



GENDER, EMPLOYMENT AND THE PLATFORM ECONOMY

EVIDENCE REVIEW

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A. Introduction

There is a dire need for expanding productive employment in the Indian economy, particularly among women, who exhibit abysmally low rates of labor force participation and high level of informalization. Leveraging the spread of technology, digital labor platforms have the potential to improve employment outcomes by embedding skilling, addressing information asymmetries, and enabling more efficient matching of workers and jobs at scale. Given gendered barriers to work participation – such as women’s domestic burden and lower mobility – the flexible nature and location of platform work holds the promise of benefiting women more. Yet, issues of restrictive norms and absence of gender-sensitive public infrastructure remain, while the gender digital divide becomes more binding.

This document¹ provides a brief overview of the employment scenario in India, with a focus on female labor force participation (FLFP). Within this context, it discusses the emergence of the platform economy, and the associated promise and challenges vis-à-vis employment in the country – particularly for women. Further, it reviews the existing evidence on the access to technology, and effectiveness of skilling efforts, information interventions, and matching mechanisms in the labor market. Drawing lessons from the literature, which is thus far mainly based on traditional labor, a women-focused research agenda for digital labor in India is presented – to be carried out under the project “Digital Platforms and Women’s Economic Empowerment: What matters and what works” (DP-WEE)².

B. India’s employment landscape

The sectoral composition of employment in India has changed over time: the share of agriculture fell from 47% in 2011-12 to 41.4% in 2018-19, manufacturing and construction increased marginally from 23.2% to 24.3%, and services grew from 28.6% to 33.2% over this period (Basole 2022). Thus, the shift away from agriculture has been more towards services rather than manufacturing. This structural transformation has been accompanied by growth of informal work, with no more than 15% of the non-agricultural workforce being formally employed in

¹ DP-WEE project team members Nalini Gulati and Rohan Regi Varghese have contributed to this document.

² Led by Prof. Farzana Afridi (Indian Statistical Institute, Delhi) in collaboration with IFMR (Institute for Financial Management and Research), this project is funded by a BMGF (Bill & Melinda Gates Foundation) grant. During 2022-2025, research will be carried out mainly in the National Capital Region of Delhi. This project builds on prior work by Prof. Afridi under a BMGF-IWWAGE (Initiative for What Works to Advance Women and Girls in the Economy) grant during 2018-2021, on the demand- and supply-side constraints on women’s work participation and possible solutions.

the last few decades (Mehrotra 2019)³. Women are more likely to be informally employed than men.

Economists have raised concern regarding the slow transition from low- to high-productivity activity, and the pressing need for creation of 'good jobs' (Kotwal 2018). A key issue is of providing high-quality, relevant and affordable skilling to the masses, a problem made harder by the weak foundation of poor learning outcomes in schools (Annual Survey of Education Reports, various years).

Further, there is evidence of significant frictions in the Indian labor market in the form of information gaps and inefficient (and informal) job search mechanisms, leading to suboptimal matching of workers and jobs (Banerjee and Chiplunkar 2021). In the presence of gender inequality, these challenges are likely to apply more strongly in the case of women in India.

B.1. Female labor force participation

Women's economic participation is salient from not just a welfare perspective but also growth (see, for instance, *Ostry et al.* 2018). Official data show that no more than one in four women in India participate in the labor force, with the urban FLFP being 18.6% in 2020-21 (Period Labour Force Survey, 2022). In its subindex of gender gaps in economic participation and opportunity, the World Economic Forum (2022) has given India a score of 0.35, ranking 143rd out of 146 countries. According to the World Bank (2021), India's FLFP stands at 19%, as compared to 22% in South Asia and 33% among the group of lower middle-income countries. Furthermore, the proportion of informal workers amongst women is large (almost 90%, including agricultural sector) and marginally higher than amongst men (International Labour Organization (ILO), 2018).

India's low FLFP is particularly astonishing, when viewed in the context of favorable conditions such as economic growth, declining fertility, and gains in female education (Afridi, Dinkelman and Mahajan 2018). This conundrum has caught the attention of several researchers in recent years, and there has emerged a large and growing body of work on both the supply- and demand-side of female labor.

At the core of this discourse lie social and cultural norms (Jayachandran 2021), which shape all aspects of women's lives in developing countries. An entrenched pro-male bias casts a shadow over the formative years of females, limiting household investment in their human capital development (Maitra, Pal and

³ This paper quotes the NCEUS (National Commission for Enterprises in the Unorganised Sector) definition of informal workers: "Informal workers consist of those working in the informal sector or households, excluding regular workers with social security benefits provided by the employers and the workers in the formal sector without any employment and social security benefits provided by the employers."

