WORKING WITHOUT BORDERS

The Promise and Peril of Online Gig Work

Short Note Series #8:
Can Poor, Vulnerable, and Low-Skilled Workers Also Access Digital Jobs?

S4YE SOLUTIONS FOR YOUTH EMPLOYMENT

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Executive Summary

Microwork, the completion of small digital tasks over the internet, is experiencing significant growth due to rapid developments in artificial intelligence, social media marketing, and the expansion of the digital economy. According to data collected for the World Bank Report Working Without Borders, there are almost 156 million people already engaging in microwork across the world.

This short note is based on a survey conducted in one of the largest microwork platforms and supplemented by data scraping from the same platform. Using descriptive statistics, network analysis, constrained linear optimization, linear regressions, and case studies, the note attempts to shed light on the world of microwork, which presents a low entry barrier opportunity for low-skilled people to supplement their incomes and participate in the digital economy.

Microworkers are more likely to be young, male, possessing a range of skills, and residing outside capital cities. They typically dedicate less than 10 hours per week to microwork, earning less than 25 percent of their monthly income from it. Formal training in microwork is relatively uncommon, as the tasks are typically fairly simple. Most microworkers are primarily motivated by bridging gaps in income, but the flexible work location and the desire to acquire digital skills are also important factors.

Our analysis shows that, among microwork tasks, image tagging, text annotation, and data categorization are good entry points as they require skills that are complementary to other tasks. Nearly half of microworkers use smartphones to perform microwork tasks and rely on digital payment systems to receive their earnings. Therefore, access to the internet, smartphones, and digital payment solutions is essential to enable people in developing countries, and particularly vulnerable groups, to participate in this type of work.

Despite modest earnings per task, microworkers from low- and lower-middle-income countries could earn more than the statutory minimum wage of their respective countries. Moreover, demographic factors such as age, experience, gender, and education do not significantly affect earnings. Microworkers consider time management and digital skills to be crucial for success. However, given the repetitive and low-skill nature of the tasks, microwork cannot be a permanent solution to unemployment challenges where jobs with a clear ladder for upward mobility are needed.

Despite financial challenges and lack of social protection, most microworkers want to continue doing online gig tasks to increase their earnings. Moreover, they want access to training in order to grow in their online work and diversify their skillset. These findings can inform the design of appropriate short-term interventions for increasing access to jobs and income-earning opportunities for low-skilled and vulnerable groups such as safety net beneficiaries, refugees, etc.

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1. What is Microwork?

Microwork is a type of online gig work. It refers to the completion of small, often digital tasks that can be done remotely, typically through the Internet. Microworkers, those engaged in microwork, tackle straightforward assignments that require minimal time, sometimes mere seconds or minutes, or specialized skills.[1] In contrast, **online freelancing,** another form of platform-mediated gig work, generally requires **a higher level of skills** and the typical tasks take longer to complete (from a couple of days to several weeks).[2] The concept of microwork traces back to the early days of the Internet, when businesses began outsourcing small tasks, like data entry, to online workers. The digital outsourcing model allowed businesses to efficiently and cost-effectively complete tasks by tapping into a vast pool of online labor. As microwork gained momentum, numerous online services specializing in micro-tasking emerged, leveraging a global workforce.

The onboarding process on platforms is straightforward. Microworkers register on a given platform (examples include Amazon MTurk, Appen, Microworkers), create an account, occasionally complete qualification tests using sample tasks, and then search for tasks aligned with their abilities and availability. Similarly, employers establish accounts on platforms to post their tasks. After microworkers complete the tasks, employers assess the quality of the work. Upon approval, the microwork platform transfers earnings to the microworkers, deducting a fee for their intermediary services from either or both sides.

Microwork presents a versatile solution for workers, requiring minimal skill and enabling workers to complete tasks at any time and from any location. This flexibility not only accommodates diverse schedules and circumstances but also helps workers fill income gaps, as workers can earn income independent of traditional employment structures. Moreover, it can be an entry point for learning digital skills, which can then enable workers to advance to more complex tasks. Microwork can potentially play a significant role in promoting employment among vulnerable and marginalized groups, thereby fostering greater economic inclusivity and empowerment.

What are microwork tasks?

There are several types of microwork tasks. Some examples include:

Table 1: Sample Microtasks

Microwork Tasks	Description
Audio Transcription	Transcribe short audio recordings into text format.
Blog Commenting	Comment on blogs or articles based on given guidelines.
Captcha Solving	Solve Captcha puzzles to verify human presence online.
Content Moderation	Moderate user-generated content on online platforms.
Data Annotation	Label images, identify objects in videos, transcribe audio recordings for machine learning models.
Data Cleaning	Clean and format datasets by removing duplicates or errors.

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[1] In contrast, freelancing requires longer period and specialized skills.
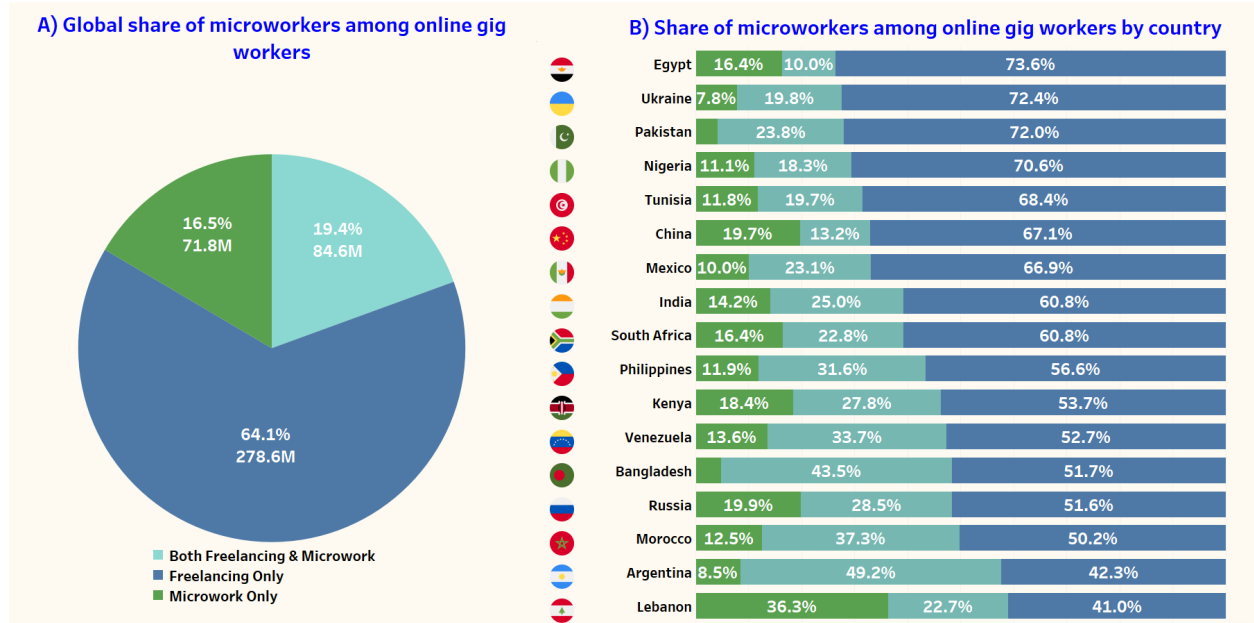[2] Examples include Upwork, Fivver, freelancer.com, PeoplePerHour, etc.

Microwork Tasks	Description
Data Entry	Enter data from scanned documents or forms into digital format.
Data Validation	Compare two data sets or check for errors to ensure data accuracy.
Data Verification	Verify accuracy of data by comparing it with provided sources.
Email Sorting	Sort and organize emails into relevant folders.
Email Verification	Check the validity of email addresses to ensure accurate email lists.
Image Annotation	Add annotations or labels to images based on given instructions.
Image Categorization	Categorize images based on provided criteria.
Image Editing	Perform basic editing tasks on images.
Keyword Tagging	Tag articles or documents with relevant keywords.
Local Knowledge Tasks	Complete tasks that require local knowledge, such as taking photos of landmarks or verifying business information.
Market Research	Participate in surveys, focus groups, or product/service testing to provide feedback.
Online Research	Conduct quick research on given topics and provide summaries.
Product Categorization	Categorize products based on their descriptions or features.
Proofreading	Review and correct grammar and spelling errors in texts.
Search Engine Optimization (SEO) Tasks	Link building (finding websites for guest posts with backlinks) or keyword research for SEO purposes.
Sentiment Analysis	Analyze sentiment of short texts or comments and categorize them.
Short Content Creation	Write short pieces of content like social media posts, blog comments, or product reviews.
Social Media Engagement	Like, comment, or share posts on social media platforms.
Social Media Listening	Monitor social media conversations for mentions of a brand or product to understand online sentiment.
Surveys and Polls	Complete surveys and polls on various topics.
Text Summarization	Summarize long texts or articles into shorter versions.
Transcription	Transcribe short audio clips or handwritten notes into text.
Translation	Converting short text from one language to another.
Video Captioning	Add captions or subtitles to short videos.
Web Scraping (manually)	Extract specific data points (e.g., product prices, contact information) from websites.
Website Testing	Test functionality and usability of websites or apps.
Writing Product Descriptions	Creating short descriptions of products for online stores.

Source: Compiled by authors from several microwork platforms.

The microwork industry is experiencing significant growth, with an estimated 156.4 million microworkers worldwide. According to the recent World Bank report "Working Without Borders: The Promise and Perils of Online Gig Work", the global number of online gig workers is estimated to be almost 435 million. Among them, 16.5 percent exclusively engage in microwork, while another 19.4 percent simultaneously perform both microwork and freelancing tasks. With more than one-third of online gig workers (35.9 percent) involved in microwork (see Figure 1, panel A), this type of work is rapidly growing, largely driven by the growth of artificial intelligence (AI). The share of microworkers

among gig workers varies across countries. It could be as small as 26 percent in Egypt and as high as close to 60 percent in Argentina and Lebanon (see Figure 1, panel B).

Figure 1: Estimated number and relative share of microworkers and freelancers

A) Global share of microworkers among online gig workers

- 16.5% 71.8M
- 19.4% 84.6M
- 64.1% 278.6M

Legend:
- Both Freelancing & Microwork
- Freelancing Only
- Microwork Only

B) Share of microworkers among online gig workers by country

Country	Microwork Only	Both	Freelancing Only
Egypt	16.4%	10.0%	73.6%
Ukraine	7.8%	19.8%	72.4%
Pakistan		23.8%	72.0%
Nigeria	11.1%	18.3%	70.6%
Tunisia	11.8%	19.7%	68.4%
China	19.7%	13.2%	67.1%
Mexico	10.0%	23.1%	66.9%
India	14.2%	25.0%	60.8%
South Africa	16.4%	22.8%	60.8%
Philippines	11.9%	31.6%	56.6%
Kenya	18.4%	27.8%	53.7%
Venezuela	13.6%	33.7%	52.7%
Bangladesh		43.5%	51.7%
Russia	19.9%	28.5%	51.6%
Morocco	12.5%	37.3%	50.2%
Argentina	8.5%	49.2%	42.3%
Lebanon	36.3%	22.7%	41.0%

Source: Global Gig Workers Survey, 2022[3]

The rapid growth of microwork is largely driven by the need for data to train AI models[4], which often involves annotating, tagging, labeling, and sorting data for training and testing purposes (*see Box 1 for examples of microwork platforms that promote an impact sourcing model in the age of AI*). Additionally, the shift in marketing strategies from traditional media to social media has created new opportunities for microwork, such as reposting, liking, following, or commenting on the social media accounts of companies and brands to increase their visibility. Furthermore, microwork platforms assist businesses in monitoring their competitors' activities, for instance by checking the presence of products in specific markets, verifying prices, and taking pictures of tags. Microworkers also review products and complete feedback forms, as well as participate in marketing and academic research projects conducted over microwork platforms.

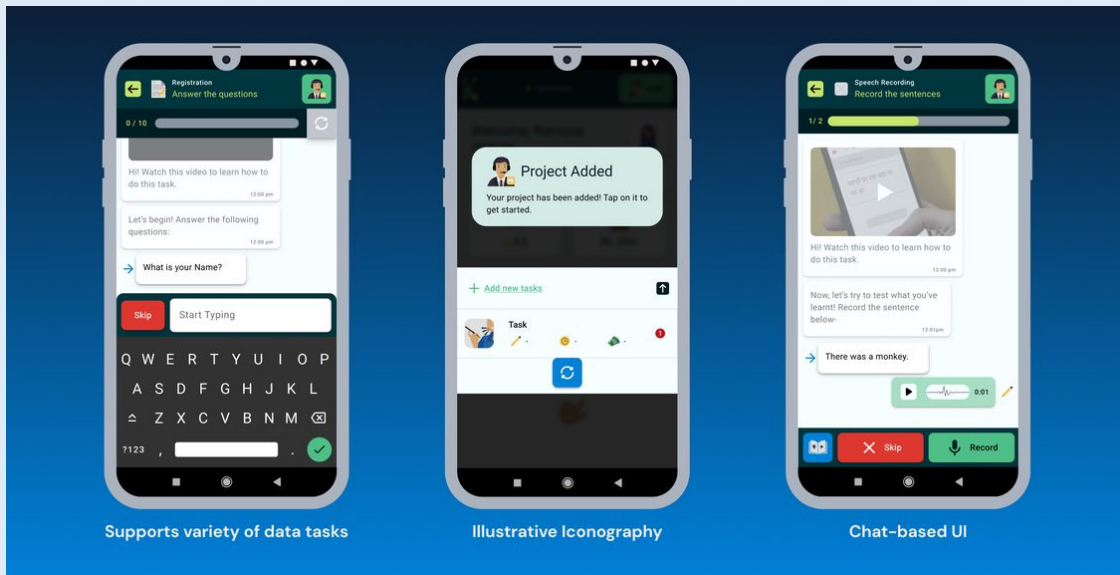**Box 1. The impact sourcing potential of microwork in the age of AI**

Microwork generally requires only basic levels of digital literacy, which makes it a potentially powerful tool for the inclusion of low-skilled and vulnerable workers. Microwork platforms such as Karya, Sama, and Humans in the Loop, have adopted an impact sourcing model, targeting microworkers from low-income and vulnerable segments of the population.

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[3]A survey conduct as part of the Working Without Borders report: The Promise and Perils of Online Gig Work report.

[4] Tubaro, P., Casilli, A. A., & Coville, M. (2020). The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence. Big Data & Society, 7(1), 2053951720919776.

