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ABSTRACT

Lockdown and Rural Joblessness in India: Gender Inequality in Employment?*

India experienced one of the strictest lockdowns during COVID-19 and sections of the workforce seemed overwhelmingly disadvantaged. Given substantial poverty still, marginalized daily wage labor and gendered outcomes in the context of India, economic shocks are expected to have disparate implications. Employing World Bank data for rural areas in six states of India, we investigate the probability of female employment during the lockdown period between March and May 2020. Based on marginal estimates of logit specifications, our results show that females, in general, were 8 percent less likely to be employed as compared to males. Females belonging to marginalized castes experienced higher likelihood of being unemployed – between 9 and 14%. Return migrants generally suffered less in terms of finding alternative jobs at the source, but being a female return migrant, the probability of joblessness rises to about 17%. For female return migrants belonging to marginalized castes, the probability of joblessness is about 10%. Lockdown is expected to have raised the economic inequality by gender and needs commensurate interventions.

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1. Introduction

The combined effect of the severity of the pandemic (Malani et al., 2021; Mohanan et al., 2020) and the consequent economic lockdown (viz. Hale et al, 2020) precipitated unforeseen economic shocks world over, with no exception for India. For a developing country like India struggling with issues of poverty alleviation with a significant share of workforce being still in the informal labor market (Marjit and Kar, 2011), the pandemic aggravated the problems for marginalized groups (Gupta, Malani and Woda, 2021). Recent studies have found that the pandemic coupled with the lockdown in India has increased unemployment significantly, reduced earnings of informal workers dramatically, enhanced food insecurity and depleted savings (viz. Kesar et al, 2020). The authors also find evidence of patchy coverage in terms of relief measures.

The informal labor market in India accounting for approximately 90% of the labor force is characterized by low earnings, insecure jobs, unhealthy and unsafe working conditions, lack of social protection and mostly no-work-no-pay job contracts (ILO, 2018; Chen, 2012; State of Working in India, 2018). Consequently, an economic shock arising from strict lockdown is expected to cause significant economic distress among a larger section of this workforce. Analytically speaking, while sustained lockdown should protect from Covid induced imminent health hazards (Agarwal, 2021), it poses a costly trade-off for economic distress – one that is not limited to present conditions of the male workers but involves that of women and children in such families over foreseeable future. It is well known due to early work of Killingsworth and Heckman (1986) and several subsequent studies of importance that female participation in the labor force, and the ability to make economic decisions at the household level, is crucial for schooling and future occupations of the children. While the short time-span covered in the

present study shall not be able to trace the future outcomes, alongside the fact that the lockdown has in effect been lifted, the temporary negative shocks may indeed have long-run impact for women and children. In other words, it should be of value to investigate as a first layer if the lockdown had a negative impact on the occupational outcomes by gender.

Building on the very recent set of studies that investigate the impact on Covid on economic outcomes (Alstadsæter et al., 2020; Chen et al., 2020), we explore the economic shocks faced in rural areas of six Indian states in terms of joblessness. Our main contribution hinges on asking if joblessness during the lockdown among rural workers had a gendered aspect to it. In other words, we investigate if females in the rural areas are less likely to be employed relative to males during the lockdown period. Pre-existing gender inequalities in terms of occupation and wages (Agarwal, 2021) exacerbated the gender disparities as evident from our findings. Based on individual level data for six states across multiple districts, we find that females are 8.4 percent less likely to be employed than males in rural areas.

Section 1.1 offers a brief survey of the recent changes in employment and generally economic outcomes due to Covid. Section 2 deals with the data, of which 2.1 details the data source, section 2.2 identifies the sample we use extensively, section 2.3 and 2.4 discuss the scope and coverage of the dependent and independent variables. Section 3 offers the empirical specification and the models to be used for our purpose. Section 4 discusses the results, of which 4.2 is about the gender outcome, while section 4.3 is about return migrants. Importantly, in section 5.1, we interact a three-way relation between gender, return migration and caste. Section 6 concludes.

1.1   A Brief Survey

As Gol (2019) points out, the informal sector, which employs almost 90% of females, experience gap in earnings. Extensive recent research provides strong evidence of exacerbating social disparities that include gender inequalities. Studies like Beland et al. (2020), Kochhar and Barroso (2020), Kristal and Yaish (2020), Lemieux et al (2020) and Qian and Fan (2020) have shown that the pandemic effect has been the harshest for women, less-educated and lower-wage workers, and other disadvantaged group in the labor market. Employing Labor Force Survey data from Canada, Qian and Fuller (2021) find that gender gap in terms of employment has widened among parents of young children. The gendered impact of the pandemic in terms of employment for in-person services has gone up since females are predominantly employed in such jobs (Kochhar and Barroso 2020; Lemieux et al. 2020). As far as household level distribution of workforce participation is concerned, more women are employed in marginal economic positions like part-time employment or work for low wage firms (Cooke and Fuller 2018; Fuller 2018; Moyser 2017). The pandemic has led to women bearing the brunt of caregiving while also losing out on such jobs (Qian and Fuller, 2021). Overall, there is extensive evidence of women left with limited opportunities relative to men due to the lockdown associated with the pandemic (United Nations, 2020; World Bank, 2020b). Some studies have found the effect to be specific for countries. For example, for OECD countries like Austria, Canada, Italy, Poland and Sweden, Galasso and Foucault (2020) find that more women stopped working in the face of pandemic as compared to men. However, this effect is not true for countries like Australia, New Zealand, UK, France, Brazil and USA.