Sharma 2016, on the gender gap in private school enrollment, is one example). This is also why daughters remain largely excluded from asset ownership, despite legal reforms strengthening their right to inherit parental property (Agarwal, Anthwal and Mahesh 2021).

Moreover, norms dictate that the burden of domestic and care responsibilities is to be borne primarily by women, leaving little time⁴ for skilling and engagement in paid work. Examining determinants of women's labor supply, Afridi, Monisankar and Mahajan (2022) suggest that this gendered allocation of couples' time combines with women's higher productivity at home vis-à-vis the market when they attain some education. Besides, there is evidence of a 'penalty' in the Indian marriage market for women who wish to work (Dhar 2021), and gendered breadwinner norms keep women from entering the labor market and realizing their full economic potential (Gupta 2022).

Outside the home, women are deterred by safety concerns and norms associated with female purity (Siddique 2022). This is endorsed by Chakraborty and Lohawala (2022) who find that cases of sexual violence in a district reduce women's probability of working. Lower physical mobility also impinges on women's ability to form networks, giving men an edge in job search (Afridi and Dhillon 2022).

Women who do make it to the workplace run into glass ceilings and old boys' clubs. In urban areas, factory work is considered inappropriate for women and factory-owners are concerned that the presence of women may lead to cases of misbehavior or sexual harassment. Female workers are assigned low-end tasks such as packaging, rather than machine operation, and hence earn less than men (Kunduri, Gupta and Kumar 2019). Even in female-dominated industries such as Bangladesh's garment sector, women workers are underrepresented in supervisory positions despite having the requisite skills (Macchiavello *et al.* 2020).

Based on the premise that the supply side is not the whole story, a strand of the literature emphasizes the role of demand-side constraints, that is, the availability of jobs for women. Afridi, Monisankar and Mahajan (2022) find that technology adoption in Indian agriculture during 1999-2011 together with gendered division of labor across farming tasks, implied a reduced demand for female labor. Looking at the broader structural transformation in the Indian economy between 2004-05 and 2011-12, Chatterjee, Murgai and Rama (2015) note that the overall decline in agricultural jobs was not accompanied by a commensurate increase in non-farm work opportunities considered suitable for rural women. Using nationally representative data for the period 2016-2019, Deshpande and Singh (2021) show

⁴ As per the latest Time Use Survey (2019) of the National Sample Survey (NSS), on average, the time spent by females in India on unpaid domestic and caregiving services for household members, is 2.5 times that of men (based on figures provided by Press Information Bureau, 2020).

that women's work participation is being pulled down by the paucity of steady gainful employment and their displacement from jobs by male workers – particularly during periods of negative economic shocks.

The various supply and demand factors converge to raise job search costs for women vis-à-vis men. Undertaking a descriptive analysis of women and work in India, Fletcher, Pande and Troyer-Moore (2019) contend that women lack information pertaining to job opportunities and returns to work. Afridi *et al.* (2022) corroborate this view – they find that women who register on a job portal expect their salary to be 133% higher than the average baseline earnings of women who were working, while men's wage expectations were only 8% higher. This mismatch in expected and actual earnings continues to persist even after accounting for differences in occupation, suggesting that either women lack labor market information or need to be compensated with higher wages to participate in paid work – or both.

Women also find it harder to match to jobs relative to men, as indicated by time spent seeking or being available for work when unemployed (Fletcher, Pande and Troyer-Moore 2019). Further, women with vocational training – irrespective of education levels – are more likely to work than those without training. The authors call for more research on how women can be provided information to ensure better matching with jobs, and how skilling interventions may enhance their economic activity.

Against this backdrop, it is pertinent to examine the expansion of digital labor platforms globally and in India, over the past decade – a significant development in the world of work.

C. Platform economy

C.1. Global scenario

The ILO's flagship report on digital labor platforms (2021) states that the world has witnessed a fivefold increase⁵ in the number of digital labor platforms – spurred by digitization and new ways of working during the Covid-19 pandemic. The ILO broadly categorizes these platforms into online web-based ones (where tasks are performed online or remotely, for example, remote work on video transcription) and location-based platforms (such as taxi, delivery, or home services). The report also defines two types of work relationships offered by the platforms, namely internal employment wherein workers are directly hired by the

⁵ From 142 in 2010 to over 777 in 2020.

platform, or external employment mediated through the platform, viz. employer-employee online/app-based matching.⁶

Even in developed countries, there is a challenge of estimating the size of the “platform-mediated” workforce due to non-disclosure of data. A ballpark from North America and Europe is that 0.3-22% of the adult population has performed platform work during 2015-2019. Globally, women represent only four in 10 workers on online web-based platforms and one in 10 on location-based platforms.