Karya[5] is a smartphone-based crowdsourcing platform that offers data generation, labeling, and digitization tasks to low-skill, low-income people in rural communities in India. Karya taps into the growing market for AI tasks while simultaneously providing work opportunities for disadvantaged Indians. The key to bringing these opportunities to those who need them the most is an accessible app for smartphones, with a chat-based user interface designed to be intuitive for users with limited digital literacy (Figure 1.1). Karya is committed to paying fair wages; microworkers using the Karya app are paid the equivalent of 20 times the minimum wage. Karya has reached 35,000 people in rural India since it was founded in 2017.[6]

Figure 1.1. Examples of the user interface of Karya app

Supports variety of data tasks   Illustrative Iconography   Chat-based UI

Source: https://karya.in/resources/newsletters/june-2023/

Sama is an AI company that provides data curation, annotation, and validation tasks. Sama aims to recruit and train disadvantaged people in East Africa, such as youth and women living below the international poverty line, workers who have never held a formal sector job, and the unemployed. Sama pays workers a living wage[7] and offers health insurance and additional benefits to lift workers out of poverty. Since 2008, the company has connected over 15,000 workers with income-earning opportunities.[8]

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[5] https://karya.in/

[6] Based on information available on the website of Karya (as of March 27, 2024): https://karya.in/

[7] Defined by the Global Living Wage Coalition as: "the remuneration received for a standard workweek by a worker in a particular place sufficient to afford a decent standard of living for the worker and her or
his dependents. Elements of a decent standard of living include food, water, housing, education, health care, transportation, clothing and other essential needs including provision for unexpected events". https://ungc-communications-assets.s3.amazonaws.com/docs/publications/Achieving_the_Living_Wage_Ambition_Reference_Sheet_and_Implementation_Guidance_EN.pdf

[8] Sama (2023). 2022 Environmental and Social Impact Report. https://4379491.fs1.hubspotusercontent-na1.net/hubfs/4379491/Downloadable%20Assets/eBooks/Sama%20Impact%20Report%202022.pdf

Humans in the Loop makes microwork tasks accessible to a subgroup of vulnerable people who often lack access to formal jobs: refugees. Humans in the Loop helps conflict-affected and displaced people to earn an income through remote online tasks such as data collection and annotation to power AI applications. The platform has connected over 1000 workers with income-earning opportunities since 2017.[9] To effectively reach conflict-affected individuals, Humans in the Loop works with a network of local NGOs to recruit, train, and manage beneficiaries. The local NGOs also play a crucial role in facilitating payments for workers who often lack access to bank accounts or payment channels that require a bank account (such as PayPal). Workers receive their earnings from Humans in the Loop through the local NGOs. Workers are also paid a minimum hourly wage above the minimum wage in their country.[10]

2. Data Sources

This short note uses four data sources:

1) A survey conducted in one of the largest microwork platforms, gathering responses from over a thousand participants across all World Bank regions.[11] The survey questionnaire included demographic details of microworkers, their motivations for working in the field, the types of tasks they perform, the devices they use, the payment systems they use, the skills they consider important, their current financial status, their aspirations, and the support they require from platforms. The survey was administered as a task on the platform, and region-level quotas were implemented to reach gig workers from multiple regions. The platform was selected based on two key factors: it has a wide geographical presence, and it accommodates multiple types of microtasks.

2) Additional data gathered by web scraping on the same platform, providing insights on total earnings and tasks completed by microworkers, as well as their ratings and locations. It's important to note that the web scraped data may not necessarily come from the same workers who participated in the survey. The team collected information from over 4200 unique microworkers registered on the platform, from various countries.

3) A global online survey of online gig workers conducted in 2022, supplemented by 4) website traffic data gathered from SEMrush.[12] The global survey data and the website traffic data were both collected for the Working Without Borders report and were used in this note to estimate the global number of microworkers.

While this research offers new insights on microwork, the data also has some limitations. First, as the microwork survey was conducted in English, it may overlook the perspectives of non-English speakers. Second, since the microwork survey was posted as a task on the microwork platform, the selection to perform the task could be correlated with certain demographics and other factors associated with the workers, potentially biasing the results. Third, to ensure geographical representation, quotas were

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[9] According to information available on the LinkedIn page of Humans in the Loop, as of March 27, 2024: https://www.linkedin.com/company/humansintheloop/.
[10] https://humansintheloop.org/why-us/fair-work-policy/
[11] Further details about the survey are available in Appendix E of the Working Without Borders: The Promise and Perils of Online Gig Work report.
[12] SEMrush is a web traffic and market analytics company.

introduced when we conducted the survey. Thus, the data may not accurately reflect the actual country composition in the platform. To account for this, we used web scraped data for the geographical analysis, which provides a better understanding of the geographical distribution of workers. Fourth, through web scraping, we were able to collect information about workers displayed on the platform interface at a spot pre-selected by the platform's algorithm. However, we experimented with different sorting criteria to ensure robustness. Finally, for the estimation of the number of microworkers, we relied on the global online survey of gig workers conducted in 17 countries using Random Domain Intercept Technology, and we extrapolated results to the rest of the world using internet traffic flow data.[13] Despite the limitations, the note provides valuable insights on microwork, which is gaining traction but is currently understudied.

3. Understanding Microworkers: Their Characteristics, Motivations, Engagement, and Learning Processes

The profile of microworkers

Microworkers predominantly consist of young, male, college-educated individuals and typically live in in cities and towns beyond capital cities (see Figure 2). Microwork is particularly appealing for youth: six out of ten microworkers are 30 years of age.[14] Survey findings also indicate that microworkers tend to be well-educated, with around two-thirds holding at least a bachelor's degree—a greater share than comparable workers in the general labor force of developing countries.[15] This finding may seem contradictory to the notion that microwork tasks require minimal specialized skills, but we will discuss this aspect in more detail later on in the note. Moreover, a significant majority of microworkers (84 percent) reside outside capital cities and live in smaller urban centers, towns, and even villages. Although 55 percent of microworkers are male, the share of women in microwork is greater than the gender balance in the overall labor market in most countries.[16]
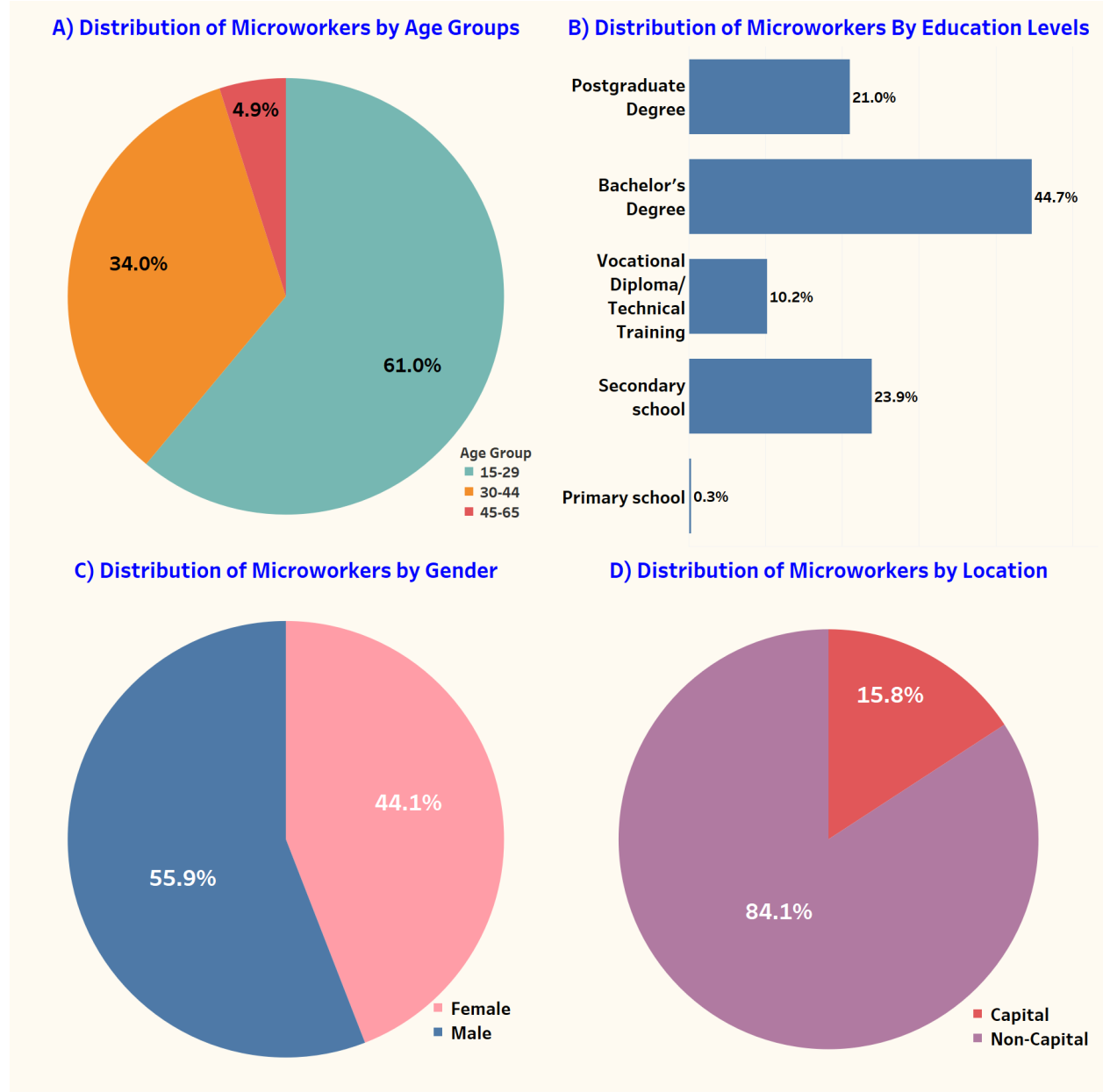
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[13] See "Datta, N., Rong, C., Singh, S., Stinshoff, C., Iacob, N., Nigatu, N. S., ... & Klimaviciute, L. (2022). Working Without Borders: The Promise and Peril of Online Gig Work" for more details.

[14] Berg et al. (2018) also found the average age of the microworkers was around 28 years in developing countries.

[15] Please see UNESCO data https://data.worldbank.org/indicator/SE.TER.CUAT.BA.FE.ZS or refer Datta N. et. al., 2023.

[16] https://data.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS

Figure 2: The Demographic Profile of Microworkers

A) Distribution of Microworkers by Age Groups

4.9%
34.0%
61.0%

Age Group
- 15-29
- 30-44
- 45-65

B) Distribution of Microworkers By Education Levels

Education Level	Percentage
Postgraduate Degree	21.0%
Bachelor's Degree	44.7%
Vocational Diploma/ Technical Training	10.2%
Secondary school	23.9%
Primary school	0.3%

C) Distribution of Microworkers by Gender

44.1%
55.9%

- Female
- Male

D) Distribution of Microworkers by Location

15.8%
84.1%

- Capital
- Non-Capital

Source: Survey on one of the largest microwork platforms.

The microwork industry has the potential to create income-earning opportunities in low- and middle-income countries. Most workers on the microwork platform we studied hail from low- and middle-income countries (see Figure 3, which shows the distribution of workers by the year they joined the platform and the income group of their respective countries). In 2009, workers from low- and middle-income countries comprised half of the platform's users. However, by 2023, this figure had surged to 84 percent, indicating steady growth from 2013 until the onset of the COVID-19 pandemic. In the aftermath of the pandemic, the share of workers from high-income countries began to rise. Notably, South Asian countries have played a pivotal role in driving the expansion of workers from low- and middle-income

nations. At the same time, however, Sub-Saharan African countries are underrepresented on this microwork platform.

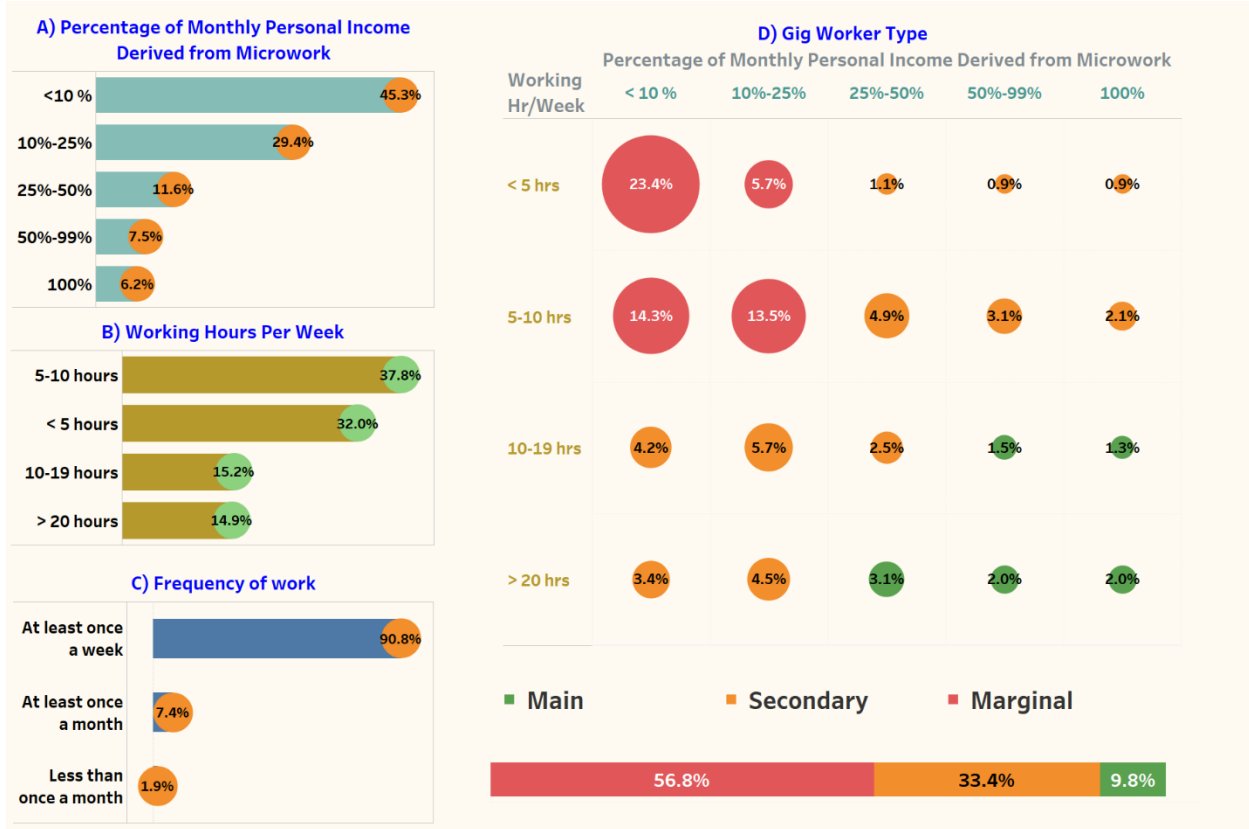**Figure 3: Composition of workers by their country's income group across years**
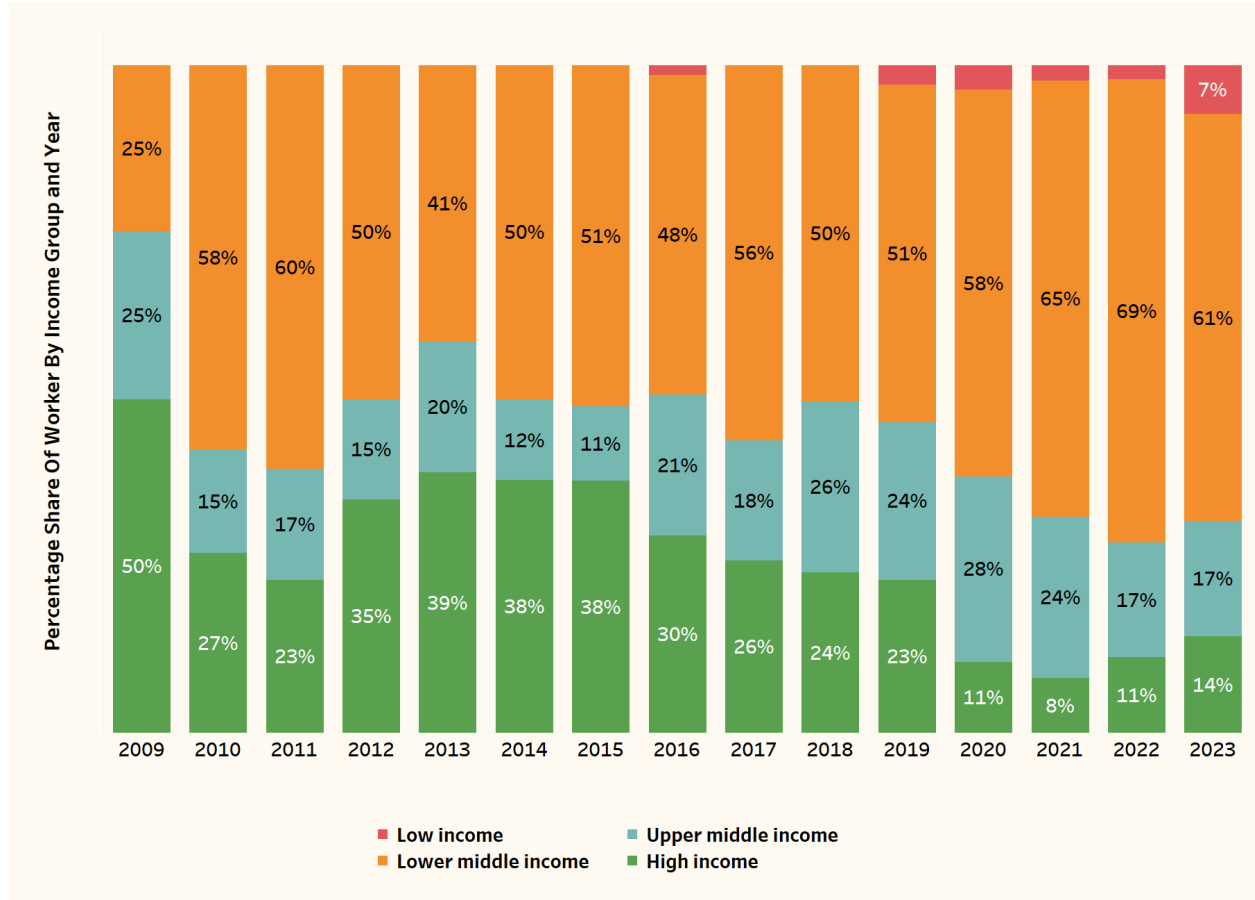
Source: Data from one of the largest microwork platforms.

