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A Dynamic Analysis of Women's Labour Force Participation in Urban India

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Abstract

The introduction of the Periodic Labour Force Survey (PLFS) heralded a methodological innovation for the study of Indian labour, allowing the researcher to build panels tracking urban individuals over a year. Using two rounds of the PLFS covering the periods 2017–18 and 2018–19, we construct a pooled panel of urban Indian individuals aged 15–65 and focus on women's experiences in the labour force. We find evidence of low dynamism in the Indian economy, with women facing significant difficulties regarding labour force participation. While a majority of women remain outside the labour force throughout the year, those who do participate face significant disadvantages. Job-finding rates for women are half that of men, indicating weak demand for women's labour in the economy. Women face significant exits from both employment and unemployment, with nearly 18% of employed women leaving their jobs and moving to non-participation over the year. Women's relative disadvantages persist even when age and education are considered, with the lowest job-finding rates seen for young and graduate women, and rates of labour force exit much higher than that of men. This paper highlights the importance of looking at demand side questions when it comes to examining women's labour force participation.

Keywords

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Introduction

There exists a significant body of empirical literature studying Indian women's participation in the labour force. A common factor is the use of 5–yearly cross-sectional surveys on Employment and Unemployment conducted by the National Sample Survey Office (NSSO) of India. Research on Indian labour is hobbled by the lack of dynamic panel surveys following the same individual over different periods of time. The use of cross-sectional panels allow for the study of aggregate changes in labour force composition over time, while dynamic panels enable a more detailed examination of labour flows and transitions within a specified time period, allowing for a more detailed study of questions of dynamics.

The release of the Periodic Labour Force Survey (PLFS) in India in 2017–18 constituted an important methodological innovation, surveying urban individuals once a quarter over four successive quarters. This allowed researchers to build a panel tracking individuals over the course of a year and construct labour market transition probabilities. The study of labour market transitions has an extensive history for the developed economies and allows not only for a deeper understanding of labour dynamics and the characterisation of unemployment (Clark and Summers, 1979; Elsby et al., 2011, 2013; Leeves, 1997) but for the construction and evaluation of important policy proposals (Atkinson and Micklewright, 1991; Bradbury, 2014; Fabrizi and Mussida, 2009; Scoppetta, 2019). The lack of such data in India until now has resulted in an inability to track the dynamic behaviour of Indian labour and understand the forces driving long-run and short-run changes.

This paper constructs a pooled panel of urban individuals aged 15–65 years from 2017 to 2019 to estimate labour market flows and their relative differences across demographic categories, quantifying important measures of labour market dynamism such as rates of job finding and job loss, measures that could not be calculated using earlier rounds of the NSSO surveys, owing to sample design. We construct conditional transition probabilities to analyse and quantify not just the extent of aggregate labour flows, but also to understand the relative disadvantages faced by women in the urban Indian labour force. Owing to the design and recent introduction of the PLFS, our results are applicable *only* for urban labour markets and only for a short time period, and hence cannot be used to comment on long-term dynamics such as structural transformation and rural-urban migration.

This paper's original contribution to a literature that has so far only focused on cross-sectional data, lies along three fronts: one, estimating conditional transition probabilities and analysing the broad dynamics of labour in urban India: two, quantifying the relative differences by gender, age and education in labour market flows; and three, highlighting patterns of disadvantage that may provide new insights into the phenomenon of low labour force participation of women. We find that the Indian urban labour market displays relatively low dynamism, with only a small minority of individuals making transitions through different labour market states, and worryingly low rates of employment generation, lower than even some developed economies. There is a clear gender divide, with men mostly remaining in employment through four quarters and women remaining outside the labour force. Where women do make transitions, the direction is largely from the labour force – from both employment and unemployment – to non-participation.

Furthermore, we find evidence that women face significant disadvantages at the intersection of age and education, with job-finding rates – the probability of transitioning from unemployment to employment – being significantly less compared to men, indicative of low demand for women's labour in the Indian urban economy (a point raised by Deshpande and Singh (2021) as well).

The aim of this paper is to uncover dynamic, short-run patterns of mobility and disadvantage faced by women in Indian urban labour markets, patterns that have largely remained unexamined due to the unavailability of longitudinal panel data over relatively short periods of time. We do not attempt an analysis of causality at this stage; the original contribution of this paper lies in uncovering and outlining 'stylised facts' relating to labour dynamics that may provide the foundation for future causal and theoretical analysis into the dynamics of women's labour force decisions in a developing economy. For instance, our analysis indicates that the phenomenon of low – and falling – rates of labour force participation for women are due to non-entry into the labour force *as well as* significant rates of exit from those already participating in the labour force, thus opening up fertile ground for policy analysis as well as future research in hitherto undiscovered areas relating to women's employment. Furthermore, the fact that job-finding rates for women are lower than even those found in developed economies despite the existence of an informal sector – where employment is supposed to be relatively easy to come by – signals a dire need for intervention by research and/or policy. Our analysis adds greater weight to a growing literature that points to questions of weak employment generation and low demand for women's labour.