Albeit not as extensive as the developed economies, many studies have started documenting the disparity in outcomes with regard to gender and disadvantaged groups for developing countries arising from the pandemic. Using individual-level data for Nigeria, Hossain and Hossain (2021), find that in the post-pandemic period employment has fallen more for women relative to men. Employing a panel data comprising mostly of developing countries, studies have documented that women-led business are at higher risks of closure relative to men-led businesses over the pandemic (Liu, Wei and Xu, 2021). Egger et al. (2021) employed post-pandemic surveys from developing countries in Africa and find negative effects in terms of income and food security, but the impacts are heterogeneous across countries. In the context of India, studies find that the burden of unpaid work for women has increased disproportionately relative to men because of the pandemic (Chauhan, 2021). It also points out, based on existing gendered roles and social norms that the burden of unpaid work mostly falls on women in India and that has been exacerbated by the lockdowns and the pandemic. Additionally, for many developing economies, it is well known that the range of jobs for women is narrower relative to men and they also have fewer assets and savings (Agarwal, et al. 2021, viz. only 14% women in India own lands in rural areas including homestead), which would be at stake during economic crisis owing to lockdown and joblessness.

We add to the growing literature on India on gender inequality arising from employment. We consider different cohorts among the females, in terms of scheduled caste (SC), scheduled tribe (ST) and other backward caste (OBC). Occupation-wise, apart from workers, we also consider women belonging to self-help groups (SHGs). Our secondary contribution in this paper relates to migrants, who have been particularly distressed by the onset of nationwide lockdown. Specifically, we consider return migrants – individual who lost their jobs due to the lockdown

and had to return to their origin following the declaration of lockdown at a few hours notice, in March, 2020. A number of migrants walked back hundreds of miles through weeks and suffered injuries and even death (Gramvaani, 2020; Jan Sahas, 2020, Thejesh, 2020).

2. Data

2.1 Data Source

All our information for India comes from survey data collected by World Bank, IDinsight, and the Development Data Lab during May, 2020 and September, 2020. As stated by the World Bank[1] (2020c), the main goal of the survey is to provide an assessment of agricultural production and consumption and the changes as induced by the Covid-19 pandemic in the rural areas. Such surveys are often quite helpful in designing stock and distribution of foodgrain in poor countries. The survey collected information on changes in agricultural production and input expenditure, alongside access to credit. The survey provides information on changes in income (wages) and consumption. Additionally, it provides information on migrant workers and access to relief. Finally, it reports coverage of health facilities.

The data was collected for six states of India, namely, Jharkhand, Rajasthan, Uttar Pradesh, Andhra Pradesh, Bihar, and Madhya Pradesh. Different sampling frames were used to assemble the final data as the survey did not have a unified sampling frame. As World Bank (2020c) mentions, four prior frames have been considered from IDinsight projects as well as the National Rural Livelihoods project. Weights[2] were applied for creating comparable state-level estimates.

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[1] https://microdata.worldbank.org/index.php/catalog/3830/study-description#metadata-coverage

[2] Precise weights tend to be idiosyncratic due to the variation in sampling frames.

The Covid-19 surveys for the rural areas in the six states were conducted using Computer Assisted Telephone Interview (CATI) techniques. Surveyors called respondents via mobile and the responses were recorded over phone. To avoid non-responses as much as possible, surveyors attempted to call back respondents up to 7 times. A software named *SurveyCTO* has been used to check for validation and consistency. Outliers have been taken into account and audits have been made on the surveys to check for consistency and accuracy. As an additional step to ensure data accuracy, supervisors randomly re-interviewed a subset of respondents.

2.2   The Sample

Of the three rounds of data collected, Round three has the maximum number of observations followed by Round 2. Round 1 data has the lowest number of observations. We start our benchmark analysis with round three data. There are multiple reasons for doing that. First, in terms of continuity of asking the questions to the same set of individuals in every round, about 20.5 percent of individuals based on round three sample have participated in all surveys. The percent increases to 38.81 when we consider overlap of participants in rounds 1 and 2. Second, our main dependent variable, as described below, is not applicable for round 1 of data, since the question was not asked in round 1. In fact, the question: *if an individual worked during lockdown for income*, has been asked in rounds 2 and 3 only. The overlap in observations between rounds 2 and 3 specifically with respect to this question is about 39%. Since close to half of the responses that constitute the dependent variable are from individuals who responded both in rounds 2 and 3, our benchmark analysis starts with round 3. As part of robustness analysis, we have subsequently checked with round 2 data.

About 80.52 percent of the respondents are male and the rest are female. Age of respondents ranges from 15 to 88 years. The mean age is about 37.5 years. In terms of caste,

14.1% individuals belong to general caste. Conversely, 28.6% of individuals belong to scheduled caste (SC), 15.8% individuals belong to scheduled tribe (ST), and almost 40% individuals belong to other backward castes (OBC). Responses categorized as 'other caste' is less than 1%. In terms of education, about 20.8% of individuals have no schooling.

2.3   Dependent variable

Based on our hypothesis and theoretical formulations the dependent variable of interest measures the extent of joblessness during lockdown in India. Joblessness can mean working without income or not working at all. The first benchmark variable is based on individual responses to the question *what was your primary work in any given week during the lockdown?* The answers can range from: *not working for income during the lockdown*, *being self-employed in non-cultivation*, *salaried job in government*, *salaried job in private sector*, *daily wage labor in agriculture* or *daily wage labor in non-agriculture*. The dependent variable is assigned 1 if individuals respond 'not working for income during lockdown', 0 otherwise. About 47.07% of individuals respond *not working for income*. Daily wage labor in non-agriculture and daily wage labor in agriculture comprise of 22.65% and about 12% individuals, respectively.