Most microworkers typically dedicate less than 10 hours per week to microwork and earn less than 25 percent of their monthly income from it, showing that this is a source of supplementary income for most workers (Figure 4, Panel A & B). Nearly nine out of ten microworkers complete at least one task per week (see Figure 4, Panel C). This suggests that microworkers perform tasks consistently but for relatively short durations, making it convenient for those seeking to diversify their income without significant time commitments. To better gauge their level of engagement, microworkers were categorized into main, secondary, and marginal groups based on the number of hours worked per week and the proportion of microwork income in their monthly earnings.[17] As depicted in Figure 4 - Panel D, 56 percent of microworkers fall into the marginal category, while 33 percent are classified as secondary workers. Only approximately 10 percent are considered main gig workers, devoting substantial hours to microwork and deriving a higher share of their monthly income from it.

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[17] We adopted an approach suggested by Brancati, U et al (2020).

Figure 4: Microworkers by their engagement level

A) Percentage of Monthly Personal Income Derived from Microwork

Income	Percentage
<10 %	45.3%
10%-25%	29.4%
25%-50%	11.6%
50%-99%	7.5%
100%	6.2%

B) Working Hours Per Week

Hours	Percentage
5-10 hours	37.8%
< 5 hours	32.0%
10-19 hours	15.2%
> 20 hours	14.9%

C) Frequency of work

Frequency	Percentage
At least once a week	90.8%
At least once a month	7.4%
Less than once a month	1.9%

D) Gig Worker Type
Percentage of Monthly Personal Income Derived from Microwork

Working Hr/Week	< 10 %	10%-25%	25%-50%	50%-99%	100%
< 5 hrs	23.4%	5.7%	1.1%	0.9%	0.9%
5-10 hrs	14.3%	13.5%	4.9%	3.1%	2.1%
10-19 hrs	4.2%	5.7%	2.5%	1.5%	1.3%
> 20 hrs	3.4%	4.5%	3.1%	2.0%	2.0%

■ Main   ■ Secondary   ■ Marginal

Marginal	Secondary	Main
56.8%	33.4%	9.8%

Source: Survey on one of the largest microwork platforms.
Note: Bubble size is proportional to the relative number of workers in each working hour and income groups.

What motivates microworkers?

Microworkers are primarily driven by the need to bridge income gaps, although factors like location flexibility and acquiring new digital skills are also important. Supplementing one's income remains the top priority across gender, age, educational background, and financial status, as illustrated in Figure 5. The exception is main microworkers (i.e., those who work more than 20 hours a week and earn more than 50 percent of their income) who prioritize flexibility in location. Interestingly, female microworkers are more motivated by the prospect of learning new digital skills than males. Location plays a crucial role in motivation, with one-third of microworkers from rural areas citing limited local job opportunities as a key driver, compared to 18 to 21 percent in capital cities and developed urban zones. This underscores the pivotal role of online gig work, including microwork, in providing opportunities to individuals who live away from urban centers. For instance, in Venezuela and Tunisia, where youth unemployment poses a significant challenge, 27-28 percent of respondents cite microwork as a means to earn better wages than in the traditional labor market.

Figure 5: Motivations to participate in microtasks across different demographics.
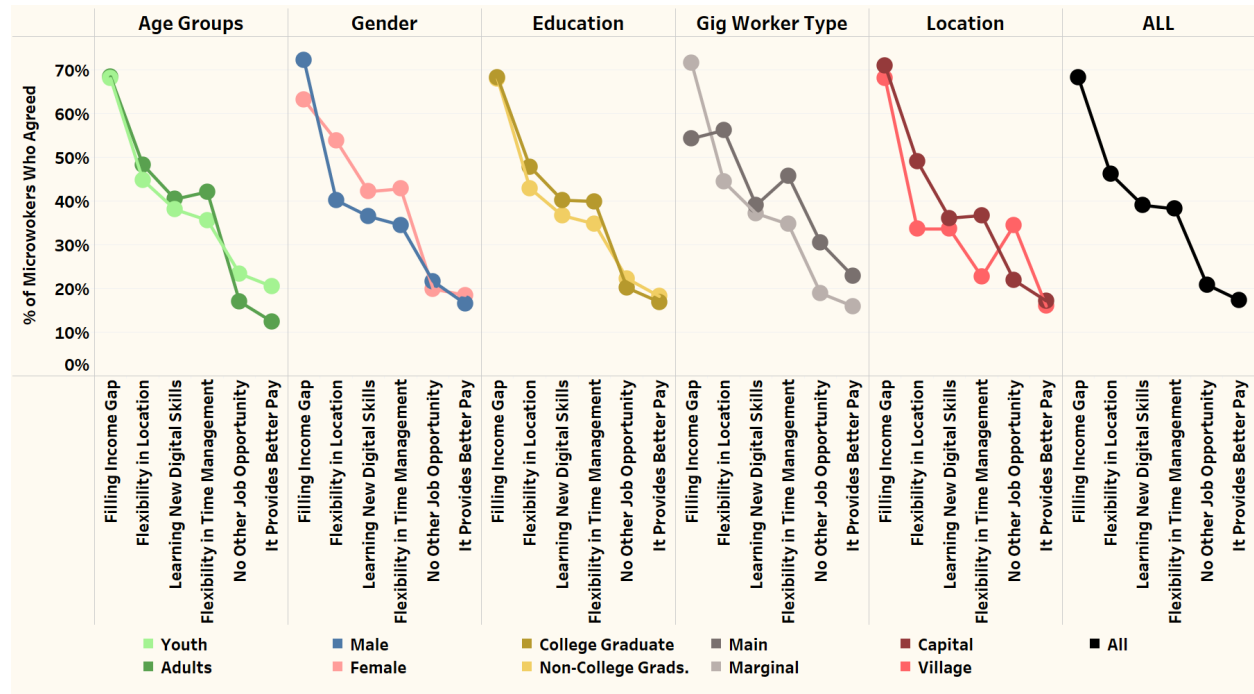
Source: Survey on one of the largest microwork platforms.

Learning how to perform microtasks within a university or formal training setting is relatively uncommon. Instead, self-teaching (learning by doing), consulting platform guides, and seeking guidance from family and friends serve as the primary channels through which microworkers acquire task proficiency. Overall, 51 percent of respondents reported learning to perform tasks through self-teaching and practice, which aligns with the tasks' relatively straightforward nature compared to traditional jobs or freelancing activities, which may require specialized training (Figure 6). However, notable disparities exist across different demographic groups. Female microworkers are less likely to be self-taught compared to their male counterparts, with a difference of close to 10 percentage points. Female workers are more inclined to consult platform guides. Additionally, older cohorts are more likely to be self-taught than younger ones. Furthermore, less educated and marginal gig workers are relatively less likely to be self-taught and tend to prefer other options such as YouTube tutorials. Generally, only 15 percent of microworkers have pursued formal education or training at universities or training centers.

Programs aiming to support safety net beneficiaries and other vulnerable groups in engaging in microwork could provide guiding material without the need for significant funds. Programs may not necessarily need to spend significant resources on establishing training facilities. Instead, they may focus on providing guides, creating peer learning platforms, and sharing easily available learning materials such as YouTube videos and massive open online courses (MOOC), which already appear to be popular and cheaper options even for less educated workers.

Figure 6: Skills to engage in microwork.

		Self Taught	Platform Guide	Family/ Friend	University/ Training Center	MOOC courses (e.g. Edx)	Took No Training	YouTube
ALL	.	51%	32%	31%	15%	13%	12%	6%
Gender	Male	56%	31%	30%	14%	12%	14%	8%
	Female	45%	35%	32%	16%	14%	11%	4%
Age Groups	15-29	50%	31%	32%	16%	12%	12%	7%
	30-44	54%	36%	28%	14%	16%	13%	7%
	45-65	55%	30%	40%	4%	6%	13%	0%
Education	Postgraduate Degree	52%	40%	33%	19%	15%	13%	4%
	Bachelor's Degree	53%	32%	29%	15%	14%	12%	6%
	Vocational/Technical Diploma	50%	26%	31%	7%	6%	11%	7%
	Primary/Secondary school	48%	30%	33%	15%	12%	12%	9%
Gig Worker Type	Main	58%	36%	35%	20%	18%	12%	4%
	Secondary	54%	30%	31%	14%	11%	11%	7%
	Marginal	48%	33%	31%	15%	13%	13%	7%

Source: Survey on one of the largest microwork platforms (multiple choices are allowed).
Note: Bubble size is proportional to the relative number of workers(respondents).

What type of tasks do microworkers perform?

Microworkers tend to engage in a diverse array of tasks, with data collection as the most popular. In terms of volume, 45 percent of all tasks surveyed are centered around collecting data (both online as well as on location, for instance in order to verify business information). Following data collection, search engine optimization and driving website traffic rank as the next most common tasks. Additionally, tasks related to audio and video platforms, as well as social media support and transcription, are also popular (refer to Figure 7, Panel A). It is typical for microworkers to engage in multiple tasks concurrently, as illustrated in Figure 7, Panel B. Thanks to the relatively simple nature of tasks, the average microworker performs 11 different tasks. The composition of tasks will differ from platform to platform; in this case, the data collected refers to a microwork platform with wide coverage of a variety of tasks.

Figure 7: Distribution of Microtasks

A) Popular Tasks (Based on the number of Jobs performed)

Task	% of Tasks Completed
Data Collection	45.7%
SEO/Web Traffic	15.9%
Video/Audio Platforms	14.2%
Sign up/Register	12.7%
Promotion	5.8%
Social Media Support	3.0%
Transcription	1.3%
Write Review for Products	0.5%
Mobile App	0.3%
Q and A	0.3%
Content Moderation	0.3%
Completing surveys/research	0.1%

B) Distribution of the Number of Tasks Performed by Microworkers
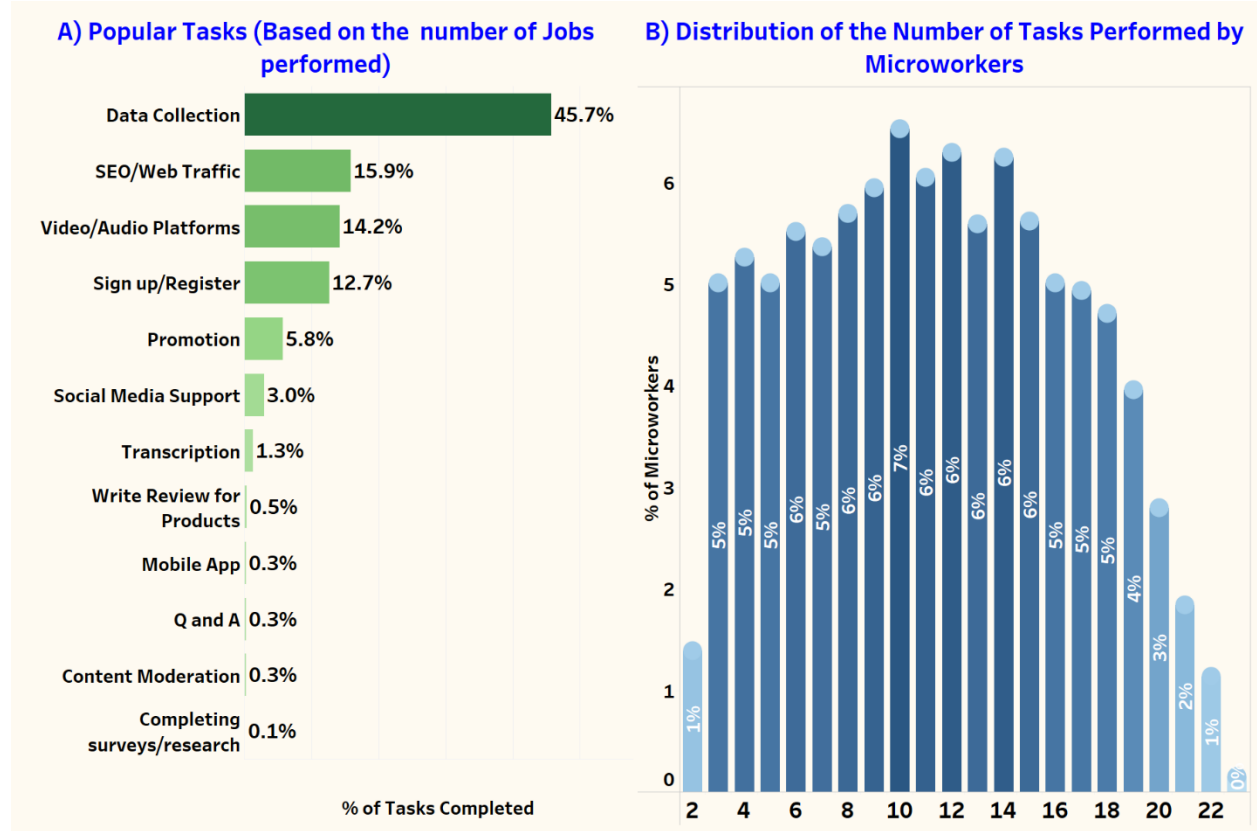
Source: Data from one of the largest microwork platforms.