Declining female labour force participation: A review of literature

Table 1 outlines labour force participation rates (LFPRs) – in terms of the usual status including principal and subsidiary forms of work – for rural and urban sectors from the 43rd Round of the Employment and Unemployment Surveys of the NSSO (covering the period 1993–94) to the PLFS of 2018–19 for women aged 15 and above. Barring a rise in the mid-2000s, women's LFPRs have been declining since the early 1990s in both rural and urban areas. While LFPRs are higher in rural areas than urban (Klasen and Pieters, 2015), the fall has been much more significant in the former, and largely seen amongst agricultural workers (Rustagi, 2013). While rural LFPRs for women have been continuously falling since 2004–05, urban women's LFPRs has remained roughly constant since 2011–12, at around the same level as that seen in 1999–2000.

The simultaneous occurrence of a fall in participation rates alongside significantly high rates of economic growth – particularly in the period between 2004–05 and 2011–12 – posed a significant paradox. This led to the hypothesis of an 'income effect', whereby increases in household incomes would lead to women withdrawing from the labour force due to income security being assured within the household (Mehrotra and Sinha, 2017). This view implicitly sees women's labour as a reserve, being called upon to address income shortfalls. At a macro level, this view assumes the existence of a 'U-shaped' curve between economic development and women's labour force participation, where growth and structural change in a developing economy leads to an initial

Table 1. Women's LFPRs (age 15 and above).

	Rural	Urban
1993–94	49	23.8
1999–2000	45.7	20.9
2004–05	49.4	24.4
2011–12	35.82	20.54
2018–19	26.4	20.4

Source: Various NSS Rounds. The figures show the percentage of women aged 15 and above participating in the labour force.

withdrawal of women's labour and then a subsequent increase (Goldin, 1995). Lahoti and Swaminathan (2013), however, find no real link between economic growth and labour force participation at the state-wise level, while Gaddis and Klasen (2014) cast doubt on the very existence of a U-shaped curve itself.

Given that the most significant reductions in LFPRs have been seen amongst rural women, much of the literature focuses largely on rural women and conditions of employment in rural India (Sanghi et al., 2015). A multitude of factors are responsible for this reduction (Kapsos et al., 2014), such as increasing educational attainment (Afridi et al., 2018; Bhalla, 2019; Das and Desai, 2003; Ghai, 2018) and increasing household incomes and rising rural real wages (Mehrotra and Parida, 2017; Neff et al., 2012). Jayachandran (2021) argues that cultural norms play a greater role in influencing women's LFPRs amongst economies at similar levels of development. In this vein, Dhanaraj and Mahambare (2019) examine the Indian institution of a joint family; they find that married women residing in a joint family are less likely to participate in non-farm employment. Deshpande and Kabeer (2021) complicate the question of norms, finding that religion and other markers of norms – such as veiling – are not as important as determinants of labour force participation as compared to the norm necessitating that the burden of domestic work be shouldered by women alone (see also Afridi et al., 2022b). Another strand of work focuses on measurement errors and the construction of these surveys itself, and how the nature of the survey and our limited conceptualisation of women's work affects our measurements in rural and urban India (Desai and Joshi, 2019; Hirway, 2012; Kapur et al., 2021; Sircar, 2010).

A growing literature has begun to look at demand-side factors such as technical change, employment generation and the demand for women's labour in rural India. Afridi et al. (2022a) examine how mechanisation in agriculture reduced the need for women's work in labour-intensive operations like weeding. Reductions in women's agricultural employment did not lead to absorption in the non-farm sector owing to the inability of the rural non-farm sector to generate enough livelihood opportunities (Chatterjee et al., 2015). The unavailability of suitable alternate livelihood opportunities in rural India affects both men and women; men, however, have the option of migrating to cities, while opportunities for women are limited (Choithani et al., 2021). Where alternate employment does exist, the ability for women to access such employment safely plays a major role in whether they take up these opportunities. Lei et al. (2019) find a positive effect of road transport infrastructure on non-farm rural employment, with a greater

impact for women than men, while Chatterjee and Sircar (2021) who undertook surveys across four urban clusters of North India found a reduced willingness to engage in work for longer hours of commute.

The focus on demand-side factors is an important one, expanding the field beyond a focus on demographic and supply-side characteristics like education and household income. The use of longitudinal data can better illuminate these questions by precisely estimating important measures of labour demand such as job-finding rates. Breman's (2012) work on 'footloose labour' studied the circulation of labourers amongst informal sectors of the economy through fieldwork and an anthropological look at the lives of migrant labour; large-scale statistical studies remained sparse. Some of the important studies that examine transitions utilise two successive rounds of the Indian Human Development Survey (IHDS), carried out in 2004–05 and 2011–12. Kesar (2020) studied informality in the context of the Indian economy, examining transitions between informal and formal sources of work for households, while Raj et al. (2020) looked at the ability of individuals to transition from informal to formal jobs. Neog and Sahoo (2020) use the methodology of labour market transitions to examine intergenerational occupational mobility. Sarkar et al. (2019) examine women's labour force transitions over this period, finding existence of a significant income effect. Though they provide valuable insights into the dynamics of the labour market, the large time period involved – 7 years separate the two successive rounds of the IHDS – makes it difficult to understand the nature of short-term transitions. Furthermore, these studies do not disaggregate movements within the labour force to understand the nature of transitions through employment and unemployment.

