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The Gig Economy in Different Engines of Growth: Understanding Regional Disparities in Gig Worker Quality in Bali and East Java

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Abstract

Gig work, commonly defined as short-term, more flexible, and non-traditional employment that typically lacks formal contractual arrangements, has shaped the emergence of the gig economy and is gradually transforming labor market dynamics in Indonesia. However, research on gig workers remains limited, particularly in the context of cross-regional comparisons. This study compares the characteristics of gig workers in two regions in Indonesia with different economic structures, i.e., Bali-an economy predominantly driven by tourism-and East Java-an industry-based economy. Using data from the August 2024 National Labor Force Survey, this research employs cluster analysis to reveal the structure of gig workers in each province based on economic, socio-demographic, and technological factors, followed by multilevel regression to identify the odds for being gig workers at individual and regional levels. The findings reveal that gig workers in Bali experience relatively higher levels of wages compared to those in East Java. A similar pattern also exists for the coverage of social protection term. At the individual level, education and sector-industry and services-influence gig workers' wages across both provinces. While at the regional level, disparities in labor market conditions and minimum wage policies contribute to differences in wage levels. These findings strengthen the understanding of gig economy dynamics across regions with different economic bases, providing valuable policy and strategic insights on expanding social protection and enhancing the use of technology to support the sustainability of labor markets in the digital era.

Keywords: digital platform, gig works, multi-level regression, wage level.

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1. Introduction

The gig economy is a new economic paradigm that offers a work system utilizing digital technology that is more flexible than traditional work, both in terms of working hours and location, and without the requirement of higher education. This paradigm has been growing in Indonesia for at least the past decade. Increasing internet penetration, the existence of e-

commerce platforms, and online motorcycle taxis have contributed to the growth of the number of GIG workers in Indonesia, marked by the increasing number of self-employed workers since 2015 (Permana et al., 2023). The COVID-19 pandemic that hit Indonesia in March 2020 also contributed to the rapid growth of GIG workers in Indonesia. Restrictions on people's mobility and economic contraction during the pandemic led to mass layoffs. The Statistics Indonesia-BPS (2020) reported that at least 29.12 million people were unemployed, became ineligible as a labor force, experienced reduced working hours, and were temporarily unemployed due to COVID-19. Furthermore, nearly a quarter of formal workers (21.98%) switched to the informal sector during that period (Tasmilah et al., 2023). Many of them become gig workers based on digital platforms due to the convenience and flexibility, making the gig economy a key contributor to informal labor absorption amidst limited formal employment opportunities.

Despite these advantages, the surge in gig workers has created a number of new challenges for the employment sector in Indonesia. The International Labour Office or ILO (2020) states that gig workers are a highly vulnerable group. The lack of employment contracts, career paths, and pension guarantees; the tendency to work longer hours to compensate for low wages; income uncertainty; and limited social and health protection are key factors contributing to gig workers' vulnerability (CELIOS, 2024; Healy et al., 2017; Setiawan, 2025). Working relationships with digital platform providers has several gaps that can disadvantage gig workers in obtaining their basic rights, leaving them vulnerable to exploitation and injustice (Muhyiddin et al., 2024). To reduce the vulnerability of gig workers, policy interventions are needed to understand more deeply the characteristics of gig workers in Indonesia.

The existing studies that discussed about the characteristics of gig workers in Indonesia are quite limited. First, Arafat et al. (2025) identified the characteristics of gig workers and examined the potential of the gig economy as a supplementary income source for the middle class in Jakarta. Second, a study by Permana et al. (2023) examined the characteristics of gig workers from various perspectives, such as gender, working hours, wages, and region. Last, Hanivan & Rakhmawan (2023) explored the characteristics of GIG workers in East Java, examining the impact of the pandemic on wages and working hours and assessing the likelihood of being gig workers by survival or by-choice category. In terms of scope, these three studies focus on observing gig workers only in specific regions. There was no study that has compared the characteristics of gig workers across different regions, especially those with different primary economic sectors.

This study tries to fill that gap by analyzing the differences in the characteristics of gig workers in two regions with distinct economic drivers: East Java Province, with its industrial base, and Bali Province, widely known as a major global tourist destination. The objective of this study is twofold. First, we examine differences in the characteristics of gig workers in both provinces based on several individual criteria, such as wages, gender, residence, household status, working hours, social or health insurance coverage, side hustle and work sector. Cluster analysis will be utilized to examine the structure of gig workers based on these criteria. Second, we employ a multilevel regression model to reveal the determinants of being gig workers in both provinces at

the individual and also regional levels, including regional minimum wage policies, cost of living, regional economic levels, and the availability of supporting infrastructure for gig workers (ICT and postal & courier services).

2. Research method

The National Labor Force Survey (Sakernas) has been widely used in studies on employment topics. The survey is conducted by the Statistics Indonesia-BPS biannually in February and August, which provides estimations at the provincial and district/city levels, respectively. This study utilized raw data of Sakernas, August 2024, from the East Java and Bali provinces, covering target samples of 26,760 and 5,410 households, or 65,782 and 15,372 individuals aged 5 years and older, respectively. Until nowadays, there is no consensus on the definition of gig workers. The gig workers based on ILO are often self-employed or independent contractors, managing their own clients, projects and income without a fixed salary or long-term employment contract, work and paid after completing tasks or clients projects through online platforms and apps. From the Sakernas, the criteria of gig workers can be obtained from workers who are self-employed or who work for other people or companies and get a wage or salary with no long-term contract or less than a one-year contract and work by using an online platform. In addition, this study only focuses on some potential sectors for the gig economy, including manufacturing, wholesale & retail trade, transportation & warehousing, accomodation & food service activities, and business activities.