The nature of tasks carried out by microworkers is NOT strongly correlated with their educational background. While our survey found more men than women engaging in microwork (44 percent of microworkers are female **and** 55 percent are male), there is no **significant variation across education levels** (as depicted by the flow sizes from the gender column to the education column in Figure 8). In addition, workers from any educational level seem to engage without any restriction in any task. Since workers often perform multiple tasks, each flow indicates the percentage of tasks falling into different categories out of the total reported tasks by survey respondents. This shows that microwork could provide ample opportunities for low-skilled workers, unlike other opportunities in the labor market where access to job opportunities can depend significantly on the educational background and/or skills of a candidate.

Figure 8: Gender, education, and task composition
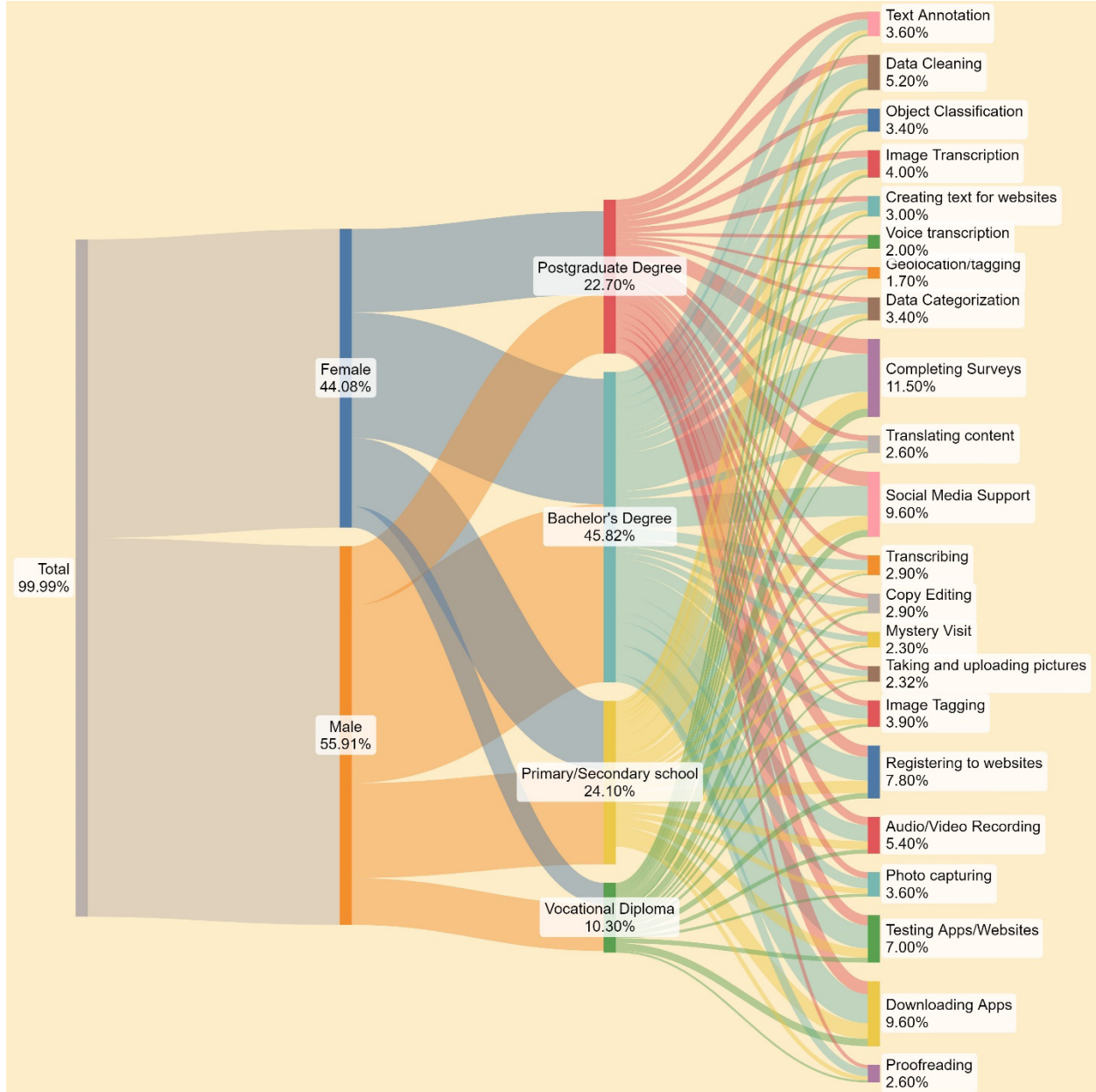
Source: Survey on one of the largest microwork platforms.

While the majority of surveyed microworkers hold at least a bachelor's degree (as noted earlier), educational attainment is thus not necessary to perform microwork. The higher share of individuals with higher education among microworkers may be explained by better access to information and awareness of these platforms rather than specific skillset. Raising awareness about the existence of income-earning opportunities from microwork could enable less educated individuals, including safety net beneficiaries and refugees with internet access, to tap into the burgeoning microtask industry.

Tasks like image tagging, text annotation, object classification, and data categorization are ideal starting points for new microworkers because of their strong complementarity with other microwork

tasks. Tasks that have high complementarity could enable workers to diversify their microwork portfolio and access more opportunities (see Box 2). Most high complementarity tasks tend to be tasks necessary for AI algorithms (e.g., image tagging, data categorization). As the AI industry continues to grow, the demand for such tasks is also expected to increase. We determine skill complementarity by the likelihood of the same individuals performing two tasks (analyzed through network analysis tools). Each node in Figure 9 represents a skill category, while edges connecting tasks indicate the likelihood of a worker performing both tasks. Blue lines show high complementarity, yellow lines moderate, and gray lines low. Nodes or tasks with higher centrality, depicted in darker shades of green, show stronger connections with all other tasks.[18] Node sizes indicate the proportion of workers performing each task, with data collection-related tasks being prevalent among microworkers (see Appendix A for more details). However, AI also poses threats to some microtasks. For example, Gilardi et. al, (2023)[19] found that ChatGPT can perform text classification tasks at better efficiency and lower cost compared to microworkers.

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[18] They are a weighted sum of the connections each task has with others, the weight being the complementarity between the tasks.

[19] Gilardi, F., Alizadeh, M., & Kubli, M. (2023). ChatGPT outperforms crowd workers for text-annotation tasks. *Proceedings of the National Academy of Sciences*, *120*(30), e2305016120.

Figure 9: Network map of typical microtasks
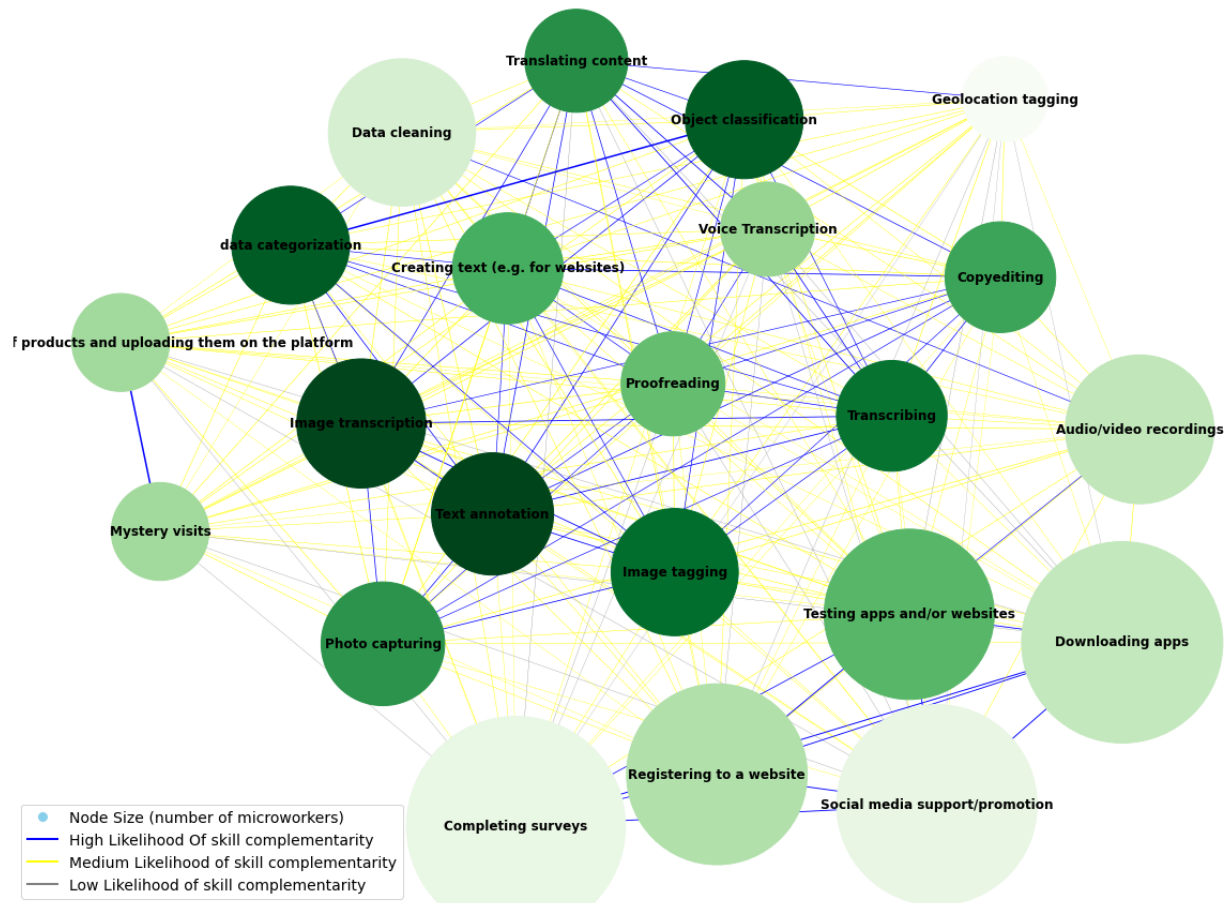
Source: Survey on one of the largest microwork platforms.

Box 2. Leveraging AI-based microtasks as an entry point for building skills

Microwork can be not only an income-earning opportunity, but also an entry point for workers to gain more skills. Some microwork platforms offer tailored training programs to help workers develop their portfolio of skills and advance to more complex tasks.

Karya, a smartphone-based crowdsourcing platform in India,[20] relies on the "Earn and Learn" strategy for recruiting workers and helping them develop new skills while earning an income. Karya classifies the tasks available on the platform based on their complexity and skills required, starting from tasks that only require minimal local language skills and/or minimal digital skills (for instance simple image annotation) to tasks that require a high level of digital literacy and knowledge of how AI systems work (e.g. expert finetuning of systems; see Table 2.1). Karya aims to help workers develop skills through embedded training pathways and gradually move to more complex—and more lucrative—tasks.

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[20] See: https://karya.in/

Table 2.1. Classification of skills based on complexity on the Karya app

Type of task	Complexity	Skills required
Monologue speech (scripted & spontaneous)	Low	Local language literacy required low to no digital literacy
Simple image/video annotation & labelling	Low	No language or digital literacy required
Conversational speech (scripted & spontaneous)	Low	Local language literacy required, low to no digital lit
Digitization/ data entry	Medium-low	Local language literacy, medium digital lit
Text annotation & labelling	Medium-low	Local language literacy, medium digital lit
Transcription & data validation	Medium-high	Local language literacy, high digital lit
Complex image/video annotation & labelling	Medium-high	Local language literacy, high digital lit
Human Feedback - expert fine-tuning, reinforcement learning	High	Local language literacy, digital fluency & knowledge of data and its use in AI

Source: Classification shared by Karya

Moreover, Karya aims to leverage data annotation tasks not only as income earning opportunities for vulnerable, low-income workers, but also to encourage learning through the work done. In collaboration with Microsoft Research and the Parinaam Foundation, Karya piloted an intervention in which workers voice-annotated specially designed financial literacy learning modules instead of random text. At the end of the intervention, the study found a significant increase in participants' financial knowledge.[21]

Still, not all microtasks contribute positively to the economy. For example, some tasks listed on platforms consist of writing positive reviews on e-commerce platforms using specific keywords. This practice undermines the integrity of rating systems. Additionally, there are concerns surrounding certain Search Engine Optimization (SOE) tasks aimed at manipulating click-through rates (CTR)[22]. SEO is the practice of optimizing website content and structure to improve its visibility and ranking on search engine results pages. A page ranking is determined by factors such as content, backlinks and on-page SEO. They are major traffic generators for many websites.[23] CTR manipulation entails artificially inflating clicks on advertisements or search results to deceive algorithms and gain an unfair advantage in visibility, often employing microworkers to generate artificial web traffic, for example, by asking them to click

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[21] The study found a significant increase in participants' financial knowledge with a high effect size (cohen's d = 1.32) and medium normalized score gain (hake's g = 0.58). For further details please see: Karya, "What happens after $1500?", published on August 6, 2023, LinkedIn: https://www.linkedin.com/pulse/what-happens-after-1500-karya-inc/

[22] Click-through rate is the percentage of people who click on a specific link compared to the total number of people who see it.

[23] https://www.gmbcrush.com/local-seo/ctr-manipulation/

certain links or google specific words. From a legal standpoint, CTR manipulation may constitute fraud, particularly when it deceives users and search engines, breaching the terms of service of most search engines and risking severe penalties such as page or website de-indexing.[24] Therefore, initiatives focusing on microtask employment should encourage participants to engage in more productive endeavors and steer clear of tasks with questionable ethical standards.

4.   Enabling Factors: Internet, Digital Devices, and a Payment System

Smartphones are the most commonly used digital devices for performing microwork tasks. Over 45 percent of the surveyed microworkers use mobile phones, followed by laptops and desktop computers (see Figure 10). Tablets are less commonly used for microwork. Smartphones are particularly favored among young microworkers, whereas laptops and desktop computers are preferred by older workers. Additionally, females, residents of small towns and villages, individuals with lower levels of education, and those new to microwork predominantly use mobile phones. Notably, 77 percent of individuals engaged in unpaid housework, such as homemakers, utilize mobile phones to perform microwork. Whether this preference stems from choice or affordability remains unclear from the data. However, as individuals gain more experience and diversify their portfolio of online gig work (that may include more complex tasks over time), there may be a shift toward using computers. For instance, close to three-quarters of microworkers with five years of experience or more opt for computers over mobile phones.