In terms of where investment in digital platforms is made, Asia is in the lead (96% share), far ahead of other developing regions such as Africa. Further, the report presents the geographical concentration of these platforms, which is in just a handful of locations – the top-three being the US (29%), India (8%) and the UK (5%). According to ILO, India is emerging as the largest supplier of global labor on online platforms, while having the lowest participation of women at 21%.⁷

The ILO report highlights the potential of digital labor platforms for creating income-generating opportunities for workers, including women. Although there are certainly concerns around precarious work conditions, limited outside options and the need for flexibility motivates workers to seek platform work.

C.2. India’s platform economy

A report by Boston Consulting Group and Michael and Susan Dell Foundation on India’s ‘gig economy’⁸ (2021) notes that the country’s predominantly informal economy always encompassed a gig component. What has in fact changed in recent years is the large-scale matching and delivery of such work via the use of technology. Raval and Pal (2019) highlight India’s upwardly mobile professional class that is increasingly employing the parallel underclass of informal workers to perform lateral services for them, with platforms enabling the professionalization and commodification of such work. A study by IWWAGE (Initiative for What Works to Advance Women and Girls in the Economy) (2020) specifies secure market access in the platform economy as one of the top attractions for informal workers.

Acknowledging methodological complexities and data gaps, NITI Aayog (2022) attempts to provide indicative estimates of the gig workforce and the sector’s employment-generation potential. In 2020-21, 7.7 million workers, or 1.5% of the Indian workforce, were engaged in the gig economy. By 2029-30, these figures are

⁶ Other categories are also used in the literature, and there are certainly some grey areas in the classification of digital labor platforms and platform work. In the context of the ILO classification, the DP-WEE project focuses on location-based work.

⁷ This holds true even for tasks like writing and translation, which are female dominated in other countries.

⁸ Here, gig work is defined as work delivered on-demand with little to no formal contracting.

expected to rise to 23.5 million and 4.1%, respectively. The report highlights the higher employment-to-GDP (gross domestic product) growth elasticity of gig work, and its expansion to all economic sectors.

As per the BCG-Dell report, “the gig economy has the potential to service up to 90 million jobs in India’s non-farm economy alone, transact over US\$250 billion in volume of work, and contribute an incremental 1.25 percent (approximately) to India’s GDP over the long term.” Their analysis is also suggestive of the promise of gig work in creating a more inclusive workforce, encompassing women along with other marginalized groups. In terms of women’s participation in platform work, the NITI report cites evidence on women being more likely to take up such jobs after their education and marriage.

D. Platform Economy: Promise, and associated challenges

Thus, given the constraints faced by women in engaging with the labor market, in principle, digital labor platforms can benefit women to a greater extent. This points towards the need for a gender lens on the digital labor platform sector, which is *hitherto* missing (IWWAGE, 2020). As discussed below, by linking skilling, information, and matching, and providing relatively flexible work close to home, platforms can reduce job search costs for women and improve their employment outcomes. However, issues emerge in the form of women’s lower access to technology becoming more binding on their access to economic opportunities. Norms and absence of gender-sensitive public infrastructure – not just transportation but also toilets – continue to act as barriers. As a result, gender-based occupation segregation and gender gap in earnings tend to persist.

The remainder of the document reviews the existing evidence and literature on access to technology, skilling, information and matching interventions in the labor market, and contextualizes the DP-WEE project that seeks to extend the analysis to include digital platforms in developing countries such as India and applying a gender lens.

D.1. Access to technology

The platform economy revolves around technology. NITI Aayog (2022) attributes the growth of digital labor to the Fourth Industrial Revolution, which encompasses breakthroughs such as internet-enabled smartphones. The report states that the government’s ‘Digital India’ initiative has enabled the widespread adoption of these mobile devices in the country, along with affordable data plans⁹. The indispensability of technology to platform economy participation makes it

⁹ It may be noted that prices of budget smartphones in India are on the rise (The Wire, 2023), and low-end mobile plans are also becoming more expensive (India Today, 2023).

imperative to consider technology access among the masses, and the gender gaps therein.