In the first stage of the analysis, the characteristics of gig and non-gig workers in East Java and Bali will be compared based on several criteria such as wages, gender, residence, household status, working hours, social or health insurance coverage, side hustle and work sector (see individual criteria in Table 1). Several graphs, tables, and statistical test will be used to determine whether there are differences in the characteristics of gig workers from the two provinces with different growth drivers. Next, hierarchical clustering (Härdle & Hlávka, 2015) using Gower's distance will be applied to determine the structure of gig worker characteristics in East Java, Bali, and in both provinces. The Gower's distance is used in this study as its ability to handle mixed data type, both numerical and categorical data (Gower, 1971). Statistical measures of several social, demographic, and economic criteria of gig workers across the obtained clusters will be compared to highlight differences in their characteristics both within each province and in general.

Table 1. Research Variables Description

Variables (type)	Definition
Gig worker (Nominal)	Individuals aged 15 years and above who work using digital technology and the internet, are self-employed (unlicensed and without employees) or are labourers/employees without a contract or with a contract of less than 1 year, or are non-agricultural freelancers working in sectors such as Trade, Hotels and Restaurants (G, I); Industry (C); Transportation (H); Information and

Variables (type)	Definition
	Communication (J); Professional Activities & Leasing Activities (M, N); and Education (P). 1: Yes; 0: No
Education Level (Ordinal)	The highest level of education completed, as evidenced by the highest diploma or certificate obtained. 0. Elementary School: (Not completed/Not yet completed Elementary School; Elementary School/equivalent) 1. Junior High School: Junior High School/equivalent 2. Senior High School: Senior High School/equivalent 3. Vocational High School : Vocational High school/equivalent 4. University: Diploma 1 – Doctorate (S3)
Age (Numeric)	Age based on the date, month, and year of data collection minus the date, month, and year of birth.
Working hours (Numeric)	Includes regular weekly working hours and actual working hours in the last week.
Side Hustle (Numeric)	The main additional job or second job is another job besides the main job/business usually done to earn or help earn additional income and is done for at least 1 hour a week.
Sectors (Nominal)	The field of work/business refers to the area of activity of the job/business/company/office where an individual works, or what is produced by the company/office where the respondent works. There are 17 types of sectors, and in this study, they are grouped into the following categories: 1) Trade, Hotels and Restaurants (G, I); 2) Industry (C); 3) Transportation (H); 4) Information and Communication (J); 5) Professional Activities & Leasing Activities (M, N); Education (P); and 6) Others.
Job Insurance (Nominal)	Social security is the company's expenditure used for the protection of workers/employees in the form of benefits in the form of money as a replacement for part of the lost or reduced income and services as a result of events or conditions experienced by workers/employees such as work accidents, illness, childbirth/annual leave without deducting wages, job loss, old age, and/or death. 1: have at least 1 0: do not have at all
Gender (Nominal)	Gender consists of Female or Male. 1: Female, 0: Male
Area Type (Nominal)	Residential Area Type: Rural (1) or Urban (0)
Relation (Nominal)	Indicates the relationship status within the household. 1: head of household ; 0: others
UMK2024 (Numeric)	The minimum wage value set based on the official regulations of the district/city.

Variables (type)	Definition
GDRP per capita (Numeric)	The value of regional GDP at constant prices per total population.
BTS (Numeric)	The proportion of villages with Base Transceiver Station (BTS)
Expenditure Per capita (Numeric)	Total expenditure per capita
High Signal (Numeric)	The proportion of villages with strong and very strong signals.

In the second stage, this study will create a probability model for each worker as to whether they are likely to become a gig worker or not based on several individual criteria that have been used in the previous analysis stage and regional criteria using a multilevel logistic regression model. According to Gelman & Hill (2007), there are two specifications of multilevel regression, i.e. model with varying-intercept and model with both varying-intercept & varying-slope. In this study, the former specification is chosen as we assume the effect of individual criteria on the chances of becoming a gig worker is equal across regions. Both individual (level 1) and regional criteria (level 2) used in this study are presented in Table 1. Most of the regional criteria are obtained from the results of the Village Potential (Podes) data collection conducted by BPS. The general formula of multilevel logistic regression with varying-intercept and two levels data is as follows:

$$Level\ 1: Y_{ij} = \beta_{0j} + \sum_{p=1}^{P} \beta_{pj} X_{pij} + e_{ij} \quad (1)$$

$$Level\ 2: \beta_{0j} = \gamma_{00} + \sum_{q=1}^{Q} \gamma_{0q} Z_{qj} + u_{0j} \quad (2)$$

where $i = 1, \dots, N_j$ indexes individuals within regency/municipality j $(j = i, \dots, J), p = 1, \dots, P$ indexes individual-level independent variables X_{pij} and $q = 1, \dots, Q$ indexes regency/municipality-level independent variables Z_{qj}, β_{0j} is the intercept for regency/municipality j, which can be influenced by regency/municipality-level variables through slopes γ_{0q} and random effects u_{0j}, while β_{pj} represents the slopes for individual-level variables. γ_{00} denotes the global intercept across all regencies/municipalities. This specification allows the analysis of how factors at both the individual and reginal levels such as minimum wage regulations, cost living, regional economic conditions, and supporting infrastructure that affect the likelihood of becoming a gig worker. Probabilities of becoming a gig worker can be compared and interpreted using odds ratio (OR) derived from the model estimation, providing an indication of the strength of influence of each factor.

3. Results and Discussion

3.1. Comparative Characteristics of Gig Workers: Bali vs. East Java

The analysis in this section discusses the differences between gig and non-gig workers in East Java and Bali, based on various individual characteristics. First, Figure 1 shows the density of gig and non-gig workers in both provinces, based on wages and gender. In general, gig workers' wages are significantly higher than non-gig workers' wages in both provinces. In more detail, this gap widens when examined more closely by province and gender. Male gig workers in Bali have an average wage of IDR 3.74 million, approximately IDR 0.83 million higher than male non-gig workers in the province. However, when compared to the average wage of male gig workers in East Java, the difference is IDR 1.11 million or greater. In East Java, the average wage difference between male gig workers and male non-gig workers is not significantly different, only IDR 0.26 million.

