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# Variables Affecting the Percentage of Informal Workforce in Gen Z in Indonesia 2021-2023

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**Abstract**

Indonesia, as the fourth most populous country in the world, has great human resource potential to drive economic growth. Based on BPS data, around 69.5% of Indonesia's population is of productive age, which also increases the number of workforce every year. However, limitations in providing formal employment can cause some of the workforce, including Gen Z, to be absorbed into the informal sector. Although the informal sector has continued to grow in recent years, this sector is still faced with a number of problems, such as low wages, minimal social protection, and the dominance of low-educated workers. This study focuses on the period 2021–2023, namely the post-COVID-19 pandemic recovery period marked by the acceleration of digitalization in the world of work. The purpose of this study is to analyze the variables that influence the percentage of Gen Z informal workers in Indonesia. Using data sourced from BPS and the Ministry of Manpower, the FEM SUR method was produced on a panel of data from 34 provinces. It was found that the variables of average length of schooling, income, internet, certified training, provincial minimum wage, and GRDP per capita had a significant negative influence on the percentage of informal workers of Gen Z.. This finding suggests that improving the quality of education and economic support can drive Gen Z towards more formal and protected jobs.

**Keywords:** Informal Worker, Gen Z, Panel Regression.

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## 1. Introduction

Population is an important component for a country, Indonesia itself has the 4th largest population in the world (Poetiray, Purnomo, & Utomo, 2023). With this large population, it means that the availability of human resources is also abundant, but it will pose challenges such as management and social welfare (Indradewa & Natha, 2015). Based on BPS data, Indonesia is still dominated by young people with a larger productive age population, namely 69.5%.

The productive age population (15-64 years) plays an important role in the country's economy. A large number of productive age population can directly increase the number of the workforce. This can be a challenge in providing adequate employment, if not balanced with the creation of new jobs, there is a risk of a spike in unemployment (Dewi & Sirait, 2024) One of the challenges in providing jobs that meet standards is the availability of jobs in the formal sector which is still lacking (ILO, 2024). Based on BPS data, the absorption of labor in the formal sector is decreasing, namely 15.6 million in 2009-2014, 8.5 million in 2015-2019, and only 2 million in 2019-2024. Due to the small number of formal jobs available, it is increasingly encouraging the workforce to seek alternatives so as not to be unemployed, namely by working in the informal sector.

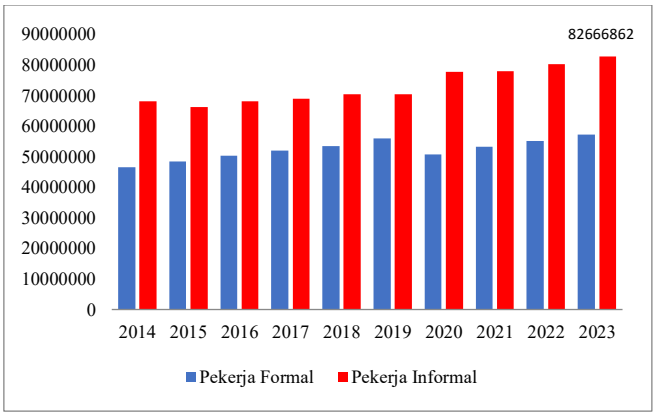



**Figure 1.** Number of Workers in the Formal and Informal Sectors 2014-2023
Source: BPS-Statistics Indonesia

Based on Figure 1, it can be seen that the workforce working in the informal sector has increased from year to year and the number of workers in the informal sector is the largest in 2023 with a total of 82.6 million workers or 59.11% of the total workforce in Indonesia. With a value of 59.11%, it means that more than half of the workforce in Indonesia works in the informal sector. So this shows that the workforce in the informal sector dominates the workforce in Indonesia. Meanwhile, the number of formal workers tends to fluctuate every year.

