Employment Transitions of Women in India: A Panel Analysis

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Why is this issue important?

- Female labour force participation rate (FLFPR) in India has not increased over the last two decades (Klasen and Pieter, 2015).

- Estimates from the National Sample Survey data show a declining trend in rural areas and a stagnant urban FLFPR.

- This is a puzzling phenomenon because India is one of the emerging countries with high growth rate.

- Gender gap in education has declined, fertility rate has declined and returns to education has increased.

- One would expect women's participation in the labour market to rise during a period when the country witnessed economic prosperity

Labour Force Participation Rate in India

25 to 55 yrs.

Year	Male	Female
1984	97,8	51,4
1994	98,0	50,0
2005	97,8	51,1
2012	97,8	38,7

Percent

■ Male ■ Female
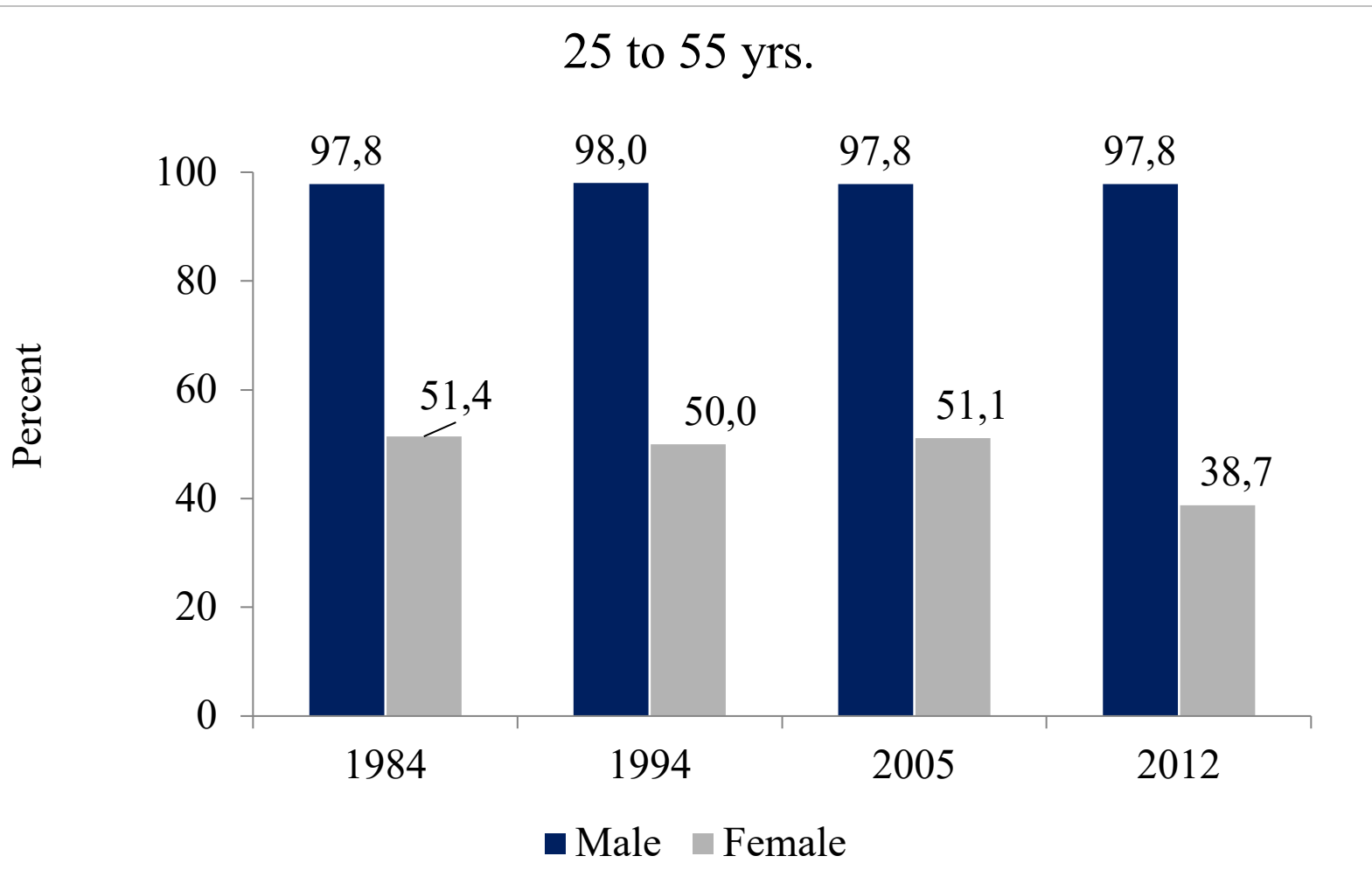
Why is this issue important?