2.4   Independent variables

Gender of the respondent, based on above deliberation, is the main variable of interest. The dummy is assigned 1 if the respondent is *female*, 0 otherwise. The variable is labeled *female* for all our results. About 19.48% responses is categorized as *female*, the rest being male. We are interested in exploring factors that interact with being a female to affect working for income and joblessness during the lockdown. The first factor considered is the caste of the individual, because it continues to create frictions in the labor market due to taste-based discrimination as

already recorded in many previous studies (viz. Eswaran, Ramaswami and Wadhwa, 2013; Betancourt and Gleason, 2000; Deshpande, 2000, etc). Consequently, we create a dummy assigned 1 if an individual belongs to SC, ST or OBC, 0 otherwise. 0 can indicate general caste or other caste. We label this variable *SCSTOBC*. To ensure that the results are not sensitive to clustering certain castes together, we create alternate dummies to check results as well – dummy assigned 1 if an individual belongs to SC or ST (variable is labeled *SCST*), dummy assigned 1 if an individual belongs to SC or OBC (variable is labeled *SCOBC*) and dummy assigned 1 if an individual belongs to ST or OBC (variable is labeled *STOBC*).[3]

The next factor we consider is an individual belonging to self-help groups (SHGs). As stated by World Bank (2020a), in the last two decades SHGs have grown substantially from small savings and credit groups empowering poor rural women. According to the World Bank (2020a) almost 67 million women in India are members of 6 million SHGs. Association with SHGs might actually salvage a situation of unemployment arising out of economic crisis. SHGs have also been extremely supportive in providing services like producing face masks, running community kitchens, delivering essential food supplies and educating people about hygiene (World Bank, 2020a). We construct a dummy assigned 1 if an individual belongs to a self-help group (SHG), 0 otherwise.

As mentioned already, our secondary hypothesis is based on status of migrants. The database provides information on whether an individual is a return migrant at the household level. Considering an individual as the unit of observation, we construct a dummy indicating if

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[3] As mentioned by Deshpande (2005) and generally well-known around the development discourse on India, that Scheduled Castes (SC) are at the bottom of caste hierarchy and have dealt with decades of social exclusion and restricted access to education and job opportunities. Scheduled Tribes (ST) are tribal communities often facing social exclusions and restrictions as well (Deshpande, 2005).

an individual's status is a return migrant, 0 otherwise. Among 4888 observations, about 22% are return migrants. Similar to the gender variable, we interact return migrants with caste and membership of SHGs in order to explore if that affects the probability to finding employment during lockdown.

3. Empirical Methodology

3.1 Main Specifications

As part of baseline results, we empirically test the following logit specification:

$$UN - lockdown_{id} = \alpha_0 + \alpha_1 Gender_{id} + \theta_d + \epsilon_{id} \qquad (1)$$

where $UN - lockdown_{id}$ is the dummy assigned 1 if the individual i did not work for income during lockdown in district d, 0 otherwise. $Gender_{id}$ is assigned 1, 0 otherwise. θ_d stands for *district fixed effects*. Local governments at the district level can potentially try to come up with arrangements to minimize the negative impacts of the pandemic.

Our benchmark results follow from testing of the following specification:

$$UN - lockdown_{id} = \alpha_0 + \alpha_1 Gender_{id} + \alpha_2 Caste_{id} + \alpha_4 (Gen * Cas)_{id} + \theta_d + \epsilon_{id}$$

$$(2)$$

$Caste_{id}$ denotes the specific caste of the individual. As mentioned earlier, we consider different dummies in alternate combinations for the castes SC, ST and OBC. $(Gen * Cas)$ is the interaction term between gender and caste.

A negative coefficient of α_1 will imply that being a female is associated with lower likelihood of working during the lockdown. Likewise, if $\alpha_2 < 0$ it will imply that belonging to certain castes like SC, ST or OBC is associated with lower likelihood of working during the

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lockdown. In the presence of the interaction term, we are interested in the coefficients: α_1, α_2 and α_3. The overall impact of gender on the probability of working during the lockdown is given by the marginal effect $\frac{\delta \text{UN-lock}_{id}}{\delta Gen_{id}} = \alpha_1 + \alpha_3 \text{Caste}_{id}$. Whether $\frac{\delta \text{UN-lock}_{id}}{\delta Gen_{id}} > 0$ or < 0 will depend on the sign and magnitude of α_1 and α_3 and the values of the *caste* dummies. When the *caste* dummies are equal to 1, $\frac{\delta \text{UN-lock}_{id}}{\delta Gen_{id}} < 0$ would imply that being female and being identified as SC, ST or OBC lower the probability of being employed during the lockdown. $\frac{\delta \text{UN-lock}_{id}}{\delta Gen_{id}} > 0$ will imply the opposite.

As part of our secondary hypothesis, we repeat the empirical analysis for return migrants. We start with a baseline specification similar to equation (1)

$$\text{UN} - \text{lockdown}_{id} = \alpha_0 + \alpha_1 \text{Ret. Mig}_{id} + \theta_d + \epsilon_{id} \qquad (3)$$

Further, similar to equation (2) we interact *return migrant dummy* with *caste*

$$\text{UN} - \text{lockdown}_{id} = \alpha_0 + \alpha_1 \text{Ret. Mig}_{id} + \alpha_2 \text{Caste}_{id} + \alpha_4 (\text{Ret. Mig} * \text{Cas})_{id} + \theta_d + \epsilon_{id}$$

$$(4)$$

The marginal effects are given by $\frac{\delta \text{UN-lock}_{id}}{\delta Ret.Mig_{id}} = \alpha_1 + \alpha_3 \text{Caste}_{id}$ similar to gender.