Among the working-age population in urban India, NSS data (2017-2018) showed that 36% of females can use the internet¹⁰ as against 52.9% of men. While the NSS considered household internet facilities via any device, mobile has now become the primary way in which most people in developing countries access the internet (GSM Association, 2022). A 2018 study by Barboni *et al.* found that 38% of women in India own mobile phones versus 71% of men. As per the National Family Health Survey (2019-2020), only 33% women in the lowest wealth quintile have a mobile phone that they themselves use. Zooming in on the gender divide, GSMA also reports that Indian women's mobile internet use did increase from 21% to 30% between 2020 and 2021¹¹ but stalled in the following year. In contrast, men's usage grew from 42% to 45% during 2020-2021 and further to 50% in 2022.

According to Oxfam India (2022), gendered social norms dictating appropriate behaviors for women and men have resulted in the lower assimilation of women in digital transformation. Sonne (2020) contends that women use fewer phone features and are constrained in terms of where they may use the phone (mainly at home), for how long, and for what purpose. While experimental evidence on the impact of providing access to mobiles or internet to Indian women is thin, a study in the state of Chhattisgarh found that distribution of free phones to women under a government program liberalized norms around their phone use (Barboni *et al.* 2021). Analysing data from about 14 countries across the developing world, Chiplunkar and Goldberg (2022) show that a 10-percentage-point increase in 3G mobile internet coverage increases FLFP by 4.9 percentage points. In terms of the effect on job types, the researchers contend that the "patterns are consistent with the emergence of a gig-economy enabled through lower information, communications and transactions costs."

It, therefore, imperative to bridge the gender gap in access to internet and mobile phones, to enhance the engagement of women in the digital labor market.

D.2. Skilling

Potential for improving employment outcomes

Lack of access to high-quality and job-relevant skilling is a key barrier to being productively employed. A clutch of studies has shown that providing training to disadvantaged groups can improve their employment outcomes.

¹⁰ This is defined here as being "able to use internet browser for website navigation, using e-mail and social networking applications, etc. to find, evaluate and communicate information".

¹¹ Changing market dynamics and Covid-19 restrictions are mentioned as possible factors.

Analyzing ‘DDU-GKY’ (*Deen Dayal Upadhyaya Grameen Kaushalya Yojana*) – Government of India’s skilling and placement program targeted at poor rural youth – Barua, Joshi and Singh (2022) find a large positive and significant impact of training on wage employment in the short run. While there are no differences by gender in the effect of training on wage employment, trained women are more likely to engage in self-employment. Maitra and Mani (2017) offer subsidized vocational training in tailoring to women in low-income households in India. ‘Treated’ women are more likely to be self-employed, work more hours per week, and have highly monthly earnings. It is noteworthy that the benefits are sustained for a period of 18 months. Working with poor youth in Colombia, Attanasio, Kugler and Meghir (2011) find that women who receive training earn more and have greater probability of being in paid employment, mainly in formal-sector jobs.¹²

Based on their study of unskilled youth in Uganda, Bandiera *et al.* (2021) suggest that an optimism channel is at work. Interestingly, the researchers observe at baseline that the youth are unskilled yet optimistic about their job prospects. Participating in a vocational training intervention gives a further boost to their optimism, leading to a more intense job search directed towards high-quality firms.

On the entrepreneurship front, McKenzie and Puerto (2021) find that business training leads to stronger sales and profits as well as enhanced well-being of business owners in Kenya – without negative spillover on competing firms. Along the same lines, Valdivia (2015) demonstrate that training for female entrepreneurs in Peru results in increased sales and self-reported adoption of recommended business practices. The positive effects on business growth of about 15% are still present two years following the end of the intervention. However, the issue is of low take-up of the program. There is also evidence from Chile that role models can amplify the impact of skilling on female microentrepreneurs (Lafortune, Riutort and Tessada 2018).

Labor market and socio-economic conditions limit benefits of skilling

Maitra and Mani (2017) highlight barriers to training program completion, such as credit constraints, distance, and lack of childcare support. In the case of DDU-GKY in Bihar, Chakravorty and Bedi (2019) note that trainees placed in jobs tend to drop out after 2-6 months. This is on account of mismatch between salary and living costs, and caste-based discrimination at the workplace.