Bhattacharya (2021) utilises PLFS data to study gross and net flows of labour. In contrast, we examine conditional transition probabilities, which allows for a deeper examination of labour dynamics. Deshpande and Singh (2021) cover similar grounds using data from the Consumer Pyramid Household Survey (CPHS) of the Centre for Monitoring Indian Economy, analysing the factors that influence entries and exits into the labour force. They find that the probability of labour force entry (exit) is negatively (positively) related to the increase in income of other household members and positively (negatively) related to the presence of unemployed male members. They further stress the importance of focusing on demand-side explanations of falling women's LFPRs, pointing to the inability of demographic characteristics to explain much of the drop in women's LFPRs over the study period (from 2016 to 2019). Despite some similarities, there exist significant differences regarding our analysis; the CPHS suffers from a relative under-estimation of women's labour force participation owing to its restrictive definition of employment (Abraham and Shrivastava, 2022) and an over-estimation of richer households (Dreze and Somanchi, 2021). Secondly, we distinguish between categories within the labour force – that is, employment and unemployment – so as to better examine demand-side constraints by calculating job-finding rates and examining the relative differences across gender and education categories.

The study of labour market transitions

An individual exists in any one of three states in the labour market: either employed (E), unemployed (U) or being out of the labour force (OLF) (non-participation). Assume an individual in state A_t at time t, transitioning to state B_{t+1} in period $(t + 1)$. The transition

Table 2. Description of the panel.

	2017–18	2018–19
N	31,846	31,817
Sex (female %)	49.9	49.6
Social group (%)		
Scheduled tribe	8.5	8.3
Scheduled caste	14.2	13.5
OBC	37.3	39.0
Others	40.0	39.2
Religion		
Hindu	71.7	73.5
Islam	17.1	15.9
Christianity	7.5	6.7
Others	3.8	3.9
Average age (in years)	35.7	36.0
Educational profile (%)		
Not literate	12.3	11.2
Literate up to primary	12.3	12.3
Middle	21.4	20.6
Up to higher secondary	33.2	33.4
Graduation and above	20.8	22.6
Household type (%)		
Self employed	38.5	38.0
Regular wage	41.9	44.1
Casual labour	12.1	10.4
Others	7.5	7.5

Source: PLFS panel for 2017–18 and 2018–19 as constructed by the authors.

probability p(AB) is measured by dividing the number of people who have made this transition by the total number of people in state A_t. With nine such transitions possible, nine transition probabilities can be calculated (Theeuwes, 1986).

$$p(AB) = \frac{A_t B_{t+1}}{A_t} \tag{1}$$

All urban individuals in the PLFS sample are interviewed once every quarter for four quarters, thus allowing for the construction of a panel that tracks changing labour force status four times – one every quarter – over a year. Transition matrices – which present the nine possible transition probabilities – are estimated for a pooled sample over the periods 2017–18 and 2018–19, covering the transitions made between the first quarter – covering the months July to September – and the fourth quarter – the months April to June of the subsequent year – for all individuals aged 15–65. The method of panel construction is outlined in the Appendix. The individual panels are largely similar in construction each consisting of roughly 31,800 individuals (as shown in Table 2) for a total

sample size of 63,633 individuals. The employment status of individuals is determined according to their Current Weekly Status (CWS), which classifies status based on an individual's activities over the 7 days prior to the date on which the survey was conducted.[1] In this paper, we make no disaggregation regarding an individual's nature of employment (whether self-employed, regular wage or casual), nor between formal, informal or precarious forms of work.

The methodology we follow differs from the literature in certain respects. We estimate transitions between the first and fourth quarters; this differs from much of the literature which estimates short-term transitions, either month-to-month or quarter-to-quarter (e.g. Leeves, 1997). Secondly, our conditional transition matrices are the probabilities of transitions conditional on certain demographic characteristics, differing from work that attempts an estimation of transition probabilities conditional on the labour market status in a previous month (Gomes, 2012; Hall and Kudlyak, 2020; Krueger et al., 2014; Kudlyak and Lange, 2018). Our conditional transition matrices are predicted probabilities of transitions estimated through the calculation of marginal effects at sample values from the following logistic regressions:

$$\log\left[\text{Tr}(AB)\right] = \beta_o + \sum_{i=1}^{n} \beta_i . X_i + u_i \tag{2}$$

where log[Tr(AB)] is the log of the odds of transitioning from state A to B. The individual is coded 1 if she makes the transition, and 0 otherwise.

The demographic characteristics chosen are age, gender, caste – with the 'Others' or General category as the base (a proxy for the privileged Upper Castes), and Scheduled Tribes (ST), Scheduled Castes (SC) and the Other Backward Classes (OBC) as the relevant categories – and education – workers without schooling form the base, with the other categories representing workers with some schooling and those with graduate degrees and higher. We construct three categories of workers – the young (aged 15–25), prime-age (26–50) and older workers (51 and above) – to evaluate younger workers' outcomes vis-à-vis their older counterparts. We do not include such variables that may influence transitions for women alone, such as the number of children within the household nor changes in marital status, a methodology more appropriate for a causal analysis. Our estimates are not estimates of the factors influencing labour supply but are an estimation of the relative strength of different labour flows for specified demographic categories, so as to provide directions and raise questions for future research.

