic duties (income effect), that employment opportunities for women are decreasing, and that social and cultural factors may be interacting with these three factors and amplifying their effects. Our findings suggest that the decline in rural women's LFP could potentially be due to an income effect and partly due to an education effect. We find no evidence of changes in employment opportunities or of social and cultural interaction effects that could explain the decline in rural female LFP.

Keywords: labor force, women, rural, India

JEL classification: J00, J20, J21

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The Puzzling Decline in Rural Women's Labor Force Participation in India: A Reexamination

Daniel Neff, Kunal Sen and Veronika Kling

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1 Introduction

The recently released report containing the key results of the National Sample Survey (NSS) 66th Round Employment and Unemployment Survey (EUS) (NSSO 2011, see also Chowdhury 2011) has triggered a debate about the labor force participation rate (LFPR) of rural women in India. The published figures suggest that the LFPR of women in rural areas fell steeply, by approximately 20 million,¹ between 2004/2005 and 2009/2010 (Rangarajan et al.

1 Kannan and Raveendran (2012) adjusted the NSS to account for the underestimation of the population and estimate that the rural female labor force declined by 38.83 million. We have refrained from using population-adjusted estimates for this paper since we believe that our results still hold.

2011). Table 1 displays the trends in the LFPRs since 1993/1994 by usual principal and subsidiary status (UPSS).² As can be seen, the all-India LFPR decreased between 1993 and 2000, then increased again in the period between 2000 and 2005, and finally dropped again between 2005 and 2010. The current LFPR of 59.6 percent is the lowest since 1993/1994. The general drop in the LFPR is mainly due to the decline in the female LFPR, which has decreased by 10.9 percentage points since 2004/2005. This decline in the female LFPR is, in turn, mainly explained by the steep fall of the rural LFPR by 12.6 percentage points since 2004/2005. In contrast, the LFPR of urban women has declined by a much smaller rate of 5.1 percentage points, that of rural men by 3.8, and that of urban men by 2.5 percentage points since 2004/2005. Interestingly, the female LFPR shows a greater fluctuation than that of men. As Mazumdar and Neetha (2011: 118) argue, “the need to understand the gender dimensions of employment trends in India has acquired a new urgency.” The question we hence aim to address with this paper is as follows: What are the potential explanations for this decline in the women's LFPR in rural areas? We try to answer this question by exploring the NSS 61st and 66th round EUS data. It has to be borne in mind that in order to derive more conclusive findings, a longer-term multivariate analysis of the trends or fluctuations in female LFPR would be required, something which is beyond the scope of this paper. The aim of this paper is to highlight the findings of a simple descriptive bivariate analysis. These findings provide us with some insights regarding the present discussion of the trends in the female LFPR. The findings should not be regarded as conclusive, but rather as indicative.

Table 1: Labor Force Participation Rates, 1993–2010
(in percent, ages 15–59)*

	1993/1994	1999/2000	2004/2005	2009/2010
All India	67.1	64.5	66.6	59.6
Females	45.2	41.6	45.4	34.5
Males	88	86.6	87.1	83.7
Rural India	71.2	68.7	70.6	62.6
Females	52	48.7	52.5	39.9
Males	89.8	88.3	88.6	84.8
Urban India	55.8	53.8	56.2	52.3
Females	25.2	22.2	26.1	21.0
Males	83.2	82.2	83.4	80.9

Sources: NSS Employment and Unemployment Reports for 1993/1994, 1999/2000 and 2004/2005; 2009/2010 figures are based on the authors' own calculations.

* Labor force participation refers to the 15–59 age group according to the usual principal and subsidiary status (UPSS). Only the quinquennial rounds are taken into account. Quinquennial rounds before 1993/1994 are not considered because of comparability problems (see Srinivasan 2010).

2 A person can either be employed or working, unemployed or not working, or not working and not available for work. Only the latter person is then classified as not being part of the labor force. The reference period is a year, week, or day. For an in-depth explanation of the classification procedure see Srinivasan (2010).

Four potential explanations for the decline in rural women's LFPR can be found in the current Indian debate: Firstly, that women in rural areas are now pursuing higher education and are therefore simply not available for the labor force (Chowdhury 2011; Rangarajan et al. 2011). Secondly, that household incomes could have risen in rural areas due to higher wage levels, which would thus take the pressure off of women to seek employment in times of economic hardship (World Bank 2010; Himanshu 2011; Rangarajan et al. 2011). Thirdly, that the decline in women's LFPR is due to an overall decline in or absence of short- and long-term employment opportunities in rural areas (World Bank 2010; Chowdhury 2011; Mazumdar and Neetha 2011). Finally, that the decline in the rural female LFPR could be due to cultural factors and social constraints which might be coming to the fore due to rising incomes or limited employment opportunities (see Das 2006; Olsen and Mehta 2006; Chowdhury 2011). The aim of this paper is to reexamine the explanations put forward in the literature through a systematic descriptive analysis of the 61st and recent 66th round NSS EUS data. Each of the four explanations is discussed in turn.

2 The Education Effect: Rural Female Labor Force Participation and Education

Education has been proposed as one of the explanations for the decline in the rural female LFPR. It is assumed that more women in rural areas are now pursuing higher education and are therefore not available for work (see Himanshu 2011, Rangarajan et al. 2011). Chowdhury (2011), however, questions this explanation and puts forward the arguments that the overall employment situation for women has not improved and that rural female LFP has declined for all women above the age of 15, not just for those in the 15–24 age group. In fact, the rural female LFPR declined across all age groups between 2004/2005 and 2009/2010 (see Table 2). The highest percentage point change of -15.9 can be found among the women aged 30–34.

Table 2: Changes in Rural Female Labor Force Participation by Age Group, 2004–2010

Age Group	LFPR 2004/2005	LFPR 2009/2010	Percentage Point Change
15–19	33.1	19.5	-13.6
20–24	43.5	31.4	-12.1
25–29	53.0	40.4	-12.6
30–34	59.3	43.4	-15.9
35–39	64.2	49.7	-14.5
40–44	62.7	49.8	-12.9
45–49	61.6	49.2	-12.4
50–54	56.2	48.5	-7.7
55–59	50.9	41.1	-9.8
Total	52.5	39.9	-12.6

Source: LFP rates for 2004/2005 from NSS Report No. 515, NSS EUS 66th round. Authors' own calculations.

Looking at Table 3, we can make three observations: Firstly, the lowest LFPR among rural women is found among those below the age of 24. It can be observed that 12 percent of those rural women who are not part of the labor force are in the 15–19 age group and 9.9 percent are in the 20–24 age group. Hence, 21.9 percent of all rural women of working age who are not in the labor force are between 15 and 24 years of age. Secondly, labor force participation increases with age, to approximately 40 percent in the group of 25- to 29-year-olds, and to nearly 50 percent in the group of 40- to 44-year-olds. Thirdly, it can be observed that the group of 15- to 24-year-olds accounts for 29.3 percent of the total rural female working-age population between 15 and 59. These figures suggest that an increase in the number of women pursuing higher education has a stronger impact on the total LFPR because those women who are attending an educational institute are primarily within the largest age group (15–24) in terms of population.

Table 3: Female LFP by Age Group, 2009/2010

Age Group	In the LF (%)	Not in the LF (%)	Share of Working-Age Population (%)	Cumulative Share of Working-Age Population (%)
15–19	2.9	12.0	14.9	14.9
20–24	4.5	9.9	14.4	29.3
25–29	5.6	8.3	13.9	43.2
30–34	5.6	7.3	13.0	56.2
35–39	6.3	6.4	12.7	68.9
40–44	5.0	5.0	10.0	78.9
45–49	4.3	4.4	8.7	87.6
50–54	3.2	3.4	6.6	94.2
55–59	2.4	3.4	5.8	100.0
Total	39.9	60.1	100.0	

Source: NSS EUS 66th round. Authors' own calculations.