Studying participants of ‘Skill India’ Program, Pande *et al.* (2017) find that men are more likely to receive and accept job offers at the end of training. Women’s high drop-out rates from jobs are linked to family reasons and job location – and

¹² This is in contrast with the Indian evidence, where skilling interventions are seen to increase self-employment (mostly informal) among women.

provision of migration support proves to be helpful. Looking into this distance constraint for women in Pakistan, Cheema *et al.* (2022) offer skilling at centers located at varying distances from residences. They find that women are four times more likely to complete the program if the training center is within their village. This is largely due to safety concerns in accessing faraway locations, with group transportation alleviating the problem to some extent.

D.3. Information

Even in a scenario where jobseekers acquire high-quality skilling that is tailored to employer needs, frictions exist in the job market in the form of information asymmetries. Gaps in information between the jobseeker and employer sides of the market may be of various types, such as employers not being able to assess worker skills, jobseekers not being aware of available jobs, and so on. Several studies in the economics literature seek to test information interventions to possibly improve labor market outcomes. A few key examples are discussed below, categorized by the nature of information and to whom it is provided.

Information on jobseekers' skills, provided to employers and jobseekers

The most significant information deficiency on the demand side of the job market pertains to the skills and abilities of jobseekers. Jobseekers may have no credible way of signaling their skills to employers, especially in the absence of traditional channels such as education, prior work experience, and referral networks (Carranza *et al.* 2022).

In an experimental study of an online marketplace involving data-entry jobs carried out remotely by workers across the globe, Pallais (2014) finds that providing detailed public evaluations for hired workers improves their subsequent employment outcomes. Comparing the long-term benefits of vocational and firm-based training among young workers in Uganda in sectors like plumbing, Alfonsi *et al.* (2020) show stronger effects from vocational training – with the main mechanism being skill certification.

Besides employers, there may be gains from providing workers information regarding their own skills. Another Uganda study finds that certification for non-cognitive skills for workers enrolled in a vocational training institute, increases workers' job market expectations resulting in positive assortative matching and higher earnings (Bassi and Nansamba 2021). Noting that most existing research in this context focuses on either employers or jobseekers, Carranza *et al.* (2022) experimentally vary the revelation of worker skills' information to both employers and young, active jobseekers in low-income areas of South Africa. They demonstrate that the two sides of the market adjust their behavior in response to the intervention, leading to better outcomes for jobseekers.

Information on labor market, jobs, and the workplace – provided to jobseekers

Research by Belot, Kircher and Muller (2019) in Scotland suggests that jobseekers may not be aware of the full range of occupations and associated job opportunities that are applicable to their job search. When they provide such information to jobseekers at local job centers in an alternative web interface, jobseekers broaden their search, and interviews increase by 44%. The effects are stronger for those that otherwise search for jobs narrowly and have been unemployed for longer.

Beyond the labor market, jobseekers may not have sufficient information regarding characteristics of jobs that are potentially available to them. Highlighting this gap, Chakravorty *et al.* (2021) worked with poor, rural youth in the Indian states of Bihar and Jharkhand, who were enrolled in DDU-GKY. The treatment group was informed regarding the job location and compensation, which enhanced their probability of remaining in the job for five months by 18%. The researchers explain that the result is driven by a ‘selection’ mechanism among trainees, with overoptimistic ones dropping out before the placement stage. However, the effect is concentrated among males.

Focusing on female jobseekers in Pakistan, Subramanian (2020) examines the effect of providing students in the final year of high school or graduation, information on the gender of supervisor and co-workers in potential jobs. Such information about the workplace increases the chances of women applying for jobs, especially those having female supervisors. Another insight from the study is that females seem to believe that their families care about the gender of their potential co-workers, while they themselves care more about the gender of the supervisor.

Information on trainees’ preferences over jobs, provided to placement managers

A third type of information may be on trainees’ preferences over jobs. Working with Skills Academy centers in Uttar Pradesh and the National Capital Region of Delhi, Banerjee and Chiplunkar (2021) elicit such information and make it available to placement managers. The impact is a 40% higher chance of receiving an interview call for a job that was among the top-four most preferred jobs of the trainee. Moreover, trainees have improved odds of ending up with jobs that they like, and of remaining in the job for three months.

D.4. Mediating external employment: Digital labor platforms matching jobseekers and employers

Various matching mechanisms attempt to reduce search costs for jobseekers and employers, address information asymmetries, and produce better matches of workers and jobs. These range from traditional channels such as job fairs and employment exchanges to online portals that have become commonplace of late.