Six out of every ten surveyed microworkers receive their earnings using digital payment platforms. Popular payment platforms from our survey results include PayPal, AirTM, Payoneer, and Skrill.[25] However, there are differences by gender (Figure 11). More than half of female workers use their bank accounts for payments, whereas only 31 percent of males do the same. This gender difference is primarily observed in India, where over 90 percent of women receive their earnings through bank accounts compared to 70 percent of males. It is not clear whether this significant difference comes from differences in access to and knowledge about online digital payment systems, or if other factors such as gender norms are at play. While most digital payment platforms require bank accounts, some offer alternatives such as gift cards.

[24] https://jemsu.com/what-are-the-legal-implications-of-ctr-manipulation-in-seo-as-of-2024/
[25] These are payment platforms used by workers on the microwork platform we studied; and may not represent a measure of the overall market share of payment platforms in general.

Figure 10: Device usage among microworkers
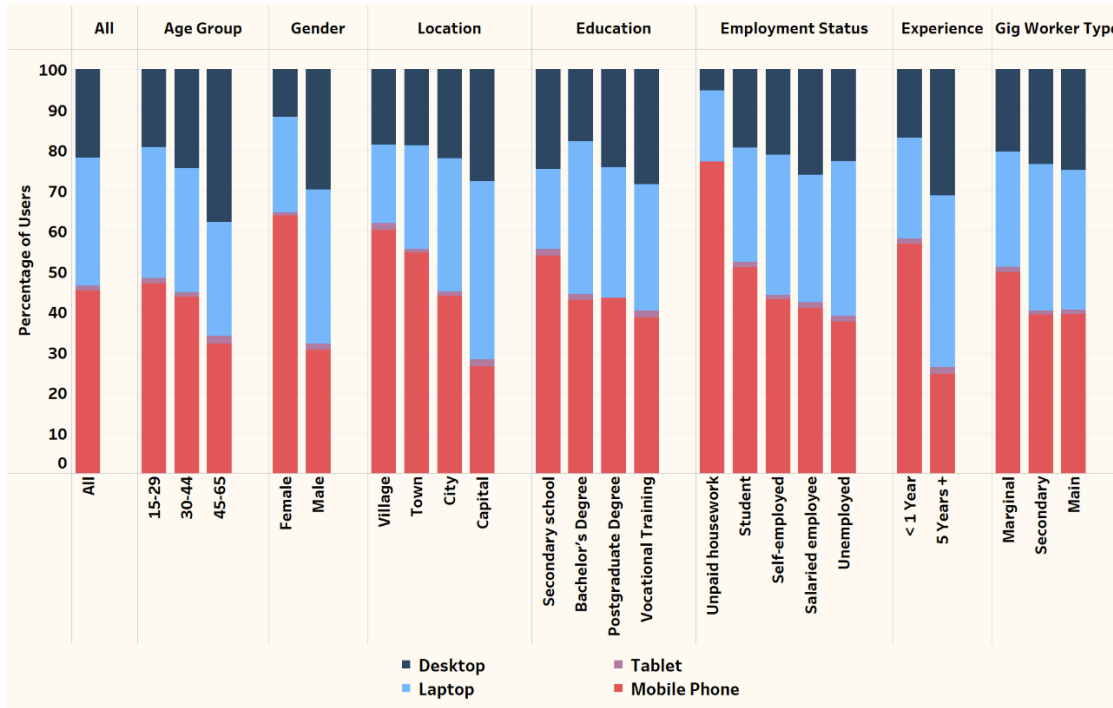
Source: Survey on one of the largest microwork platforms.

**Figure 11: Payment systems used by one of the largest microwork platforms**
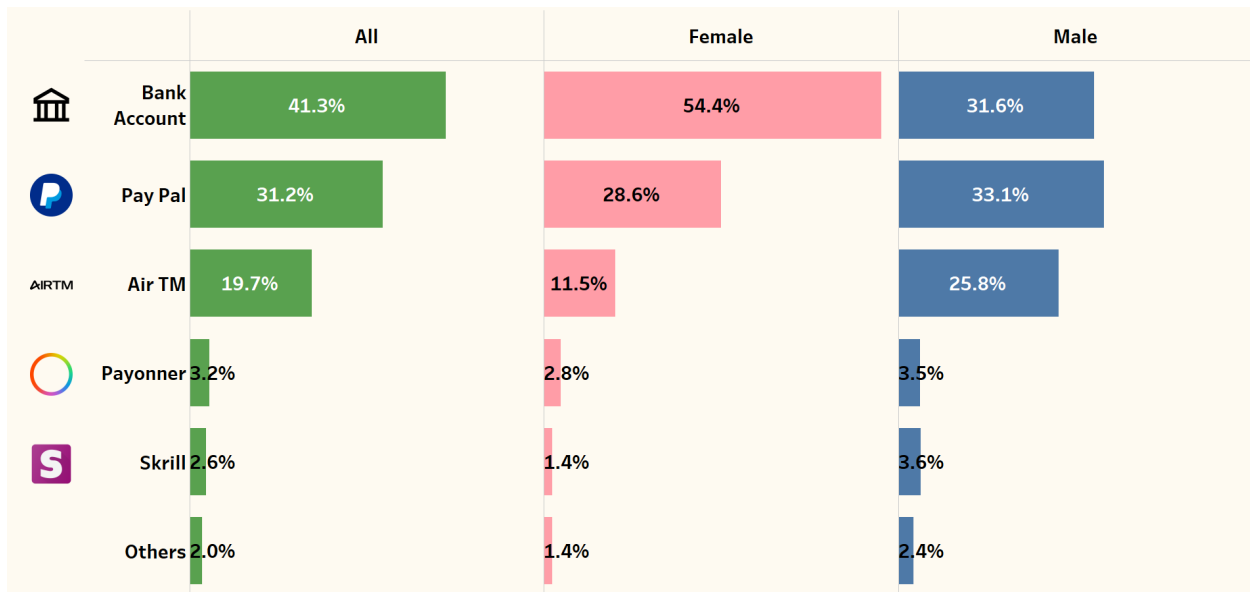
Source: Survey on one of the largest microwork platforms.

5.   Is Microwork a Financially Viable Option?

The earnings per task for microworkers tend to be very modest, with a global average below $0.15 USD based on data from the microwork platform analyzed in this note. However, the pricing of tasks varies across countries. For example, the price per task is at least three times higher in the USA compared to Bangladesh (see Figure 12). Several factors could explain the differences. First, pricing differences may be influenced by the geographical distribution of tasks: workers in certain regions may prefer to focus on specific types of tasks. In addition, the minimum price per task expected by workers may differ from country to country. Second, the practice of restricting access to certain tasks by location and only allowing workers from specific countries to perform them (geofencing) could play a significant role. Workers in developing countries often face discrimination in accessing online gig work.[26] In addition, some microtasks require physical presence, such as taking photos of shelves in supermarkets to understand how brands are represented or submitting receipts from specific stores. Such tasks may favor workers in more developed regions who typically receive better compensation for such tasks. While microwork platforms generally specify task prices in job ads without discriminating against eligible workers, the use of geo-fencing or country-specific microwork programs may result in differing prices for the same type of work across countries.

**Figure 12: Distribution of earnings per task within countries**
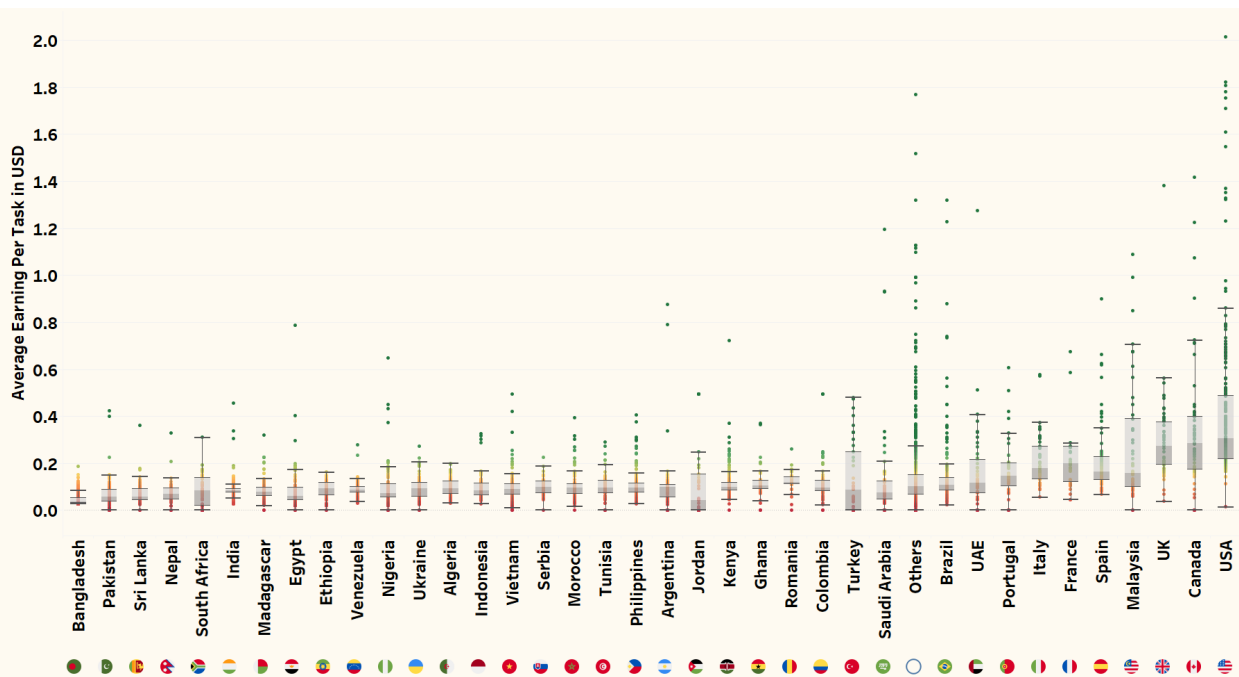
Source: Survey on one of the largest microwork platforms

Common microwork tasks like data collection and annotation typically yield lower pay per task, but they tend to be relatively fast to complete. In the absence of specific data on earnings or prices per tasks, microworkers' total earnings from all tasks performed are calculated as the product of the price

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[26] Working Without Borders: The Promise and Perils of Online Gig Work

per task and the number of tasks completed by each worker.[27] By dividing both sides of the equation by the total tasks performed by the worker, we derive the average price per task on the left side and the proportion of each task performed multiplied by the task price on the right side. Both the average earnings and task proportions are available in our dataset; the only missing components are the price levels. Economic theory dictates that prices cannot be negative; we employed linear optimization with non-negativity constraints ($Price_j > 0$) to derive likely price levels, with the results showcased in Figure 13 (see Appendix B for details). Manual validation with current job ads also confirms our findings. Tasks such as data annotation, forum contributions, and data collection typically yield lower pay, whereas tasks like article writing and survey completion offer relatively better compensation. However, tasks such as data collection are widespread, thereby lowering the average pay per task. Conversely, translation and writing tasks are less common but offer higher pay.

Figure 13: Estimated Price Per Task
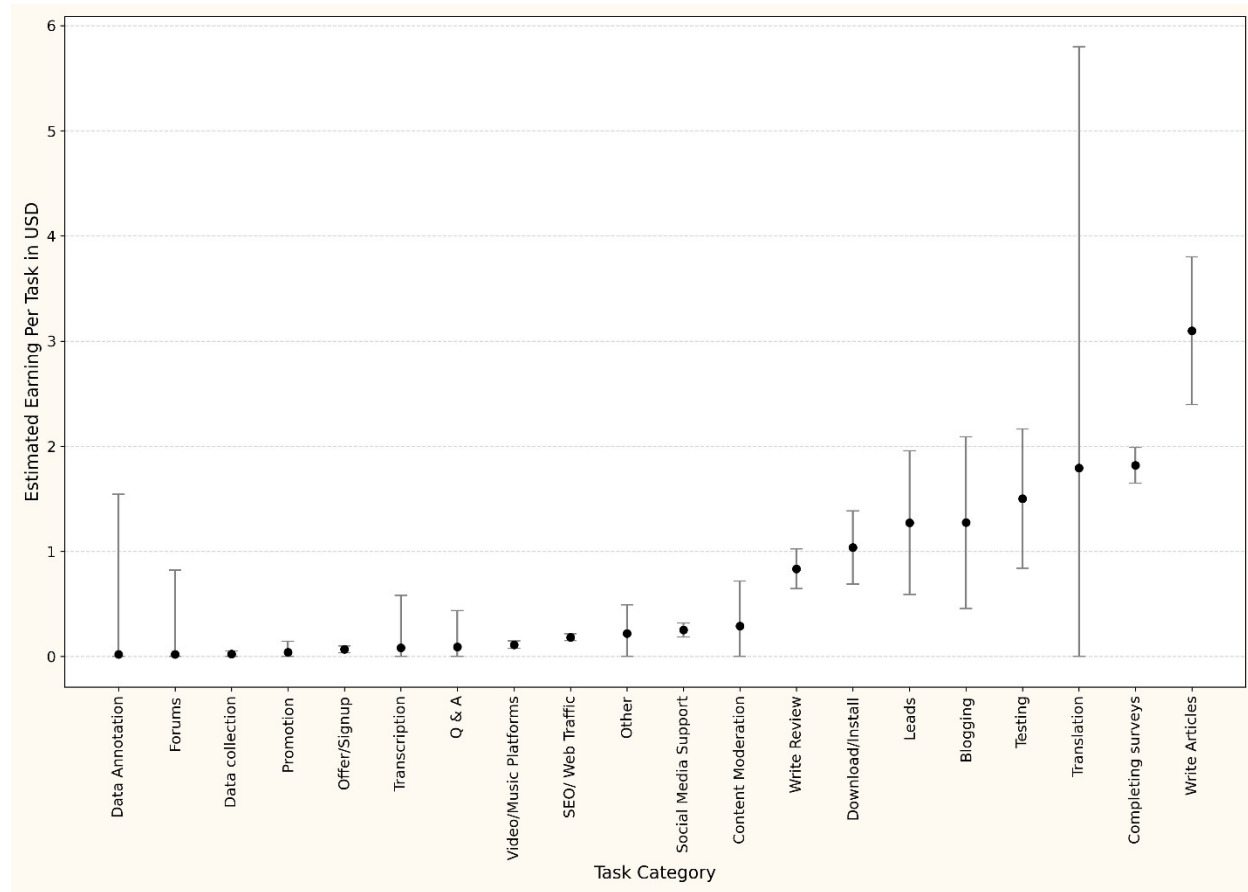
Source: Data from one of the largest microwork platforms.