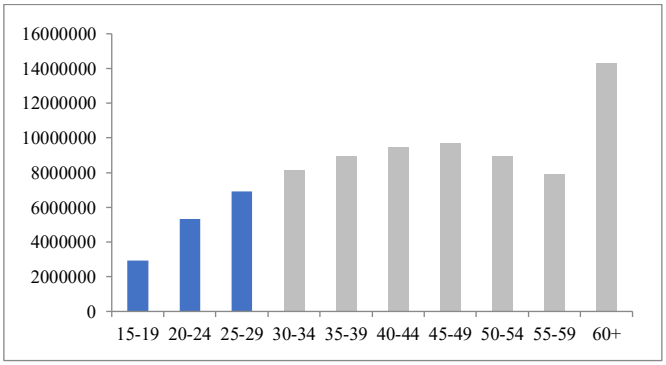



**Figure 1.** Number of Informal Workers by Age Group in 2023
Source: BPS-Statistics Indonesia

Based on Figure 2, the number of informal workers by age group is obtained. Young workers aged 15-24 years who work in the informal sector have significant involvement. According to the ILO (2022), in developing countries, young workers are vulnerable to entering the informal sector because it is relatively easy to enter and does not require high qualifications. This young age group is included in Gen Z, so the existence of informal workers from the young age group can be used as an initial reflection of the employment conditions faced by Gen Z in general.

Gen Z is the population born in 1997-2012. As of February 2024, there were 18.4 million workers aged 15-24 years in Indonesia. As many as 8.3 million people or 45.1% of them work in the informal sector. Of the group of young people who work informally, 61% or 5.07 million people have the status of unpaid workers (Theodora, 2024). The availability of jobs that offer flexible time is increasingly driving the increase in the proportion of informal workers among Gen Z, in line with changes in the labor market landscape. This form of flexible work according to Gen Z based on a survey conducted by Deloitte (2024), work-life balance is a top priority for 22% of Gen Z compared to other aspects. This finding reflects a global trend showing an increase in flexible forms of work, which regionally can be linked to the increase in youth participation in the informal sector, including non-standard digital work..

However, the informal sector faces various challenges. As stated by Prihanto (2013), the absence of special qualifications often causes workers in this sector to have a low level of education, so that the quality of informal workers becomes a problem where the workforce working in the informal sector is dominated by workers who only have basic education, which limits their opportunities to enter the formal sector. Then, the average wage of informal workers for young people (15-24 years) is always lower than those working in the formal sector. According to Izzaty and Sari (2013), the determination of the minimum wage aims to ensure that workers receive a decent income. However, this regulation cannot be applied to informal workers, the majority of whom do not have work contracts, so the wages received by informal workers tend to be lower than those received by formal workers and their income is also unstable.

In addition to wages and education, workers in the informal sector also face challenges in dealing with limited access to social security, employment benefits, or legal protection, especially if they work in a dangerous environment (Sibagariang, Mauboy, Erviana, & Kartiasih, 2023). According to the OECD (2020), the long-term impacts of these limitations include decreased productivity and tax bases that can affect the country's economy. Then, these challenges are more prominent in regions with lower levels of economic development. Regions with small and limited GRDP per capita usually do not have the capacity to open decent and protected formal employment opportunities, which can encourage residents, especially Gen Z, to work in the informal sector. Therefore, GRDP per capita is also an important factor in explaining the level of informality in a region. Although the informal sector is significant to the national employment structure, its growth has not fully reflected the principles of inclusive and

sustainable development, especially in regions with low economic carrying capacity (World Bank, 2018).

In addition, Indonesia is facing a global commitment to achieve the sustainable development goals (SDGs), especially goal 8 which contains providing decent work and promoting inclusive and sustainable economic growth. This is in line with the 1945 Constitution Article 27 Paragraph 2 which guarantees the right to decent work for all citizens and Article 34 Paragraph 2 which emphasizes the importance of social security. According to the ILO, decent work includes productivity, fair compensation, social security, and protection of workers' rights.