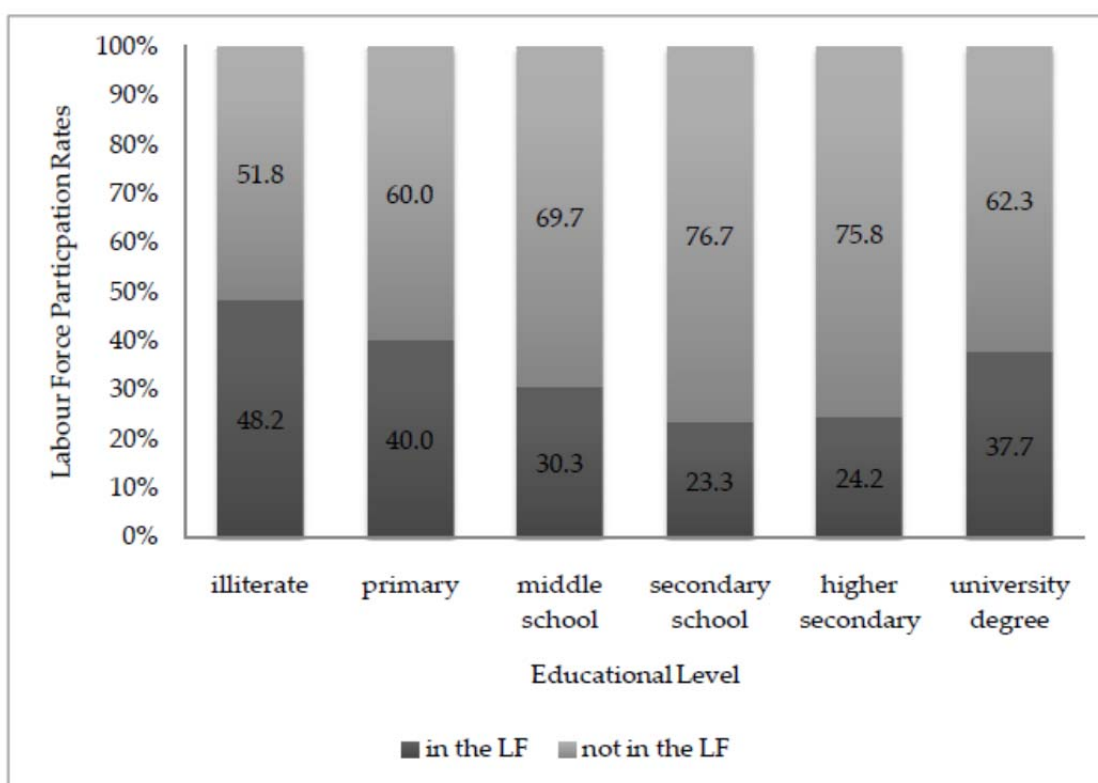
The percentage of rural women in the 15–24 age group increased by nearly 10 percentage points between 2004 and 2010 (see Table 4). This seems to support the hypothesis that the decline in rural women's LFPR is due to an increase in the number of women pursuing higher education. However, a similar increase of 9 percentage points can be observed among the urban women in the same age group, without an accompanying strong decline in female LFPRs in urban areas.

Table 4: Women Aged 15–24 Receiving Education, 2004–2010

Education Attendance	Rural Females		Urban Females	
	2004/2005 %	2009/2010 %	2004/2005 %	2009/2010 %
Yes	36.57	45.89	18.74	28.46
No	63.43	54.11	81.26	71.54
Total	100	100	100	100

Source: NSS EUS 61st and 66th round. Authors' own calculations.

Moreover, even if the larger number of women pursuing higher education is responsible for the currently observed decline in the rural female LFPR, this does not mean that the LFPR of rural women will increase in the future because they are better educated. In India, there is a clear U-shaped relationship between educational level and LFPR. As Figure 1 illustrates, women who are illiterate have a higher probability of being in the labor force. With rising education level, the labor force participation of rural women declines; it only rises significantly again with a university degree. Hence, the assumption would be that with rising educational levels rural women are more likely not to be in the labor force and also have a higher likelihood of remaining outside the labor force. This trend might only be reversed for those with a university degree.

Figure 1: Labor Force Participation of Rural Women by Educational Level

Source: NSS EUS 66th round. Authors' own calculations.

Taken together, these findings appear to only partly support the hypothesis that rural female labor force participation has declined because of the rising numbers of rural women pursuing higher education. Even though rural female LFP is declining across all age groups, as Chowdhury (2011) suggests, the relative size of the 15–19 and 20–24 age groups (29 percent of the total rural female labor force) and the increase in the number of rural women in the 15–24 age group attending education since 2004/2005 indicate the existence of an education effect. However, there has been a similar increase in the number of urban women receiving education without an accompanying decline in the LFPR. Moreover, it has been argued that the effect of education can be twofold. The increased number of rural females pursuing higher education might lead not only to a temporary decline in their LFP but could also lead to underemployment and perhaps also a permanent decline in their LFP rates in the long term. There is evidence that education does not pay off for all social groups. Jeffrey et al. (2004), for example, show that in Uttar Pradesh young Dalit and Muslim men are not able to convert their education into secure employment; this leads parents to withdraw their support for their male children's higher secondary and tertiary education. Breman (2007) found in his village studies in South Gujarat that those men of the lower castes who acquired a higher degree were disadvantaged within the labor market because of their caste and were often forced to return to their villages and work as casual laborers. We assume that women – especially those from lower caste groups and religious minorities – face similar disadvantages. To conclude, therefore, the education effect alone does not seem to sufficiently explain the decline in the female LFPR. Other factors must be at work. Another prominent explanation is the “income effect” (see Abraham 2009; Srivastava and Srivastava 2010; Himanshu 2011).