A total of nine logistic regressions are run, one for each relevant transition. The sample for each regression consists only of those individuals who are in state A in the initial time period (first quarter of the year); the results of the logistic regressions are displayed in Appendix 1. Predicted probabilities for each demographic category are then calculated through the estimation of marginal effects, and the relevant conditional transition matrices are presented, along with confidence intervals of each estimate.

Our paper suffers from three main limitations. The use of the CWS to define quarterly labour force status implies that individuals' labour force status for the entire quarter is defined according to their activities in the given reference week within that quarter. They might undertake several transitions within the quarter outside the reference week which

Table 3. Broad movements (as % of entire sample).

	Overall	Men	Women
Those with same status throughout	88.52	87.89	89.16
In labour force throughout	43.93	72.79	14.78
Employed throughout	38.4	63.75	12.79
Unemployed throughout	2.28	3.32	1.23
Out of labour force throughout	47.84	20.82	75.13
Making more than one transition (as share of population)	4.65	5.06	4.21
Making more than one transition (as share of those making *at least* one transition)	40.51	41.78	38.84
Total number of observations	63,663	31,990	31,673

Source: From panel constructed by authors.

cannot be taken account of. Secondly, the PLFS records individuals over a relatively short period – once every quarter for four quarters – unlike the CPHS, which records individuals monthly over a couple of years. Our panel is thus restricted to analysing individuals' labour market behaviour over a period of 1 year alone. And finally, since such a panel has been constructed in the NSSO for the urban sector alone, we cannot comment on the dynamics of the rural sector, a sector which has seen the largest falls in women's labour force participation.

Descriptive analysis

We begin by outlining broad trends as shown in Table 3. A high proportion of individuals – nearly 89% – remain in the same status – either employed, unemployed or outside the labour force – in each quarter; roughly 11% of the total sample experience at least one transition within the year. Nearly 48% of individuals spend all four quarters OLF, while 44% spend all four quarters within it. About 38.4% of the total sample remain employed throughout all four quarters, while 2.28% remain unemployed.

Across both genders, the proportions of those who retain the same status in all four quarters is roughly the same (between 88% and 89%). The difference lies in the rates of labour force participation. While only 21% of men remain outside the labour force in all periods, three-quarters of women do not register their presence in the labour force for even one quarter. While 63.75% of men remain employed in all four quarters, only 13% of women remain so, testifying to the significantly low levels of labour force engagement of urban women in India.

Of those who do make transitions, the share of those who make multiple transitions, either through different statuses – that is, from employment to unemployment and then non-participation – or through the same statuses but at different periods – that is, from employment to unemployment and back again to employment – is relatively low, at around 4.65% of the overall population and 40.5% of those who make *at least* one transition. The share of men making more than one transition is higher than that of women.

Table 4 presents gross labour market flows between the first and fourth quarter disaggregated by gender. As mentioned above, a greater proportion of men tend to remain

Table 4. Gross flows (as % of entire sample).

	Overall	Men	Women
Employment-Employment	40.08	66.05	13.85
Employment-Unemployment	1.15	1.94	0.34
Employment-OLF	2.17	1.43	2.93
Unemployment-Employment	1.14	1.96	0.31
Unemployment-Unemployment	2.85	4.13	1.55
Unemployment-OLF	0.91	0.83	0.99
OLF-Employment	1.58	1.21	1.96
OLF-Unemployment	0.88	0.83	0.93
OLF-OLF	49.24	21.62	77.14
Total number of observations	63,663	31,990	31,673

Source: From panel constructed by authors.

Table 5. Unconditional transition matrix: Aggregate.

	E	U	OLF
E	92.35 (25,514)	2.64 (729)	5.01 (1384)
U	23.25 (724)	58.16 (1811)	18.59 (579)
OLF	3.06 (1007)	1.71 (562)	95.23 (31,341)

The table above outlines transition probabilities calculated as shown in equation (1). Figures in brackets are sample sizes for that transition.

employed throughout the year; however, the share of men who remain unemployed in both periods is significantly higher than that of women.

The proportions of those moving from unemployment to employment is relatively low at only 1.14%, indicating low rates of employment generation; movement from employment to unemployment is higher at 1.15%. The difference in terms of gender is stark, with nearly 2% of men moving from unemployment to employment as compared to only 0.3% of women. A high proportion of women, in contrast, move from employment to non-participation. The multiple difficulties faced by women is displayed in the tables above; a reduced propensity to participate in the labour force, lower movements into employment and high movements out of employment to non-participation.

Transition probabilities

Table 5 presents the unconditional transition matrices at the aggregate level. Each cell represents the transition probability (as outlined in equation (1)) from employment (E), unemployment (U) or non-participation (Out of the Labour Force or OLF) in the initial quarter to any one of these three possible states in the fourth quarter; each row sums up to 100. These tables confirm the findings outlined when studying gross flows: both those employed and those OLF in the first quarter largely remain in the same state by the fourth quarter.

The consideration of gross flows alone wouldn't provide an adequate understanding of transitions if there existed significant differences in LFPRs.[2] Consider, for example, the movements from employment and unemployment to non-participation. Gross flows from employment to non-participation is 2.17% while from unemployment, 0.91%. This would imply that the problem of moving from employment to non-participation is more acute than movements from unemployment. But this relative ranking is due to the share of employed in the population being much larger than that of the unemployed. When considering transition probabilities, we see that 5% of the employed move to non-participation as compared to 18.6% of the unemployed.