Despite the relatively low price per task, microworkers, particularly those from low- and lower-middle-income countries, may earn above the statutory minimum wage of their respective countries. To understand the relative importance of earning from microwork, we compared microworkers' earnings to

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[27] The web scraped data encompasses the total earnings of microworkers since their enrollment on the platform, alongside the number of tasks they have undertaken within each task category. Using this information, the team attempted to estimate likely price levels.

their countries' statutory minimum wages. For this, we computed the number of tasks an average microworker in each country needs to complete per hour to achieve the statutory minimum wage (see Figure 15).[28] Given that over 90 percent of tasks take around 10 minutes or less to complete, workers in low- and middle-income countries can potentially meet or surpass the minimum wage threshold, or even earn significantly higher incomes than traditional minimum wage jobs.[29] However, this outcome is influenced by both government-set statutory minimum wages and the task composition in individual countries. In some countries, the low compliance rate with minimum wage laws[30] suggests that microworkers could earn more than the official minimum wage. Conversely, in certain instances, the minimum wage may lag behind actual starting wages, leading to an underestimation of the number of tasks required to reach the actual minimum wage level.

Figure 14: The number of microtasks required to earn the minimum wage in each country
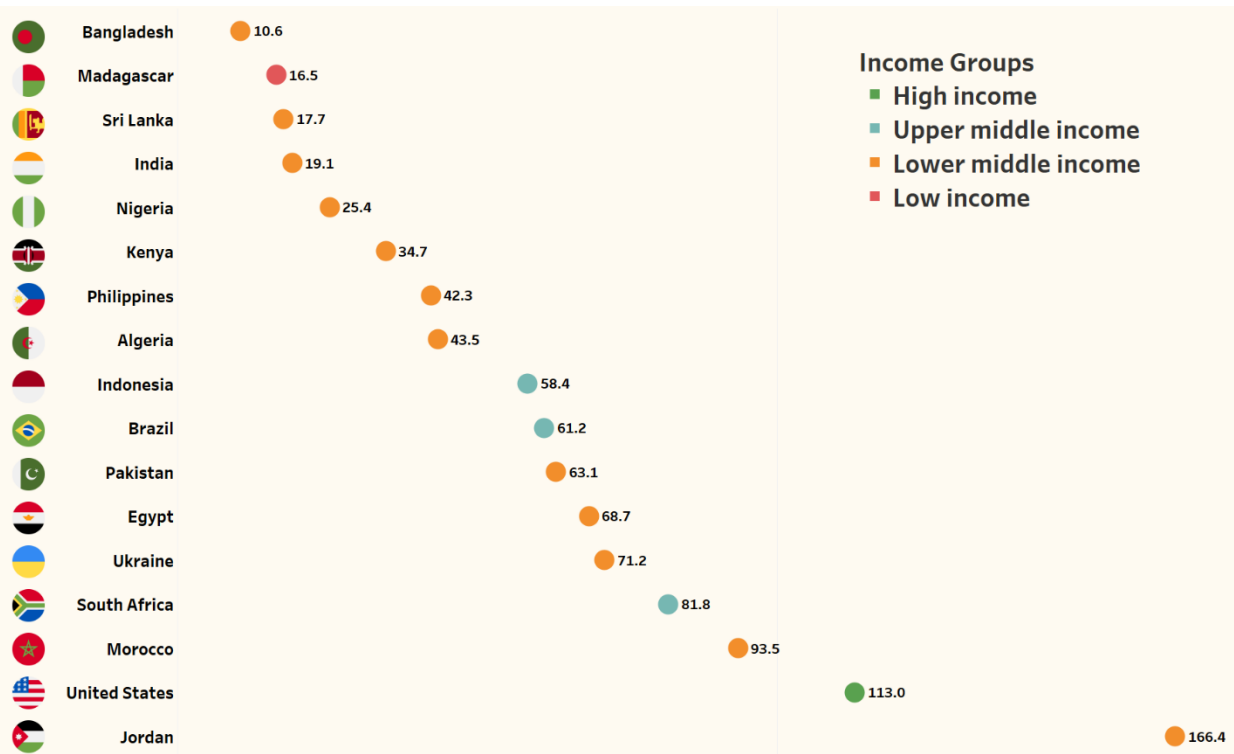
Average number of tasks a workers need to perform to reach the houly minimum statutory wage

Source: Data from one of the largest microwork platforms and ILO data

Factors such as age/experience, gender, education, and location within the country of workers do not affect the earnings of microworkers. Typically, experience and education (also known as Mincerian

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[28] For the calculation, we used data on the used statutory minimum wage from the ILO database divided by the average earnings per task in each country (using data from the microwork platform studied in this note).

[29] According to the findings of O'Higgins, N., & Caro, L. (2022), the hourly earnings from microwork in middle and low-income countries surpass the prevailing hourly wage rates in those nations, thus attracting more workers to engage in such tasks.

[30] Soares, S. (2018). Minimum wage: global challenges and perspectives. Poverty In Focus 42, International Policy Centre for Inclusive Growth.

regressors explain a significant portion of the wages earned by workers in the general labor market. However, these factors do not influence the earnings of microworkers,[31] nor do other factors such as gender and location within the country (e.g. urban versus rural) as demonstrated by the regression coefficients plotted in Figure 15 (further methodological details are in Appendix C) This is not surprising as most microwork platforms require candidates to undergo testing to determine their qualification for tasks, rendering factors like primary education or post-graduate degrees irrelevant as signaling instruments. The price per task is usually predetermined and available in job postings; whoever successfully completes the task will receive the stated amount. This is notable from an inclusion perspective **as biases related to gender, location within the country, or age do not dictate the income earned per task unlike in offline labor markets or online freelancing work**. This is in contrast to our study on online freelancing jobs, which revealed a confidence gap in the prices quoted by female workers on some online freelancing platforms, where workers must set their desired price, unlike in microwork, where employers determine prices.[32]

One might question why the share of college graduates is 60 percent if education doesn't impact earnings. It is likely that even though performing these tasks does not require much education or skills, _access to information_ and digital devices may be positively correlated with education and skills. Therefore, advocacy and creating awareness, especially among less skilled or poorer groups, could even out the playing field and expand income earning opportunities—especially for those who may have limited alternate options.

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[31] The team used an indirect approach to infer the earnings of microworkers. In the survey conducted on one of the largest microwork platforms, we asked respondents to mention the wage that would be sufficient for them to abandon microwork and pursue full-time jobs.

[32] See: Short Notes Series #6: Spotlight on Gender Gaps in Online Hourly Rates

Figure 15: Mincer regression results for microworkers and workers in the general labor force
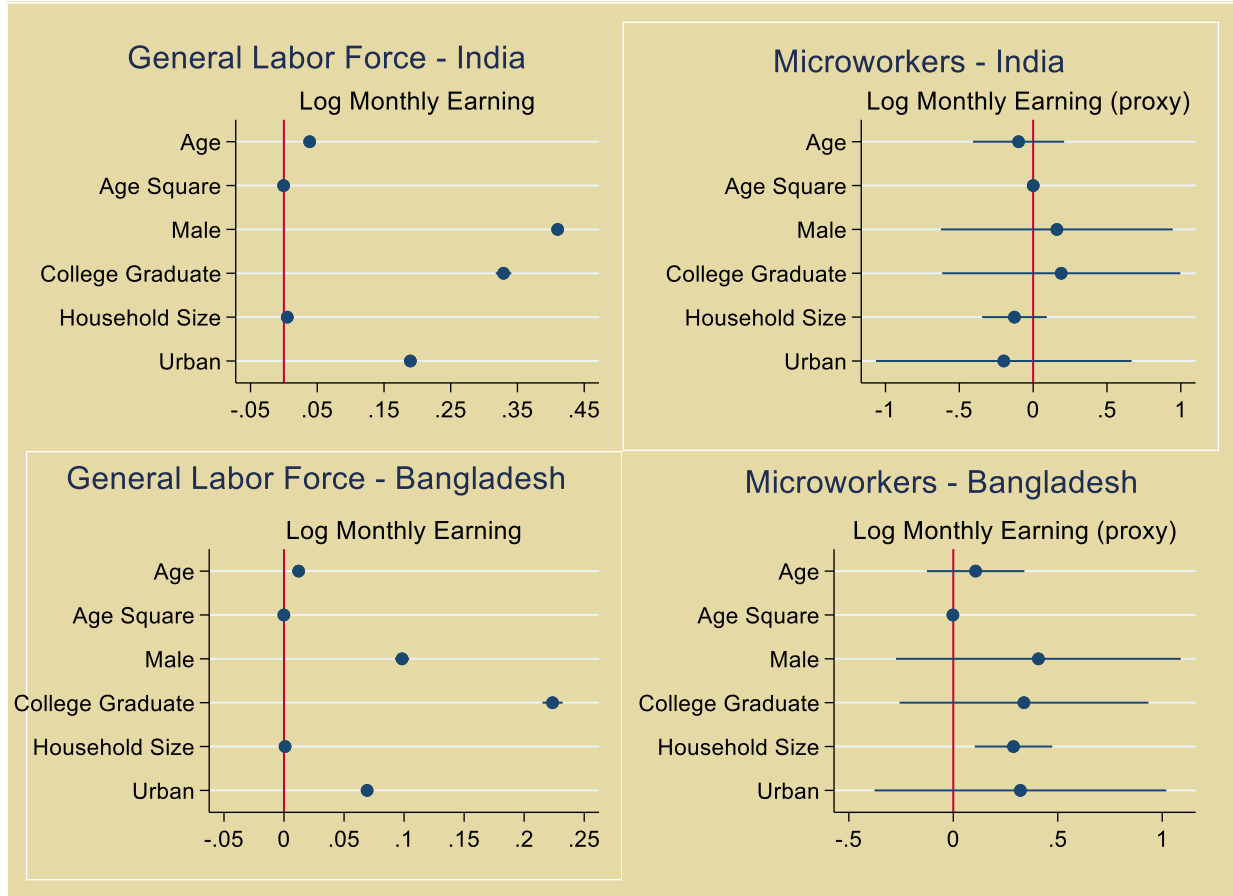
Source: Analysis based on data from one of the largest microwork platforms and ILO data
Note: The left-hand side shows the coefficient plots from a regression on determinants of earning using labor force surveys from India and Bangladesh. The right-hand side results show similar coefficient plots using a survey of microworkers from the two countries working on one of the largest microwork paltforms.

One caveat of the analysis is that we do not directly observe the earnings of microworkers; rather, in the survey conducted on one of the largest microwork platforms, we asked respondents to mention the wage that would be sufficient for them to abandon microwork and pursue full-time jobs. We adopted this approach as respondents tend to underreport their earnings due to factors such as tax concerns. However, we argue that the reported wage sufficient for switching to full-time employment is just above their current earnings from microwork, or at least proportional to it, providing information on whether demographic factors or Mincerian regressors are effective in explaining earnings in this industry.

Experience on the platform and learning by doing do not significantly impact the level of earnings per task. Unlike traditional labor markets, where experience often results in skill enhancement and higher wages, microworkers do not observe a clear correlation between experience (measured by the number of tasks completed since joining the platform) and average earnings per task, as depicted in panel N of Figure 16. However, platform experience does show a slight positive correlation with worker ratings from employers, potentially increasing opportunities for receiving more tasks. Therefore, although experience

on the platform may not directly influence earnings per task, overall income could still be affected as some employers may prefer workers with a track-record on the platform.

Nevertheless, engaging in microwork indefinitely may hinder progress as tasks are often routine and repetitive, leading to limited career growth, as demonstrated by the similar average earnings per task across the spectrum. Thus, it may be more suitable to view microwork as a secondary job for supplemental income, catering to individuals such as students, refugees, and beneficiaries of safety nets who experience an income shock or have other constraints (like household responsibilities) that affect their offline labor market options. However, the ultimate objective should be to guide these workers toward stable jobs with clear career advancement opportunities.

Figure 16: Experience, Rating and Earning Per Task
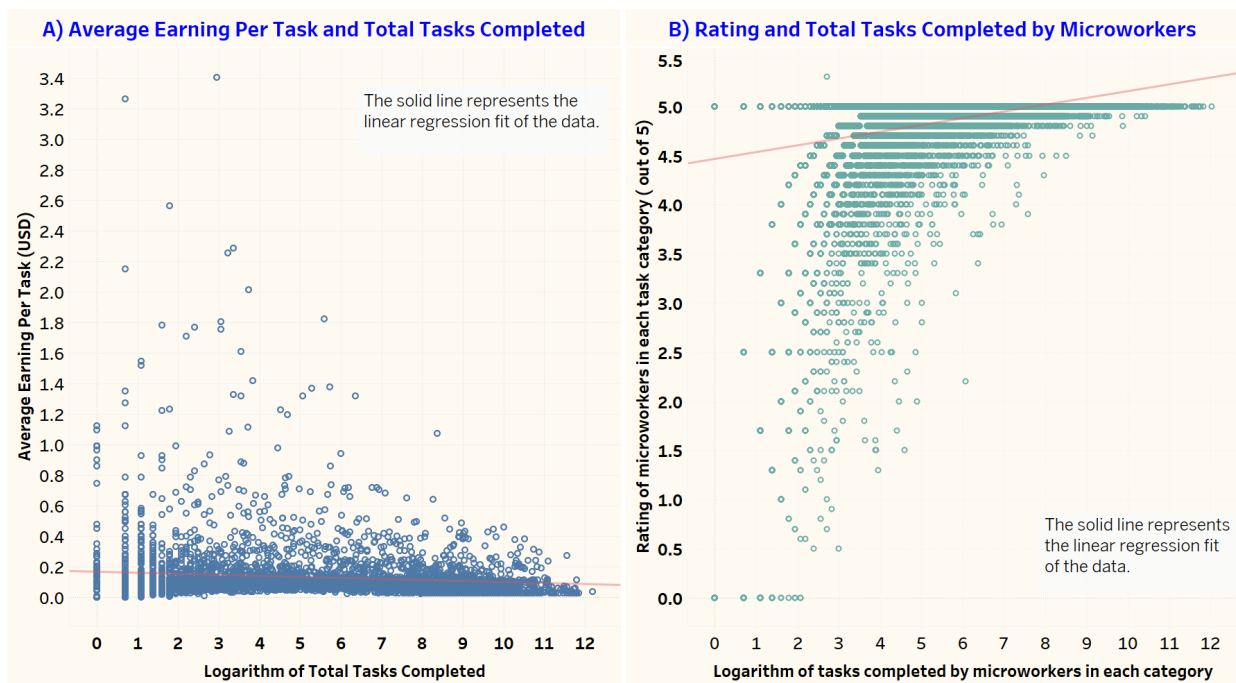
Source: Analysis based on data from one of the largest microwork platforms

6. Navigating Microwork: What Does it Take to Succeed?

Microworkers prioritize time management and digital skills as the two most crucial abilities for success in their roles. For 8 out of 10 microworkers, time management is the essential skill for this type of work. Given that the price per task is predetermined, the key determinant of cumulative earnings is the ability to efficiently complete as many tasks as possible within a short timeframe. Similarly, over 7 out of 10 microworkers emphasize the importance of digital skills. However, given their experience, microworkers who dedicate relatively more hours and derive a greater share of their income from microwork ("main gig workers") prioritize self-confidence as the second most crucial skill (see Figure 17A). The third most important skill is self-confidence, except among female respondents who regard English proficiency as more vital. Contrary to expectations, all demographic groups agree that communication skills are less important than other skills, yet nearly half of the respondents still consider them very important (see Figure 18B). Females from villages and towns attach greater importance to communication skills than

others. Microwork typically involves minimal communication between clients and workers, with all tasks initiated, performed, evaluated, and compensated within the system, often with limited interaction between the two parties. Generally, women value all types of training more than their male counterparts, while less experienced individuals prefer all types of training more than their more experienced counterparts, and individuals from villages and towns prioritize most types of training more highly than those from capital regions.