The robustness analysis in this case involves checking how (i) gender interacted with return migrants only, (ii) interacted with return migrants and caste, (iii) interacted with self-help groups (SHGs) and (iv) finally, gender interacted with SHGs and return migrants affect the probability of employment during the lockdown. We interact different cohorts to see how the sign and significance varies.

3.2   Empirical Methodology

In the presence of binary dependent variables, ordinary least squares (OLS) suffer from challenges like predicted probabilities lying outside the unit interval. Limited dependent variable (LDV) models like probit and logit are more suited for the purpose (Klasen, Lamanna, and Asfaw, 2010; Pande, 2003). Logit estimators, similar to Probit, use Maximum Likelihood Estimation (MLE) while using a logistic distribution function of the error terms.

The initial specification can be written as

$$\text{Pr}(\text{Un} - \text{lock} = 1) = F(\hat{X}\Omega) \tag{5}$$

Thus, $\text{Pr}(\text{Un} - \text{lock} = 1)$ is the probability that an individual is employed without income during the lockdown, 0 otherwise. F is the cumulative standard logistic distribution. X is the vector of explanatory variables and Ω is the vector of coefficients to be estimated. Success event in our case, will be when individuals are unemployed (do not work for income) during lockdown, 0 otherwise. An individual's probability of not working will depend on an unobservable latent (disutility) index I_i which, in turn, is determined by an array of explanatory variables. Finally, the model we estimate can be written as $\text{Pr}(\text{Un} - \text{lock}_{id} = 1 | X_{ijs}) = \Phi(\beta X_{id})$. Equations (1) and (2) above formulate the hypothesis that is empirically tested via a logit model incorporating district fixed effect. As we know that for logit regressions, the estimated coefficients cannot be meaningfully interpreted and average coefficients may be potentially biased, the marginal estimates are, thus, reported for all the variables (recent examples available in Dutta, Kar and Beladi, 2021; Webster and Piesse, 2018; Fernández-Val, 2009, etc).

One important point to note in the context of our empirical analysis is for specifications involving interaction terms; the individual significance of the coefficients is still meaningful, but such interactions are appropriate for explaining the coexistence of multiple factors behind joblessness. Therefore, it is the joint significance of the terms that matter, and it can be tested not only for the omission of both variables, but it can also be tested for different underlying values of the conditioning variable. Note that, for different values of the interacted variables, the magnitude and statistical significance usually vary (Brambor, Clark, and Golder 2006). For example, it is possible that for the binary values of the alternate caste dummies the combination of effects is statistically significant or insignificant regardless of the significance of gender and caste variables in the regression. We need to examine the conditional effects or marginal effects to be able to meaningfully interpret the probability of females to be employed without income during the lockdown (Dutta, Giddings and Sobel, 2021; Berry, Golder, and Milton, 2012; Brambor, Clark, and Golder 2006; Braumoeller 2004).

4.   Results

4.1   Baseline Results

In Figure 1, we present the percentage of females surveyed in each state based on SC, ST or OBC, and general and other caste. We find that for the state of Jharkhand, the percentage of females belonging to SC, ST or OBC caste is about 34%. For Uttar Pradesh, the percentage is just less than 30. The percentage of female respondents surveyed in Rajasthan is the smallest in both categories – SC, ST or OBC, and general or other caste. In Figure 2, we present the percentage of females based on having a membership in self-help groups (SHGs) or without. For

states like Andhra Pradesh and Rajasthan, the percentages are similar for SHG or non-SHG categories. Both Uttar Pradesh and Jharkhand have about 30% females in SHG.

In Table 1 we report the summary statistics. In Table 2, we present our baseline results along with the marginal effects pertaining to specification (1). The coefficient of gender (being female) is positive and significant suggesting that it is associated with higher likelihood of not working for income over lockdown. Based on the marginal effects, we find that relative to males, females are 8% less likely to be employed for income during lockdown.

[Insert Table 1 about here]

[Insert Table 2 about here]

Our results corroborate available evidence, as in Agarwal (2021). It points out that women typically have fewer livelihood options and are paid less - often not paid at all, and are part of less secure work - all of which are exacerbated during the pandemic. Due to domestic responsibilities as well as physical insecurities, women are also less mobile. On a related note, using an all-India survey Deshpande (2020) find that while more men lost jobs relative to women in absolute terms, women were almost 20 percentage points less likely to be employed relative to men in the pre-lockdown period.

4.1 Benchmark Results – Gender

In Table 3A, we present the benchmark results for the paper. We present the results for empirically testing specification (2). We interact gender (being a female) with different caste dummies – *SCSTOBC*, *SCST*, *SCOBC* and *STOBC* – and the results are presented in columns (1),

(2), (3) and (4) respectively. We find that the interaction term, *female*caste*, is positive and significant for all specifications. The sign and significance suggest that belonging to certain castes like OBC, SC or ST might further lower the probability of females to be employed during the lockdown. However, the independent coefficient of female is not significant for any of the specifications, although that does not imply the non-responsive of gender altogether. In fact, the conditional effect or marginal effects are of prime importance here, to adequately interpret the probability of joblessness among women classified by caste and other identifiers.

For each caste dummy, we present the probability of a female to work for no income during lockdown in Table 3B via estimating the marginal effects. Based on the marginal effects we report that belonging to SC, ST or OBC caste for a female leads to about 9 to 14 percent higher likelihood of *not being employed* for income during lockdown.

[Insert Tables 3A and 3B about here]

Our results resonate with earlier studies documenting differences in wages and consumption between SC/STs and non-SC/STs (Hnatkovska, Lahiri, and Paul, 2012), as also employment levels (viz. Borooah et al., 2007).