3 The Income Effect: Rural Female Labor Force Participation and Income

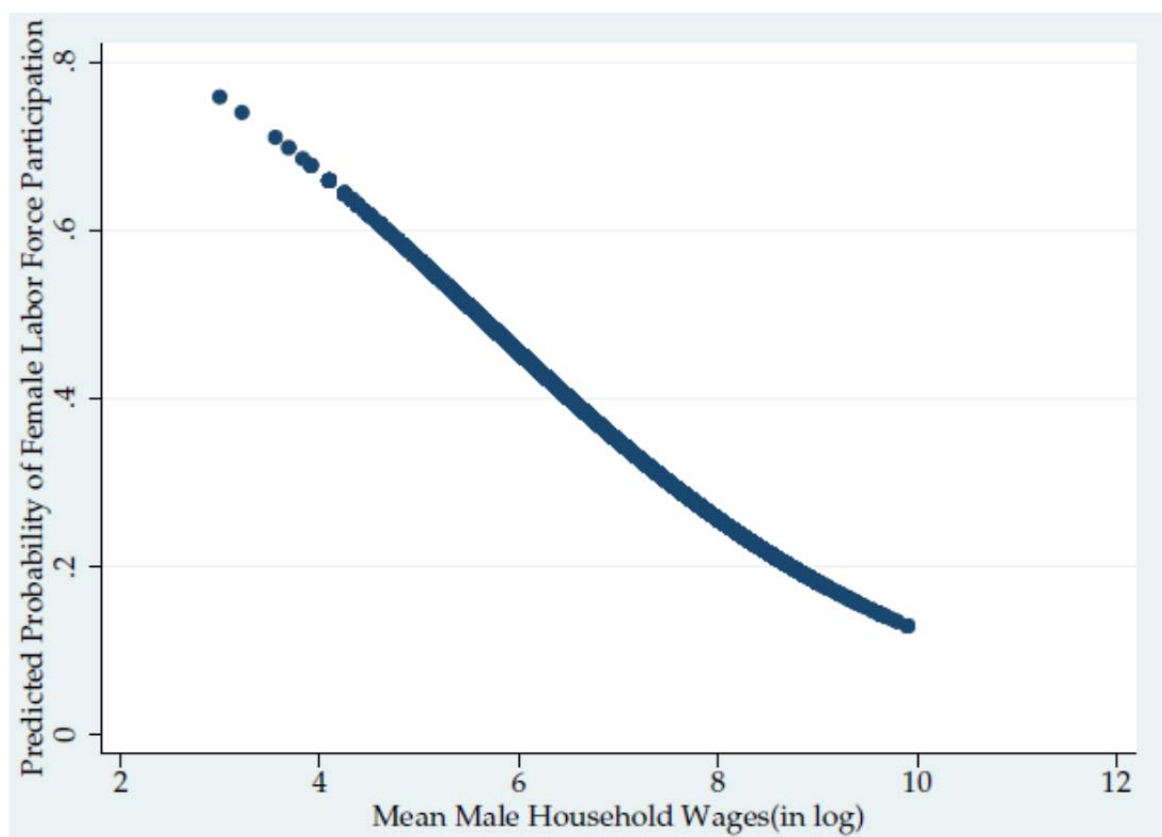
A number of authors have pointed to the existence of an income effect that impacts women's LFP. Olsen and Mehta (2006), for example, find that economic poverty makes female labor force participation more likely. Similarly, Srivastava and Srivastava (2010, see also Himanshu 2011: 47) argue that the female LFPR increases in times of distress – that is, when there is a “perceived fall in the reservation income of the household.” The employment growth in the periods 1999/2000 and 2004/2005, for example, is believed to have been distress employment driven by a deep agrarian crisis (Abraham 2009). However, as Himanshu (2011) puts forward, 2009 was also a drought year, the worst in 30 years, yet the LFP of rural women did not increase but rather decreased. Rangarajan et al. (2011: 70) propose that this could be because agriculture has become drought resilient, because the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)³ has managed to provide supplementary jobs,

3 The MGNREGS guarantees a hundred days of paid manual work for each rural household. The average daily wage paid through the scheme is in most cases higher than the average daily wages paid in the respective regions.

or because wages have gone up. The income effect can thus also work the other way: with higher incomes, which help households escape poverty, there could be a tendency for women to withdraw from the labor force to attend to domestic duties (Rangarajan et al. 2011). This could be a pure income effect, where women opt out of the labor force, but it could also be the result of social norms coming to the fore again with rising incomes, and women thus being pushed out of the labor force (see Section 5). In the following discussion we first explore the potential relationship between income and rural female LFP and secondly try to analyze the extent to which an income effect could explain the decline in rural female LFPR.

Figure 2 displays the probability of labor force participation among rural women by the mean household wages of male household members.⁴ It clearly shows that with higher mean male household wage levels, the probability that the female/s in the household will be part of the labor force diminishes.⁵

Figure 2: Probability of Rural Female LFP by Mean Male Household Wages, 2009/2010



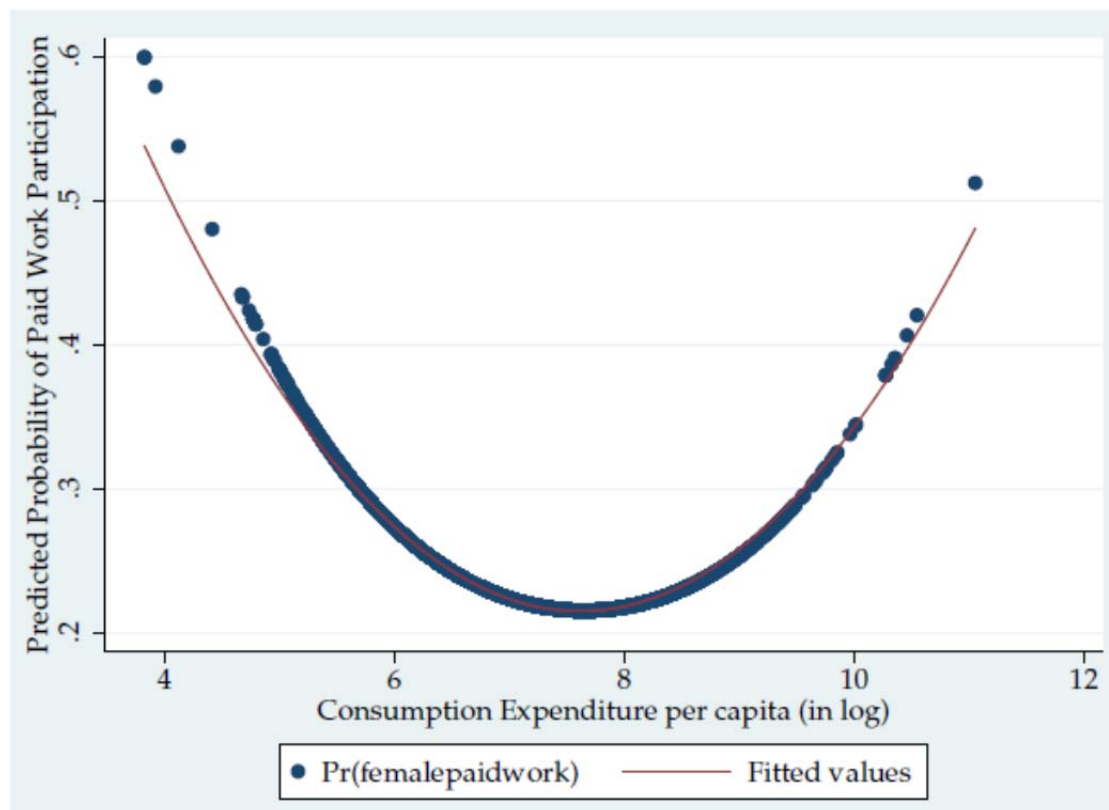
Source: NSS 66th round. Authors' own calculations.

4 Note: Figure 3 contains information only about households where wage data for males were available. Females who live in households without a male member or without wage data for a male member – for example, households which exclusively pursue self-employed activities – are not part of this figure.

5 In the logit estimate the coefficient of log male wage is -0.441 and it is statistically significant at the 1 percent level.

A U-shaped probability curve between rural women's paid LFP and log household consumption expenditure can be seen in Figure 3.⁶ The probability that women will pursue paid work is higher for households with lower per capita household consumption expenditure, then declines at mid-range per capita household consumption levels and rises again for households with high per capita household consumption levels. This supports the hypothesis of distress employment – that is, that women are forced to work in times of economic distress in the household. Once the household has reached and can sustain a certain level of consumption, rural women are not forced to work. However, after a certain threshold the probability that rural women will pursue work increases again with rising per capita household expenditure.

Figure 3: Predicted Participation in Paid Work for Rural Women Based on Household Monthly per Capita Expenditure, 2009/2010



Source: NSS 66th round. Authors' own calculations.

Another indicator of the existence of an income effect can be seen in Table 5. The majority of never married (75.87 percent) and currently married women (58.63 percent) of working age are not part of the labor force, whereas those who are widowed (64.53 percent) or divorced/separated (75.74 percent) are likely to be part of the labor force.⁷ In India widows, divorcees

6 In the logit estimate both the coefficient of the logarithm of monthly per capita expenditure (-1.77) and its square (.1157253) are significant at the 1 percent level.

7 The difference in labor force participation rates by marital status ($\chi^2 = 16700$) is significant at the 1 percent level.

and women who have left their husbands are often not financially supported by either their own family or their husband's family and are thus forced to secure their livelihood through work. Drèze and Srinivasan (1997), for example, show that single widows living with unmarried children and female household heads were more likely to live in poverty when compared to the society as a whole, in all of India. Widows or divorcees might, however, face fewer cultural or social barriers that prevent them from working outside the home and are sometimes more free to migrate seasonally since there is no husband or family to prevent them from doing so.

