J-naker
Jurnal Ketenagakerjaan

Jurnal Ketenagakerjaan
Volume 19 No. 2, 2024
Online ISSN: 2722-8770
Print ISSN: 1907-6096

The Impact of Digital Technology on Women's Participation in the Labor Force in Papua Province

Aida Muthia Suhaib*, Fitri Kartiasih

STIS Polytechnic of Statistics

*Email Correspondence: 112111863@stis.ac.id

Abstract

The high female participation rate in Papua Province's labor force in 2015-2022 still needs to be followed by equity in each district/city. One of the targets of the Sustainable Development Goals (SDGs) is to increase women's empowerment through the use of digital or information and communication technology. The difference in ICT development conditions in Papua Province from 2015-2022 is feared to impact the unequal participation of females in the labor force in each district/city. This study aims to find out the general picture of women's labor force participation and digital technology to determine the influence of digital technology on the female labor force participation rate (FLFPR). The analysis approach included panel data regression analysis and descriptive analysis, and the data were secondary data taken from the BPS-Statistics Papua Province online publication. The results of the study show that digital technology (mobile phones usage, internet access, and computer usage), the average length of schooling (RLS) of women, the share of the agricultural sector in the GDP, and the average number of children have a significant effect on increasing FLFPR. In contrast, the GDP per capita is not significant. Therefore, it is necessary to improve and equitably distribute access and digital infrastructure as well as the ability to use it, especially for women.

Keywords: digital technology, flfpr, panel data regression, papua

DOI: 10.47198/jnaker.v19i2.342 Received: 31-3-2024 Revised: 23-8-2024 Accepted: 30-8-2024

1. Introduction

Female participation in the workforce is crucial in driving economic growth and development. More women entering the workforce can spur the economy to grow faster due to higher labor inputs (Ngoa & Simon, 2021). The female labor market can assist families in escaping the cycle of poverty on a micro level by raising household income and boosting consumption of

products and services (Asri et al., 2023; Sibagariang et al., 2023; Verick, 2018; Widiyasari et al., 2023). Furthermore, as stated in goal five of the Sustainable Development Goals (SDGs), "Gender equality and empowerment," raising the proportion of women in the workforce is perceived as a step toward achieving these goals (Shirazi, 2012).

Female labor force participation rate (FLFPR) is an indicator of the great potential of the workforce that can be utilized by a region (Annazah et al., 2021). BPS-Statistics Indonesia reported that the level of FLFPR in Indonesia increased from 2015 to 2022. In 2015, the FLFPR in Indonesia was 48.87 percent and continued to increase until 2022 to 54.31. Despite the increase, the value of FLFPR has remained stagnant at 50 percent for eight years. The national FLFPR is, on average, 51.75 percent. There are 17 provinces with an average FLFPR value above the national FLFPR, where Papua is one of the provinces with the highest average FLFPR in Indonesia during 2015-2022, which is 63.95. The high number of FLFPR means that the working-age female population who are ready to work or are economically active is getting larger (Sari & Anisah, 2023).

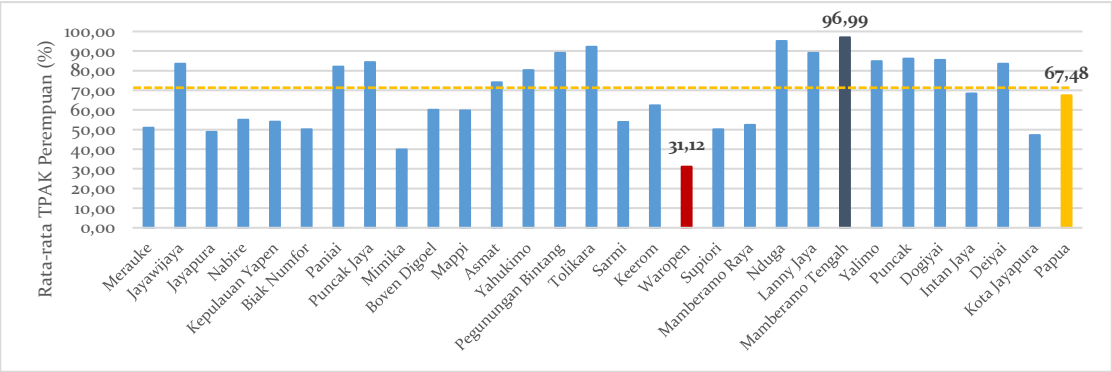


Figure 1. Average Women's TPAK in Papua Province by Regency/City, 2015-2022
Source: BPS-Statistics

During the 2015-2022 period, Waropen Regency became the area with the lowest average FLFPR in Papua Province, while the highest average FLFPR was in Central Mamberamo Regency. The difference between the highest and lowest average FLFPR in Papua Province which reached 65.17 percent shows that the value of FLFPR in Papua Province is heterogeneous. The high FLFPR in Papua Province does not indicate that the condition will be the same in the district/city area. In other words, female's participation in the labor force in districts/cities of Papua Province has not been evenly distributed.

Digital or information communication technology plays a critical part in the demands of rapid information sharing brought on by globalization (Kartiasih et al., 2023, 2023a, 2023b; Putri & Idris, 2020; Wiryany, Natasha, & Kurniawan, 2022; Umam & Kartiasih, 2023). Information And Communication Technology (ICT) has great potential for raising the proportion of female participation in the labor force fairly and consistently. Employment prospects Employers may rapidly and easily fill workforce demands by using ICT. However, married women are able to keep working from home by using ICT, saving them from having to resign from their jobs and roles.