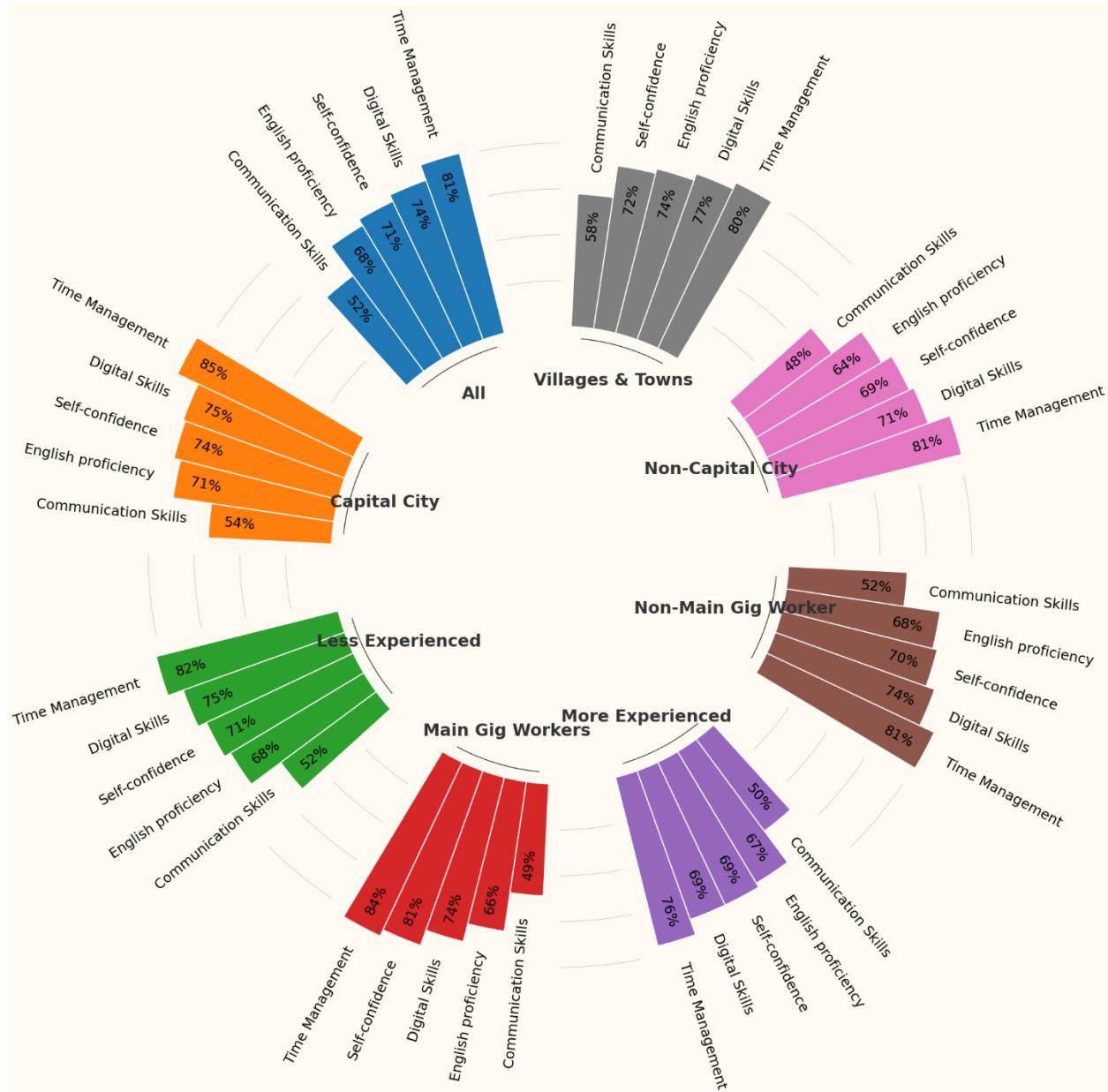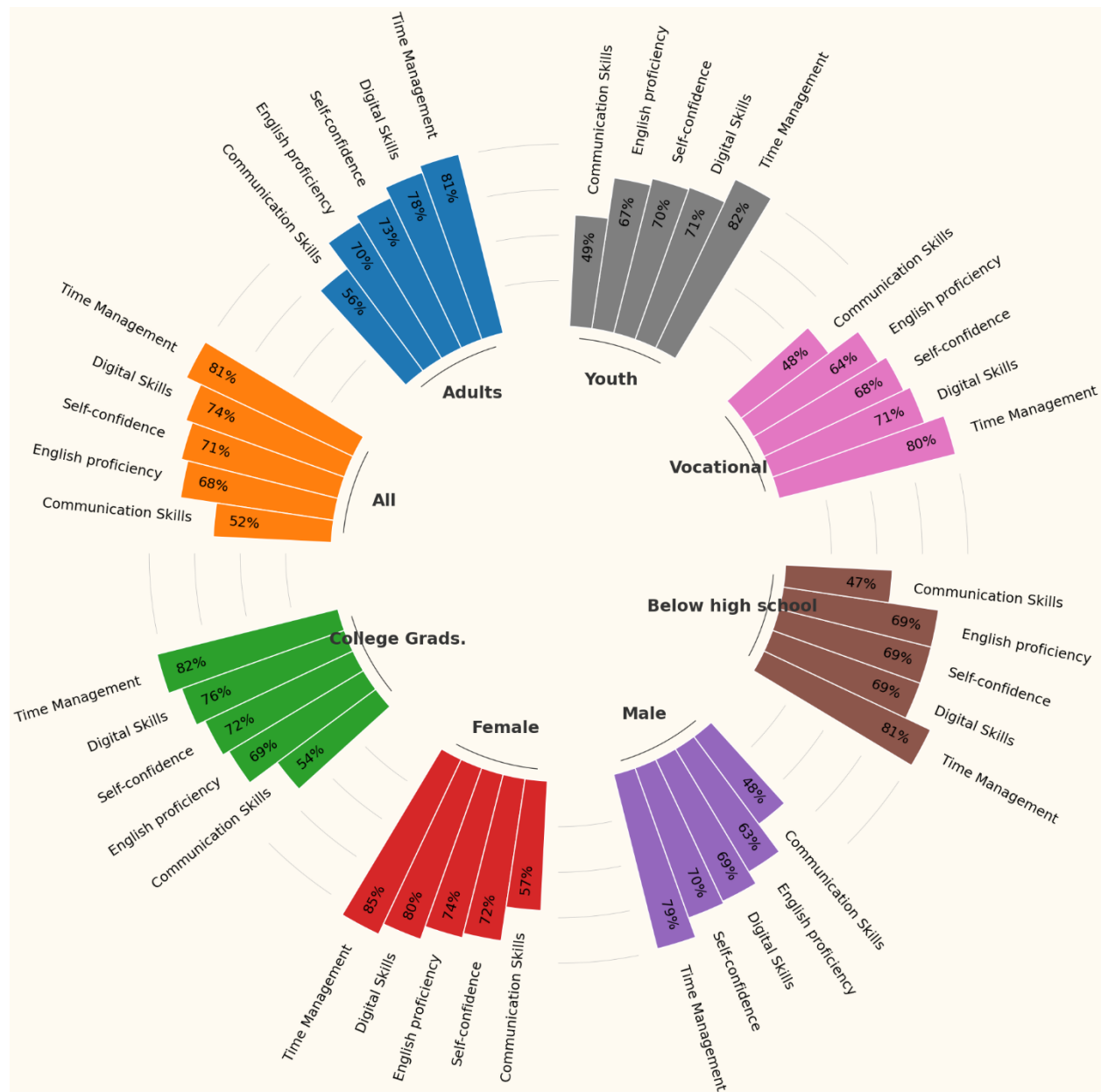**Figure 17A: Importance of skills to succeed in microwork across location and engagement of microworkers**

Figure 17B: Importance of skills to succeeded in microwork across different demographics

Source: Survey on one of the largest microwork platforms

In general, microworkers perceive ratings as a helpful tool for securing future opportunities with clients (six out of ten microworkers confirm this; see Figure 18). However, individuals with only primary or secondary education, as well as homemakers, do not view ratings as significantly helpful. Main gig workers tend to hold a more positive opinion of ratings among microworkers. Surprisingly, dissatisfaction with ratings is higher among experienced gig workers, ranging between 13 and 15 percent, compared to less experienced microworkers. Moreover, 14 percent of the surveyed workers are unaware of the

existence of ratings on the platform. The lack of awareness could put workers at a disadvantage, since better ratings increase the likelihood of getting more jobs.

Figure 18: Microworkers' opinion about the relevance of rating in the platform

| Group	Iteam	It is helpful in matching me with clients	It exists, but doesn't affect my experience	The platform doesn't provide rating	I am not aware of a rating system on the platform	It makes it difficult to get a gig
All	All	60%	19%	17%	14%	9%
Age Group	15-29	59%	18%	17%	14%	10%
	30-44	62%	21%	16%	13%	8%
	45-65	57%	23%	15%	15%	4%
Gender	Female	57%	19%	19%	14%	9%
	Male	62%	19%	15%	14%	9%
Education	Postgraduate Degree	61%	18%	19%	15%	13%
	Bachelor's Degree	64%	21%	13%	11%	7%
	Vocational/Technical Diploma	61%	16%	16%	16%	13%
	Primary/Secondary school	51%	18%	22%	18%	8%
Experience	Less than 1 year ago	58%	16%	18%	15%	8%
	1-3 years ago	63%	22%	15%	12%	8%
	3-5 years ago	64%	22%	17%	12%	15%
	More than 5 years ago	61%	26%	16%	8%	13%
Gig Worker Type	Main	68%	29%	15%	7%	9%
	Secondary	60%	17%	15%	13%	11%
	Marginal	59%	18%	18%	15%	8%
Location	Capital	66%	14%	16%	15%	12%
	City	59%	23%	17%	13%	8%
	Town	59%	18%	17%	13%	9%
	Village	59%	10%	18%	17%	10%

Source: Survey on one of the largest microwork platforms.

7. Navigating Microwork: Challenges, Desired Benefits, and Worker Aspiration

Microwork offers job opportunities for those in need; however, nearly half of microworkers surveyed have minimal savings, and over half lack access to health insurance and pensions. In fact, 39 percent struggle to make ends meet. A staggering 54 percent of microworkers lack any form of health insurance

or pension, leaving them vulnerable to various shocks (see Figure 19). While these numbers are alarmingly high, they reflect a common feature of developing countries, where the informal sector comprises a significant portion of the workforce and access to benefits such as health insurance and pensions is limited. Given the pervasive nature of informality in developing countries, this note, in line with the Working Without Borders report, supports extending social protection coverage to all informal workers. This approach would be beneficial in providing social protection for both microworkers and the broader labor force, predominantly composed of informal sector workers.

Figure 19: Current finance and access to social protection
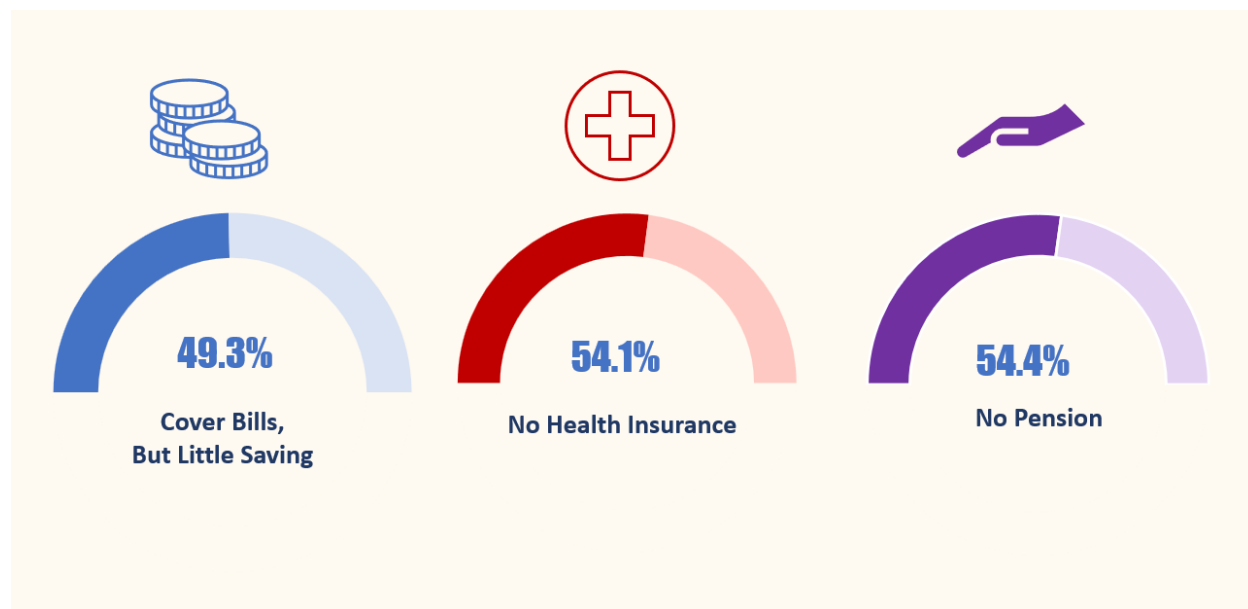
Source: Survey on one of the largest microwork platforms.

Despite facing financial challenges and lacking basic social protections, over half of the surveyed microworkers aspire to continue pursuing microwork to increase their earnings, while another 30 percent aim to enhance their digital skills (see Figure 20). Gig work offers an opportunity to learn new skills while earning money. Overall, these findings suggest that those who have already begun microworking are likely to continue for a considerable period of time, indicating potential improvements in their livelihoods; otherwise, they would seek alternative employment or quit altogether, conditional on available opportunities. Interestingly, there is no significant variation across age groups and genders. Notably, the desire to continue microworking is particularly high among homemakers (over two-thirds of homemakers want to continue doing microwork). The proportion of microworkers aiming to transition to full-time employment is relatively small. However, since most are already engaged in microwork as a secondary job, this finding should be understood in that context.

The potential for career growth in microwork is, nevertheless, limited. Microtasks are often routine and repetitive, making it more suitable as an option to earn additional income. It can be an income-earning opportunity for vulnerable groups such as students, refugees, beneficiaries of safety nets who experience an income shock, and low-skilled workers. Microwork can be used to introduce workers to online gig jobs and as a first step toward learning more skills and advancing toward more complex and higher paying online freelancing jobs.