Table 5: Labor Force Participation among Rural Women (aged 15–59) by Marital Status, 2009/2010

Marital Status	In the LF	Not in the LF	Total
Never married	24.13	75.87	100
Currently married	41.37	58.63	100
Widowed	64.53	35.47	100
Divorced/separated	75.74	24.26	100
Total	39.86	60.14	100

Source: NSS 66th round. Authors' own calculations.

So far we have looked at potential indications of a relationship between income and the rural female LFPR. But to what extent can the decline in rural women's LFPR be explained by an income effect – that is, have rising income levels led to a decline in the female LFPR? One way to potentially shed some light on this question is to analyze the wage-level trends over time. In the following discussion we aim to first explore whether male wage levels have increased over time and whether this is related to the decline in the rural women's LFPR between 2004 and 2010. Furthermore, we explore whether the opportunity costs for women of entering the labor force have remained high by exploring the mean wage-level changes for male and female casual workers since 2004/2005.

The mean wage levels of the male household members across all wage quintile groups did increase (see Table 6). The largest increase can be observed for the two lowest quintile groups, where mean male household wages increased over 100 percent between 2004/2005 and 2009/2010. In the third wage quintile the increase in mean wages was approximately 90 percent, and in the top quintile it was approximately 43 percent. Rural women's LFPR changes between 2004 and 2010 seem to correspond quite well with the increases in mean male household wages. The greater the increase in male household wages in the quintile groups, the greater the decline in the female LFPR. This seems to support the hypothesis that increases in income led to a decline in the rural women's LFPR between 2004 and 2010.

Table 6: Mean Male Household Wage and Rural Female LFPR Changes, 2004–2010

Quintiles of Household Wages	2004/2005		2009/2010		Change in Mean Male Household Wage	Change in LFPR in Percentage Points
	Mean Male Household wage (Rs.)	Rural Female LFPR (%)	Mean Male Household Wage (Rs.)	Rural Female LFPR (%)		
Lowest 20%	158.9	64.6	319.2	50.3	100.9	-14.28
Second 20%	270.7	58.5	544.8	41.79	101.3	-16.67
Third 20%	388.0	54.3	735.7	39.07	89.6	-15.19
Fourth 20%	607.7	43.2	1076.0	33.96	77.1	-9.23
Top 20%	1326.5	29.6	1902.2	25.23	43.4	-4.4
Total	305.3	53.4	614.0	40.38	101.1	-12.99

Source: NSS 61st and 66th round. Own calculations. Wages are measured in Indian Rupees (Rs.).

What is more, there is evidence that wage levels for women rose over this period. The wages of female casual workers increased by 117 percent whereas those of men increased by 101 percent (see Table 7). This unequal rise slightly narrowed the gender wage gap for casual workers. The mean wage of female casual workers was 64 percent of that of men in 2009/2010; in 2004/2005 it was just 59 percent. Hence the wage gap decreased by approximately 5 percentage points.

Table 7: Mean Casual Worker Wages by Gender, 2004–2010

	Mean Wage 2004/2005 (Rs.)	Mean Wage 2009/2010 (Rs.)	Difference (%)
Female casual worker	179.34	389.76	117.3
Male casual worker	305.31	614.03	101.1
Wage ratio (female to male)	0.59	0.64	0.05

Source: Weekly wages of casual workers from NSS 61st and 66th round (current weekly status).
Authors' own calculations.

How has the activity status of rural women changed since 2004/2005? In 2004/2005 approximately 47.3 percent of rural working women (aged 15–59) were unpaid family workers (see Table 8). In 2009/2010 this rate had dropped by 8.2 percentage points to 39.1 percent. At the same time, the relative share of casual workers increased by 7.3 percentage points; hence, one could argue that the share of unpaid family workers had mainly moved towards casual work. In total, 61.8 percent of the working women were remunerated. Nevertheless, due to the total rural female LFP decline, in 2009/2010 only 24 percent of all working-age rural women had a rem.

As highlighted in this section, the descriptive and bivariate analysis seems to support the hypothesis regarding the existence of an income effect that could explain the decline in the rural female LFPR. Firstly, we find that the probability of rural women's LFP drops the higher the men's wages are. Secondly, the probability that rural females will participate in the labor force initially declines with higher household expenditure and then rises again in a U-shaped

way. Thirdly, widows, divorcees and women living alone are significantly more likely to be in the labor force.

Table 8: Type of Work Performed by Rural Women (aged 15–59) according to their Usual Activity Status, 2004–2010 (in percent)

Type of Work (UPSS)	2004/2005	2009/2010	Change
Paid self-employed	15.7	15.8	0.1
Unpaid family worker	47.3	39.1	-8.2
Regular employee	3.9	4.7	0.8
Casual worker	33.2	40.5	7.3
Total	100	100	

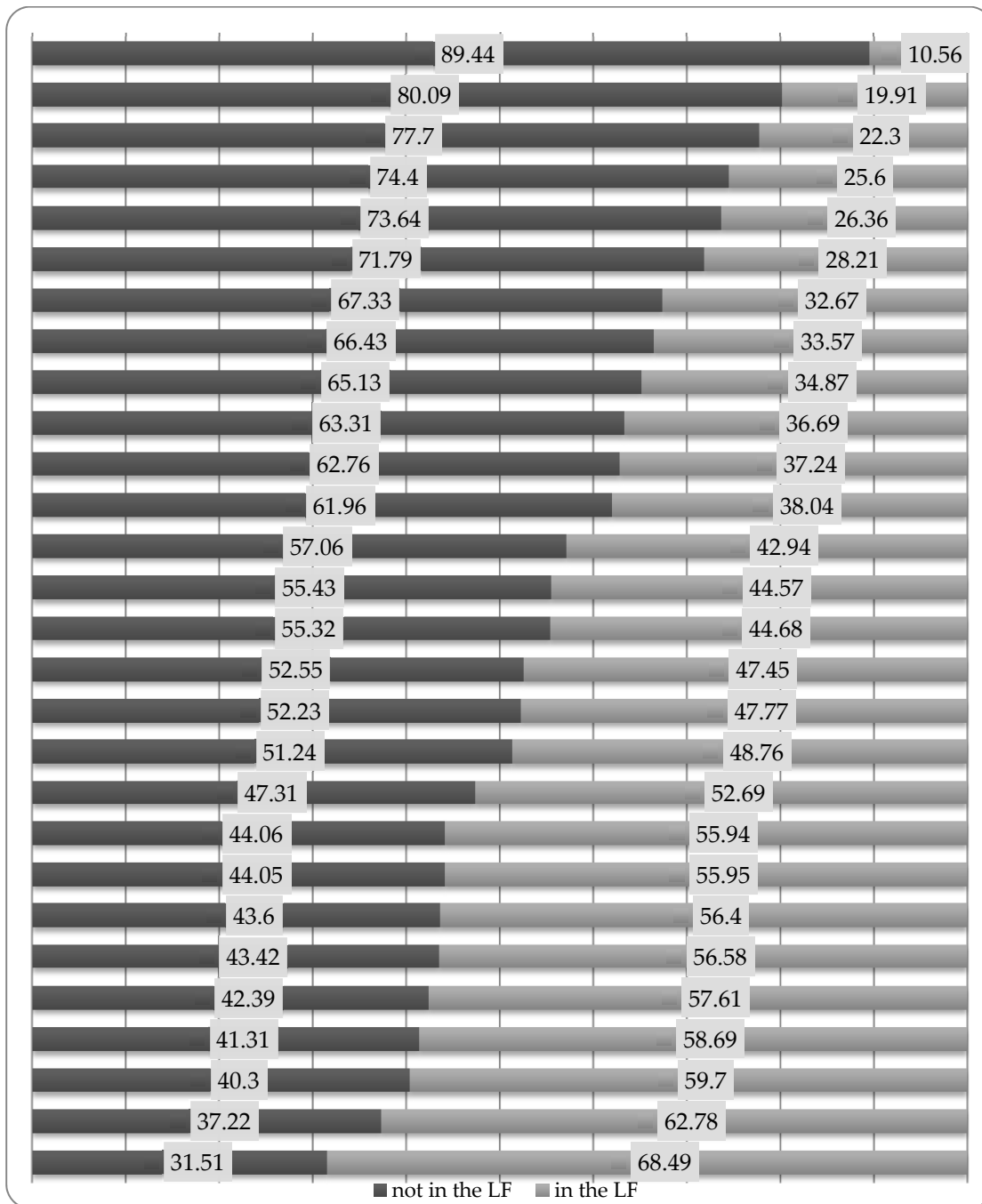
Source: NSS 61st and 66th round. Authors' own calculations.