4.2   Benchmark Results – Return Migrants

In Tables 4A, 4B and 4C, we present the results of our secondary hypothesis. In Table 4A, we only include the dummy for return migrants along with district fixed effect. The coefficient of return migrant is positive and significant. Based on the marginal effects, we argue that being a return migrant is associated with a 4.7 percent likelihood of not working for income during lockdown.

[Insert Table 4A about here]

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Thus, comparing the results with Table 2A, females overall are more likely to be jobless relative to return migrants. We discuss the outcome for return migrants being female, subsequently.

In Table 4B, we interact the dummy of return migrants with caste. We consider the same caste dummies as before – SCSTOBC, SCST, SCOBC and STOBC. Columns (1), (2), (3) and (4) present the results, respectively. The interaction term, *Ret.Mig.*Caste*, is positive in all columns but only significant in columns (1) and (2). The positive sign would mean that for belonging to

[Insert Table 4B about here]

castes like SC, ST or OBC will aggravate the likelihood for return migrants of not working during the lockdown. Since the joint significance of the terms matters, we need to estimate marginal effects to be able to interpret economic significance of our findings.

In Table 4C, we present the marginal effects. The marginal effects point out that caste identity did not aggravate the effect of return migrants not finding work during lockdown. Only in columns (1) and (2), the *p values* are marginally significant but still greater

[Insert Table 4C about here]

than 10% level of significance. Thus, based on our analysis in sections 5.2 and 5.3, we can reasonably conclude that gender identity led to graver outcomes and aggravated the likelihood of not finding work during lockdown. It is also established that the negative effect was stronger if females belonged to SC, ST or OBC groups. Note that, the return migrants also suffered, but the magnitude is not as strong as in the case of gender.

5.   Robustness Analysis

The following robustness analysis consists of an array of tests to expand on the benchmark results above and also to establish the validity of alternate sensitivity tests.

5.1   Gender, Return Migrants and Caste

To check if gender and return migrants matter together in the context of unemployment during lockdown, we consider the following specification

$$\text{UN} - \text{lockdown}_{id} = \alpha_0 + \alpha_1 \text{Gender}_{id} + \alpha_3 \text{Ret. Mig.}_{id} + \alpha_4 (\text{Gen} * \text{Ret. Mig})_{id} + \theta_d + \epsilon_{id}$$

$$(6)$$

We aim to assess if the probability of being employed for a female differed based on being a return migrant or not. The results are presented in Table 5 along with the marginal effects in Column (1). The marginal effects are estimated from: $\frac{\delta \text{UN} - \text{lock}_{id}}{\delta Gen_{id}} = \alpha_1 + \alpha_4 \text{Ret. Mig}_{id}$

We find from the table that α_4 is positive and significant. It suggests that for females who are return migrants, the probability of being unemployed is high and approximately, 11%. The marginal effects also confirm this.

[Insert Table 5 about here]

For a female who is not a return migrant, the probability of joblessness is about 6 percent.

In column 2, we investigate how the probability varies for females being a return migrant as well as belonging to SC, ST or OBC groups. We use a three-way interaction – *gender*ret.mig.*caste*, and it is positive and significant. It suggests that for a female who is a return migrant and belongs to SC, ST, or OBC, the effect can be magnified. Yet again, we need to estimate marginal effects that are a bit more complicated in this case. In the presence of a

three way interaction term, $\frac{\delta \text{UN}-\text{lock}_{\text{id}}}{\delta Gen_{\text{id}}}$ need to be estimated at four pairs of values – [Ret.Mig = 0, Caste = 0], [Ret.Mig. = 1, Caste = 0], [Ret. Mig. = 0, Caste = 1] and [Ret. Mig =1, Caste = 1]. This will help us evaluate all the different scenarios. For example, in the first case, we would estimate the probability of a female being unemployed during lockdown who is not a return migrant or is not SC, ST or OBC. We present the results in Table 5. It is direct that belonging to SC, ST or OBC increases the likelihood of being unemployed by almost 10 percent compared to females and males who belong to the *general caste*. For females who are return migrants in addition to being SC, ST or OBC, the probability rises to almost 14 percent.

5.2   Gender, Return Migrants and SHGs

Given the role that Self-Help Groups (SHGs) can play in the context of female employment in rural areas (Srivastava and Srivastava, 2010), we explore if being in a self-help group affects the probability of employment for females in lockdown. The characteristics of SHGs do not automatically ensure retention of jobs, because the products that SHGs sale were also severely affected during lockdown and therefore retaining jobs would be difficult, unless availability of credit and marketing facilities continued even during this period. The dummy indicating if an individual is in a SHG is interacted with gender. We present the results in Table 6 along with the marginal effects in column (1). We also present the marginal effects according to:

$\frac{\delta \text{UN}-\text{lock}_{\text{id}}}{\delta Gen_{\text{id}}} = \alpha_1 + \alpha_4 \text{SHG}_{\text{id}}$. In column (2), we interact return migrant dummy with SHGs. We again present the marginal effects. Finally, in column (3), we consider three way interaction terms among gender, return migrants and SHGs. As we can see from the marginal effects in column (1), the dummy for female is positive and significant attesting our benchmark findings. But for females who have affiliation with SHGs, the significance goes away suggesting that

SHGs might have played a critical role in reducing joblessness among females over the lockdown period. In other words, the processed food items, household handicrafts of daily use, etc, that the SHGs typically produce might have continued even during lockdown. For return migrants, we find that SHGs did not play any significant role in terms of joblessness. Finally, we have some interesting conclusions from marginal effects in column (3) which supports our previous findings. For female who are not return migrants or not affiliated with SHGs, the probability of being unemployed is about 10%. When the female is a return migrant as well, the probability rises to about 17%. Being affiliated with SHGs helps mitigate joblessness for females and the coefficient turns insignificant. This is true for all females irrespective of being a return migrant or not.