(Chun & Tang, 2018; Davani & Sulistyaningrum, 2023; Ngoa & Simon, 2021; Roztocki, Soja, & Weistroffer, 2019). In addition, women, from professionals to housewives, use the internet a lot to increase productivity (Rahman, 2020). This is consistent with one of the Sustainable Development Goals (SDGs) at Goal 5 (target 5.b), which emphasizes that utilizing enabling technology—particularly information and communication technology—more frequently can lead to greater women's empowerment.

Indonesia's ICT development has great potential to develop (Badan Pusat Statistik, 2019). One of the measures used to see the development of ICT development nationally is through the ICT Development Index (IDI). Based on the IDI value, which ranges from 0-10, ICT development in Indonesia has increased for eight years, marked by an increase in IDI value from 3.88 in 2015 to 5.85 in 2022. However, the average IP-ICT score in Papua Province has always been in the lowest category with a score of 3.07 and is below Indonesia's IDI value of 5.10 during 2015-2022. A low IDI score indicates a low value of the IDI constituent subindex (Badan Pusat Statistik, 2023a). In other words, ICT development in the Papua region still needs to be improved. This reflects the fact that there are differences in ICT development conditions between Papua Province and other provinces in Indonesia. This difference is certainly inseparable from the problem of uneven ICT development, which shows limited access to technology. Papua is a province that has challenges in digital infrastructure, so it is feared that it may have an effect on the unequal participation of female in the labor force in its districts/cities.

Various studies have been conducted on digital technology's influence on female participation in the workforce. Scarf & Sulistiangirum (2023) concluded that IDI and Total Fertility Rate (TFR) in Indonesia significantly impact how many women are hired. Ngoa & Simon (2021) found that in 48 African countries, women's engagement in the job market increased dramatically as a result of using mobile phones, the internet, and receiving an education. Similar to the research conducted by Watson, Corliss, & Le (2018) in some Indo-Pacific countries, internett use also has a significant effect. However, more related research is carried out abroad at the country or provincial estimates level. This study intends to ascertain the overall status of women's employment and digital technology in Papua Province from 2015 to 2022, as well as the impact of digital technology on women's labor force participation across the district/city levels in Papua Province from 2015 to 2022.

2. Research Methods

This study covers 28 out of 29 districts/cities in Papua Province. One district/city, namely Nduga Regency, must be covered due to limited data. Panel data, which combines time series data (2015–2022 period) and cross-section data (28 districts/cities), is used in this analysis. The female labor force participation rate (FLFPR) is the dependent variable. At the same time, the percentage of women who own/control mobile phones, the percentage of women who access the internet, and the percentage of women who own/control computers are the independent variables. Furthermore, this study also involves control variables such as GDP per capita (rupiah),

average length of schooling (RLS) for women (years), share of the agricultural sector to GDP (percent), and average number of children (people). GDP per capita is a measurement of the value-added increase in the products and services generated by its different production units per person at a given time. This variable controls economic development between regions and reflects that an increase in income levels affects the availability of workers. The average length of schooling for women is the average number of years that female citizens who are 25 years of age and older spend pursuing formal education. This variable for controlling higher education tends to increase skills and knowledge, which can improve women's chances of entering the job market. The percentage of an agricultural sector's economic contribution to an area is expressed as its share of GDP. This variable is to control agricultural activities that are widely cultivated in Papua Province, thereby encouraging labor supply. The average number of children reflects the average number of children each household has. This variable is to control the fact that the presence of children can motivate women to enter the workforce because of their duty to provide for their families.

Secondary data from the BPS-Statistics Papua Province is the source of the data used, which is collected through various official publications in the form of electronic information. Electronic publicity is published annually through www.bps.go.id and www.papua.bps.go.id, consisting of the State of the Labor Force; Information and Communication Technology Development Index; People's Welfare Statistics; People's Welfare Indicators; and Papua Province GDP according to Business Field. Both descriptive and inferential analysis were applied in this research. The goal of descriptive analysis is to describe the data's state. Moreover, panel data regression is the inference approach applied. There are a total of 224 observations because the panel data observation unit includes 28 districts/cities in the province of Papua from 2015 to 2022.

The following are the steps involved in applying the panel data regression model to inferential analysis:

1. By utilizing the Chow, Hausman, and Breusch Pagan-Lagrange Multiplier (BP-LM) tests, determine which of the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) has the best fit.
2. Finding out if the residual variance-covariance structure is homoscedastic or heteroscedastic requires running a residual variance-covariance matrix structure test using the Lagrange Multiplier test. When the structure of the residual variance-covariance matrix is heteroscedastic, it is followed by a λ_{LM} test to find out if there is an individual cross-sectional correlation.
3. Select the appropriate estimation method based on the amtrix structure of residual variance-covariance and cross-sectional correlation between individuals.
4. Conduct a classical assumption test using the estimation method. Ordinary least square (OLS) estimation requires that the underlying assumptions of non-autocorrelation, homoscedasticity, normality, and non-multicollinearity be met. On the other hand, normality

and multicollinearity are prerequisites for using Generalized Least Square (GLS) or Feasible Generalized Least Square (FGLS) as estimate methods.