Moreover, we find that the mean male wage levels in the two lowest wage quintiles saw the largest increase between 2004 and 2010, and that the decline in the rural female LFPR was highest for these two wage quintile groups. The mean wages of male and female casual workers appear to have risen, whereas the gender wage gap has only slightly decreased, implying that the opportunity costs for rural women have not decreased much. To summarize, although they rely on a simple analysis, our findings can be seen to support the assumption that the income effect provides a plausible explanation for the decline in the rural women's LFPR since 2004. This income effect could, however, be mediated by other factors, such as labor market opportunities.

4 Labor Demand: Rural Female Labor Force Participation and Employment Opportunities

Labor market outcomes for rural women differ significantly across India's states. The lowest LFP among rural women can be found in Bihar (see Figure 4), where only about 11 percent of rural women participate in the labor force. This state is followed, surprisingly, by Goa (20 percent) and West Bengal (22 percent). In contrast, Andhra Pradesh and Himachal Pradesh have the highest rural female LFP, with 63 percent and 68 percent, respectively. According to the World Bank (2010), most of the differences in LFP among states are due to the differences in female employment rates. What explains these regional differences? One common explanation is that there are varying employment opportunities for women across states (labor demand).

Figure 4: Rural Female LFP by State, 2009/2010⁸



Source: NSS 66th round. Authors’ own calculations.

In the 1990s an average of 5.5 million jobs were created per annum (WB 2010), but in the period between 2004/2005 and 2009/2010 only about 1 million new jobs were created per year (Rangarajan et al. 2011). This implies that there could be an acute shortage of employment opportunities given that the working-age population is estimated to increase by 12 million people a year over the next decade, of whom between 8 to 9 million persons will be looking for jobs (WB 2010).

8 The difference in labor force participation by state is significant at the 1 percent level ($\chi^2 = 49500$).

If we take the per capita state domestic product as an indicator of the availability of employment opportunities in the respective state (the higher the per capita net state domestic product [NSDP], the greater the employment opportunities), we can derive the following picture (see Table 9). Bihar, which has the lowest level of rural female LFP (rank 1), also has the lowest per capita NSDP. The per capita NSDP rankings for most states seem to be largely consistent with the rural female LFP ranking.⁹ Noteworthy negative outliers are Goa, Punjab, Kerala, and Haryana, which have rather low rural female LFP despite high rates of per capita NSDP. This seems to imply a lack of employment opportunities for rural women in these states. Positive outliers appear to be states such as Rajasthan, Chhattisgarh, Mizoram, and perhaps Andhra Pradesh, which have relatively high rural female LFP rates despite low to middle per capita NSDP levels.

Is the decline in the rural female LFPR due to a decline in employment opportunities at the state level? Have certain states seen a larger decline in employment opportunities due to their share in the total rural female workforce? A preliminary analysis of the changes in rural female LFP and NSDP between 2004/2005 and 2009/2010 finds significantly different trends across states (see Table 10). Four findings stand out:

- 1) All states have experienced substantial annual growth rates of between 4 and 17 percentage points; hence, one would assume that employment opportunities have increased.
- 2) The rural female LFPR has, however, declined in the majority of the states – with the exception of Jammu and Kashmir and Tripura, where an increase in rural women's LFP of 1.5 and 15 percentage points, respectively, can be observed.
- 3) The relatively small states of Arunachal Pradesh (-20 percentage points), Jharkhand (-25 percentage points), Meghalaya (-21 percentage points), and Nagaland (-26 percentage points) have experienced the largest relative decline (over 20 percentage points) in rural female LFP.
- 4) Overall, the change in the LFPR of rural women in these states does not have a big impact on the all-India female LFPR since their share of the total working-age (15–59) population is rather small. In contrast, the LFPR decline in states such as Uttar Pradesh is likely to have had the largest impact, since the female LFPR there has dropped by 12 percentage points and because the state is home to 16 percent of all rural women of working age. Other states with a large share of working-age women that have experienced a significant decline in rural women's LFP are Bihar, West Bengal, Maharashtra, and Madhya Pradesh.

9 The strength of the correlation between the rankings of the LFPR and the NSDP = 0.32 and is significant at the 10 percent level.

Table 9: State Female Labor Force Participation Rankings, Per Capita Net State Domestic Product, and Gender Ratio

State	Rural Female LFPR (2009–10) – (lowest=1)	Per Capita NSDP (2009–10) – Rank (lowest=1)	Gender Ratio (2011) – Rank (lowest=1)
BIHAR	1	1	6
GOA	2	28	18
WEST BENGAL	3	11	13
ASSAM	4	3	15
JHARKHAND	5	4	13
UTTAR PRADESH	6	2	5
MANIPUR	7	6	24
TRIPURA	8	13	16
PUNJAB	9	20	4
KERALA	10	23	28
ORISSA	11	8	22
HARYANA	12	26	1
JAMMU & KASHMIR	13	10	2
MADHYA PRADESH	14	5	11
ARUNACHAL PRADESH	15	15	8
SIKKIM	16	22	3
GUJARAT	17	25	7
NAGALAND	18	18	12
KARNATAKA	19	17	18
TAMIL NADU	20	24	27
MAHARASTRA	21	27	9
MEGHALAYA	22	12	23
RAJASTHAN	23	7	10
CHHATTISGARH	24	9	25
UTTARAKHAND	25	19	17
MIZORAM	26	14	21
ANDHRA PRADESH	27	16	26
HIMACHAL PRADESH	28	21	20

Source: NSDP: MOSPI, Central Statistics Office (CSO) website¹⁰ as on 7 May 2012. Gender ratio: Provisional Population Totals India Census 2011.¹¹ LFPR: NSS EUS 66th round. Authors' own calculations. *The states are ranked according to their rural female LFPR, whereby the higher ranking (e.g., 1) is assigned to those states with the lowest rural female LFPR (e.g., Bihar).