Indonesia's employment conditions experienced significant shocks during the COVID-19 pandemic. In 2020, the percentage of informal Gen Z workers increased significantly from only 39.8% to 48.3% which then in the next period, 2021-2023, tended to fluctuate. The post-pandemic economic recovery period, according to WHO and the World Bank, is marked by major changes in the structure of the workforce, which is the expansion of digital-based informal work. The increase in the percentage of Gen Z in the informal sector, if not accompanied by appropriate policies, will put Indonesia at risk of hampering the increase in national productivity, and could increase the potential for youth unemployment and poverty, intergenerational inequality, and reduce contributions to the country's social security and tax systems.

The trend of informality in the workforce is getting more attention, studies that specifically analyze the variables that influence Gen Z working in the informal sector are still limited. Most previous studies have focused more on the general employment structure. For example, studies conducted by Antyanto (2014), Sibagariang et al. (2023), Cantika (2019), Birgitta (2021), and Angel-Urdinola & Tanabe (2012) which discuss the variables that influence labor absorption in the informal sector, but do not explicitly analyze Gen Z. Then there are several journals that discuss the Gen Z workforce during the pandemic, such as Basid & Atmaja (2022) who discuss the gig economy and Putranto & Natalia (2022) who discuss blue-collar. Then for 2021-2023 which is the post-pandemic recovery period, research is still limited. Thus, this study aims to fill this gap by identifying factors that increase the percentage of Gen Z informal workers in the post-pandemic period. The purpose of this study is to determine the general picture of the Gen Z workforce working in the informal sector in Indonesia in 2021-2023 and to determine what variables influence the percentage of the informal Gen Z workforce in Indonesia in 2021-2023.

## 2. Research method

This study analyzes the variables influencing the percentage of informal workers among Gen Z in Indonesia during the economic recovery period following the Covid-19 pandemic, from 2021 to 2023. The research draws on data from the National Labor Force Survey (Sakernas) and data from the Ministry of Manpower. The variables used are dependent and independent. The dependent variable is the percentage of informal workers among Gen Z, and the independent variables are RLS (Regional Employment Opportunity), wages, certified training, internet usage,

the Minimum Wage (UMP), and the per capita GRDP (Gross Regional Domestic Product). This study covers all 34 provinces in Indonesia from 2021 to 2023.

2.1. Analysis Method

The analysis methods used are descriptive analysis and panel data regression analysis. Data processing is carried out using the Rstudio, QGIS, and Eviews applications. Descriptive analysis in this study is used to describe the percentage of informal Gen Z workers in Indonesia in 2021-2023, which is a period of economic recovery. Panel data regression analysis is a regression method that uses panel data, namely data that combines time series and cross-section dimensions. According to Gujarati & Porter (2009), panel data involves the same cross-sectional units that are observed repeatedly over a certain period of time or in short, panel data has dimensions of space and time. According to Hutagalung & Darnius (2022) by using panel data regression analysis, researchers can find out the characteristics between times and between subjects in variable data that can vary. Therefore, the results of the panel data model estimation are more comprehensive and cover things that are close to reality. The use of panel data regression in this study is considered appropriate because it allows researchers to capture variations in the percentage of Gen Z's informal workforce not only between provinces but also across time throughout the economic recovery period. This approach offers the advantage of tracking the dynamics of changes and employment patterns that emerge from year to year, resulting in a more in-depth analysis that more fully reflects the reality of Gen Z's working conditions than using only a single cross-section of data.

This research was conducted with the following stages.

1. Building the CEM, FEM, and REM model specifications.
2. Conducting the Chow test to choose the best model between CEM and FEM
3. Conducting the Hausman test to choose the REM or FEM model
4. If both tests result in a decision to reject the null hypothesis, the FEM model is better used than the CEM and REM models.
5. If the FEM model is obtained, a variance-covariance structure test (LM and $\lambda$LM tests) is carried out. First, the LM test is carried out to detect heteroscedasticity in the residuals. If the null hypothesis is rejected, the test is continued with the $\lambda$LM test. If the null hypothesis is rejected, the $\lambda$LM test does not need to be carried out. The selected model is the FEM OLS.
6. Carrying out the selected model specifications, the model specifications can be written as follows

$$PIZ_{it} = (\alpha + \mu_i) + \beta_1 RLS_{it} + \beta_2 UPAH_{it} + \beta_3 SERT_{it} + \beta_4 INT_{it} + \beta_5 UMP_{it} + \beta_6 PDRB_{it} + v_{it} \quad (1)$$