5. Conducting a model significance test with a determination coefficient R^2 and R^2_{Adj}, a model significance test simultaneously with the F test and partially with the T test.
6. Analyze the chosen panel data model.

   The panel data regression model used in this study is as follows (Gujarati, 2009):

$$TPAK_{it} = \beta_0 + \beta_1 Seluler_{it} + \beta_2 Internet_{it} + \beta_3 Komputer_{it} + \beta_4 PDRBpkapita_{it} + \beta_5 RLS_{it} + \beta_6 Agri\_Share_{it} + \beta_7 Anak_{it} + \varepsilon_{it} \quad (1)$$

where, $TPAK_{it}$ it is the level of participation of women in the labor force; $Seluler_{it}$ is the percentage of women who own/control a mobile phone; $Internet_{it}$ is the percentage of women who access the internet; $Komputer_{it}$ is the percentage of women who own/master computers; $PDRBpkapita_{it}$ is GDP per capita; RLS_{it} is the average length of schooling for women; $Agri\_Share_{it}$ is the share of the agricultural sector in GDP; $Anak_{it}$ is the average number of children; β_0 is an intercept; $\beta_1 \ldots \beta_7$ is the regression coefficient of the independent variable; ε_{it} is an error; i is the-i district/city in Papua Province; and t is period of the-t.

3. Results and Discussion

3.1. Overview of the Employment Status of Women in Papua Province in 2015-2022

Employment is one of the important indicators of economic activities. The participation of the workforce determines the progress of development in an area. The workforce also empowers and applies other factors to achieve the planned goals (Hidayat, Sutrisno, & Hadi, 2017). An overview of women's employment conditions at the district/city level can be shown from the female labor force participation rate (FLFPR) value.

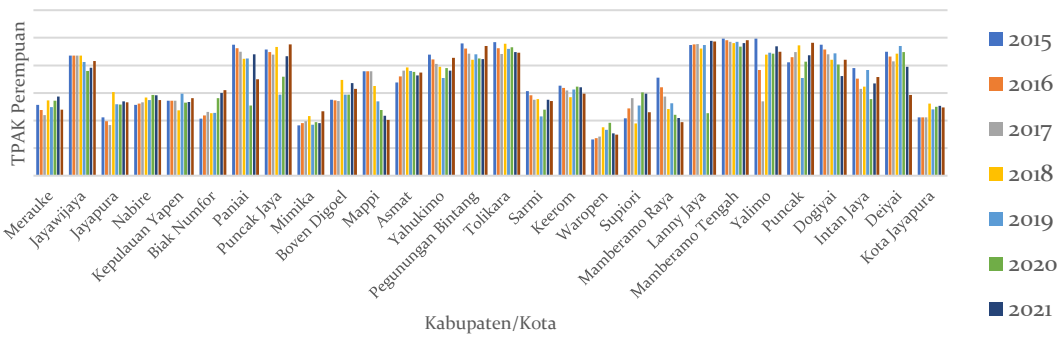


Figure 2. Papua Province FLFPR by Regency/City, 2015-2022
Source: BPS-Statistics

Figure 3 illustrates that for the period of 2015–2022, most districts/cities in Papua Province tend to experience diversity in FLFPR. Within eight years, Waropen Regency became the area with the lowest FLFPR. However, in general, the value of FLFPR increased from 2015 to 2020, then decreased in 2021-2022. In 2015, the FLFPR in Waropen Regency was 26.21 percent, and the value continued to increase until 2018 to 35.01 percent. The highest FLFPR score was in 2020, which was 38.33 percent, and continued to decline until 2022 at 29.72 percent. Then, in 2015, Central Mamberamo Regency had the highest FLFPR of 99.36 percent, indicating that nearly all of the population of working age is included in the labor force. In the following years, namely 2016-2022, Central Mamberamo Regency experienced fluctuations but remained the area with the highest FLFPR score in Papua Province. Geographically, Central Mamberamo Regency is a mountainous area with the agricultural sector as the main contributor to its economic activities. Thus, FLFPR in the region tends to be high because the agricultural sector does not require special qualifications that make it easier for women to work (Badan Pusat Statistik, 2023b). On the other hand, most of the Waropen Regency is a coastal area where the role of men is more dominant than that of women. The increase on FLFPR in a district/city indicates that women are starting to actively contribute to the job market, either by working, looking for a job or preparing for a business. This is a success of various policies that have been carried out by the central or regional governments in achieving gender equality (Badan Pusat Statistik, 2023b).

3.2. Overview of Digital Technology and Other Variables in Papua Province in 2015 and 2022

The proportion of women who own/control mobile phones increased in 2022 in nearly all Papua Province districts/cities. However, the increase in value has not been followed by a decrease in diversity. The area with the highest percentage of women who own/control a phone in 2022 is still the same, namely Jayapura City at 76.27 percent – but Puncak Regency is no longer the area with the lowest percentage value. Tolikara Regency moved this place, which had a drop in the proportion of women who own/control mobile phones (totaling 7.04 percent). Figure 3 shows that there is diversity between districts/cities in digital variables. In 2015, the highest percentage of women who owned/controlled mobile phones was in Jayapura City with a score of 73.12 percent and the lowest value was in Puncak Regency with a value of 4.4 percent (Figure 3a). Economic, social, and technological factors can influence the diversity of mobile phone ownership/ownership. An individual's or family's income directly affects the ability to buy and own a cell phone (James, 2011). In Puncak Regency, women's main business field is the agricultural sector, where income is relatively low. In contrast to women in Jayapura City who are predominantly employed in the trade, restaurant, and accommodation sectors, the income received is greater (Badan Pusat Statistik, 2022).