These matching mechanisms have been keenly studied by researchers, showing mostly positive – and a few unintended – effects on employment outcomes.

Positive effects of matching

Analyzing Bangladesh Enterprise-based Skills Survey data (2012), Matsuda and Nomura (2022) find that workers in the same firm that had been matched through social networks earn 5% less and have worse match quality vis-à-vis skills and career progression, than those matched through formal channels. Yet, workers with lower socio-economic status tend to use social networks more as formal channels are costly.

Jones and Sen (2022) conducted research on graduates of training institutes in Mozambique, testing the impact of inviting randomly selected graduates via text messages to join established digital platforms – one for informal manual tasks and the other for conventional formal jobs. They find that employment outcomes of qualified females improved with respect to informal work. However, no other positive effects are obtained, perhaps on account of poor supply-side of employment.

In ongoing work, Field *et al.* encourage marginal jobseekers in Pakistan to register on ‘Job *Talash*’ – a digital platform where jobseekers provide their CV and specify job preferences, and firms post job advertisements along with information like job title, salary, and location. Jobseekers receive matches and choose whether to apply, following which firms decide whether to interview the candidate. In the study, some jobseekers are sent matches via text only, while others receive a text and a phone call. Preliminary findings show that a reduction in the non-pecuniary costs of applications, which involve evaluating matches and communicating decisions, increases the number of applications made.

Besides explicit matching, there may be benefit from training active jobseekers to join ‘LinkedIn’, an online professional networking platform. Wheeler *et al.* (2022) tested this for applicants of ‘*Harambee’s* job readiness program’ in urban South Africa and saw an increase in employment from 70% to 77%, with effects persisting for at least 12 months. The authors indicate that the mechanism at play is improved flow of information between jobseekers and employers, and possibly also the facilitation of referrals. However, there is no lowering of job search costs or change in self-belief as such.

Zero or negative effects of matching

Chakravorty *et al.* (2021) studied DDU-GKY during the Covid-19 pandemic, in the rural areas of Bihar and Jharkhand. At the time, male trainees were taking up informal jobs whereas women dropped out of the labor force. The authors find that the introduction of a government-supported digital platform failed to increase job

search or employment. They conclude that more active and targeted intervention is needed, especially for women. Another issue was that trainees had to log on to the app and they may have required a longer period to get accustomed to this technology.

A Uganda study (Bandiera *et al.* 2021) found that adding a light-touch matching intervention – matching young, urban jobseekers to job interviews – gave worse results than vocational training only. When the intervention solely involves skilling, youth are more optimistic and search intensively among high-quality firms. This produces better matching and higher employment rates. However, lower callback rates under the matching intervention makes them revise their expectations downwards.

The role of expectations is also underlined by Kelley, Ksoll and Magruder (2022). With a study sample of recent graduates of a public training program in urban Delhi, a randomly chosen treatment group was registered on a job portal ‘*jobshikari.com*’ and several text messages were sent to them about job opportunities. Surprisingly, the researchers saw that the intervention initially made graduates increase their reservation wage and work less. They contend that jobseekers’ beliefs about job arrival rates mediate the effectiveness of matching.

Gendered effects of matching

Using a cluster randomized control trial, Afridi *et al.* (2022) study the role of women's social networks in improving FLFP. In the first treatment arm, a hyperlocal digital job search platform service was offered to a randomly selected group of married couples (non-network treatment) in low-income neighborhoods of Delhi, India. In the second treatment arm, the service was offered to married couples and the wife's social network (network treatment), to disentangle the network effect. Neither couples nor their networks were offered the service in the control group. Approximately one year after the intervention, they find no increase in the wives' likelihood of working in either treatment group relative to the control group. Instead, there is a significant improvement in the husbands' labor market outcomes, including the likelihood of working, work hours, and monthly earnings, while home-based self-employment increased among the wives – both in the network treatment group only. They argue that the gendered structure of social networks reinforces (conservative) social norms about women's (outside) work, limiting the benefits women can derive from the new labor market technology.

D.5. Internal employment: Digital labor platforms providing gig work

Scope for expanding and improving work options, in an informal setting

A second type of digital labor platforms involve self-employed workers being provided gig work on the platform itself, for instance, hiring the services of a home

cleaner for a few hours via Urban Company in India. Hunt and Samman (2019) put forth the view that platform technologies can possibly bring about incremental improvements in labor conditions in low- and middle-income economies that are characterized by high degrees of informality. A study of gig workers in Kenya and South Africa finds that while many would prefer a stable, regular job, they believe that platforms offer better options than they would have otherwise (Hunt *et al.* 2019).