Where $PIZ_{it}$ percentage of informal worker in province i in year t. RLS is the Average Years of Schooling of Gen Z, WAGE is the average wage received by Gen Z workers, SERT is the percentage of Gen Z workers who have received certified training, INT is the

percentage of Gen Z workers who use the internet in their work, UMP is the provincial minimum wage, PDRB is GRDP per capita at constant prices, 2021–2023, $\beta$ regression coefficient parameters, and $v_{it}$ error components of the i-th individual model and the t-th period, $\alpha$ constanta, $\mu_i$ i-th individual effect, i number of cross sections (provinces), and t number of years of observation.

7. Classical assumption tests (normality test and multicollinearity test) were carried out on the selected model.
8. Next, a significance test of the model is carried out by looking at the R-squared adj., simultaneous test, and partial test.

## 3. Results and Discussion

### 3.1. Descriptive Analysis

Based on the results of data processing from the 2021-2023 National Labor Force Survey, it can be seen that in the informal workforce group, Gen Z (1997-2012) continues to show an increase. In August 2021, there were 7.72 million Gen Z working in the informal sector, then in August 2022 it increased to 8.48 million people, and in August 2023 it increased again to 10.34 million people and the percentage tends to fluctuate.

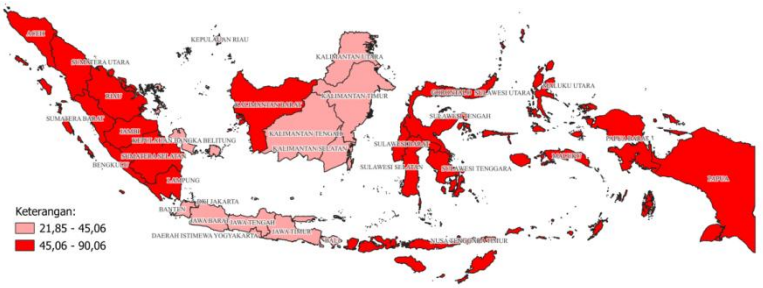



**Figure 3.** Percentage of Distribution of Informal Gen Z Workforce by Province in August 2023

Furthermore, based on Figure 3, it was found that there is an inequality of informal Gen Z workers in Indonesia and also shows that the majority of the workforce still works in the informal sector because they are dependent on work related to nature, such as agriculture, fisheries, and also small businesses and the underdevelopment of the formal sector (manufacturing, industry) and poor economic and educational infrastructure. (Amelya & Marna, 2023).

Furthermore, when viewed based on employment status, the majority of the informal Gen Z workforce in 2021-2023 worked as family workers, as can be seen in Figure 4.