10 Online: <http://mospi.nic.in/Mospi_New/upload/State_wise_SDP_2004-05_14mar12.pdf> (7 May 2012).

11 Online: <www.censusindia.gov.in/2011-prov-results/census2011_PPT_paper1.html> (7 May 2012).

Table 10: Changes in the Rural Female LFPR (age 15+) and NSDP between 2004 and 2010

State	LFPR 2004/2005	State Share of Total Population of Working-Age Rural Women 2004/2005	LFPR 2009/2010	State Share of Total Population of Working-Age Rural Women 2009/2010	Percentage point change in LFPR	NSDP 2004/2005	NSDP 2009/2010	Percentage point change of NSDP per year
Andhra Pradesh	70.78	8.16	62.78	7.84	-8	201303	310009	10.80
Arunachal Pradesh	64.9	0.1	44.68	0.11	-20.22	3185	4727	9.68
Assam	34.13	3.09	25.6	3.26	-8.53	47181	60653	5.71
Bihar	23.88	8.12	10.56	8.62	-13.32	70167	115131	12.82
Chhattisgarh	75.49	2.49	57.61	2.43	-17.88	41387	60490	9.23
Goa	34.82	0.1	19.91	0.16	-14.91	10921	16383	10.00
Gujarat	67.09	4.51	47.77	4.27	-19.32	172265	280929	12.62
Haryana	52.7	2.06	38.04	2.05	-14.66	85928	136382	11.74
Himachal Pradesh	75.21	0.83	68.49	0.81	-6.72	21189	29023	7.39
Jammu & Kashmir	41.41	0.7	42.94	0.9	1.53	22842	30312	6.54
Jharkhand	51.25	2.64	26.36	2.46	-24.89	53056	63724	4.02
Karnataka	66.41	5.15	52.69	4.77	-13.72	148299	226278	10.52
Kerala	45.92	3.82	36.69	3.49	-9.23	104776	157078	9.98
Madhya Pradesh	60.96	5.87	44.57	6.47	-16.39	99940	148891	9.80
Maharashtra	70.94	7.69	55.95	7.62	-14.99	368369	634829	14.47
Manipur	48.55	0.23	32.67	0.21	-15.88	4603	6083	6.43
Meghalaya	76.86	0.25	56.4	0.28	-20.46	5846	8568	9.31
Mizoram	63.66	0.06	59.7	0.06	-3.96	2400	3805	11.71
Nagaland	75.16	0.08	48.76	0.12	-26.4	5421	7739	8.55
Orissa	52.87	4.73	37.24	4.52	-15.63	66614	99835	9.97
Punjab	51.1	2.26	34.87	2.16	-16.23	86108	121802	8.29
Rajasthan	67.75	5.48	56.58	5.99	-11.17	112636	160248	8.45
Sikkim	47.93	0.06	47.45	0.06	-0.48	1511	2664	15.26
Tamil Nadu	67.42	5.34	55.94	5.5	-11.48	193645	312072	12.23
Tripura	18.71	0.42	33.57	0.41	14.86	8170	12210	9.89
Uttar Pradesh	40.58	16.22	28.21	16.34	-12.37	231037	320675	7.76
Uttarakhand	67.65	0.83	58.69	0.91	-8.96	22288	41201	16.97
West Bengal	28.69	8.48	22.3	7.95	-6.39	190029	268292	8.24
Total	52.46	100	39.85	100	-12.61	2651573	3987317	10.08

Source: NSS 61st and 66th round; Authors' own calculations. NSDP: Central Statistics Office (India) website¹² as on 7 May 2012.

12 Online: <http://mospi.nic.in/Mospi_New/upload/State_wise_SDP_2004-05_14mar12.pdf> (7 May 2012).

The structure of the rural economy is thus characterized by an oversupply of labor (Harriss-White 2003). As a result of stronger competition with men due to the increasing population, women might have even fewer employment opportunities and might be forced out of or drop out of the labor force altogether. Moreover, supply-side factors such as social customs that disadvantage certain social groups (for instance, women or lower-caste groups) in the labor market might also be at work. For example, tasks are traditionally assigned along gender lines. This is referred to as the sexual division of labor. In agriculture women undertake most tasks except for plowing, which has traditionally remained a male domain. If a task is performed by women, then it is perceived as less valuable (Banerjee 1995), which in turn negatively affects the wage. Women are paid much lower wages than men and are often forced to work as unpaid family workers. Mazumdar and Neetha (2011) argue that the period of deindustrialization between 1999 and 2005 led to a decline in nonagricultural employment opportunities for women.

In 2009/2010 the rural economy was still dominated by low-productivity agriculture. The vast majority of both rural working men (61 percent) and rural working women (80 percent) work in the agricultural sector, which accounts for 67 percent of the total rural workforce (see Table 11). Other industries with a significant share of women include manufacturing (6.1 percent), construction (5.6 percent), and other services (4.9 percent). Apart from agriculture, rural men work in construction (12 percent), retail, hotels and restaurants (8.3 percent), manufacturing (7.3 percent), and other services (5.9 percent). The gender difference in workforce presence by industry is significant at the 1 percent level.¹³

Could changes in the output of a specific industrial sector with a substantial number of women workers be responsible for the decline in rural women's LFPR? All industrial sectors experienced GDP growth between 2004 and 2010; some, however, suffered a relative loss in terms of their share in total GDP (see Table 12). Although the agricultural sector has experienced annual growth of 3.2 percentage points, its share of the total GDP has declined by 4.4 percentage points. Apart from the agricultural sector, only the mining (-0.6 percentage points) and electricity/water (0.1 percentage points) sectors suffered relative (but very small) losses in their share of total GDP. The category "other services" profited the most from this relative loss, gaining 2.19 percentage points in the share of total GDP, followed by transportation (1.75 percentage points), and manufacturing (0.62 percentage points). The fact that the output of the agricultural sector (the agricultural sector also has the highest proportion of female employment) increased during the period 2004/2005–2009/2010 along with the relatively small decline in the share of this sector for the same period suggest that there is little to support the hypothesis that a decrease in the output of a specific sector with a substantial share of women workers is accountable for the decline in the rural female LFPR.

13 The distribution of industries is significantly different (1 percent level) between male and female workers. Pearson-test: Design-based $F(6.29, 78980, 19) = 198,24$, $\chi^2(7) = 17900$.

Table 11: Distribution of Rural Workers by Industry and Gender, 2009/2010

UPSS* Industry		Male	Female	Total
Agriculture, forestry, fishing	Column %	61.0	80.3	
	Share of total workforce (%)	42.0	25.0	66.9
Mining	Column %	0.88	0.3	
	Share of total workforce (%)	0.6	0.1	0.7
Manufacturing	Column %	7.3	6.1	
	Share of total workforce (%)	5.0	1.9	6.9
Electricity, water	Column %	0.2	0.04	
	Share of total workforce (%)	0.2	0.01	0.2
Construction	Column %	12.0	5.6	
	Share of total workforce (%)	8.3	1.7	10.0
Trade, hotels, restaurants	Column %	8.3	2.7	
	Share of total workforce (%)	5.7	0.9	6.6
Transportation	Column %	4.5	0.2	
	Share of total workforce (%)	3.1	0.1	3.2
Other services	Column %	5.9	4.9	
	Share of total workforce (%)	4.1	1.5	5.6
Total	Column %	100	100	
	Share of total workforce (%)	68.89	31.11	100

Source: NSS 61st and 66th round. *UPSS: Usual principal and subsidiary status. Authors' own calculations.

Table 12: GDP by Industry in Crore Indian Rupees at Constant 2004/2005 Factor Costs

UPSS Industry		2004/2005	2009/2010	Annual Percentage Point Change/Change in Share of Total GDP
Agriculture, forestry, fishing	Total	565,426	656,975	3.23
	GDP share (%)	19.03	14.62	-4.41
Mining	Total	85,028	103,999	4.46
	GDP share (%)	2.86	2.31	-0.55
Manufacturing	Total	453,225	713,428	11.48
	GDP share (%)	15.25	15.88	0.62
Electricity, water	Total	62,675	88,654	8.29
	GDP share (%)	2.11	1.97	-0.14
Construction	Total	228,855	355,918	11.10
	GDP share (%)	7.70	7.92	0.22
Trade, hotels restaurants	Total	477,303	736,628	10.87
	GDP share (%)	16.05	16.39	0.34
Transportation	Total	250,417	456,654	16.47
	GDP share (%)	8.43	10.16	1.74
Other services	Total	848,535	1,381,487	12.56
	GDP share (%)	28.56	30.74	2.19
Total	Total	2,971,464	4,493,743	10.25
	GDP share (%)	100	100	

Source: NSS 61st and 66th round. GDP: Central Statistics Office (India). Authors' own calculations.