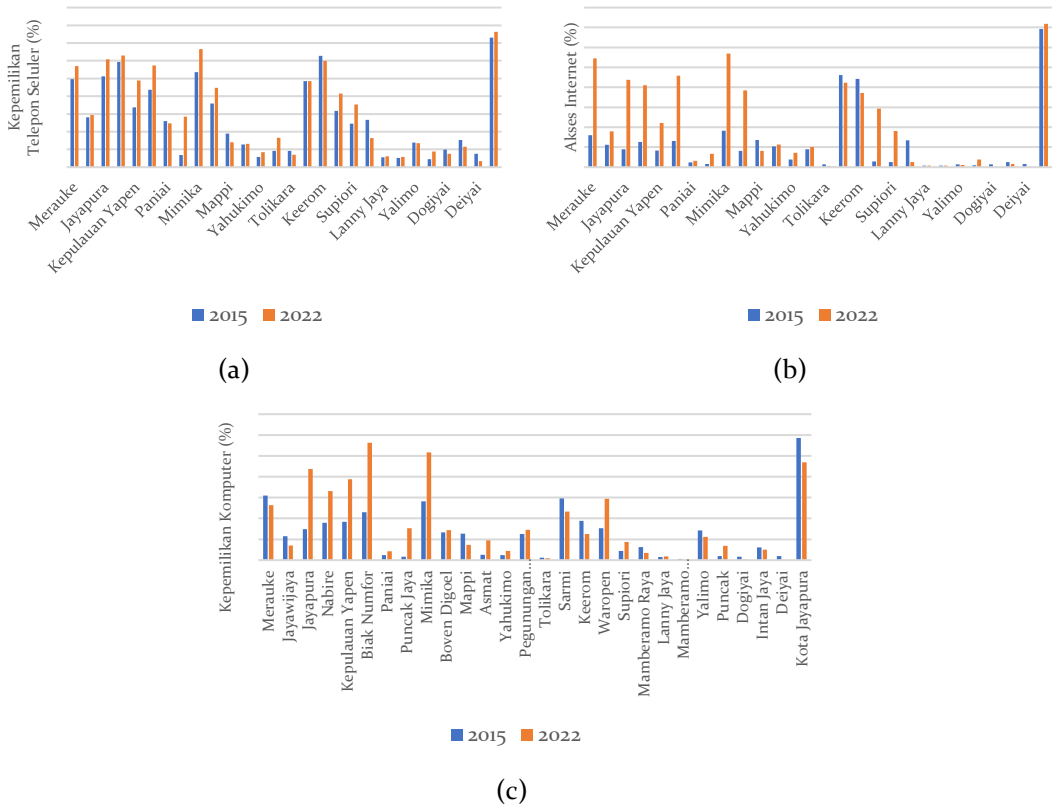
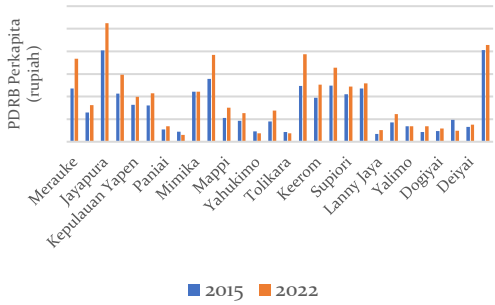


Figure 3. Development (a) Mobile phone ownership; (b) Internet access; and (c) Computer ownership in Papua Province in 2015 and 2022
Source: BPS-Statistics

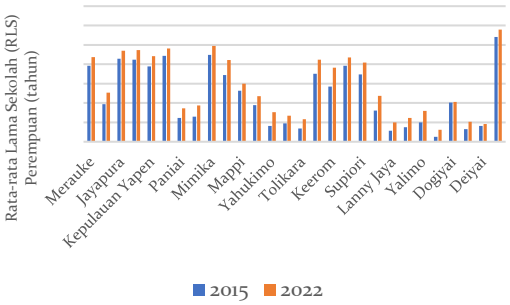
The highest number of women accessing the internet was in Jayapura City, with a score of 69.35 percent, and the lowest score was in Lanny Jaya Regency, with a score of 0.74 percent in 2015 (Figure 3b). Then, in 2022, the percentage of women using the internet increased dramatically in practically all Papua Province districts/cities. However, the increase in the percentage value has not been followed by a decrease in the gap. Geographically, the existence of Jayapura City makes it easier to develop digital infrastructure because of its easily accessible areas, so that digital infrastructure in these areas is more adequate. It is different in Lanny Jaya, Puncak, and Dogiyai Regency, which is a mountainous area and difficult to access.