Transition probabilities provide insights into the dynamics of unemployment, a question relatively unaddressed in the field of Indian labour economics. Around 58.16% of those unemployed at the beginning of the year are *still* unemployed by the fourth quarter, indicating a significant problem of long-term unemployment. However, of those who do exit unemployment, the share of those who actually find employment is low; only 23.25% of the unemployed find work at the end of the year, while 18.6% move to non-participation. The problem of unemployment is heightened due to low employment generation; the problem would be *even worse* were it not for the movement to non-participation.

Donovan et al. (2020) construct and analyse cross-country measures of labour market flows, ranging from relatively low-income countries like Palestine – with a gross domestic product (GDP) per capita in the range of 2800–4600 in purchasing power parity terms – to South Africa – GDP per capita 11,800–12,400 – to richer countries like Denmark, the United Kingdom and the United States (For comparison, India's GDP per capita lies in the range 6500–6900). They find an inverse relation between flows and GDP, with job-finding and job-loss rates higher in poorer economies. However, India's quarterly job-finding rates are much lower than even richer countries in the sample. Ward-Warmedinger and Macchiarelli (2014) report an average annual job-finding rate (transition from unemployment to employment) of Nordic economies – for those aged 16–64 – of 39.7% (over the period 2004–2008), higher than that of India at 23.25%, even though the Nordic economies are all significantly richer. A developing economy like Vietnam also exhibits higher job-finding rates, with the average quarterly measure (across the period 2011–19) of the transition from unemployment to employment calculated at 39.9% (Samaniego and Viegelahn, 2021).

The above table presents unconditional transitions and does not control for the impact of different demographical variables – such as age, caste and educational status – on the probability of transitions. We calculate conditional transition probabilities for each variable through the methodology discussed above. The conditional transition probability matrix for gender is displayed in Table 6. The transition dynamics for men are similar to that seen at the all-India level, with significant retention of employment, low job-loss rates (the transition probability from employment to unemployment) and relatively low job-finding rates (the transition probability from unemployment to employment). While 27% of unemployed men find some form of employment over the year, only 12.45% of unemployed women are able to secure employment. In comparison, the average annual job-finding rate for women in Nordic economies as estimated by Ward-Warmedinger and Macchiarelli (2014) is 39.47%. While the period of comparison might differ – their

Table 6. Conditional transitions matrix: Gender.

Men	E	U	OLF
E	95.17 (0.9489, 0.9545)	2.8 (0.0259, 0.0302)	2.04 (0.0185, 0.0222)
U	27.02 (0.2529, 0.2876)	61.25 (0.593, 0.6319)	11.71 (0.1037, 0.1304)
OLF	7.22 (0.06328, 0.0811)	3.37 (0.0286, 0.0388)	89.63 (0.8868, 0.9059)

Women	E	U	OLF
E	80.48 (0.7938, 0.8158)	1.98 (0.016, 0.0236)	17.81 (0.1672, 0.1889)
U	12.45 (0.1016, 0.1474)	50.48 (0.4727, 0.5369)	36.4 (0.3313, 0.3966)
OLF	2.24 (0.0206, 0.0242)	1.18 (0.0104, 0.0132)	96.57 (0.9635, 0.968)

Conditional transition probabilities derived from marginal effects calculated from regressions using equation (2).

estimates are averages for 2004–2008 – it does uncover a significant problem. One would expect a relatively lower-income country like India to have higher job-finding rates, given the presence of a large informal economy. The fact that it does not outlines the onerous burdens faced by Indian women.

In spite of low job-finding rates, the problem of long-term unemployment is higher for men than women, with 61.25% of unemployed men remaining unemployed in the fourth quarter compared to 50.5% of women. This is due to the significant movement to non-participation seen in the case of women; 36% of unemployed women and 17.8% of employed women move to non-participation by the fourth quarter. It is unclear whether this is due to women being fired from jobs at a faster rate and not spending as much time in unemployment as men, or because women voluntarily leave employment. Moreover, it is unclear whether transitions from unemployment to non-participation are because of low job-finding rates – women, discouraged from not finding suitable employment, cease the process of job search – or *determine* low job-finding rates, as women face social constraints and norms that cause them to cease job search early and hence do not take up what employment opportunities are available. These are important questions for future research; the main contribution of this paper is to highlight future avenues of research in what is already a well-studied phenomenon.

What is surprising is that even in an environment of low labour demand for women's work, there exists a significant flow from employment to non-participation. As outlined above, a large literature has emerged pointing to several factors – childbirth, household incomes etc. – that influence women's exits from the labour force. The fact that exits can occur from employment even when employment opportunities are so hard to come by is indicative of the significant pressures faced by Indian women.

We next provide estimates on the influence of age (Table 7) and education (Table 8) on transitions. Workers aged 15–25 faced higher rates of job-loss – 7.25% compared to prime-age workers (2.01%) and older workers (1.39%) – and lower job-finding rates – 17.13% compared to 29.25% for prime-age workers and 38.44% for older workers. Nearly 63.5% of young unemployed workers remained unemployed over four quarters, compared to 27.75% of older unemployed workers.