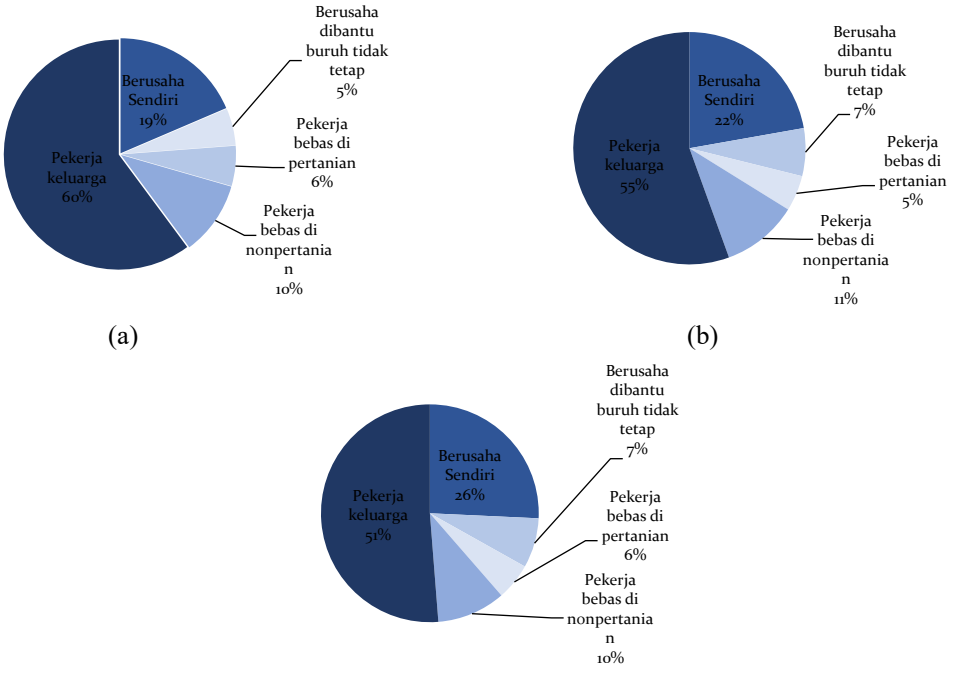
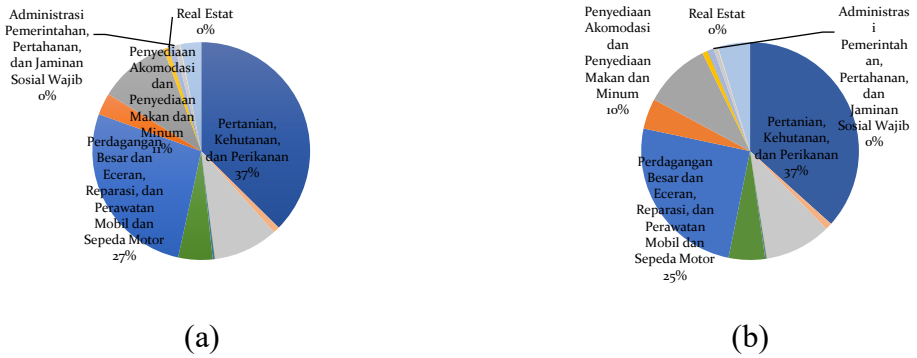
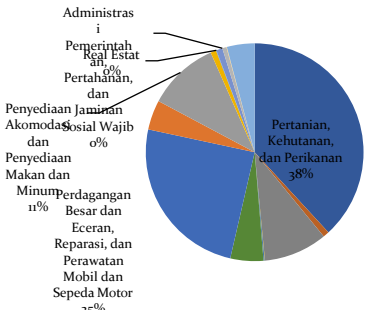



**Figure 4.** Percentage of Gen Z Informal Workforce by Employment Status: (a) 2021; (b) 2022; (c) 2023

This shows the dominance of unstable, low-income, and minimally protected jobs. In early 2021, the category of family workers was quite large due to the economic pressures of the pandemic, but began to decline in 2022 and 2023 along with the recovery of economic activity and increasing self-employment efforts through micro-enterprises. During this period, there was a tendency for an increasing role in self-employment, especially in the service and small trade sectors, which are widely accessed by Gen Z through social media and digital platforms.

Furthermore, based on the field of work, the informal workforce of Gen Z in 2021-2023 can be seen in Figure 5.






(c)

**Figure 5.** Percentage of Gen Z Informal Workforce Based on Field of Business: (a) 2021; (b) 2022; (c) 2023

Based on the field of work, the sector with the largest percentage of informal Gen Z workers during 2021-2023 is dominated by the traditional sector with labor-intensive characteristics and a low level of formalization. The agriculture, forestry, and fisheries sector is the largest absorber of informal Gen Z workers, followed by the wholesale and retail trade sector and the accommodation and food and beverage provision sector. Although the agricultural sector has fluctuated, the sector remains the largest mainstay, especially in provinces with an agrarian economic structure. This confirms that the primary sector still plays a major role in absorbing Gen Z workers.