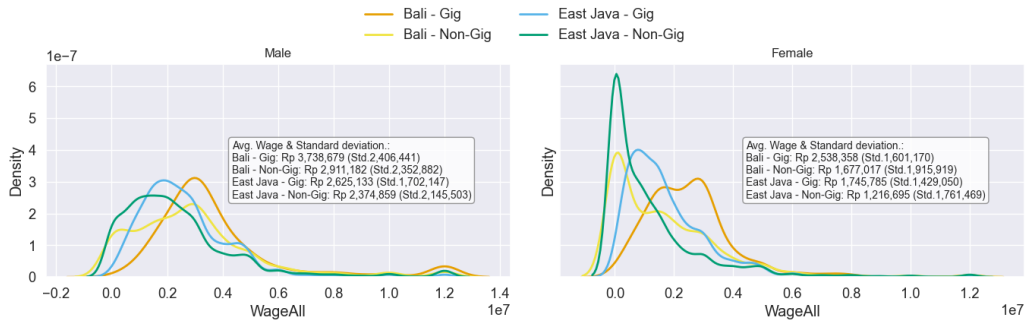

Figure 1. *Gig and Non-gig Workers by Wage and Gender in Bali and East Java*
Source: Sakernas (Processed), August 2024

The average wage of male workers is relatively higher compared to the average wage of female workers in both provinces. For example, the average wage for female gig workers in Bali is only IDR 2.54 million, or IDR 1.2 million less than that of male gig workers. Similarly, female gig workers in East Java only have an average wage of IDR 1.75 million, or IDR 0.88 million less than that of male gig workers. On average, the wages of female non-gig workers in East Java are the lowest, at IDR 1.22 million, and in terms of density, they are the largest among other worker categories (see the green line in Figure 1. female workers). Female workers are still often associated with low-income workers (Agusalim et al., 2025). When viewed in terms of density, this study confirms the results of research by Hanivan & Rakhmawan (2023) which showed that the number of female workers in East Java, both gig and non-gig, earning wages below IDR 1 million is significantly higher than wages of male workers. That condition was also found in Bali, especially for gig workers.

Figure 2 shows how the wages of gig and non-gig workers in East Java and Bali vary depending on where they live (urban or rural). Upon closer inspection, the density patterns in this figure are very similar to those in Figure 1. The density patterns of gig and non-gig workers in East Java and Bali who live in urban areas are similar to those of male workers. Meanwhile, those living in rural areas are similar to those of female workers. Workers living in urban areas

have relatively higher average wages than those living in rural areas. Urban-rural disparities have remained a significant issue in developing countries for decades (Yan et al., 2025). Furthermore, gig worker status also offers wage advantages compared to non-gig workers. Regionally, gig workers living in Bali tend to have higher average wages than workers in East Java. Therefore, gig workers in Bali and those living in urban areas have the highest average wages in this case. High densities were also found among non-gig workers in East Java who lived in rural areas, with the lowest average wage being Rp 1.43 million, a finding similar to that found among female non-gig workers in East Java.

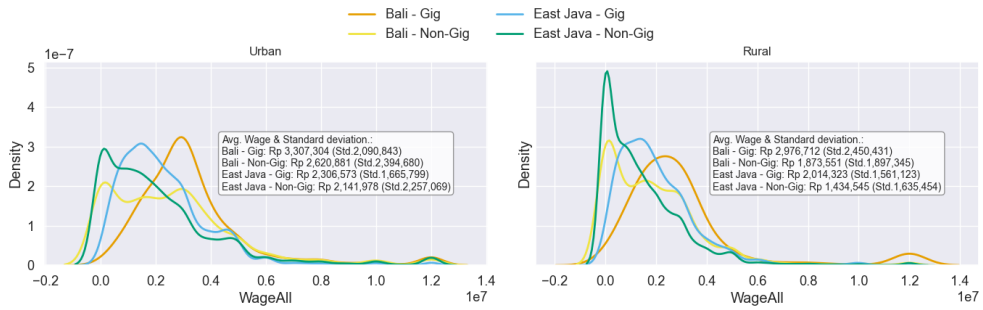

Figure 2. *Gig and Non-gig Workers by Wage and Area Type in Bali and East Java*
Source: Sakernas (Processed), August 2024

The wage disparity between workers in Bali and East Java exist as presented in Figure 3. For the same category: gig or non-gig workers, or their relationship within the household (head of household or otherwise), the average wage in Bali remains higher than in East Java. However, there is a significant difference in the average wage across each category in Bali. Gig workers with head-of-household status in Bali have the highest average wage, at Rp. 3.81 million, approximately Rp. 0.92 million higher than gig workers with other statuses. This figure is even higher by approximately Rp. 1.1 million compared to gig workers with head-of-household status in East Java, who have an average wage of Rp. 2.71 million. In this province, the wage gap between categories is not significantly different compared to Bali. The average wage difference between gig workers with head-of-household status and others in East Java is only approximately Rp. 0.82 million.