While the possession of a graduate degree does provide some protection against the risk of losing employment – job-loss rates were 2.14% for graduates as compared to

Table 7. Conditional transition matrix: Age group.

15–25	E	U	OLF
E	86.07 (0.8499, 0.8714)	7.25 (0.0643, 0.0806)	6.67 (0.059, 0.0744)
U	17.13 (0.1534, 0.1892)	63.53 (0.6125, 0.6582)	19.2 (0.1734, 0.2105)
OLF	2.1 (0.0185, 0.0235)	2.16 (0.019, 0.0242)	95.7 (0.9534, 0.9606)

26–50	E	U	OLF
E	94.08 (0.9375, 0.944)	2.01 (0.0181, 0.0221)	3.92 (0.0366, 0.0417)
U	29.25 (0.2693, 0.3157)	54.03 (0.5141, 0.5664)	16.88 (0.1499, 0.1877)
OLF	4.82 (0.043, 0.0534)	1.76 (0.0146, 0.0205)	93.55 (0.9298, 0.9411)

51–65	E	U	OLF
E	90.51 (0.8968, 0.9134)	1.39 (0.0107, 0.0172)	8.27 (0.0747, 0.0907)
U	38.44 (0.3077, 0.4611)	27.75 (0.1912, 0.3637)	27.79 (0.1992, 0.3566)
OLF	2.72 (0.0231, 0.031)	0.45 (0.0029, 0.0062)	96.82 (0.964, 0.9725)

See Table 5.

Table 8. Conditional transition matrix: Education.

Illiterate	E	U	OLF
E	90.02 (0.8903, 0.9101)	3.94 (0.0315, 0.0472)	6.07 (0.0535, 0.0678)
U	32.92 (0.2582, 0.4003)	37.17 (0.2887, 0.4547)	27.27 (0.201, 0.3444)
OLF	4.02 (0.0341, 0.0462)	1.25 (0.0082, 0.0167)	94.45 (0.9371, 0.952)

Schooling	E	U	OLF
E	91.86 (0.9145, 0.9227)	2.66 (0.0243, 0.029)	5.5 (0.0516, 0.0585)
U	28.01 (0.2591, 0.301)	51.16 (0.4869, 0.5363)	20.64 (0.1862, 0.2266)
OLF	2.77 (0.0256, 0.0299)	1.28 (0.0114, 0.0142)	95.97 (0.9572, 0.9623)

Graduate	E	U	OLF
E	94.56 (0.9404, 0.9506)	2.14 (0.018, 0.0247)	3.43 (0.0303, 0.0384)
U	15.95 (0.1395, 0.1795)	67.74 (0.6529, 0.7018)	15.84 (0.1401, 0.1767)
OLF	3.5 (0.03002, 0.04004)	4.3 (0.0372, 0.0488)	92.29 (0.9155, 0.9303)

See Table 5.

2.66% for workers with some level of schooling and 3.94% for illiterate workers – it confined its holders to longer spells in unemployment. The job-finding rate was only 16% for graduates as compared to 28% for workers with schooling and nearly 33% for illiterate workers, with the result that 67.7% of unemployed graduates remained unemployed over four quarters, compared to 37.17% of illiterate workers. The high rates of job-finding for illiterate workers could be due to working in the informal economy, where employment opportunities are (relatively) greater, but are of a precarious and ill-paid nature.

Gender, education and transitions

The above tables highlight the specific vulnerabilities faced by women, the young and the highly educated in the labour market. Women face significant pressures not only at the point of entry into the labour market, but also in the direction of exits. The young and graduates face different kinds of pressures – the inability to find employment and the threat of long-term unemployment. But do these vulnerabilities remain the same across genders? In the following tables, we calculate transition probabilities of gender and its intersection with age and education through the calculation of marginal effects for interacted variables.

Across both genders, the disparities seen with regards to age and education still hold, both the young and graduates face lower rates of job-finding and longer spells of unemployment in comparison to older and less educated workers, respectively. The disparity across genders within the same age and education categories, however, is stark. While 20.11% of young unemployed males find employment, only 8.5% of young female job-seekers are successful (Table 9). This disparity is seen for all age-groups, where the job-finding rate for prime-age and older women workers are nearly half that of prime-age and older male workers, respectively.

As mentioned above, the low rates of women stuck in long-term unemployment in the face of low job-finding rates is due to exits to non-participation, exits which are worryingly high across all age groups. While 37.49% of young unemployed women leave the labour force by the fourth quarter, this proportion rises to 50.29% in the case of older women, rates that are much higher than for men. Prime-age unemployed women and men do face lower exit rates as compared to the young and the old, but it is still much higher for women (33.64%) as compared to men (10.4%).

We noted above that the rates of employment retention – the E-E transition – were lower for younger workers than for prime-age and older workers. Table 8 indicates just how skewed this in terms of gender. Only 66.74% of young women employed in the first quarter remain employed by the end of the fourth, in contrast to nearly 90% of young men. This is not because young women are moving into unemployment by the last quarter of the year – the E-U rate for young women is 5.5% compared to 7.68% for young men – but because they exit the labour force at higher rates. A staggering 23.14% of young women who are employed in the first quarter move to non-participation by the fourth, compared to only 2.74% of young men. This discrepancy is seen across all age-groups, with the E-E transition probabilities for prime-age and older women significantly less than that of men.