The diversity of women who own/control computers between districts/cities in Papua Province is quite high. In 2015, the highest percentage of women who owned/control computers were in Jayapura City with a score of 29.33 percent and the lowest score was in Central Mamberamo Regency with a value of 0.29 percent (Figure 3c). Then in 2022, almost all districts/cities in Papua Province experienced a rapid increase in the percentage of women who own/control computers. However, the increase in the percentage value has yet to be followed by a decrease in the gap. The area with the highest percentage of women who own/control

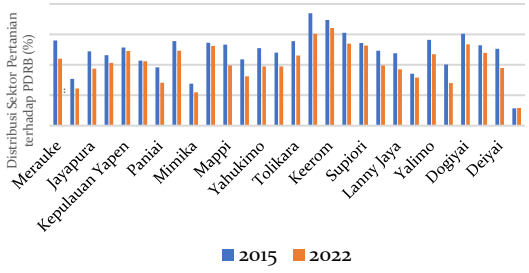
computers in 2022 is Biak Numfor Regency at 28.15 percent – but Central Mamberamo Regency is no longer the area with the lowest percentage value. This position was shifted by Deiyai Regency, which experienced a decrease in the percentage of women who owned/controlled computers with a percentage value of 0.02 percent. The availability of adequate telecommunications network infrastructure, the ability to purchase goods, and the level of education play an essential role in the adoption of technology, including computer ownership/controls (James, 2011; Wei & Hindman, 2011). Regencies in mountainous areas such as Puncak, Deiyai, and Lanny Jaya tend to experience difficulties accessing education and digital infrastructure.



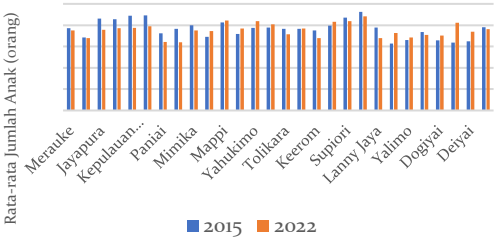
(a)



(b)



(c)



(d)

Figure 4. Development (a) GDP per capita; (b) Average length of schooling (RLS) of women; (c) The share of the agricultural sector in the GDP; and (d) The average number of children in Papua Province in 2015 and 2022

Source: BPS-Statistics

GDP per capita (Figure 4a) and average length of schooling (RLS) of women (Figure 4b) tend to increase from 2015 to 2022 in almost all districts/cities. However, this increase has not been followed by equity and a decrease in the gap between districts/cities. This indicates that community welfare and education levels are improving in various districts/cities in Papua Province. Meanwhile, the share of the agricultural sector in GDP (Figure 4c) and the average

number of children (Figure 4d) have decreased in several districts/cities from 2015 to 2022, this shows how government programs, such as Family Planning (KB), are being implemented in the Papua Province region. Based on the 2018-2023 Papua RPJMD publication, 19 districts in the Papua region are located in hard-to-access plains and mountainous areas. The diversity of geographical conditions in district/city areas that are not balanced is one of the obstacles the provincial government has faced so far in optimizing equitable development.

3.3. The Influence of Digital Technology on Women's Participation in the Labor Force in Papua Province

Regression analysis of panel data typically uses three models: Random Effect Model (REM), Fixed Effect Model (FEM), and Common Effect Model (CEM). To ascertain the panel data regression model, the Chow, Hausman, and Breusch Pagan Lagrange Multiplier (BP-LM) tests must be performed. In order to choose between Fixed Effect Model (FEM) and Common Effect Model (CEM), the Chow test was used to see whether there were variations in intercepts in each district/city. In order to choose between Fixed Effect Model (FEM) and Random Effect Model (REM), the Hausman test was used to determine whether there is a correlation between individual effects and independent variables. Table 1 displays the findings from the Hausman and Chow tests.

Table 1. Chow Test and Hausman Test Results

Test	Ho	H1	Test Statistics	*p-value*	Results	Conclusion
Chow Test	CEM	FEM	14,876	0,000	H_0 Rejected	FEM
Uji Hausman	REM	FEM	65,794	0,000	H_0 Rejected	FEM

Source: Processed

In estimating the panel data regression model, Table 1 demonstrates that the FEM model performs the best. Additionally, in order to identify the best estimation technique, tests are run on the residual variance-covariance matrix's structure.

Table 2. LM Test and Tests λ_{LM} Results

Test	Ho	H1	Test Statistics	Critical Value	Results	Conclusion
LM Test	Homoscedastic	Heteroskedastic	184,877	40,113	H_0 Rejected	Heteroskedastic
Test λ_{LM}	No cross-sectional correlation	There is cross-sectional correlation	470,874	424,334	H_0 Rejected	There is cross-sectional correlation

Source: Processed

It is clear from Table 2's test findings that the residual model's variance-covariance matrix structure is heteroscedastic. Furthermore, at a significance level of 5 percent, sufficient evidence was obtained to state that there was a cross-sectional correlation between individuals in

districts/cities in Papua Province. Based on the two tests that have been carried out, so the estimation method used in forming FEM is FGLS with a Seemingly Unrelated Regression (SUR)-PCSE.

Table 3. LM Test and Tests λ_{LM} Results

Test	Ho	H1	Test Statistics	Critical Value	Results	Conclusion
Jarque-Bera Test	Normally distributed residual	Residual is not normally distributed	4,431	0,109	H_o Accepted	Normally distributed residual
Non-Multicollinearity Examination						
Variable		VIF	Variable		VIF	
Seluler		3,197	PDRBpkapita		6,219	
Internet		5,378	RLS		1,481	
Komputer		2,457	Agri_Share		4,683	
			Anak		3,817	

Source: Processed

Table 3 shows the results of normality assumption testing and non-multicollinearity checks. The Jarque-Bera test yielded a p-value of 0, higher than the 5 percent significance level. The assumption of normality is satisfied since the residuals, according to the results, follow a normal distribution. Concurrently, VIF was used to examine the beliefs of non-multicollinearity. and showed that there was no violation of non-multicollinearity assumptions because all VIF values were not more than 10.