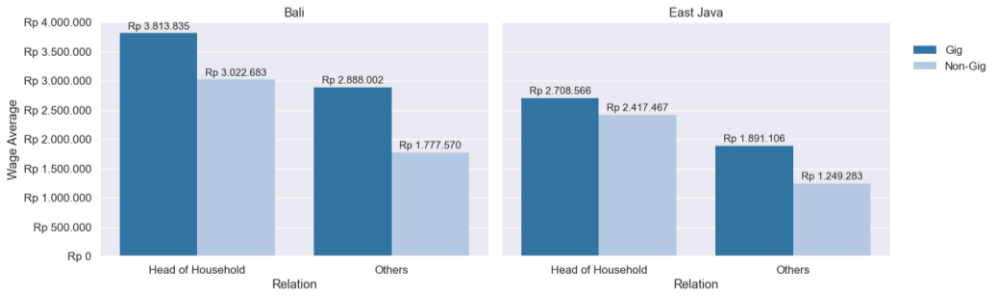

Figure 3. *Gig and Non-gig Workers by Average Wage and Relation Type in Bali and East Java*
Source: Sakernas (Processed), August 2024

A fair comparison can be achieved by focusing on hourly wages. Similar to total wages in the previous results, hourly wages in Figure 4 also show disparities between gig and non-gig workers, gender, and region. Male gig workers living in Bali province tend to have a higher average hourly wage than other categories combined, at Rp 93,000, or a difference of Rp 27,000 compared to female gig workers in Bali. Gig workers tend to have higher hourly wages than non-gig workers in both regions. Interestingly, this disparity pattern does not apply to male gig workers in East Java, who actually have slightly lower hourly wages than male non-gig workers.

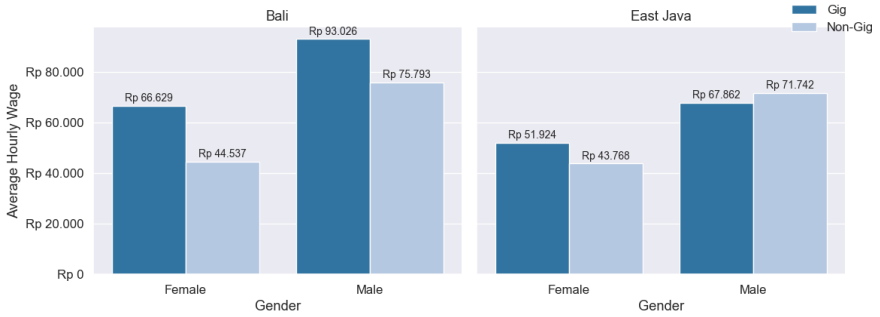

Figure 4. *Gig and Non-gig Workers by Average Hourly Wage and Gender in Bali and East Java*
Source: Sakernas (Processed), August 2024

Platform support can provide easier and broader job opportunities and access for the workforce (CELIOS, 2024). Furthermore, gig workers have the freedom to choose their own working hours. However, these conveniences and flexibility don't leave gig workers without problems. One major concern for gig workers is the lack of insurance coverage provided by the platforms. Figure 5 shows that insurance coverage for gig workers in Bali and East Java is still quite low, ranging from 1% to 32%. This coverage varies depending on the type of insurance, with health insurance in both regions having the highest coverage at around 24% to 32%. While pension insurance covers only 1.4% and 3.4% of gig workers in Bali and East Java, respectively, making it the lowest among other insurance types. More specifically, the coverage by type of insurance protection in both regions follows a similar pattern.

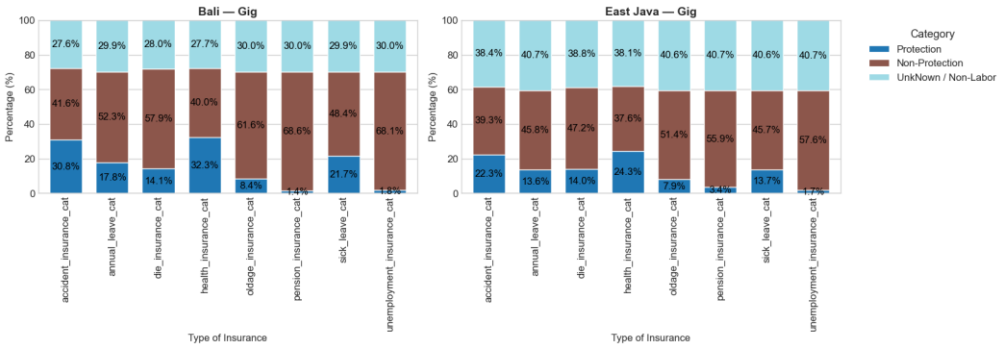

Figure 5. *Gig Workers by Insurance Protection in Bali and East Java*
Source: Sakernas (Processed), August 2024

As independent workers with the freedom to choose their own working hours, gig workers are more likely to explore other alternatives of work (gig or non-gig) in search of higher wages or jobs that better align with their passions. They also often search for side hustles as supplementary income. Nowadays, side hustling has become a growing trend alongside the rise of gig workers (Dua et al., 2022; Sessions et al., 2021). However, this study shows that only a small percentage of gig workers have side hustles in Bali and East Java. In East Java, the percentage of gig workers with side hustles is slightly higher (16.0%) than in Bali (12.4%). These results are quite reasonable when compared to the previous discussion, where the average total and hourly wages of gig workers in East Java are relatively lower than in Bali.