Has there been a decline in agricultural or nonagricultural employment opportunities? If we assume that the type of occupation households are engaged in can be seen as an indication of employment opportunities, we can observe whether agricultural or nonagricultural work opportunities have decreased. Table 13 displays the rural female LFPR by household type. It can be observed, firstly, that LFP among rural women, in both 2004/2005 and 2009/2010, was higher in agricultural labor households and those households categorized as being self-employed in agriculture than in other labor households and those households self-employed in nonagricultural activities. Secondly, the LFPR declined between 2004/2005 and 2009/2010 across all household types. This could imply that the decrease in the rural female LFPR cannot be explained by a decline in agricultural employment opportunities or by a decline in nonagricultural employment opportunities.

Table 13: Rural Female LFPR by Household Type, 2004–2010

Household Type	2004/2005		2009/2010		Percentage Point Change in Rural Female LFPR
	LFP (%)	Share of the Total Female Labor Force	LFP (%)	Share of the Total Female Labor Force	
Self-employed, nonagriculture	41.6	12.9	29.9	12.05	-11.7
Other labor	52.4	30.33	38.3	31.81	-14.2
Self-employed in agriculture	54.8	10.42	41.8	13.94	-13
Agricultural labor	65.3	41.35	51.5	36.97	-13.8
Others	28.1	4.989	21.9	5.22	-6.3
Total	52.5	100	39.9	100	-12.6

Source: NSS 61st and 66th round. Authors' own calculations.

In this section we have explored the potential differences in labor market opportunities for rural women. We have found that there were large differences in rural female LFP rates at the state level in 2009/2010 and that the changes in rural women's LFPRs were quite different across states between 2004 and 2010. This appears to indicate different degrees of employment opportunities for women across states. A further analysis has shown that despite growth in the NSDP in all states, rural women's LFP declined in all states except Tripura and Jammu and Kashmir. This implies that the decline in the rural women's LFPR cannot be explained by a change in employment opportunities across states. We have, however, found that certain states have a much larger share of the total rural female labor force; hence, a decline in the LFPR in these states has a bigger overall impact than a LFPR decline in smaller states. The case of Uttar Pradesh is especially noteworthy in this respect. We have also analyzed whether rural female LFP varies by industry. We have found that the majority of working women are engaged in agriculture, followed by manufacturing, construction, other services and trade. An examination of changes in employment opportunities in these industries (measured in terms of industry output) and the relative importance of the industry (measured as changes in its GDP share) has shown not only that all industries have experienced

increasing output levels, but also that the relative importance of certain industries – especially of agriculture, where the majority of working women are employed – has changed. Lastly, no evidence of a decline only in agricultural or in nonagricultural employment opportunities was found.

5 The Cultural/Social Effect: Rural Female Labor Force Participation and Cultural/Social Barriers

In Section 3 we identified some indicators of a potential income effect. A number of authors have pointed out that there are cultural and social barriers that prevent women from entering and remaining in the labor force. India is a predominantly patriarchal society where the existing gender roles and norms dictate that it is honorable for women to confine themselves to the reproductive role and to household duties (see for example Olsen and Mehta 2006). It could hence be argued that income alone is not sufficient to explain the decline in the LFPR of rural women, and that this drop is better explained by looking at income in conjunction with social and cultural norms. The argument is that certain cultural factors and social constraints might come to the fore as incomes rise (see Das 2006; Olsen and Mehta 2006; Chowdhury 2011).

Are there social and cultural constraints in existence which prevent women from entering the labor force? As was established in Section 3, there are large differences in rural women's LFP according to region. This implies not only structural but also cultural differences (see Table 10 above).¹⁴ An indicator of unfavorable gender roles is the prevailing gender ratio in the respective states. It could be argued that a low gender ratio – that is, a lower ratio of females to males – is an indication of prevailing social and cultural norms that discriminate against women. Many of those states (for example, Meghalaya, Chhattisgarh, Mizoram, Andhra Pradesh, Himanchal Pradesh) with rather neutral or natural gender ratios also seem to be the states with higher rural female LFP. Some of the states (Bihar, Punjab) with gender ratios strongly skewed towards male children also have lower levels of rural female LFP. However, the relationship is not that clear. Outliers include Kerala, Haryana, Jammu and Kashmir, and Maharashtra. A better picture can perhaps be derived by comparing regions. If we assume that regions within India are culturally distinct, a comparison of regions could serve as an indicator of the effect of culture on rural female LFP.¹⁵ The lowest rural female LFPR can be found in the East, where approximately 79 percent of women are not part of the labor force, followed by the Northeast, with approximately 70 percent of women absent from the labor force, and the North, with a total of nearly 60 percent (see Table 14). In contrast, the rural female LFPs in the West (52 percent) and South (55 percent) are much higher, with over

14 The correlation between state-level rural female LFP and the gender ratio is not significant at the 10 percent level.

15 The states in the North, Northeast and East are also those that are economically backward in comparison to the states in the West and South.

50 percent of rural women in the labor force. There are pronounced differences between the cultural regions in terms of labor market outcomes for rural women.¹⁶

Table 14: Rural Female LFP by Region, 2009/2010¹⁷

Region	In the LF	Not in the LF	Total
North	40.1	59.9	100
Northeast	30.4	69.6	100
East	21.3	78.7	100
West	52.5	47.5	100
South	54.6	45.4	100
Total	39.9	60.1	100

Source: NSS EUS 66th round. Authors' own calculations.

The main reason that women give for why they are not part of the labor force (according to their activity status) is that they are doing domestic work (85 percent), which is a sign of patriarchal gender roles and norms. Only 13 percent report that they are receiving an education, and a small percentage are pensioners, disabled, beggars, etc. (2 percent). Of these rural women who are not part of the labor force, 91 percent report that they are required to do domestic work, which no other member of the household can (63 percent), because they are not able to afford household help (8 percent) or because of social constraints (17 percent). If one explores the reasons why rural women are performing domestic work as their principal status, 20.5 percent of them give the nonavailability of work as the main reason. Approximately 35 percent of them would accept work if it were available; most of them prefer part-time work (70 percent) over full-time work (23 percent); and only a small minority would opt for occasional full- or part-time work (7 percent). More than half of these women also report, however, that they do not have the necessary skills to undertake the work they would accept (52 percent).

That women are confined to their reproductive roles seems to be a conclusion that one can derive from Table 15. Rural women with at least one child below the age of five have a significantly (at the 5 percent level) lower LFPR.¹⁸ When the male household wage levels are taken into account, however, the picture changes (see Table 16). It seems that it is not the presence of a child below the age of five that explains rural women's LFP but rather the actual wage levels of the male household members.¹⁹

16 The relationship between region and rural female LFP is significant at the 1 percent level ($\chi^2(4) = 29000$).

17 North: Jammu and Kashmir, Himachal Pradesh, Punjab, Uttaranchal, Haryana, Rajasthan, Uttar Pradesh, Chhattisgarh, and Madhya Pradesh. Northeast: Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, and Assam. East: Bihar, West Bengal, Jharkhand, and Orissa. West: Gujarat, Maharashtra, Goa. South: Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu.

18 $\chi^2(1) = 129.1$; $P = 0.0349$.

19 $\chi^2(9) = 10300$; $P = 0.0000$.

Table 15: Rural Female LFP by Children under the Age of Five, 2009/2010

Children under Five	In the LF	Not in the LF	Total
No	40.3	59.7	100
Yes	38.3	61.7	100
Total	39.9	60.1	100

Source: NSS 66th round. Authors' own calculations.