Table 4. Summary of Panel Data Regression Model Estimation Output

Variable	Coefficient	t-Statistic	Prob.
C	-31,475	-0,906	0,366
Seluler	0,833	10,581	0,0000
Internet	0,089	2,388	0,017
Komputer	0,246	3,552	0,000
ln(PDRBpkapita)	0,380	0,198	0,843
RLS	1,369	2,411	0,017
Agri_Share	2,140	9,481	0,000
Anak	2,704	4,511	0,000
Summary of Statistics			
R^2		0,987	
R^2_{Adj}		0,985	

Summary of Statistics	
F_{hitung}	436,497
p-value	0,000

Source: Processed

Based on the FGLS SUR-PCSE method's FEM estimation, the result was obtained that the p-value of the simultaneous test F was 0.000 which was less than the significance level of 5 percent. This indicates that FLFPR in Papua Province is significantly influenced by at least one of the seven independent variables. Additionally, the partial t-test results show six significant variables at the test level of 5 percent. The value RAdj2=98,5 shows that 98.5% of the diversity of FLFPR in the province of Papua is explained by the model that was developed. In the meantime, variables not included in the model account for 1.5% of the explanation.

The regression equation of the panel data formed is as follows.

$$\widehat{TPAK}_{it} = (-31{,}475 + \hat{\mu}_i) + 0{,}833\ Seluler^*_{it} + 0{,}089\ Internet^*_{it} + 0{,}246\ Komputer^*_{it} + 0{,}380 \ln(PDRBpkapita)_{it} + 1{,}369\ RLS^*_{it} + 2{,}140\ AgriShare^*_{it} + 2{,}704\ Anak^*_{it} \quad (2)$$

Information: *significant on $\alpha = 5\%$

Based on Table 4, the percentage of women who own/control mobile phones have a positive and significant effect on FLFPR. This means that every 1 percent increase in women who own/control a cell phone will increase the FLFPR by 0.833 percent, assuming other variables are fixed or constant. In accordance with research Putri & Idris (2020) that the use of mobile phones makes women more accessible to actualize their abilities and skills so that they are able to improve their competence and compete in the labor market.

The percentage of women who own/control the internet has positively and significantly affected FLFPR. Every 1 percent increase in women accessing the internet will increase FLFPR by 0.089 percent, assuming other variables are fixed or constant. Research by Ngoa & Simon (2021) stated that the internet, which includes information and communication technology (ICT), can help women in managing work-life balance. Furthermore, female's tiny share in the workforce may be influenced by financial constraints, which the internet helps them overcome, as well as socioeconomic and cultural restrictions.

The percentage of women who own/master computers positively and significantly affects FLFPR. It means every 1 percent increase in women who own/master computers will increase FLFPR by 0.246 percent, assuming other variables are fixed or constant. In line with the research conducted by Rachmawati, Choirunnisa, Pembagyo, & Syarafina (2021) which explains the use of computers and mobile phones as hardware in performing remote work (work from home). The number of people who view work and family boundaries as fluid and potential avenues for women to enter the workforce is increasing among those who utilize digital technologies for working from home.

GDP per capita does not have a significant effect on FLFPR. This study's findings are consistent with the findings of the Scarf & Sulistiangirum (2023) that GDP per capita does not significantly affect FLFPR in Indonesia. It describes how the Papua Province's income does not rise considerably, which has no impact on the availability of female labor. In the province of Papua, women labor mainly in the agricultural sector, where pay is quite meager.

Women's average length of schooling (RLS) has a positive and significant effect on FLFPR. The regression coefficient of 1.369 shows every 1-year increase in the average size of schooling for girls will increase 1.369 percent of FLFPR, assuming other variables are fixed or constant. The findings of this study are consistent with earlier studies carried out by Septiawan & Wijaya (2019) and Alamsyah & Effendi (2020). The study explains how women's educational attainment and FLFPR are related. Women have a better chance of breaking into the workforce if they are more educated.

Table 5. Individual Effects

Regency/City	Individual Effects	Regency/City	Individual Effects
Merauke	-50.273	Tolikara	44.616
Jayawijaya	39.783	Sarmi	-61.917
Jayapura	-49.543	Keerom	-59.337
Nabire	-49.207	Waropen	-70.043
Yapen Islands	-34.772	Supiori	-37.188
Biak Numfor	-42.056	Mamberamo Raya	-6.5165
Paniai	36.144	Lanny Jaya	52.429
Puncak Jaya	26.701	Central Mamberamo	72.642
Mimika	-44.690	Yalimo	32.525
Boven Digoel	-28.159	Top	60.140
Mappi	0.834	Dogiyai	30.588
Asmat	30.607	Intan Jaya	19.345
Yahukimo	40.350	Deiyai	44.258
Pegunungan Bintang	44.852	Jayapura City	-42.115

Source: Processed

The agricultural sector's share has a positive and significant effect on FLFPR. Every 1 percent increase Share of the agricultural sector to GDP will increase 2.140 percent of FLFPR, assuming other variables are fixed or constant. Consistent with research, Septiawan & Wijaya (2019) say the agricultural sector has helped increase female participation in the labor force. This is because the agricultural industry does not require higher education qualifications, so it is easier for women to contribute.