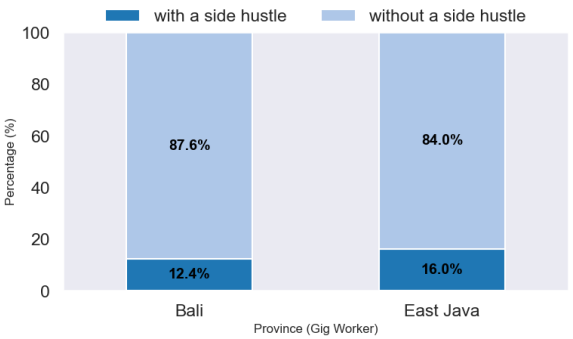

Figure 6. *Gig Workers by Side Hustle in Bali and East Java*
Source: Sakernas (Processed), August 2024

The disparity in average gig worker wages across regions becomes even more apparent when viewed by the sector in which gig workers work. We categorize gig worker sectors into two groups: the industrial sector and the service sector. Descriptive statistics in Table 2 further clarify that gig worker wage levels in Bali and East Java are highly relevant to the primary economic sectors driving each region. Bali, synonymous with tourism and its various supporting service sectors, has a relatively high average gig worker wage of IDR 3.59 million, higher than the average wage for gig workers in the industrial sector, which is only IDR 2.38 million. As a top-tier tourist destination in Indonesia and even globally, Bali has a comparative advantage over other regions. Of the total foreign tourist visits to Indonesia, at least 37.99% choose Bali as their primary destination (BPS, 2025). Foreign tourists, with higher purchasing power compared to local currencies and a focus on service orientation, increase the likelihood of gig workers receiving higher wages and tips for services rendered. Conversely, in East Java, with the industrial sector as a driving force of the economy, the average wage for gig workers in the industrial sector is IDR 2.38 million. 2.42 million, or higher than the service sector, which is around Rp 2.06 million. Although wages in the industrial sector in East Java are not quite different compared to the industrial sector in Bali, the difference is only Rp. 0.02 million. The results of the t-test statistically show significant disparities between regions and sectors.

Table 2. Independent Samples t-Test of Gig Workers Income

	Sector	Avg. Wage	Std. Wage	t-test
Bali	Industry	2.380.387	1.412.042	p-value : < 0.01
	Services	3.591.789	3.560.883	
East Java	Industry	2.417.935	1.823.708	p-value : < 0.01
	Services	2.056.568	1.728.488	

Source: Sakernas (Processed), August 2024

In more detail, the services sector also shows a fairly high disparity in average wages for gig workers, with Bali's wage rate being higher than that of East Java. The sector with the largest average wage difference is transportation, with a difference of approximately IDR 2.72 million, followed by business activities at IDR 1.19 million, education and information at IDR 1.09 million, and trade, hotels, and restaurants at IDR 0.98 million. These results further emphasize that gig workers tend to have a wage advantage in key sectors of a region's economy compared to other sectors with lower contributions. This is especially true for Bali, with its service sector supporting its tourism. Although East Java is supported by the industrial sector, the wage level of gig workers there is only slightly higher than that of gig workers in the industrial sector in Bali.

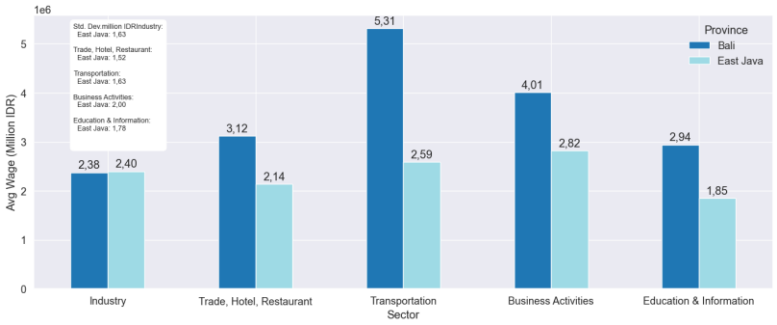

Figure 7. *Gig Workers by Sectors in Bali and East Java*
Source: Sakernas (Processed), August 2024

The clustering process for gig workers in Bali, East Java, and in both regions yielded two clusters with distinct characteristics, summarized in Table 3. Based on the average characteristics of wages, working hours, and age, cluster 2 is a group of gig workers with higher levels of characteristics than cluster 1. This condition applies in Bali, East Java, and in both regions, except for the average age characteristic in cluster 2 in Bali, which is actually younger, at around 43 years old, younger than the average age in cluster 1, around 47 years old. From the gender and status in the household perspectives, cluster 2 is dominated by male gig workers who are heads of households. Interestingly, according to education level, there are differences in characteristics between the two clusters. Cluster 1 is dominated by gig workers with vocational high school education. Meanwhile, cluster 2 is dominated by senior high school graduates. Based on the residential location and business sector of gig workers, both clusters show a similar pattern, dominated by gig workers living in urban areas and working in the trade, hotel, and restaurant sectors.

Table 3. Results of Clustering of characteristics Gig Workers in Bali and East Java

Characteristics	Cluster 1		Cluster 2	
	Bali	East Java	Bali	East Java
Avg. Wage	3.020.729	1.902.610	4.002.326	2.734.917
Avg. Job hours	46.43	43.94	49.52	47.82
Avg. Age	±47	± 32	±43	± 44
Relation	0 (100.0%)	0 (100.0%)	1 (100.0%)	1 (100.0%)
Gender	1 (63.3%), 0 (36.7%)	1 (64.6%), 0 (35.4%)	0 (93.3%), 1 (6.7%)	0 (84.3%), 1 (15.7%)
Education level	Vocational High School/ equivalent (29.5%), Senior High School/equivalent (25.6%), University (23.4%)	Vocational High School/ equivalent (28.5%), Senior High School/equivalent (26.0%), University (20.2%)	Senior High School/equivalent (34.2%), University (18.9%), Vocational High School/ equivalent (17.5%)	Senior High School/equivalent (25.0%), Vocational High School/ equivalent (20.2%), Junior High School/ equivalent (19.8%)
Area type	1 (75.0%), 2 (25.0%)	1 (76.2%), 2 (23.8%)	1 (79.0%), 2 (21.0%)	1 (79.6%), 2 (20.4%)
Sectors dominant	Trade, Hotel, and Restaurant (59.35%) Industry (20.76%)	Trade, Hotel, and Restaurant (46.08%) Industry (27.13%)	Trade, Hotel, and Restaurant (47.80%) Industry (19.45%)	Trade, Hotel, and Restaurant (42.89%) Industry (27.06%)

Source: Sakernas (Processed), August 2024

Examining the relationship between wage levels and regional minimum wage regulations is one way to understand the gap between welfare conditions and the standards gig workers should receive. Figure 8 shows the percentage of gig workers in Bali and East Java according to their wage compliance status with the regional minimum wage at the district/city level. The percentage of gig workers earning at least the regional minimum wage is 35.5%, nearly double the figure in East Java. This figure is slightly higher than the percentage of gig workers earning below the regional minimum wage, 34.3%. In East Java, the opposite is true, with the percentage of gig workers earning below the regional minimum wage (40.1%) significantly higher than those earning at least the regional minimum wage (18.9%).