6. Conclusion and Policy Implications

The several direct and interacted estimates presented in this paper establish that for a considerable share of women across six large and populous states in India suffered disproportionately during the strict lockdown in India that continued for close to six months with intermittent relief. During this time, it is worth noting that the flow of essential commodities, especially foodgrain, vegetables, fish and meat, poultry items, processed food, garments etc, were not heavily disrupted in major cities and towns in the country. The state and central government systems jointly catered to maintain the provisions for subsidized food distribution for the rural and urban poor through the popularly known 'ration shops' across the country. The job market for daily labor, mostly unskilled and belonging to the large contingent of unorganized, informal workforce in India suffered differently. Since many of the production units for non-essential commodities, construction sites, public works, restaurants and hotels,

tourism related activities were shut down temporarily, the workers were rendered jobless with immediate effect. The impact was considerable in the urban locations, but remembering that almost 65% of the population India still lives in semi-urban and rural areas, the pervasiveness was deep into rural habitation also. The outcome was at least two-faceted. One, it created direct joblessness among workers in rural areas associated with non-farm industrial and semi-industrial activities. Two, it also rendered large number of migrant workers returning from the cities and towns back to their origin, jobless. But, was the effect uniform across male and female population across the major states in India, as also by caste types? To this end, we investigated the outcomes for women classifying them according to caste identities, by resident or return migrant status and by occupational categorization, of which affiliation to self-help groups seemed most relevant. The importance of these questions, as explained above arises from the high degree of fragmentation in the Indian society still, by gender, caste and occupation.

We observed with the help of appropriate econometric specifications applied on a sample of data collected by the World Bank during the six months of the lockdown in 2020 from six major states in the country, that women workers were disproportionately distressed during the lockdown in terms of the probability of not being employed at this time. The probability of not retaining the jobs among the women varied according to various specifications, of which the aforementioned conditions played significant roles. For example, being a woman and having a caste identity such as SC, ST or OBC leads to a poorer outcome in terms of the probability of holding jobs during lockdown. It also gets worse if the woman is a return migrant. However, if the woman has affiliation with self-help groups then the impact of lockdown on the probability of losing jobs becomes non-significant. It implies that the production of these small, micro units

continued even during lockdown, because most are associated with making of semi-essential processed food ranging from pickles, jam and jelly, puffed rice etc, but also manufacturing (handlooms, power looms) traditional dress materials for men and women. Of course, the joblessness among large sections of the population in these locations as also elsewhere created an aggregate demand deficiency in the country, a factor that is particularly responsible for the negative growth effects (-24%) that India witnessed around this time, but the production (and perhaps credit extension from SHGs) did not stall completely. Indeed, it seems that if the government extended direct income support to rural workers through unconditional cash transfers it could have salvaged the negative outcome on jobs.

The government responded briefly by raising the allocation under the rural employment guarantee schemes which allows workers to take up to maximum 100 days of jobs in India, but the claimants during this shock would naturally be many more than the allocation permits. Clearly, the extent of joblessness that our estimate reveals is a testament that the flow of support through rural employment guarantee was rather insufficient. Our results have been tested in multiple stages via inclusion of more than one interaction variable across a large set of identifiers for women. All of the two-way and three-way interactions reveal considerable strength in explaining that the probability of being a rural woman, of holding a caste identity, and being a return migrant, have joint negative impact on holding on to a job during an economic shock such as the lockdown. Evidently, all possible development implications associated with women losing jobs in large numbers are potential candidates for analysis if subsequent studies on the post-lockdown information for similar population is made available in India. Finally, while it is beyond the empirical scope of this paper, it is possible to estimate if the effect of joblessness on consumption, schooling, health expenses and other standard variables in development discourse

get affected by the provision of unemployment insurance -- a policy that the government could initiate for the unorganized sector workers in India in view of all future shocks.

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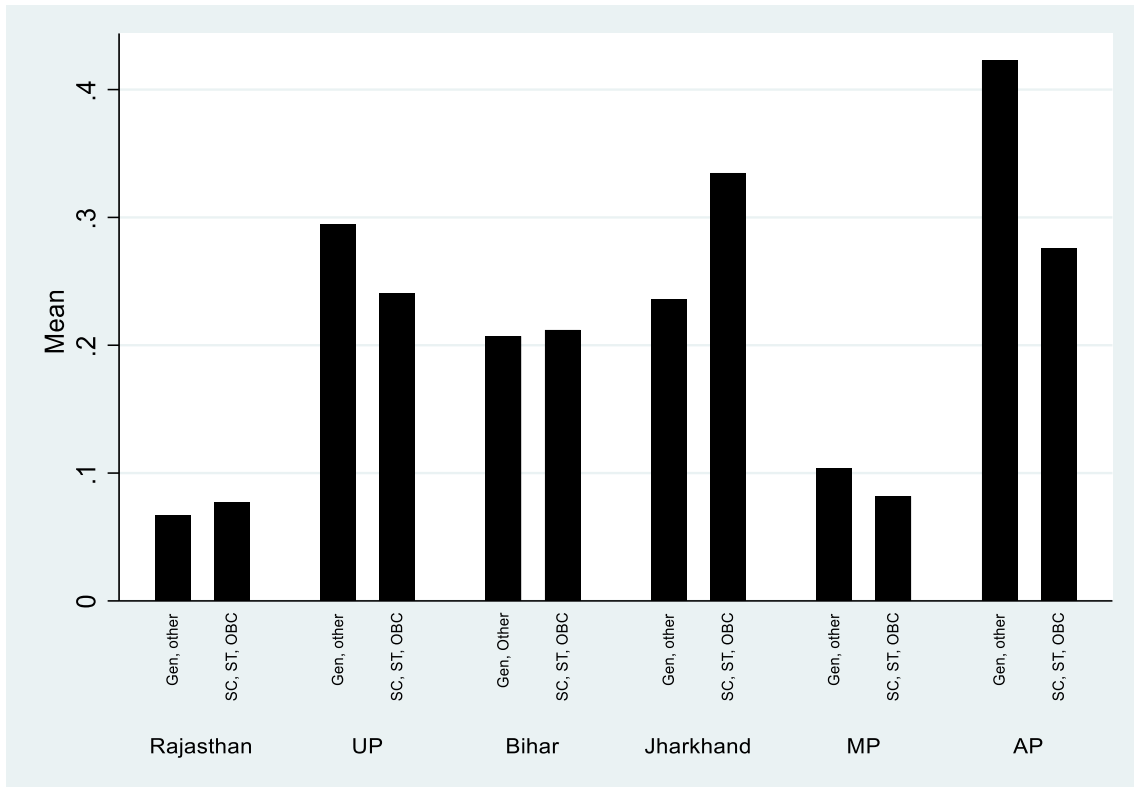
Figure 1: Percentage of females by (SC, ST and OBC) and (General and other) castes in states