Similar differences can be seen with regards to education (Table 10). Across both genders, job-finding rates reduce as education levels increase; graduates find it harder to secure employment compared to illiterates. But within any given educational category, job-finding rates for women are much less than those of men. The job-finding rate for graduate women falls to only 8%, indicating a significant problem of employment generation for educated women in the urban Indian economy.

The phenomenon of low job-finding rates and high labour force exists for women are seen across all educational categories. While only 9.5% of unemployed graduate men exit to non-participation by the end of four quarters, the proportion rises to 31.55% for women, resulting in the fact that roughly 71% of unemployed male graduates remain so

Table 9. Age and gender.

15–25	Men			Women		
	E	U	OLF	E	U	OLF
E	90.73 (0.8983, 0.9162)	7.68 (0.06679, 0.0858)	2.74 (0.0232, 0.0317)	66.74 (0.6433, 0.6916)	5.5 (0.0438, 0.0662)	23.14 (0.2063, 0.2567)
U	20.11 (0.1801, 0.2221)	66.52 (0.6407, 0.6898)	12.08 (0.1036, 0.1382)	8.5 (0.0652, 0.1044)	55.8 (0.5216, 0.5943)	37.49 (0.3370, 0.4128)
OLF	4.6 (0.0408, 0.0513)	4.29 (0.0376, 0.0483)	90.97 (0.9024, 0.917)	1.39 (0.0115, 0.0162)	1.51 (0.0123, 0.0179)	97.07 (0.967, 0.9744)

26–50	Men			Women		
	E	U	OLF	E	U	OLF
E	96.4 (0.9616, 0.9667)	2.13 (0.019, 0.0236)	1.5 (0.0136, 0.0163)	84.45 (0.8337, 0.8554)	1.5 (0.0119, 0.018)	14.07 (0.1296, 0.1518)
U	33.98 (0.3116, 0.3681)	57.26 (0.5445, 0.6007)	10.4 (0.0885, 0.1194)	16.17 (0.1317, 0.1917)	46.01 (0.4216, 0.4986)	33.64 (0.2951, 0.3776)
OLF	10.31 (0.0859, 0.1204)	3.5 (0.0262, 0.0438)	86.7 (0.8494, 0.8846)	3.25 (0.0296, 0.0354)	1.22 (0.0105, 0.014)	95.53 (0.9519, 0.9586)

51–65	Men			Women		
	E	U	OLF	E	U	OLF
E	93.9 (0.9336, 0.9462)	1.48 (0.0113, 0.0182)	3.54 (0.0304, 0.0404)	76.12 (0.7401, 0.7823)	1.04 (0.0072, 0.0135)	28.1 (0.2556, 0.3063)
U	44.2 (0.3572, 0.5269)	30.46 (0.2133, 0.3957)	18.89 (0.1224, 0.2553)	23.09 (0.1603, 0.3016)	21.71 (0.1401, 0.2941)	50.29 (0.3907, 0.6151)
OLF	5.9 (0.0494, 0.0686)	0.2 (0.0056, 0.0126)	93.26 (0.9228, 0.9424)	1.8 (0.0149, 0.0210)	0.3 (0.0019, 0.0043)	97.85 (0.9752, 0.9818)

See Table 5.

Table 10. Education and gender.

Illiterate	Men			Women		
	E	U	OLF	E	U	OLF
E	93.54 (0.9275, 0.9434)	4.16 (0.033, 0.0502)	2.5 (0.021, 0.0291)	75.18 (0.7299, 0.7737)	2.97 (0.0224, 0.0369)	21.23 (0.1894, 0.2352)
U	38.43 (0.3048, 0.4638)	40.22 (0.3156, 0.4888)	18.28 (0.1218, 0.2438)	19.06 (0.1309, 0.2502)	29.77 (0.2181, 0.3773)	49.46 (0.3898, 0.5993)
OLF	9.28 (0.0763, 0.1093)	2.47 (0.0155, 0.0339)	88.1 (0.8629, 0.8987)	2.92 (0.0247, 0.0338)	0.85 (0.0056, 0.0113)	96.04 (0.9548, 0.9659)

Schooling	Men			Women		
	E	U	OLF	E	U	OLF
E	94.84 (0.9452, 0.9516)	2.82 (0.0257, 0.0308)	2.24 (0.0203, 0.0245)	79.25 (0.7786, 0.8064)	1.99 (0.0159, 0.024)	19.42 (0.1798, 0.2087)
U	32.93 (0.3049, 0.3538)	54.47 (0.5191, 0.5704)	12.99 (0.1135, 0.1464)	19.06 (0.1309, 0.2502)	43.04 (0.39, 0.4708)	39.55 (0.3499, 0.4412)
OLF	6.52 (0.0565, 0.074)	2.52 (0.0209, 0.0296)	91.2 (0.9029, 0.921)	2.01 (0.0181, 0.022)	0.87 (0.0074, 0.0099)	97.15 (0.9691, 0.9738)