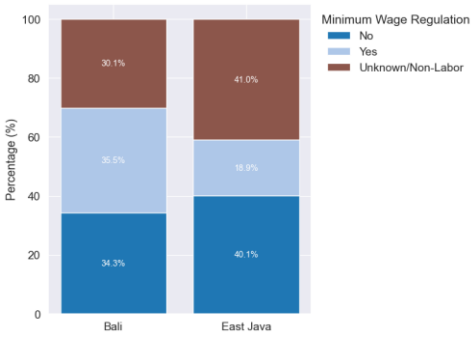

Figure 8. *Gig Worker by Regulated Minimum Wage Compliance in Bali and East Java*
Source: Sakernas (Processed), August 2024

The employment status of gig workers also contributes to wage disparities. The same pattern is observed in each region, with the highest average wages for gig workers coming from employee/labor. Gig workers with employee/labor status in Bali and East Java have average wages of Rp 3.30 million and Rp 2.34 million, respectively, followed by independent gig workers and freelance non-agricultural workers. It's normal for employees/laborers to have slightly higher wages than independent workers, as employees/laborers have a more stable salary and the possibility of receiving various allowances. Independent workers, on the other hand, have more fluctuating wages, depending heavily on their business performance, so their average wages are lower.

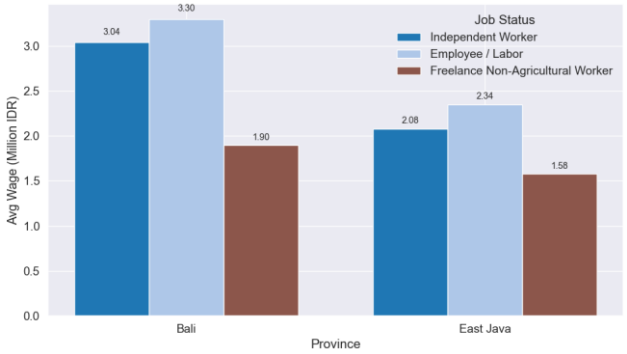

Figure 9. *Gig Worker by status and wage in Bali and East Java*
Source: Sakernas (Processed), August 2024

3.2. Multilevel Linear Regression Model

Multilevel regression was applied to investigate how micro-level (individual) and macro-level (regency/municipal) factors influence gig worker status in Bali and East Java. The first level represented individual characteristics, while the second level captured provincial factors. Analysis began with null models, both without and with random effects, to test the significance of random variation via a likelihood ratio test (Pontoh et al., 2022). The test statistic exceeded the critical chi-square value at a 5% significance level, leading to the rejection of the null hypothesis, indicating that random effects significantly contribute to variation in gig worker status across

regencies/municipalities. The interclass correlation coefficient (ICC) further quantified this variation, yielding values of 0.06107 for Bali and 0.06738 for East Java, meaning approximately 6.11% and 6.74% of the variability in gig worker status is attributable to differences among regencies/municipalities, consistent with hierarchical modelling principles (Rahani & Caesar, 2025).

After establishing the conditional model, regression coefficients were assessed jointly using the G-test and individually using the Wald test. Joint significance was confirmed at the 5% level, while the standardized Pearson test indicated good model fit. Multicollinearity was checked through the variance inflation factor (VIF), with all values below 5. The Wald test identified specific explanatory variables significantly affecting gig worker status, demonstrating that at least one factor at either the individual or provincial level has a meaningful impact. Odds ratios for each predictor are summarized in Table 4.

Table 4. Results of Regression Logit Multilevel Model

Variable	Bali (LR. Logit)		East Java (LR. Logit)	
	β	Exp (β)	β	Exp (β)
(Intercept)	-0.41091 (0.0436)**	0.66305	-1.17653 (< 00001)***	0.30835
Area type (1: Rural)	-0.11460 (0.0964)*	0.89172	-0.02014 (0.58539)	0.98006
Relation (1: Head of household)	0.14790 (0.0729)*	1.15940	0.26978 (< 00001)***	1.30968
Job hours	0.27182 (< 00001)***	1.31235	0.17208 (< 00001)***	1.18777
Job Hours Square	-0.15832 (< 00001)***	0.85358	-0.09720 (< 00001)***	0.90737
Age	-0.67710 (< 00001)***	0.50809	-0.57999 (< 00001)***	0.55991
Gender (1: Female)	-0.20125 (0.00776)***	0.81771	0.01614 (0.64899)	1.01628
Sector (0 = Trade, Hotel, Restaurant)				
Education, Information, Communication	0.27581 (0.0131)**	1.31760	0.86191 (< 00001)***	2.36768
Business activities	0.87169 (< 00001)***	2.39095	0.89145 (< 00001)***	2.43866
Industry	0.10262 (0.1320)	1.10807	0.12762 (0.00021)***	1.13612
Transportation	0.98341 (< 00001)***	2.67356	1.08831 (< 00001)***	2.96926
Others	-23.43810 (0.628)	6.28e-10	-22.20085 (0.06642)*	2.282e-10
Education Level (0 : < Elementary School)				
Junior high school	0.39507 (< 00001)***	1.48464	0.55562 (< 00001)***	1.74303
Senior high school	0.64833 (< 00001)***	1.91235	0.77148 (< 00001)***	2.16296