Gender matters

While there is a dearth of economics research on India's gig economy, a large chunk of the developed country and global literature puts the spotlight on the gender gap in earnings within the gig sector. Studying an online micro-tasks platform for research tasks, Litman *et al.* (2020) indicate that the gender gap in earnings may be driven by women choosing work that has a lower advertised pay rate. Analyzing 2 million tasks on Amazon Mechanical Turk, Adam-Prassl (2022) finds that women's lower earnings are on account of greater work interruptions and lower task completion speed – especially among those with children. Research by Cook *et al.* (2021) on a large sample of Uber drivers in the US shows that gender gaps in earnings are due to women's domestic burden and less experience on the app, and preferences regarding where to work – say, close to home or keeping safety concerns in mind – and how fast to drive. The authors are of the view that the gig economy may not be able to bridge the gaps, conditions of flexibility and absence of discrimination notwithstanding. Similar evidence from the UK, on crowd-work platforms providing white-collar, gig work at home attributes gender gap in earnings to factors such as gendered division of care responsibilities and constraints on women's algorithmic visibility and ability to compete (James 2022). Echoing the non-discriminatory environment of the gig sector, Adams-Prassl and Berg (2017) demonstrate the existence of gender gap in earnings on an online crowd working platform where the gender of the workers is not known to employers. They point towards reasons like worker education and experience on the platform, and women's unpaid work at home. Besides, in the developing and developed worlds alike, gig work is known to reinforce the same gendered division of work that afflicts traditional work (Kasliwal 2020, in India; and Tubaro *et al.* 2022 study of micro-tasks on online platforms in France's technology sector).

There is a call for greater acknowledgment of women's contributions to the perceived safety of customers and support for peer workers, enforcement of anti-harassment policies by platforms (Ma *et al.* 2022, based on interviews of a small sample of female gig workers in North America) and addressing women's health and safety issues (James 2022, in the UK).

Precarious work conditions and under-regulation

More broadly, there is concern around the informal work conditions and lack of social protection among gig workers (Aleksynska, Bastrakova and Kharchenko 2019, in Ukraine). Women's lower ability to engage with place-based gig work also brings into focus the absence of public infrastructure such as public toilets (Ratho 2018)¹³, public transport and other amenities to improve their physical mobility (IWWAGE, 2021). Scholars in both developed (Adams-Prassl and Berg 2017, in the US) and developing countries (Ghosh, Ramachandran and Zaidi 2021, for India) have emphasized the need for better regulation of the gig economy.

E. Contextualizing DP-WEE

E.1. Drawing lessons from the review of evidence

The existing literature supports the view that skilling has tremendous potential to improve employment outcomes. Yet, in practice, the realization of this potential runs into challenges pertaining to actual job market conditions – what skills are in demand, where work is located, how much it pays, and whether the work environment is conducive. Further, the research on skilling takes cognizance of gendered constraints on accessing skilling such as physical mobility and domestic obligations. DP-WEE field visits also find that women who live far from training centers and/or have children, prefer morning batches. In scenarios where the women's families are not entirely supportive of their pursuit of skilling, women may be motivated by friends who are also undergoing training – with commuting in pairs enhancing sense of safety.

The information literature indicates the significance of better information flow among jobseekers and employers, in terms of worker skills and preferences as well as labor market conditions, and characteristics of jobs and workplaces. Reduced information asymmetry implies lower search costs for both jobseekers and employers, and better employment outcomes via improved alignment of demand and supply in the job market.

The third strand of the literature focused on matching illustrates the benefits from interventions that can better align the demand and supply aspects of the job market. In cases where no effects are seen or there are unexpected negative effects, there is a role for digital training and counselling of jobseekers to manage expectations.

¹³ While the lack of women-friendly sanitation facilities in urban areas has been noted in the public discourse – especially in the context of women's work participation – there is a need for evidence generation on the issue.

E.2. Gaps in the existing evidence, and emerging issues

Across skilling, information and matching, the developing country literature is mostly based on conventional forms of employment and there is a need to include digital labor platforms in the analysis.