The average number of children has a positive and significant effect on FLFPR. It means every 1-point increase in the average number of children will increase 2.7045 percent FLFPR, assuming other variables are fixed or constant. Consistent research, Scarf & Sulistiangirum (2023) and Purvahati (2019) say that the average number of children has increased, which motivates women to work to support their families.

Table 5 shows that Central Mamberamo has the most significant individual effect among other districts/cities. This means that when all independent variables and control variables are constant, the female labor force participation rate (FLFPR) from Central Mamberamo will be the highest. On the other hand, Waropen has the lowest individual effect among other districts/cities, so if the independent variable is constant, the female labor force participation rate (FLFPR) of Waropen is the lowest. The existence of Central Mamberamo Regency is geographically located in the central mountainous region with the agricultural sector as the main contribution to its economic activities. Thus, FLFPR in the region tends to be high because the agricultural sector does not require special qualifications that make it easier for women to work (Badan Pusat Statistik, 2023b). On the other hand, most of the Waropen Regency is a coastal area where the role of men is more dominant than that of women.

4. Conclusion and Recommendations

During 2015-2022, FLFPR in most districts/cities in Papua Province experienced fluctuations. The highest FLFPR was in Central Mamberamo Regency from 2015 to 2022, with its diverse development in each district/city, starting from an increase, little change, or a decrease. Women's ownership/control of mobile phones, internet access, and computers has increased from 2015 to 2022 but has yet to be able to reduce diversity or disparities between districts/cities. GDP per capita, women's average length of schooling, and the agricultural sector's share of GDP tend to increase from 2015 to 2022. The increase was followed by equity in some districts/cities. The average number of children in a family has decreased in most districts/cities in Papua Province, with the lowest average number of children in 2022 being in Puncak Jaya Regency.

The percentage of women who own/control mobile phones, the percentage of women who access the internet, and the percentage of women who own/control computers significantly increase FLFPR in Papua Province. The average length of schooling, the share of the agricultural sector in the GDP, and the average number of children also significantly increased FLFPR in Papua Province. Meanwhile, GDP per capita does not significantly affect the increase in FLFPR in Papua Province.

Based on the conclusion above, the provincial and district/city governments in Papua Province are expected to strengthen digital literacy for the community, especially women, for example technology skills training and economic empowerment through online markets and e-commerce. It is also necessary to introduce digital technology to women farmers so that they can increase the efficiency and competitiveness of the agricultural sector.

References

Alamsyah, & Effendi, M. (2020). Pengaruh Tingkat Pendidikan dan Upah Minimum terhadap Penyerapan Tenaga Kerja di Provinsi Kalimantan Selatan Tahun 2014-2018. *Jurnal Ilmu Ekonomi Dan Pembangunan*, *3*(2), 500–515. https://doi.org/10.1016/j.fcr.2017.06.020

Annazah, N. S., Suryono, I. L., & Muhyiddin. (2021). *Visualisasi Informasi Ketenagakerjaan Berbasis Spasial: Komparasi Kondisi Ketenagakerjaan Umum di Indonesia Tahun 2008-2020 (Studi Kasus : Tingkat Partisipasi Angkatan Kerja dan Pengangguran Tahun 2008-2020)*. Pusbangjak.

Asri, Y. S., Wijayanti, S. K., Vianey, A. M., & Kartiasih, F. (2023). Indikator Ketenagakerjaan terhadap Kemiskinan di Indonesia. *Jurnal Ekonomi: Journal of Economic*, *14*(2), 157–166. https://doi.org/https://doi.org/10.47007/jeko.v14i02.7242

Badan Pusat Statistik. (2019). *Indeks Pembangunan Teknologi, Informasi, dan Komunikasi (ICT Development Index) 201*.

Badan Pusat Statistik. (2022). *Keadaan Ketenagakerjaan Provinsi Papua 2022*.

Badan Pusat Statistik. (2023a). *Indeks Pembangunan Teknologi, Informasi, dan Komunikasi 2022*.

Badan Pusat Statistik. (2023b). *Profil Ketenagakerjaan Provinsi Papua 2022*.

Chun, N., & Tang, H. (2018). Do Information and Communication Technologies Empower Female Workers? Firm-level Evidence From Vietnam. *ADB Economics Working Paper Series D0*, 49. www.adb.org

Davani, I., & Sulistyaningrum, E. (2023). Pengaruh Digitalisasi terhadap Penyerapan Tenaga Kerja Perempuan Indonesia. *Jurnal Ekonomi Indonesia*, *11*(3), 301–316. https://doi.org/10.52813/jei.v11i3.240

Gujarati, D. N. (2009). *Basic Econometrics* (5th ed.). Mc Graw Hill.