Variable	Bali (LR. Logit)		East Java (LR. Logit)	
	β	Exp (β)	β	Exp (β)
Vocational high school	0.65859 (< 00001)***	1.93207	0.88038 (< 00001)***	2.41182
University	0.27362 (0.00884)***	1.31472	0.57395 (< 00001)***	1.77526)
Side hustle (1: No)	0.01800 (0.8268)	1.01816	-0.16628 (0.00003)***	0.84681
Job insurance (1: No Protection)	-0.57660 (< 00001)***	0.56205	-0.05280 (0.16889)	0.94857
LnGDRP per capita	0.47489 (0.1608)	1.60814	0.09866 (0.07139)*	1.10369
lnUMR2024	-1.35205 (0.0311)**	0.25889	0.01055 (0.82678)	1.01060
LnExpenditure per capita	0.26255 (0.000156)***	1.30010	0.07794 (0.31564)	1.08106
BTS	-0.53003 (0.0744)*	0.58890	-0.07903 (0.16349)	0.92401
BTS Square	0.28779 (0.0422)**	1.33330	0.02270 (0.60718)	1.02296
High Signal	-0.01684 (0.8234)	0.98330	0.01940 (0.73074)	1.01959
Observation	11702		46326	
Interclass Correlation Coefficient	0.06107536		0.06738353	
Sig. Likelihood Random Effect Test	Yes		Yes	
Sig. Likelihood Ratio Test	Yes		Yes	
Sig. Standardized Pearson Test	No		No	

Note: *p<0.1; **p<0.05: ***p<0.01; p-values in parentheses

Source: Sakernas (Processed), August 2024

Based on Table 4, the estimation results show that residing in urban areas in Bali significantly increases the likelihood of becoming gig worker by approximately $\frac{1}{0.11460}$ or 1.12 times, while this effect is not significant in East Java. In Bali, although the availability of basic digital infrastructure initially shows a negative effect, the quadratic term (BTS^2) indicates that digital connectivity begins to positively influence gig participation only after reaching a certain quality threshold (OR = 1.33). This implies that it is not merely the presence of internet access or BTS infrastructure that matters; network quality and digital skills must be sufficiently high to effectively support and encourage participation in gig work. This finding aligns with the regional context of Bali, where areas with high tourism intensity and strong global connectivity exhibit higher gig worker wages compared to East Java, both in urban and rural areas. Fiers (2024) underscores the crucial role of digital skills in determining the success of online freelancers, while Heeks (2022) cautions that expanding digital access without improving economic and market capacity may reproduce existing inequalities—for instance, rural areas with strong signals but

lacking digital literacy remain disadvantaged compared to urban communities that can leverage such access for online work and global market engagement.

Furthermore, Household status, working conditions, and demographic characteristics jointly shape gig work participation. Household heads are more likely to engage in gig work, with odds approximately 1.31 times higher in East Java and 1.15 times higher in Bali, reflecting greater economic responsibility and the need for flexible income sources. Working hours also increase the likelihood of becoming a gig worker in both regions; however, this effect diminishes beyond a certain threshold, as indicated by the quadratic term, suggesting a saturation point where heavier workloads reduce the propensity to enter gig work. Age further plays a significant role, as the probability of engaging in gig work declines by about 67% in Bali and 57% in East Java with each additional year, likely due to the technological demands of platform-based work that favor younger workers (Permana et al., 2023). Gender effects differ across regions: in Bali, male workers are significantly more likely to participate in gig work (1.22 times higher), whereas in East Java gender has no signficant effect on gig employment, consistent with the findings of Hanifan and Rackhmawan (2021).

According to the potential sectors, the estimation results reveal that in Bali, individuals working in the transportation; trade, hotel, and restaurant; education, information, and communication; as well as business services sectors are more likely to participate in gig work compared to those employed in other sectors. A relatively similar trend is observed in East Java. Overall, individuals employed in the trade, hotel, and restaurant sector exhibit a higher propensity to engage in gig work than those in other sectors. Notably, the transportation sector demonstrates the strongest association with gig employment in both provinces, with a slightly higher tendency in East Java than in Bali.

Regarding educational attainment, a consistent pattern emerges among individuals with higher education levels, where the odds ratio tends to decline as education attainment increases. For example, individuals with a senior high school education are approximately twice as likely to engage in gig work compared to those with no schooling or only primary education, both in Bali and East Java. Meanwhile, individuals with a university degree exhibit a slightly lower likelihood—about 1.3 times in Bali and 1.7 times in East Java—of becoming gig workers compared to those with no or only primary education. Interestingly, vocational school graduates demonstrate the highest propensity to participate in gig work, with odds approximately 1.93 times higher in Bali and 2.41 times higher in East Java. Overall, East Java shows a higher likelihood of entering gig work across these sectors and education levels, yet offers lower average wages than Bali. This indicate that workers enter gig jobs are driven more by economic necessity than by profitable choices.

The role of additional jobs differs across regions. In Bali, individuals without side jobs are more likely to become gig workers, reflecting the island's supportive ecosystem, wider market access, and stronger infrastructure. In contrast, in East Java—where average working hours often exceed 40 hours per week—having additional jobs does not increase the likelihood of engaging

in gig work, as longer working hours reduce the incentive and capacity to take on flexible gig employment.