Table 16: Rural Female LFP by Household's Male Wage Quintiles and Children under the Age of Five, 2009/2010

Quintiles of Male Household Wage	Children under Five	In the LF (%)	Not in the LF (%)	Total (%)
Lowest 20%	No	50.15	49.85	100
	Yes	50.78	49.22	100
Second 20%	No	43.24	56.76	100
	Yes	36.2	63.8	100
Third 20%	No	38.81	61.19	100
	Yes	40.05	59.95	100
Fourth 20%	No	33.85	66.15	100
	Yes	34.39	65.61	100
Top 20%	No	23.54	76.46	100
	Yes	33.36	66.64	100
Total		40.38	59.62	100

Source: NSS 66th round. Authors' own calculations.

A similar income effect can be observed across social groups (see Table 17), since social groups correspond very significantly with income groups. Across all wage quintiles, rural Scheduled Tribes (ST) women have the highest LFPR of all social groups, followed by Other Backward Castes (OBCs) (except for the fourth quintile), Scheduled Castes (SCs) and others. Nevertheless, the LFPR decreases across all social groups the higher the household's male wage level is. The results are significant at the 1 percent level²⁰.

Cultural constraints can be observed across religious groups (see Table 18). Of the two largest religious groups, Hindus have a significantly higher rural female LFPR than Muslims.²¹ This holds true across all wage quintile groups. The Muslim rural female LFPR remains rather low across all wage quintiles except for the lowest wage quintile, where a larger proportion of Muslim women are part of the labor force than all other quintile groups. In the so-called "Sachar Report" the Government of India (2006) highlighted the fact that Muslim girls have a very low school enrollment rate and a very low probability of working in a salaried job. The Muslim religious group is also believed to have the highest average reproduc-

20 Chi2 (19)= 15400; P = 0.0000.

21 Chi2 (14)= 17300; P = 0.0000.

tion rate, which implies that Muslim women might be more likely to be reduced to their re-productive role than their Hindu counterparts.

Table 17: Rural Female LFP by Household Male Wage Quintile and Social Group, 2009/2010

Male Wage Quintile	Social Group	In the LF (%)	Not in the LF (%)	Total (%)
Lowest 20%	ST	62.93	37.07	100
	SC	49.25	50.75	100
	OBC	52.25	47.75	100
	Others	34.93	65.07	100
Second 20%	ST	53.49	46.51	100
	SC	42.71	57.29	100
	OBC	42.72	57.28	100
	Others	29.85	70.15	100
Third 20%	ST	45.3	54.7	100
	SC	37.3	62.7	100
	OBC	42.03	57.97	100
	Others	32.41	67.59	100
Fourth 20%	ST	42.82	57.18	100
	SC	36.06	63.94	100
	OBC	33.37	66.63	100
	Others	28.87	71.13	100
Top 20%	ST	26.73	73.27	100
	SC	23.24	76.76	100
	OBC	26.18	73.82	100
	Others	24.96	75.04	100
Total		40.38	59.62	100

Source: NSS 66th round. ST = Scheduled Tribes, SC = Scheduled Castes, OBC = Other Backward Castes, Other = Other Castes. Authors' own calculations.

Table 18: Rural Female LFP by Household's Male Wages and Religion

Male Wage Quintile	Religion	In the LF	Not in the LF	Total
Lowest 20%	Hindu	52.76	47.24	100
	Muslim	29.49	70.51	100
Second 20%	Hindu	44.33	55.67	100
	Muslim	22.45	77.55	100
Third 20%	Hindu	41.56	58.44	100
	Muslim	18.15	81.85	100
Fourth 20%	Hindu	34.91	65.09	100
	Muslim	22.14	77.86	100
Top 20%	Hindu	25.86	74.14	100
	Muslim	16.92	83.08	100
Total	Total	40.38	59.62	100

Source: NSS 66th round. Authors' own calculations.

An initial simple exploratory descriptive analysis of the current data does not find strong evidence for the hypothesis that cultural and social factors accentuate other factors such as the income effect. There is no doubt that cultural and social factors are at work in preventing rural women from entering or remaining in the labor market. It has been demonstrated that the rural women's LFPR varies across cultural regions within India and that the LFPR rate of rural women is lower for those who have children below the age of five in their household. Nevertheless, a potential income effect seems to be more probable. The higher the household's male wage contribution, the lower the probability of rural female LFP, with or without the presence of children below the age of five. A similar picture emerges for the different social groups. The only social or cultural factor at work independently of income can be found across religious groups. Rural Muslim women have a significantly lower LFPR across all wage quintiles compared to their Hindu counterparts.

6 Summary and Conclusion

This paper has tried to revisit the main explanations – namely, that there is possibly an education, income, employment opportunity, or social/cultural-interaction effect – put forward for the puzzling decline in India's rural female LFPR between 2004/2005 and 2009/2010 through a simple exploratory analysis of the NSS EUS 61st and 66th round EUS data.

Our exploratory analysis has found some potential evidence of an education effect. Although rural female LFP declined across all age groups, the 15–24 age group had the largest relative impact because it constituted 29 percent of the total rural labor force (aged 15–59). We have shown that the number of rural women pursuing higher education increased after 2004, which could explain the decline in the rural women's LFPR, but we also found this trend for urban women without an accompanying decline in the LFPR. Hence, it seems that education cannot be seen as the main reason behind the decline.

The effect of income, in contrast, appears to be stronger. Our analysis supports the existence of a general income effect since the probability of rural females' participation in the labor force falls with higher male household wage levels. The analysis also reveals a U-shaped relationship between rural women's LFP and household expenditure. Moreover, wages, particularly among the lower-income groups, appear to have increased; this appears to support the hypothesis that due to increasing household incomes, women are not forced to work in order to supplement the household income in times of distress. The income effect could, however, be mediated by changes in employment opportunities.

Our analysis of employment opportunities found significant differences in rural female LFP across states. Furthermore, we found a weak relationship between employment opportunities (proxied by NSDP) and rural women's LFP. Despite substantial economic growth in all states in the years 2004–2010, the rural female LFP declined in all states with the exception of Tripura and Jammu and Kashmir. Due to their share of the total rural women's labor

force, the LFP decline in the larger states – especially in Uttar Pradesh – seems to have had the strongest impact on the overall decline in rural women's LFP. Could a change in the importance of a sector which employs a large share of women in its workforce be responsible for the decline? We found that 80 percent of rural working women were active in the agricultural sector. All of the sectors with larger shares of rural women grew after 2004 and increased in relative importance (measured by their share of total GDP) with the exception of the agriculture sector. In exploring rural female LFP by household type, we did not find that the share of women from households engaged in agricultural activities declined more than that of women from households not engaged in agricultural activities. This implies that a change in employment opportunities, whether in the agricultural sector or in the nonagricultural sector, cannot serve as an explanation for the decline in rural women's LFP.

Lastly, our analysis tried to explore whether there is evidence of social and cultural interaction effects. It is assumed that social and cultural factors could amplify possible income or employment opportunity effects. Although there is no doubt regarding the existence of social and cultural barriers to entering the labor force, we do not find support for any such amplifying effects. Our findings suggest that the decline in rural women's LFP between 2004/2005 and 2009/2010 is mainly due to an income effect and partly due to an education effect. Neither changes in employment opportunities nor social and cultural interaction effects seem to play as big a role as the income effect and, to a lesser degree, the education effect in explaining the decline in rural female LFP.

As pointed out in the introduction, our simple bivariate analysis should only be seen as a first exploratory step in revisiting the four main explanations put forward regarding the puzzle of the declining rural female LFPR. More in-depth research is needed to better understand this puzzle, especially research with a focus on trends or fluctuations in the female LFPR over time. In addition to an in-depth analysis of the quinquennial NSS EUS rounds, focused primary surveys and more in-depth qualitative research are required to better address questions regarding the determinants of women's labor force participation in general, the constraints they face in the labor market, the type of work they do, and so on. It is especially important that the family and household contexts be incorporated in order that the influences on women's decisions and choices around work can be better understood.

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