- One aspect ignored in the existing literature is that employment status can be dynamic.

- Cross-sectional models are unable to capture inter-temporal dependence of women's employment participation.

- Considering transition is important for policy making.

- For example, those who are continuously out of the labour force may need to break social norms to enter the labour force, while those who are already in employment may need policies to support them to continue the employment.

- Entry and exit relationships may not be symmetric or reversible.

How do we address this issue?

- We use panel data from India Human Development Survey, a nationally representative survey of 41k households and 215,754 individuals.

- It has collected information on the same individuals and households in 2004-05 and 2011-12.

- Panel element allows us to look at the transition in employment, capture the life events of women such as new child birth between survey rounds and also look at changes in various factors.

- $Exit = \begin{cases} 1 & if\ Working\ in\ 2005\ but\ NOT\ Working\ in\ 2012 \\ 0 & if\ Working\ in\ both\ 2005\ and\ 2012 \end{cases}$

- $Entry = \begin{cases} 1 & if\ NOT\ Working\ in\ 2005\ but\ Working\ in\ 2012 \\ 0 & if\ NOT\ working\ in\ both\ 2005\ and\ 2012 \end{cases}$

Sample (Women aged 25 to 55 years in 2005)

	Women	Men
Employed in both rounds (Exit = 0)	13,519	26,179
%	*32.45*	*62.27*
Employed in 2005 but not in 2012 (Exit = 1)	4,302	2,534
%	***10.33***	***6.03***
Not employed in 2005 but employed in 2012 (Entry = 1)	5,273	2,186
%	***12.66***	*5.2*
Not employed in both rounds (Entry = 0)	9,919	645
%	*23.81*	*1.53*
Attrition	8,652	10,494
%	*20.77*	*24.96*
Total	41,665	42,038
%	*100*	*100*

- 62% men have persistence employment, compared to 32% women.

- 23% women experience transition while only 11% men experience some transition.

Empirical model

- $Exit = \begin{cases} 1 & if\ Working\ in\ 2005\ but\ NOT\ Working\ in\ 2012 \\ 0 & if\ Working\ in\ both\ 2005\ and\ 2012 \end{cases}$

- $Entry = \begin{cases} 1 & if\ NOT\ Working\ in\ 2005\ but\ Working\ in\ 2012 \\ 0 & if\ NOT\ working\ in\ both\ 2005\ and\ 2012 \end{cases}$

Status in 2005	Status in 2012 (row percentage)		
	Not employed	Employed	Attrition
Not employed (49.89 %)	47.72	25.37	26.91
Employed (50.11 %)	20.60	64.75	14.65
Total (N = 41,665)	34.13	45.10	20.77

Entry sample

Exit sample

Empirical model for entry and exit

$$Prob(Entry_{ihds} = 1) = X_{ihds}\,\beta + u_{ihds}$$ → Observed only for those who were NOT working in 2005

$$Prob(Exit_{ihds} = 1) = X_{ihds}\,\gamma + \varepsilon_{ihds}$$ → Observed only for those who were working in 2005

- Initial employment is endogenous:

$$Emp^*_{0,ihds} = Z_{ihds}\,\alpha + v_{ihds}$$

$$Employed_{0,ihds} = 1[Emp^*_{0,ihds} > 0]$$

- Attrition can be non-random:

$$Retention^*_{ihds} = W_{ihds}\,\delta + e_{ihds}$$

$$Retention_{ihds} = 1[Retention^*_{ihds} > 0]$$

Estimated by a bi-variate probit.