Some of the leading platforms have an embedded skilling component through dedicated physical centers in urban areas. Given that digital labor platforms largely overlap with the growing services sector of the Indian economy, there is some focus on soft skills such as communication with clients¹⁴ in the delivery of personal services, but more needs to be done. Moreover, so long as norms and socio-economic conditions prevent women from acquiring driving skills and owning vehicles, they will be unable to fully engage in the growing segments of doorstep delivery and ride-hailing. In this regard, safety in public spaces and gender-sensitive transport infrastructure¹⁵ become crucial.

Preliminary field work under DP-WEE finds that some of the skill training is also imparted through videos on the platform apps and learning is assessed through online tests. This can plausibly ease skilling for women with mobility constraints to some degree, except that it makes women's digital disadvantage more glaring. Besides device ownership and exclusive usage, women tend to lack skills in technology, making it harder to negotiate the digital labor space.

Additionally, high-quality skilling is often costly, and families may be reluctant to devote limited resources to the vocational training of women as they may not foresee good returns to such an investment. In this regard, some platforms have arrangement such as deducting training costs from worker earnings in small instalments over time, rather than charging a lumpsum upfront.¹⁶

Field visits conducted so far have also discovered that the skilling centers run by platforms are making efforts to organize sessions for trainees with alumni of the program and experienced workers on the app – activating the 'role model' effect.

In terms of information, digital platforms have the capacity of making extensive information available to jobseekers and employers, at scale and in a cost-effective manner. For instance, platforms have mechanisms of worker evaluation in the

¹⁴ Of course, such skilling by platforms can only be successfully delivered if the trainees come with a basic level of language competency, ideally obtained during schooling or perhaps in broader training programs. By the same token, platforms can train workers in app use but digital literacy on part of workers would be a precondition.

¹⁵ In October 2019, the Delhi government made public buses free for women throughout the city. In ongoing work, Borker, Kreindler and Patel are assessing the impact of this policy on women in terms of their mobility constraints of cost, safety, and coordination.

¹⁶ Traditionally, government-run industrial training institutes (ITIs) have required fee payment to be made at the beginning of the course.

form of client ratings and reviews, signaling the skills and abilities of workers to prospective service-users. Although, with the absence of ‘middle agents’ that operate in the traditional job market, there may be an issue of trust among workers and employers on platforms. This can be addressed by embedding portable, government-provided skills certification on platforms.

With women’s lower access to networks, technology, and public spaces, they are expected to face wider information gaps and correspondingly, to gain more from measures that bridge these gaps. Yet, there is an absence of an explicit gender lens in most of the developing country research on information asymmetry in the job market.

On the matching front, while some of the evidence does cover the working of online job portals, research is needed on the current generation of digital labor platforms that enable hyperlocal job search and present a wide gamut of job types to registered users via smartphones. Since flexible work options close to home are likely to benefit women more, a gendered analysis of digital labor platforms is warranted.

Generating evidence on the gig economy in India, including a gender perspective, has become crucial, such that there can be appropriate policies and women can fully gain from the potential of digital platforms to provide suitable work. Along with the promise of easing some of the constraints that women have faced in engaging with traditional paid work, gig work does bring forward certain challenges too. Seeking gig work on platforms involves costs such as buying kits from the platform or needing to own a vehicle for providing door-to-door services.¹⁷ This puts women at a disadvantage as they tend to have lower financial empowerment in the form of access to formal credit, possession of collateral and assets. Additionally, the lack of skills and access to technology – as discussed earlier – become limitations in gig and platform work as well.

E.3. Potential contribution of DP-WEE

In sum, based on lessons from existing literature and the need for gendered analysis of India’s platform economy, the DP-WEE project will design and test interventions in skilling, information, and matching:

- (i) The DP-WEE project aims to collaborate with platform service providers to explore how skilling can encourage young women to participate in the platform economy. This in turn can foster a sense of empowerment as they make decisions pertaining to marriage, working post marriage, childbearing and occupational choice.

¹⁷ Similarly, startup capital is needed for selling own goods on online platforms.

- (ii) The DP-WEE project will examine job search behavior with a gender lens and examine how expansion of information among women, including correction of beliefs regarding the labor market and work opportunities, can improve their participation and work tenure in the platform sector.
- (iii) The DP-WEE project will explore the optimal design of matching algorithms on digital labor platforms, to improve the quality of matching from a gender perspective. This can promote greater take-up of this technology on the demand and supply side of the job market and generate superior employment outcomes.

New, rigorous evidence on what works and what matters in harnessing digital labor platforms for women’s productive employment, will enable the design and implementation of suitable, gender-sensitive policies for to this fast-expanding segment of the economy.

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