Interestingly, job insurance in Bali significantly influences the likelihood of becoming a gig worker, whereas in East Java, the effect is not significant. In Bali, individuals without social protection are less likely to become gig workers, while those with job security are nearly twice as likely to participate in gig work (OR ≈ 1/0.56 = 1.78). This pattern suggests that the presence of social protection, in the form of several insurance, serves as an enabling factor that strengthens participation in gig employment. Economically, this phenomenon can be explained through the concept of "gig work as calculated flexibility," where individuals with basic employment protection, such as social insurance or labor security—are more willing to take the risks associated with flexible gig work, as minimal safeguards cushion income instability. This aligns with the ILO (2023) and Ishaq et al (2021), who found that access to social protection reduces perceived risks and enhances participation in productive informal work. In Bali, where the labor market is dominated by service and tourism sectors connected to global markets (e.g., transport, digital creative services, hospitality support), social protection also acts as a form of "social trust capital," enhancing workers' credibility and acceptance by clients or platforms. Conversely, in East Java, where gig work remains largely domestic and supplementary, and formal labor protection coverage is limited, the relationship between social security and gig participation is insignificant—consistent with Wibowo et al (2025), who argue that in weakly regulated labor systems, access to protection has limited influence on workers' decisions to engage in gig employment.

Differences in macroeconomic conditions also shape individuals' decisions to participate in gig work. The multilevel regression results reveal that in Bali, a 1 percent increase in individual consumption expenditure raises the likelihood of becoming a gig worker by 1.3 times, indicating a demand-driven pattern in which higher per capita consumption—reflecting stronger purchasing power and local market demand—stimulates participation in gig work. In areas with higher household consumption, local demand for services such as transportation, tourism, delivery, and digital work is greater, providing a ready market for gig activities. Conversely, in East Java, a 1 percent rise in regional GDP increases the odds of gig employment by 1.1 times, suggesting that participation in gig work is more closely linked to regional economic capacity rather than individual consumption behaviour. This contrast highlights fundamental structural differences: Bali's economy is driven by tourism and external consumption, making local spending a direct driver of gig opportunities, while East Java's more diversified economy—spanning industry, manufacturing, and agriculture—relies on overall economic output (regional GDP) to shape labor demand. In essence, regions with high consumption or robust economic output tend to attract more gig workers, as these conditions foster both service demand and market flexibility.

Furthermore, the regional minimum wage policy shows contrasting effects across provinces. In Bali, the minimum wage exerts a significant negative influence on gig work participation (odds

ratio = 0.25), implying that higher formal-sector wages reduce the attractiveness of gig employment. In other words, as formal wages rise, workers are more likely to remain in stable and regulated sectors. This finding aligns with evidence from Indonesia's digital labor market, where rising formal wages diminish the appeal of platform-based work, particularly in service-oriented economies such as Bali (Annazah et al, 2924). In contrast, in regions with weaker labor markets-such as parts of East Java-gig work continues to serve as a supplementary income source, even when wages are relatively low. This explains indicate why the regional minimum wage is not statistically significant in East Java.

4. Conclusion and Recommendations

This study finds that the average income of gig workers is higher than that of non-gig workers, with this wage advantage being more pronounced in Bali than in East Java. This challenges the common perception that gig workers are inherently low-paid. In Bali, gig work serves as a viable and increasingly primary source of livelihood, whereas in East Java, it remains supplementary and unstable. The multilevel regression results further reveal that individual characteristics and regional play a meaningful role in shaping gig work participation with approximately 6-7 percent of the variation in gig worker status explained by region. In Bali, a 1 percent increase in per capita household consumption significantly raises the likelihood of engaging in gig work, reflecting a demand-driven mechanism in which higher purchasing power and strong local demand-particularly in tourism, delivery, and digital services—create favourable conditions for gig employment. In contrast, in East Java, a 1 percent rise in regional GDP is associated with a higher probability of gig work participation, suggesting that gig employment there is more closely tied to economic capacity and production networks rather than individual consumption. In essence, Bali's gig economy is demand-driven, reflecting a consumption-based service ecosystem, while East Java's is supply-driven, reflecting broader economic capacity. These distinctions highlight the importance of region-specific policy approaches in managing and supporting the gig economy.

Beyond economic indicators, structural factors—particularly digital connectivity and social protection-emerge as critical determinants. Areas with robust digital infrastructure, such as dense BTS coverage and strong internet penetration, exhibit higher participation in gig work. However, the persistence of informality and the limited reach of social security systems indicate that flexibility often comes at the expense of protection. Without institutional reform, the expansion of gig work risks reproducing new forms of labor precarity under digital capitalism.

Based on these findings, two key policy implications are proposed. First, strengthening regionally tailored digital ecosystems should be a priority. In Bali, policy efforts should prioritize digital tourism and consumption-oriented gig sectors, reflecting the island's service-driven and demand-based economy. In East Java, strategies should focus on integrating gig work into productive sectors such as logistics, creative industries, and small-scale manufacturing. At the

same time, investment in high-quality digital infrastructure and the expansion of digital skills training should be accelerated in both regions—particularly in East Java, where opportunities to enter gig work are higher but wage quality remains relatively low. Reliable and high-quality connectivity is essential, as gig work can only thrive when digital infrastructure is not merely available but truly dependable, a condition especially critical for Bali's globally connected service market. Stronger government intervention in East Java is therefore needed to ensure that rising participation in gig work does not translate into low-quality or precarious employment. Second, the protection and bargaining power of gig workers must be enhanced. While gig work offers flexibility, it frequently comes at the cost of income instability, limited social protection, and unclear labor rights. To address this, adaptive and portable social protection schemes should be expanded to ensure access to health insurance, work accident coverage, and old-age security regardless of platform mobility. In parallel, strengthening gig worker associations and social dialogue mechanisms is crucial to improve worker representation, enhance bargaining power, and support the development of fairer and more inclusive labor regulations. Overall, this study underscores that gig work holds substantial potential for inclusive economic growth if managed through a context-sensitive, protective, and future-oriented policy framework. Integrating local economic dynamics, adaptive social protection, and digital capacity building will be key to fostering a fair, productive, and sustainable gig economy in Indonesia.

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