Figure 20: Aspirations of microworkers across different groups

Source: Survey on one of the largest microwork platforms.

For microworkers, the most coveted benefit of platforms is access to training, a finding mirrored in our global report on freelance workers (Figure 21). However, in contrast to freelancers, for whom access to credit for equipment purchases is a top priority, microworkers prioritize access to health insurance and pension plans. The demand for training is particularly high among adults and individuals with vocational degrees, reaching 30 percent. Conversely, access to credit and loans is relatively more sought after among males and vocational diploma holders. Women and main gig workers show a stronger desire for health insurance coverage. Unlike gig workers who have other jobs in addition to online work, microworkers who spend most of their time on microwork and derive most of their income this way are unlikely to have access to such benefits (e.g. through a formal job). Finally, middle-aged and older microworkers are most interested in pension plans.

Figure 21: Most sought benefits by microworkers from platforms
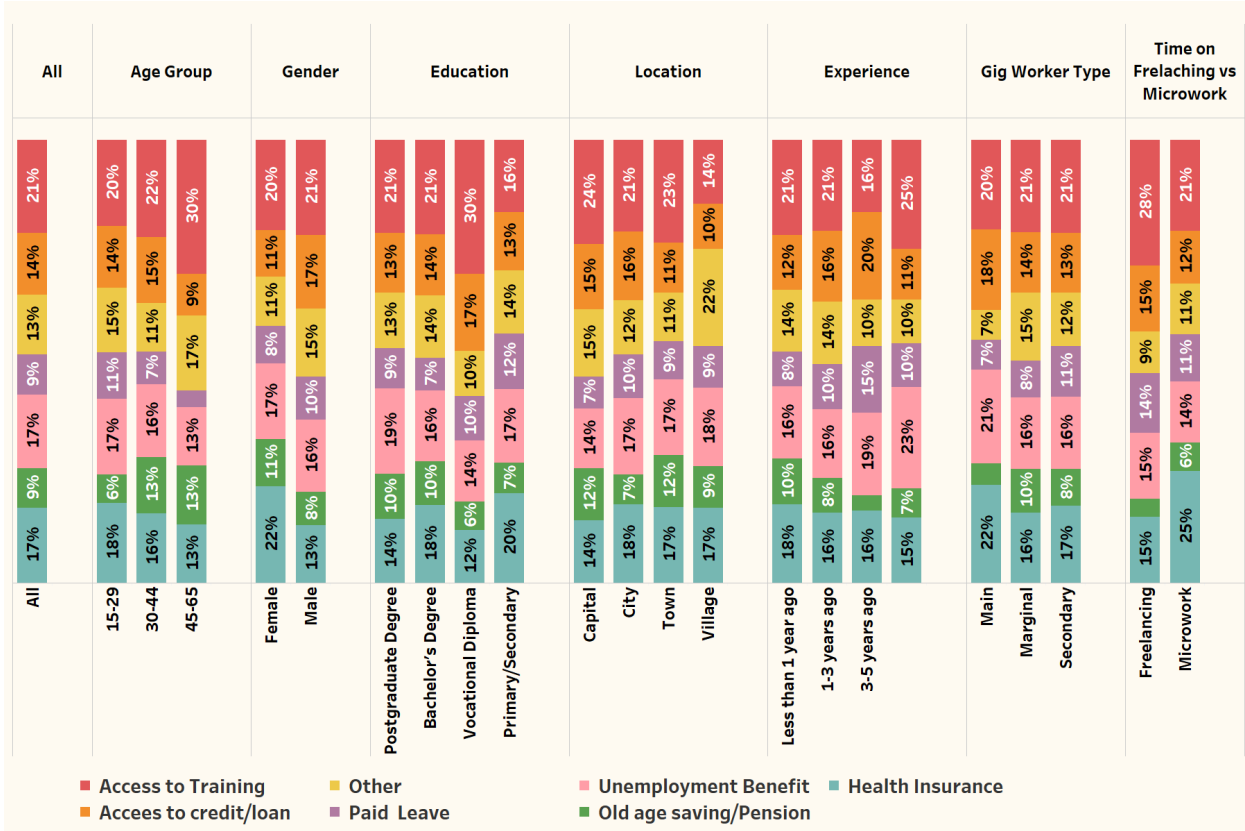
Source: Survey on one of the largest microwork platforms.

Conclusion

In conclusion, microwork presents an intriguing avenue for job creation and economic inclusion, particularly for vulnerable groups such as youth, women, refugees, and safety net beneficiaries. Its low skill requirements and flexibility make it accessible to a wide range of individuals, while its growing market offers scalability opportunities for operations focused on vulnerable communities.

Despite its potential benefits, microwork also faces challenges including competition from artificial intelligence and the proliferation of unethical tasks. Some tasks (such as writing positive reviews and generating artificial web traffic) undermine rating systems and can deceive users and search engines. Initiatives that leverage microtasks to create work opportunities should therefore encourage participants to engage in more productive tasks. Additionally, key enabling factors such as internet access, payment systems, and digital literacy are essential.

While microwork can provide supplemental income and valuable skills, its routine nature may limit long-term career growth. Therefore, it's crucial to view microwork as a secondary job and guide workers toward stable employment with clear advancement opportunities.

Overall, the findings suggest that microwork has the potential to promote employment, skill upgrading, and consumption smoothing for vulnerable communities. By addressing challenges and providing support, World Bank operations can leverage microwork to contribute positively to economic development and social inclusion.

References

Berg, J., Furrer, M., Harmon, E., Rani, U., & Silberman, M. S. (2018). Digital labour platforms and the future of work. *Towards decent work in the online world. Rapport de l'OIT*.

Brancati, U., Pesole, A., & Fernández-Macías, E. (2020). New evidence on platform workers in Europe. *Results from the second COLLEEM survey*.

Datta, N., Rong, C., Singh, S., Stinshoff, C., Iacob, N., Nigatu, N. S., ... & Klimaviciute, L. (2022). Working Without Borders: The Promise and Peril of Online Gig Work.

Gilardi, F., Alizadeh, M., & Kubli, M. (2023). ChatGPT outperforms crowd workers for text-annotation tasks. *Proceedings of the National Academy of Sciences*, *120*(30), e2305016120.

Sama (2023). 2022 Environmental and Social Impact Report

Singhal, K., Nigatu, N. S., & Datta, N. (2024). Working Without Borders-The Promise and Peril of Online Gig Work: Short Note Series Number Six-Spotlight on Gender Gaps in Online Hourly Rates.

Soares, S. (2018). Minimum wage: global challenges and perspectives. Poverty In Focus 42, International Policy Centre for Inclusive Growth.

Tubaro, P., Casilli, A. A., & Coville, M. (2020). The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence. *Big Data & Society*, *7*(1), 2053951720919776.

Website source

GMB Crush. (n.d.). *CTR manipulation*. Retrieved May 30, 2024, from https://www.gmbcrush.com/local-seo/ctr-manipulation/

JEMSU. (n.d.). *What are the legal implications of CTR manipulation in SEO as of 2024?*. Retrieved May 30, 2024, from https://jemsu.com/what-are-the-legal-implications-of-ctr-manipulation-in-seo-as-of-2024/

Karya. (2023, August 6). *What happens after $1500?* LinkedIn. Retrieved May 30, 2024, from https://www.linkedin.com/pulse/what-happens-after-1500-karya-inc/

Humans in the Loop. (n.d.). *Humans in the Loop*. LinkedIn. Retrieved May 30, 2024, from https://www.linkedin.com/company/humansintheloop/

Humans in the Loop. (n.d.). *Fair work policy*. Retrieved May 30, 2024, from
https://humansintheloop.org/why-us/fair-work-policy/

"n.d." stands for "no date" when the publication date is not available.

Methodological Appendixes

Appendix A

    A.   Skill Complementarity Using Network Approach

One way to quantify these relationships or skill complementarity between tasks is through the concept of the likelihood of shared participants. This metric measures the probability that individuals involved in one task are also involved in another task, indicating potential complementarity or association between the tasks.

$$L_{ij} = \frac{N_{ij}}{\max{(N_i, N_j)}}$$

N_{ij} represents the number of individuals engaged in both tasks i and j

N_{ij} denotes the total number of individuals performing task i

N_j denotes the total number of individuals performing task j

The value of L_{ij} ranges between 0 and 1. A higher L_{ij} indicates a stronger likelihood of individuals participating in both tasks i and j. A value of 1 signifies a complete overlap, indicating that all workers participating in task i are also engaged in task j. Conversely, value of 0 indicates no shared participation between tasks i and j. The likelihood of shared participants offers a quantitative measure of task relationship based on participant commonality. This metric enhances our understanding of task interdependencies, guiding informed decision-making in collaborative environments.

Appendix B

    B.   Estimating earnings per task

Neither the survey data nor the scraped data contain information on the price/earnings level per task. However, the scraped data contains the following relevant information for every worker, which helps to estimate the desired figures.

1.   The total earnings of the microworkers since he or she joined the platform.
2.   The total number of tasks completed since joining the platform.
3.   The total number of tasks performed under each task category.

In order to estimate the price levels per task using the three variables, we implemented a linear optimization with a non-negative constraint. Assume task categories are denoted by the letter '*j*' and there are '*n*' total number of task categories that microworker '*i*' performed.

We know that a worker's total earning is given by the sum of earning from each task performed. The earning from each tasks category is equal to the price of the task multiplied by the total number of tasks performed in the same task category. Adding incomes across categories gives total earning and captured by the equation below.

$$Total\ Earning_i = \sum_{j=1}^{n} Price_j \ x\ Total\ Tasks\ Performed_j$$

Diving both sides of the equation with Total Tasks performed gives the following equation:

$$\frac{Total\ Earning_i}{Total\ Tasks\ Performed_i} = \sum_{j=1}^{n} Price_j * \frac{Total\ Tasks\ Performed_{ij}}{Total\ Tasks\ Performed_i}$$

The left-hand side is the average earning per worker, and it should be equal to the weighted price across task categories. The weight is given by the proportion of task *j* performed by worker *I* relative to the total tasks performed by the same worker. We have data on both sides of the equations except for the price levels.

$$\Omega = \frac{Total\ Earning_i}{Total\ Tasks\ Performed_i} - \sum_{j=1}^{n} Price_j * \frac{Total\ Tasks\ Performed_{ij}}{Total\ Tasks\ Performed_i}$$

Aggregating across microworkers provides the equation below:

$$\sum_{i=1}^{n} \Omega_i = \sum_{i=1}^{n} \frac{Total\ Earning_i}{Total\ Tasks\ Performed_i} - \sum_{j=1}^{n} Price_j * \frac{Total\ Tasks\ Performed_{ij}}{Total\ Tasks\ Performed_i}$$

Now we minimize Ω with respect to prices j. We also add additional constraints from economic theory. Prices are, by definition, nonnegative; we restrict the prices to be higher than $0.01, the minimum price level observed in the platform. Thus, our final minimization problem is given below, which produced the results in figure X.

$$Minimize \sum_{i=1}^{n} \Omega_i$$
$$Subject\ to\ Price_j > 0.01$$

Appendix C

    C.   Determinants of Earning: Regression Analysis

The Mincer regression used a labor force survey from 2021 for India and 2016 for Bangladesh. The regression specification is given below. Both are accessed from the Global Labor Database (GLD).

$$Hourly\ Wage_i = \alpha + \beta_1 * Age_i + \beta_2 * Age2_i^2 + \beta_3 * Male_i + \beta_5 * College\ Graduate_i +$$
$$\beta_6 * HHsize_i + Industry\ FEs + \varepsilon_i$$

Where 'i' refers to workers, Age refers to the age of the worker, which is a proxy for experience, Male is a dummy which takes a value of 1 if the person is male, or zero otherwise; college graduate refers to workers who attended tertiary school; and household size refers to the number of people living with the worker. Industry fixed effects are dummies, and they are a 2-digit international standardized classification of industries. However, in the case of microwork, we consider it as one industry, so we didn't use a fixed effect. α is a constant term, the β are coefficients for each regressor and ε_i an orthogonal error term. We didn't include other factors because these were the only variables that were simultaneously present in the labor force survey data and the survey data on microworkers.

Construction of hourly wage data for microworkers

The hourly wage data for labor force surveys is from the harmonized Global Labor Database and calculated as total monthly earnings by working hour. However, the case of microworkers is not straightforward, and we need to rely on some assumptions to construct it. Our survey data only contains information on the share of earnings from microwork, not the exact amount. This is because respondents usually tend to reduce their earnings fearing taxation and other related matters, as well as the high attrition level when such questions are posted directly. So, we ask them hypothetical questions that can help us to infer their earnings indirectly. The question asked is, "What is the minimum monthly salary that a full-time salaried job would have to offer for you to stop doing freelance work on the platform?

We need to assume the following points to use this information as hourly earnings of microworkers.

Let's assume a worker's current average hourly wage or earning of worker 'i' is given by , Y_{0i}, which is the sum of income from microwork and other jobs. Let's say ϕ_i is the share of income from a microworker and $(1-\phi_i)$ is the share of income from other income sources. $\phi_i * Y_{0i}$ gives income from microwork. Thus, income will be given by:

$$Y_{0i} = \phi_i * Y_{0i} + (1 - \phi_i) * Y_{0i}$$

The hourly wage level of a full-time salaried job should be higher than and proportional to the worker's current earnings. It is fair to assume that workers wouldn't abandon microwork unless they earn a better

livelihood from the new job offer. This also implicitly assumes that pecuniary benefits are the only attribute workers consider to switch or not. Let's assume the full-time salaried wage that has to be offered to stop doing microwork is given by Y_{1i}. If so, switching happens when the following equation holds true. And the worker would be indifferent at the point where the two sides are equal.

$$Y_{1i} \geq \delta * Y_{0i}$$
$$Y_{1i} = \delta * (\phi_i * Y_{0i} + (1 - \phi_i) * Y_{0i})$$

$$\phi_i Y_{0i} = \frac{\phi_i Y_{1i}}{\delta}$$

The parameter δ shows the linear proportional relationship between the current income from the microworkers and the full-time salaried job income expected should the worker switch. The parameter captures the switching cost to new full-time salaried work. If the proportionality assumption holds

$$\phi_i Y_{0i} = \frac{\phi_i Y_{1i}}{\delta},$$

linear regression coefficients from using ϕY_1 will be the same except for the constant term which will be δ times higher. For example, if someone earns a total of X USD per month and we know from the survey 20% of the her income is from microwork and she says she needs a job offer that pays at least 1000 USD to stop microwork, it implies her current jobs are paying her at most 1000 USD and 20 percent of this would be 200 USD. One additional caveat is the data provides the share of income from microwork in ranges or intervals rather than exact percentage, so we use midpoints which could also affect results. The ideal approach would have been getting the exact earning of the microworkers along with their demographic and other relevant factors that explain earning. However, our survey data doesn't include the exact earnings and the scraped data doesn't include relevant demographic and other factors. In the presence of these constraints, we relied on the assumption stated above to estimate the earnings. Therefore, readers need to take these caveats into consideration when interpreting the results.