Table 1: Summary Statistics

Un-Lockdown is the dummy indicating if an individual 1 if an individual did not work for income during lockdown, 0 otherwise. Female indicates an individual is female or not. Return Mig. implies if an individual is a returned migrant or not. SCSTOBC is a dummy indicating if an individual belongs to SC, ST or OBC caste, or not. SCST is a dummy representing if an individual belongs to SC or ST, 0 otherwise. SCOBC is a dummy representing if an individual belongs to SC or OBC, 0 otherwise. STOBC is a dummy representing if an individual belongs to ST or OBC, 0 otherwise. The dummy indicating if an individual is affiliated with a SHG or not is given by SHG.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Un-Lockdown	2,031	0.47	0.50	0	1
Female	5,200	0.19	0.40	0	1
Return Mig.	4,888	0.23	0.42	0	1
SCSTOBC	5,200	0.80	0.40	0	1
SCST	5,200	0.42	0.49	0	1
SCOBC	5,200	0.65	0.48	0	1
STOBC	5,200	0.53	0.50	0	1
SHG	5,182	0.43	0.49	0	1

Source: Author's calculations

Table 2: Logit Specifications: Unemployment during lockdown and Gender

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. Female is dummy assigned 1 if an individual states female to be the gender, 0 otherwise. District fixed effects are incorporated. Marginal effect for female is presented in Column (2). Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

	(1)	(2) Marginal Effects
Female	0.341***	0.084***
	(0.109)	(0.027)
District F.E.	Yes	---
Constant	-0.426	---
	(0.372)	
Observations	2,009	2,099

Source: Author's calculations

Table 3A: Logit Specifications: Unemployment during lockdown, Gender and Caste

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. *Female* is a dummy assigned 1 if an individual states female to be the gender, 0 otherwise. Caste represents different dummies constructed based on an individual belonging to the castes SC, ST or OBC, SC or ST, SC or OBC and ST or OBC. Caste dummies are interacted with female. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

	(1) SCSTOBC	(2) SCST	(3) SCOBC	(4) STOBC
Female	-0.148	0.146	0.084	0.304**
	(0.229)	(0.142)	(0.183)	(0.149)
Caste	-0.060	-0.0408	-0.019	-0.008
	(0.141)	(0.109)	(0.115)	(0.108)
Fem*Caste	0.420**	0.567***	0.458***	0.373**
	(0.167)	(0.167)	(0.151)	(0.156)
Constant	-0.376	-0.369	-0.425	-0.426
	(0.389)	(0.375)	(0.383)	(0.375)
Observations	2,009	2,009	2,009	2,009

Source: Author's calculations

Table 3B: Logit Specifications: Unemployment during lockdown, Gender and Caste

Marginal effects. We estimate $\frac{\delta UN - lock_{id}}{\delta Gen_{id}} = \alpha_1 + \alpha_3 Cas_{id}$ for different binary values of the caste variables. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** $p<0.01$, ** $p<0.05$, * $p<0.1$

$\dfrac{\delta UN - lock_{id}}{\delta Gen_{id}}$	(1) SCSTOBC	(2) SCST	(3) SCOBC	(4) STOBC
Caste = 0	-0.035	0.035	0.020	0.074*
	(0.054)	(0.034)	(0.044)	(0.036)
Caste = 1	0.116***	0.146***	0.115***	0.092**
	(0.029)	(0.039)	(0.032)	(0.037)
Observations	2,009	2,009	2,009	2,009

Source: Author's calculations

Table 4A: Logit Specifications: Unemployment during lockdown and Returned Migrants

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. Return Mig. is a dummy assigned 1 if an individual is a returned migrant or not. District fixed effects are incorporated. Marginal effect for female is presented in Column (2). Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

		Marginal Effects
Return Mig.	0.191*	0.047*
	(0.116)	(0.029)
District F.E.	Yes	---
Constant	-0.273**	---
	(0.131)	
Observations	1,987	1,987

Source: Author's calculations

Table 4B: Logit Specifications: Unemployment during lockdown, Return Migrants and Caste

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. *Return Mig.* is a dummy assigned 1 if an individual is a return migrant or not. Caste represents different dummies constructed based on an individual belonging to the castes SC, ST or OBC, SC or ST, SC or OBC and ST or OBC. Caste dummies are interacted with return migrant dummies. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