In contrast, sectors such as real estate (approaching 0%) and government administration, defense, and mandatory social security (0%) show very low informal labor absorption rates, indicating that these sectors are formal and strictly structured, and generally require high qualifications and a selective recruitment process. This pattern shows that not all economic sectors have the same capacity to absorb young workers in the informal sector, thus creating inequality between sectors in providing job opportunities, where the informal sector is still the main buffer in areas with limited formal labor market capacity.

### 3.2. Panel Data Regression Model Estimation

The first thing to do is to select the best model, where based on the chow test and hausman test, the best model is FEM. Furthermore, because FEM was selected, an examination and testing of the residual variance-covariance matrix structure must be carried out with the Langrange Multiplier test and the Lambda Lagrange Multiplier test. The results obtained are that heteroscedastic and there is a cross-sectional correlation. So the model used in this study is FEMSUR. Furthermore, the model must meet the classical assumptions, namely the normality and multicollinearity tests. So it is found that the residual model is normally distributed and there is no multicollinearity problem.

Based on the previous results, it was found that FEM SUR is the best selected model used in conducting analysis and explaining the influence of the x variables used in this study on the

percentage of informal Gen Z workers in Indonesia in 2021-2023. The estimated FEM parameters produced can be seen in Table 2.

**Table 1.** FEM SUR Estimation

| Variable | coefficient | t-Statistics | t-Table | p-value |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| C (*intercept*) | 40,061 | 7,394 | 1,670 | 0,000* |
| RLS | 1,105 | 1,895 | 1,670 | 0,062* |
| UPAH | -1,320 | -14,803 | 1,670 | 0,000* |
| SERT | -0,193 | -2,846 | 1,670 | 0,006* |
| INT | 0,038 | 1,530 | 1,670 | 0,130 |
| UMP | 2,870 | 3,476 | 1,670 | 0,000* |
| PDRB | 0,2 | 4,140 | 1,670 | 0,000* |
| Summary Statistics | | | | |
| *R-Squared* | 0,9987 | F-*statistic* | | 1286,062 |
| *Adjusted R-Squared* | 0,9978 | Prob(F-*statistic*) | | 0,000* |

Source:National Labor Force Survey 2021-2023, proccessed

Based on Table 1, the regression equation formed can be written as follows:

$$PIZ_{it} = (40{,}061 + \mu_i) + 1{,}105RLS^*_{it} - 1{,}320UPAH^*_{it} - 0{,}193SERT^*_{it} + 0{,}038INT_{it} + 2{,}870UMP^*_{it} + 0{,}2PDRB^*_{it}$$

In Table 1, the coefficient of determination ($R^2 adjsted$) of the model is 99.78 percent. This can indicate that 99.78 percent of the variation in the percentage of Gen Z workers working in the informal sector can be explained by the variable x used. While the remaining 0.22 percent can be explained by other variables outside the model. Furthermore, a simultaneous test was carried out to test the significance of the independent variables simultaneously in influencing the dependent variable. In the processing, the results showed that the independent variables simultaneously influenced the dependent variable. After conducting simultaneous testing, partial testing was carried out. Based on the processing results in Table 2, it is known that all independent variables partially influence the percentage of Gen Z workers working in the informal sector in Indonesia with a significance level of 10 percent except for the variable percentage of Gen Z who use the internet in their work.

Fixed Effect Model is a model that has different individual effects for each cross section. Papua Province is the province with the highest individual effect and DKI Jakarta Province is the province with the lowest individual effect, meaning that if all independent variables are assumed constant, then the province with the highest percentage of Gen Z informal workers is Papua Province and the lowest is DKI Jakarta Province.

For the Gen Z informal workforce, RLS has a positive and significant coefficient. When the RLS variable increases by 1 year, the percentage of Gen Z informal workers increases by 1.106 percent. This is in line with Birgitta's research (2019) which shows that the relationship between RLS and the percentage of informal workers is positive. Sugiharti, Aditina, and Equivias (2022)

also show that although the informal sector is dominated by low-educated workers, there is an increasing trend in the percentage of highly educated workers in this sector. This is because the quality of education is uneven and during the study period which was the recovery period after COVID-19, the education process was disrupted and its quality declined so that the increase in RLS did not reflect an increase in the quality of the workforce.