Equations for estimation

$$Prob\big(Entry_{ihds} = 1 \mid Employed_{0,ihds} = 0, Retention = 1\big)$$
$$= \boldsymbol{X}_{ihds}\,\boldsymbol{\beta} + \eta\lambda^1_{ihds} + \theta\lambda^2_{ihds} + u_{ihds} \tag{7}$$

$$Prob\big(Exit_{ihds} = 1 \mid Employed_{0,ihds} = 1, Retention = 1\big)$$
$$= \boldsymbol{X}_{ihds}\,\boldsymbol{\gamma} + \xi\lambda^1_{ihds} + \zeta\lambda^2_{ihds} + \varepsilon_{ihds} \tag{8}$$

Identification

- The initial employment and attrition equations should include some explanatory variables (instruments) which are validly excluded from the main entry and exit equations.

- Initial employment:
    - Average district level rainfall of 2004 (Attanasio et al., 2005; Bhalotra and Umana-Aponte, 2010)
    - Average district level night time luminosity of 2004 (Henderson et al., 2012) .

- Attrition equation: Member id or person identifier is used as an instrument (Mahringer and Zulehner, 2015).

Main explanatory factors

- **Social status**: Caste, education level of woman, education level of male household members,.

- **Income effect:** Household asset, household income by other members, change in household assets, change in household income.

- **Care responsibility**: Number of children, child birth between rounds, number of elderly in the households, change in number of elderly between rounds, in-laws cohabitates.

- **Active labour market policy**: NREGS labour expenditure.

Results: Probability of **ENTRY** and EXIT into employment

	Entry			Exit		
VARIABLES	All	Rural	Urban	All	Rural	Urban
Age 30-34 years	0.018	0.054**	0.018	-0.002	-0.002	0.028
Age 35-39 years	-0.011	0.031	-0.012	0.005	0.007	0.034
Age 40-44 years	-0.023	0.009	-0.024	0.029*	0.029	0.081
Age 45-49 years	-0.063***	-0.066**	-0.057**	0.083***	0.084***	0.127**
Age 50-55 years	-0.110***	-0.196***	-0.084***	0.196***	0.207***	0.181***
Marital status: Single	-0.048	-0.198**	0.073	0.056	0.122	-0.027
Marital status: Widowed	-0.046**	-0.107***	0.03	0.03	0.042	0.012
Marital status: Separated/Divorced	-0.014	-0.038	0.002	0.026	0.035	-0.036
Wife of head	-0.004	-0.075*	0.006	0.051**	0.051**	-0.044
Daughter of head	0.009	-0.101	0.07	0.062*	0.053	0.051
Daughter-in-law of head	-0.043	-0.198***	0.013	0.080***	0.088***	-0.071
Other relationship to head	-0.015	-0.212***	0.018	0.116***	0.122***	-0.038
Household size	0.004**	0.003	0.001	0.001	0.002	0.004
Primary educated	-0.025**	-0.086***	-0.016	0.034***	0.035***	0.001
Secondary educated	-0.039***	-0.122***	-0.029*	0.028*	0.032*	-0.014
Tertiary educated	0.023	-0.019	0.047	-0.103***	-0.09	-0.008
Caste: OBC	0.018*	0.046**	-0.001	-0.018	-0.015	0.007
Caste: SC	0.038***	0.041**	0.021	-0.025**	-0.021*	-0.027
Caste: ST	0.084***	0.187***	0.081**	-0.017	-0.015	0.007
Religion: Muslim	-0.062***	-0.121***	-0.049***	0.076***	0.061***	0.073
Religion: Others	0.013	0.054*	0.032	0.009	0.014	-0.05

- U-shaped relationship with entry.

- Inverted U-shaped relationship with exit.

Results: continued..

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- Women from socially disadvantaged or backward caste categories are significantly more likely to enter and less likely to exit as compared to the high caste category.

- The effect of caste on employment transition stronger for ENTRY.

Results: continued..