	(1) *SCSTOBC*	(2) *SCST*	(3) *SCOBC*	(4) *STOBC*
Return Migrant	0.0699	0.0945	0.280	0.123
	(0.260)	(0.159)	(0.198)	(0.155)
Caste	0.0824	0.0291	0.109	-0.016
	(0.133)	(0.108)	(0.114)	(0.107)
Return Mig.*Caste	0.279*	0.286*	0.235	0.214
	(0.166)	(0.163)	(0.158)	(0.164)
Constant	-0.410	-0.350	-0.434	-0.333
	(0.380)	(0.365)	(0.376)	(0.369)
Observations	1,987	1,987	1,987	1,987

Source: Author's calculations

Table 4C: Logit Specifications: Unemployment during lockdown, Return Migrants and Caste

Marginal effects. We estimate $\frac{\delta UN-lock_{id}}{\delta Ret.Mig_{id}} = \alpha_1 + \alpha_3 Cas_{id}$ for different binary values of the caste variables. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** $p<0.01$, ** $p<0.05$, * $p<0.1$

[a] – The p value is 0.11.
[b] – The p value is 0.12.

$\frac{\delta UN-lock_{id}}{\delta Ret.Mig_{\cdot id}}$	(1) SCSTOBC	(2) SCST	(3) SCOBC	(4) STOBC
Caste = 0	0.016	0.022	0.067	0.029
	(0.062)	(0.038)	(0.047)	(0.037)
Caste = 1	0.047[b]	0.062[a]	0.030	0.056
	(0.031)	(0.039)	(0.033)	(0.040)
Observations	1,987	1,987	1,987	1,987

Source: Author's calculations

Table 5: Logit Specifications: Unemployment during lockdown, Gender, Return Migrants and Caste

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. *Female* is a dummy assigned 1 if an individual states female to be the gender, 0 otherwise. *Return Mig.* is a dummy assigned 1 if an individual is a returned migrant or not. SCSTOBC represents the dummy assigned 1 if an individual belongs to the castes SC, ST or OBC, or not. In column (1), we interact female with return migrant. In column (2), we consider the three way interaction term among female, return migrant and SCSTOBC dummy. Caste dummies are interacted with return migrant dummies. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

	(1)	(2)
Female	0.274**	-0.180
	(0.125)	(0.257)
Return Migrant	0.127	0.031
	(0.133)	(0.306)
SCSTOBC	---	-0.072
		(0.158)
Female*Mig	0.575***	-0.034
	(0.208)	(0.463)
Mig*Caste	---	0.076
		(0.195)
Fem*Caste	---	0.338*
		(0.189)
Fem*Mig*Caste	---	0.650**
		(0.264)
Constant	-0.418	-0.358
	(0.372)	(0.394)
Observations	1,987	1,987
$\frac{\delta UN - lock_{id}}{\delta Gen_{id}}$		
Return Migrant = 0	0.066**	---
	(0.030)	
Return Migrant = 1	0.108**	---
	(0.053)	
[Ret. Mig. = 0, Caste = 0]	----	-0.043
		(0.061)
[Ret. Mig. = 1, Caste = 0]	---	-0.015
		(0.124)
[Ret. Mig. = 0, Caste = 1]	---	0.099**
		(0.034)
[Ret. Mig. = 1, Caste = 1]	---	0.137**
		(0.058)

Source: Author's calculations

Table 6: Logit Specifications: Unemployment during lockdown, Gender, Return Migrants and SHGs

Logit specifications are considered. The dependent variable is a dummy assigned 1 if an individual did not work for income during lockdown, 0 otherwise. *Female* is a dummy assigned 1 if an individual states female to be the gender, 0 otherwise. *Return Mig.* is a dummy assigned 1 if an individual is a returned migrant or not. SHG represents belonging to an SHG or not. SCSTOBC represents the dummy assigned 1 if an individual belongs to the castes SC, ST or OBC, or not. In column (1), we interact female with SHG. In column (2), we interact returned migrant with SHG. In column (3), we consider the three way interaction term among female, return migrant and SHG. District fixed effects are incorporated in all the specifications. Robust standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

	(1)	(2)	(3)
Female	0.505***	0.311***	0.428**
	(0.152)	(0.110)	(0.169)
Return Migrant	---	0.165	0.117
		(0.157)	(0.174)
SHG	0.138	0.032	0.128
	(0.114)	(0.113)	(0.131)
Fem*SHG	0.303**	---	0.221
	(0.151)		(0.177)
Ret. Mig.*SHG	---	0.204	0.255
		(0.164)	(0.196)
Fem*Ret. Mig.	---	---	0.837**
			(0.337)
Fem*Ret. Mig.*SHG	---	---	0.507*
			(0.259)
SCSTOBC	0.132	0.142	0.135
	(0.120)	(0.121)	(0.121)
Constant	-0.691*	-0.654*	-0.677*
	(0.393)	(0.395)	(0.393)
Observations	2,001	1,979	1,979
$\frac{\delta \text{UN}-\text{lock}_{id}}{\delta Gen_{id}} / \frac{\delta \text{UN}-\text{lock}_{id}}{\delta Ret.Mig._{id}}$			
SHG = 0	0.121***	0.039	---
	(0.036)	(0.038)	
SHG = 1	0.040	0.041	---
	(0.037)	(0.039)	
$\frac{\delta \text{UN} - \text{lock}_{id}}{\delta Gen_{id}}$			
[SHG = 0, Ret. Mig. = 0]	---	---	0.103**
			(0.040)
[SHG = 1, Ret. Mig. = 0]	---	---	0.022
			(0.044)
[SHG = 0, Ret. Mig. = 1]	---	---	0.171**
			(0.082)
[SHG = 0, Ret. Mig. = 1]			0.061
			(0.071)

Source: Author's calculations