Graduate	Men			Women		
	E	U	OLF	E	U	OLF
E	96.66 (0.9627, 0.9703)	2.26 (0.019, 0.0263)	1.32 (0.0111, 0.0153)	85.6 (0.8427, 0.8693)	1.6 (0.0122, 0.0198)	12.48 (0.1106, 0.1389)
U	19.08 (0.1666, 21.5)	70.69 (0.6797, 0.7341)	9.5 (0.0781, 0.112)	7.99 (0.0616, 0.0981)	60.38 (0.5692, 0.6384)	31.55 (0.2810, 0.35)
OLF	8.15 (0.0679, 0.0952)	8.32 (0.0689, 0.0974)	83.82 (0.8205, 0.8561)	2.55 (0.0215, 0.0294)	3.01 (0.0251, 0.0351)	94.43 (0.9381, 0.9505)

See Table 5.

after four quarters compared to roughly 60% of unemployed women graduates. At every education level, more men remain in long-term unemployment, but more unemployed women exit the labour force. Employment generation is failing urban women, but their large-scale exits from the labour force imply an inability to properly estimate the contours of the problem.

Conclusion

This paper outlines the difficulties faced by Indian women in the labour market in a dynamic context, pointing to the low rates of labour force participation and relatively high rates of labour force exits faced by women. The urban Indian economy suffers from significantly low rates of job creation, lower than even richer economies, when the presence of a large informal sector would imply otherwise. Women face a further disadvantage, in that their job finding rates are even lower than the economy-wide job-finding rate, more so for young and highly educated women. This indicates the significant burdens facing Indian women who decide to enter the labour market, where the probability of finding employment is extremely low. An important direction for future research, therefore, is to examine the factors that determine these low rates of employment generation, both in the aggregate and for women specifically.

The purpose of this analysis is to provide a broad picture of labour mobility – an analysis that has not been advanced till now in the case of India – to provide grounds for future causal analysis. The literature has established that women's labour force participation is inversely related to household income, with women participating in the labour force when the household faces income shortages. Future research must also examine the relationship between low job-finding rates and the decisions to exit the labour force. Does low demand for women in the workforce drive them OLF? Or are low job-finding rates the result of women not being able to spend as much time in job search as men, being forced to exit the labour force before finding work owing to household and societal pressures? What determines the exits from paid employment? The answers to these questions will provide deeper insight into the factors determining low female LFPRs; the contribution of this paper is to highlight these patterns and the dynamics that require further study.

Notes

1. Individuals classified as being employed correspond to statuses 11–72, covering the self-employed, casual wage and regular wage workers. Status 81 refers to those individuals who were not working but actively sought and were available for work, while status 82 referred to those who did not actively seek work but were available for work. For the purpose of this study, these two statuses have been included in the definition of unemployment.
2. For individuals transitioning from state A to B, the transition probability equals the proportion of gross flows divided by the population share of individuals in state A.

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Appendix 1. Regression estimates.

	E-E	E-U	E-OLF
Year – 2018	1.226316**	0.7043272**	0.897337
Female	0.2002244**	0.6980523**	10.87338**
Age category (base 15–25)			
26–50	2.757295**	0.2600232**	0.5393224**
51–65	1.604068**	0.1790437**	1.303473**
Caste (base Gen)			
ST	1.872249**	0.5144115**	0.550942**
SC	0.8210701**	1.471708**	1.050666
OBC	0.8335117**	1.188765**	1.181566*
Education (base Illiterate)			
Schooling	1.272895**	0.66181**	0.890984
Graduates	2.010698**	0.5259854**	0.5201854**
Constant	6.897173**	0.1352091**	0.0356086**
Number of obs	27,557		

	U-E	U-U	U-OLF
Year – 2018	1.111309	1.045364	0.8283556
Female	0.357836**	0.6202645**	4.432638**
Age category (base 15–25)			
26–50	2.119611**	0.6603947**	0.8431636
51–65	3.358104**	0.2031163**	1.70057*
Caste (base Gen)			
ST	0.323371**	2.12648**	0.7719416
SC	1.168861	0.9602665	0.8631553
OBC	1.227567*	0.9648895	0.8148178
Education (base Illiterate)			
Schooling	0.7749375	1.818379**	0.6661679
Graduates	0.3582578**	3.77125**	0.4676954**
Constant	0.4011431**	0.7727082	0.2895805**
Number of obs	3112		

	OLF-E	OLF-U	OLF-OLF
Year – 2018	0.8925823	0.6366353**	1.27642**
Female	0.2911064**	0.3374376**	3.312473**
Age category (base 15–25)			
26–50	2.390924**	0.8056818	0.6435469**
51–65	1.300492**	0.2019657**	1.377239**
Caste (base Gen)			
ST	0.805301	1.31442	1.014075
SC	1.480758**	1.761876**	0.6196881**
OBC	1.140299	1.221633	0.8443624**
Education (base Illiterate)			
Schooling	0.678729**	1.024093	1.407704**
Graduates	0.8660792	3.635381**	0.6977026**
Constant	0.0617239**	0.0330489**	8.770985**
Number of observations	32,834		

[l]o.s.: level of significance.
*Indicates significance at 5% l.o.s, and **indicates significance at 1% l.o.s.