VARIABLES	Entry			Exit		
	All	Rural	Urban	All	Rural	Urban
Highest education level of male	-0.003***	-0.007***	-0.003	0.002**	0.003***	-0.001
Household asset	-0.015***	-0.023***	-0.015***	0.007***	0.006***	0.003
Household income excluding own income (/10^5)	-0.008	-0.015	-0.012**	0.026**	0.021	0.002
Change in household asset	-0.008***	-0.008***	-0.008***	0.003***	0.002**	0.009***
Change in household income excluding own income (/10^5)	-0.015***	-0.022***	-0.010***	0.018***	0.023***	0.005
Number of elderly (above 65)	0.007	0.002	0.028*	0.008	0.005	0.022
Change in number of elderly	0.002	-0.006	0.009	0.028***	0.028***	0.021
Mother/Father-in-law cohabitates	0.015	0.025	-0.001	-0.030**	-0.029**	-0.008
Number of children below 5	0.027***	0.008	0.020*	-0.017***	-0.018***	-0.033
Number of new children born	-0.01	-0.012	-0.011	0.032***	0.031***	0.03
Average annual rainfall 2005-2011	-0.004	0.002	-0.005	0.002	-0.014*	0.006
Growth rate of night lights 2005-2011	0.285*	0.429**	-0.057	-0.291*	-0.147	-0.513
Log of total NREGS labour expenditure		-0.008			-0.011***	
Urban area	-0.159***			0.123***		
Selection - Not employed	0.104**	-0.283**	0.058	0.06	0.044	0.299
Selection - Retention	0.056	-0.076	-0.045	-0.205	-0.142	-0.29
Constant	0.629***	1.416***	0.553***	0.003	0.086	0.082
Observations	15,118	7,349	7,571	17,768	15,031	2,644
R-squared	0.186	0.118	0.086	0.116	0.106	0.111
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

- **Asset**: Women from the 75th percentile household are 15 ppt less likely to enter in employment than women from the 25th percentile.
- This effect is stronger for rural women.
- on the exit probability is around 7 ppt in the opposite direction.

- **Income** women from the 75th percentile household have about 1.4 percentage points higher probability of exit than women from the 25th percentile

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- In the overall sample, a one standard deviation higher increase in income leads to 2 ppt lower entry and 2.4 ppt higher exit.
- However, the likelihood of entry diminishes by 2.9 ppt while exit rises by 1.1 ppt due to a one standard deviation higher increase in assets.

Results: continued..

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State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

- Having a new-born child is associated with a 3 ppt higher probability of exit.

- Presence of in-laws reduces dropout by 3 ppt in rural areas.

- In the rural sample, having an additional elderly person in the household increases the exit probability by 2.8 ppt.

Results: continued..

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State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

- A standard deviation increase in this measure of NREGS implementation in the district would prevent women's exit from employment by around 3.4 percentage points.

- But insignificant coeff in Entry equation suggests that the rural workfare program may not sufficiently attract women who are away from the workforce

What we find

- Women are not only participating less in the labour market, their withdrawal is also very high.

- 21% of the initially employed women exited employment over the next seven years.

- Entry and exit are not mirror reflection of each other. Many factors significantly affect either entry or exit, but not both.

- E.g. having a new-born child between the two rounds is associated with a 3 percentage point increase in the probability of exit but no impact on entry.

- Having an additional elderly member increases the exit probability by 2.8 ppt.

- The intensity of NREGA in the locality significantly reduces exit but has no significant impact on entry.

- Factors such as household wealth affect both but magnitudes differ.

Shorter term transitions

- The two rounds of data collected by IHDS are seven years apart.

- We utilise data from the 2017-18 Periodic Labour Force Survey (PLFS), a panel dataset, making it possible to estimate transitions across quarters in the same year for urban areas.

- We find that about 24% of women (vis-à-vis 92% of men) are in the labour force in a given quarter. Out of these women, over 10% exit in the next quarter (corresponding figure is only 1% for men).

- Among the women who exit, about 70% are likely to remain out of the labour force even in the following quarter.

- Both short- and long-term employment exit rates among women are quite significant.

- Even in normal circumstances, women's attachment to the labour market is much lower than that of men – they are more likely to exit, and less likely to re-enter.

Policy implications

- Such findings indicate that some of the labour force participation relationships observed in cross-section data are not reversible

- It is crucial to consider the inter-temporal dependence of labour supply decisions to design policy instruments.

- Low FLFPR is indeed a major problem, but it is also important to consider women who break the barrier to enter the labour market and then leave at a high rate.

- Our study highlights the importance of designing policies that create a favourable condition for women to retain their employment status.

Thank you!