The percentage of Gen Z workers who have taken certified training and the percentage of Gen Z informal workers have coefficients that are significantly negative. A one percent increase in Gen Z workers who have taken certified training will reduce the percentage of Gen Z informal workers by 1.159 percent. This is in line with research by Sugiharti, Aditina, & Equivias (2022), which shows that the role of certified training will support the workforce to acquire additional skills that make the area more valuable for employment, thereby increasing the region's opportunities to reduce the percentage of workers in the informal sector and encourage workforce transformation towards a more formal and protected direction.

In the informal workforce of Gen Z, the average wage received by Gen Z has a significant negative coefficient. An increase in the average wage received by Gen Z by 1 million rupiah will reduce the percentage of informal workers of Gen Z by 1.32 percent. This result is in accordance with research conducted by Birgitta (2021) and Cantika (2019) where net wages have a negative and significant relationship with the percentage of workers working in the informal sector. The higher the wages obtained, the percentage of informal workers decreases because workers will later offer their services to the formal sector to get higher wages (Spiegel, 2012). This also in line with the ILO (2023) and World Bank (2022) reports which show that improving the quality and compensation of formal work at the regional level can reduce the proportion of informal workers, especially in young age groups, during the post-pandemic transition period.

In the informal workforce of Gen Z, the UMP has a significant positive coefficient. An increase of one million rupiah will increase the percentage of informal workers of Gen Z by 2.87. Comola & de Mello showed that the increase in the UMP in Indonesia has encouraged an increase in informal workers in areas with rigid labor markets. Gunawan (2020) also found that a higher minimum wage increases the proportion of informal workers, especially among young people. The increase in the UMP burdens the formal sector with costs, so that Gen Z, who are generally just starting their careers and have little experience, are more vulnerable to moving to informal jobs. Therefore, a minimum wage policy without being followed by the creation of inclusive formal jobs tends to increase the number of young informal workers.

GRDP per capita at Constant Prices has a positive relationship with the percentage of informal Gen Z workers. This is also in line with research conducted by Hapsari, et al. (2023) which states that the growth of GRDP per capita is not accompanied by a decrease in informality, mainly due to the growth of the non-traditional service sector and the flexibility of the labor market, especially for young workers. In the context of Indonesia from 2021 to 2023, data shows that a number of provinces with high HK GRDP per capita still recorded a fairly high percentage of informal Gen Z workers. This is because several developed provinces

continue to experience stagnation in opening formal employment opportunities and are also followed by an increase in the contribution of the informal technology-based service sector and non-traditional economic activities.

## 4. Conclusion and Recommendations

This study analyzes the variables that influence the percentage of informal Gen Z workers in Indonesia in 2021-2023. Significant variables include Gen Z RLS, average wages received by Gen Z workers, Gen Z certified training, UMP, and GRDP per capita at Constant Prices. Gen Z RLS, UMP, GRDP per capita at Constant Prices, average wages received by Gen Z, and Gen Z certified training has a significant influence. However, internet use in work does not show a significant effect.

Based on these conclusions, several policy recommendations are proposed to reduce the percentage of informal Gen Z workers in Indonesia. First, adjust educational programs to ensure that educated individuals have the appropriate competencies to enter the workforce. Second, provide training to support the development of young people's skills so that they can compete effectively in the labor market together with adult workers. Furthermore, there needs to be special attention from the government to open formal employment opportunities and increase awareness among workers of the importance of having social protection by conducting educational campaigns that are packaged creatively and relevantly to convey the benefits and mechanisms of social security registration. And for further research, it is recommended to develop the analysis by adding other variables to obtain a more comprehensive picture and try to conduct in-depth interviews to capture subjective factors that are not covered by quantitative methods.

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