Hidayat, M., Sutrisno, S., & Hadi, M. F. (2017). Tingkat Partisipasi Angkatan Kerja (TPAK) Perempuan Antar Kabupaten Di Provinsi Riau. *Media Trend*, *12*(1), 76–89. https://doi.org/10.21107/mediatrend.v12i1.2541

James, J. (2011). Sharing Mobile Phones in Developing Countries: Implications for the Digital Divide. *Technological Forecasting and Social Change*, *78*(4), 729–735. https://doi.org/10.1016/j.techfore.2010.11.008

Kartiasih, F., Djalal Nachrowi, N., Wisana, I. D. G. K., & Handayani, D. (2023). Inequalities of Indonesia's regional digital development and its association with socioeconomic characteristics: a spatial and multivariate analysis. *Information Technology for Development*, *29*(2–3), 299–328. https://doi.org/10.1080/02681102.2022.2110556

Kartiasih, F., Nachrowi, N. D., Wisana, I. D. G. K., & Handayani, D. (2023a). *Potret Ketimpangan Digital dan Distribusi Pendapatan di Indonesia: Pendekatan Regional Digital Development Index* (1st ed.). UI Publishing.

Kartiasih, F., Nachrowi, N. D., Wisana, I. D. G. K., & Handayani, D. (2023b). Towards the quest to reduce income inequality in Indonesia: Is there a synergy between ICT and the informal sector? *Cogent Economics & Finance*, *11*(2), 1–18. https://doi.org/10.1080/23322039.2023.2241771

Ngoa, G. B. N., & Simon, L. J. (2021). Female participation in African labor markets: The role of Information and Communication Technologies. *Telecommunications Policy*, *45*(9). https://doi.org/10.1016/j.telpol.2021.102174

Purbowati, A. (2019). *Kelahiran Yang Tidak Direncanakan : Apakah Hambatan Bagi Wanita Untuk*

Bekerja? 14(1), 14–28.

Putri, R., & Idris, I. (2020). Pengaruh Teknologi Informasi dan Komunikasi Terhadap Pasar Tenaga Kerja dan Pertumbuhan Ekonomi di Indonesia. *Jurnal Kajian Ekonomi Dan Pembangunan*, *2*(4), 15. https://doi.org/10.24036/jkep.v2i4.13386

Rachmawati, R., Choirunnisa, U., Pambagyo, Z. A., & Syarafina, Y. A. (2021). *Work from Home and the Use of ICT during the COVID-19 Pandemic in Indonesia and Its Impact on Cities in the Future*. 1–17.

Rahman, W. A. (2020). *Pengaruh Tingkat Partisipasi Angkatan Kerja Perempuan,Perempuan Yang Pernah Mengakses Internet Dan PersentasePenduduk Perempuan Terhadap Indeks Pemberdayaan GenderProvinsi Di Pulau Kalimantan*. 1–34.

Roztocki, N., Soja, P., & Weistroffer, H. R. (2019). The role of information and communication technologies in socioeconomic development: towards a multi-dimensional framework*. *Information Technology for Development*, *25*(2), 171–183. https://doi.org/10.1080/02681102.2019.1596654

Sari, D. N., & Anisah, L. (2023). Studi Ketenagakerjaan Jawa Tengah: Analisis Data Sakernas 2019-2022. *Jurnal Ketenagakerjaan*, *18*(3), 308–318. https://doi.org/10.47198/jnaker.v18i3.259

Septiawan, A., & Wijaya, S. H. (2020). *Determinan Tingkat Partisipasi Angkatan Kerja Perempuan Di Indonesia Tahun 2015-2019 Menggunakan Model Regresi Data Panel*. 449–461.

Shirazi, F. (2012). Telematics and Informatics Information and communication technology and women empowerment in Iran. *Telematics and Informatics*, *29*(1), 45–55. https://doi.org/10.1016/j.tele.2011.02.001

Sibagariang, F. A., Mauboy, L. M., Erviana, R., & Kartiasih, F. (2023). Gambaran Pekerja Informal dan Faktor-Faktor yang Memengaruhinya di Indonesia Tahun 2022. *Prosiding Seminar Nasional Official Statistics 2023*, *Vol.1 2023*, 151–161.

Umam, K., & Kartiasih, F. (2023). Resiliensi Wilayah terhadap Shock Pandemi COVID-19 : Studi Kasus Kabupaten/Kota di Pulau Jawa. *Jurnal Ekonomi Indonesia*, *12*(3), 283–304. https://doi.org/Retrieved from https://jurnal.isei.or.id/index.php/isei/article/view/415

Verick, S. (2018). *Female labor force participation and development Improving outcomes for women takes more than raising labor force participation — good jobs are important too*. *September 2014*, 1–11. https://doi.org/10.15185/izawol.87.v2

Watson, T., Corliss, M., & Le, M. (2018). Digitalisation and Women's Workforce Participation in the Indo-Pacific. *Australian Journal of Labour Economics*, *21*(1), 45–74.

Wei, L., & Hindman, D. B. (2011). Does the digital divide matter more? Comparing the effects of new media and old media use on the education-based knowledge gap. *Mass Communication and Society*, *14*(2), 216–235. https://doi.org/10.1080/15205431003642707

Widiyasari, A. I., A'mal, I., Yunardi, N. F. P., & Kartiasih, F. (2023). Analisis Variabel Ketenagakerjaan Terhadap Produktivitas Pekerja Indonesia Tahun 2022. *Prosiding Seminar Nasional Official Statistics 2023*, *Vol.1 2023*, 117–127.

Wiryany, D., Natasha, S., & Kurniawan, R. (2022). Perkembangan Teknologi Informasi dan Komunikasi terhadap Perubahan Sistem Komunikasi Indonesia. *Jurnal Nomosleca*, *8*(2), 242–252. https://doi.org/10.26905/nomosleca.v8i2.8821