Forum Analisis Statistik
Desember 2024, 4 (2): 91-102

A Dynamic Panel Model to Identify Factors Affecting the Labor Force Participation Rate in Districts/Municipalities of Kalimantan Barat Province in 2018 – 2023

Murni Syahida[1*], Yuyun Eka Pratiwi[2], Nur Asih Kurniawati[3]

[1,2,3] Universitas Tanjungpura, Jl. Prof. Dr. H. Hadari Kota Pontianak;
[3]Badan Pusat Statistika Provinsi Kalimantan Barat, Jl. Sultan Syahrir, Pontianak
*Penulis Korespondensi. e-mail: h1091221026@student.untan.ac.id
(Diterima: 13 Desember 2024; Disetujui: 14 Januari 2025)

ABSTRACT

One metric used to determine the percentage of the labor force in a population is the Labor Force Participation Rate (LFPR). The degree of economic activity engagement among working-age individuals, including those who are employed and those seeking employment, is depicted in this figure. A wide range of factors, including government policies across several sectors, education, and economic conditions, influence LFPR. This study aims to investigate the effects of a number of factors, including the Total Population, the Human Development (HDI), and the Regency/City Minimum Wage (MSW), on the Labor Force Participation Rate (LFPR), specifically in the regency/city of Kalimantan Barat Province between 2018 and 2023. The Generalized Method of Moment Arellano-Bond is the methodology employed in this research. The GMM Arellano-Bond Method was selected due to its capacity to resolve endogeneity issues. According to the estimation results, the Labor Force Participation Rate (LFPR) is significantly impacted by the Human Development Index (HDI), while Total Population, or Minimum Wage have no significant on LFPR. Kalimantan Barat has a diverse proportion of working-age population so that it does not describe all individuals in the population who are classified as working age willing to enter the labor market, and the minimum wage also has no effect on LFPR because Kalimantan Barat has an economy that is still dominated by the informal sector such as agriculture, where informal workers are not bound by wage regulations.

Keywords: LFPR, Dynamic Panel Data Regression, GMM-Arellano-Bond

INTRODUCTION

Indonesia is one of the largest archipelagic countries in the world with a total of 17,000 islands distributed in each region and rich in diversity. Currently, Indonesia is divided into 38 provinces grouped into three main regions, namely the western, central and eastern regions (Aini et al., 2022). One of the provinces located in the western region is Kalimantan Barat Province, which includes 14 regencies/cities. As part of a province in Indonesia, where the country is still included in the category of developing countries, Kalimantan Barat certainly faces various types of challenges, including those related to the economy and labor issues. Seen from the economic perspective, Kalimantan Barat faces poverty and unemployment rate that is still quite high.

One of the main issues related to the employment context in Kalimantan Barat Province is the Labor Force Participation Rate (LFPR). LFPR is a condition that represents the proportion of the workforce in a certain group expressed as a percentage of the population in that age group (Mulyadi, 2003). The Labor Force Participation Rate is a benchmark that shows how large a percentage of the working-age population is actively involved in economic activities, both as workers and job seekers (Aini et al., 2022) (Sari & Susanti, 2018). LFPR is an important reference in analyzing labor market changes and economic growth in a region. The more Labor Force Participation increases, the more people participate in economic activities that can contribute and help reduce poverty and unemployment in the region.

According to data from BPS-Statistics Kalimantan Barat Province, from year to year, the LFPR in each Regency/City of Kalimantan Barat Province fluctuates. The LFPR in Kalimantan Barat Province in 2023 was recorded at 69.42%, an increase of 0.45% from the previous year. The figure ranks 19th among provincial LFPRs in Indonesia from highest to lowest. To increase labor force participation, the Human Development Index (HDI) has a very important role, HDI describes the quality of life of the population through three main aspects: health, education, and decent living standard. When people have better opportunities for education and health services, they are more prepared to participate in the labor market (Siswati & Hermawati, 2018).

Rapid population growth without being matched by sufficient job creation can lead to high unemployment rates because the number of job opportunities available is smaller than the total population (Aini et al., 2022). Population can be interpreted as an individual who acts as an individual, part of a family, community, resident, and a group that lives somewhere in a country area and a certain time (Hardiani et al., 2020). Based on data from BPS-Statistics Kalimantan Barat Province, the total population in Kalimantan Barat in 2023 was recorded at 5.623.328 people, where this number showed an increase compared to the previous year. This population increase indicates demographic growth that needs to be responded with the right strategy to create jobs.

Wages are classified as one of the factors of concern for the labor force when determining the choice to join the employment sector. Regions with high wages are usually the top priority for the labor force in determining where they work (Sri Rahmany, 2018). Therefore, it is very important for local governments to ensure that the wages set are based on applicable standards and are able to attract labor.

Various previous studies related to this research, such as in research by Ramadhan and Setyowati (2023) which explains that the HDI and minimum wage variables have a notable positive influence on LFPR. Then for the economic growth variable shows insignificant results on LFPR. Another study conducted by Dika Pramana and Muhammad Dandy (2023) explains that the HDI and GRDP variables are not significant to LFPR. However, the wage variable exerts a notable positive influence on LFPR. Research by Wisna Sarsi, Tri Sukirno Putro, and Lapeti Sari (2014) which explains the level of wages has a negative and significant effect on the Labor Force Participation Rate (LFPR). This study aims to analyze the effect of the Human Development Index (HDI), Population, and Regency/City Minimum Wage (MSW) on the Labor Force Participation Rate (LFPR) in the Regency/City of Kalimantan Barat Province during the period 2018-2023 using dynamic panel data regression through the Generalized Method of Moment (GMM) Arellano-Bond approach. This study is expected to provide a deeper understanding of the factors that influence labor force participation and provide useful guidelines for the development of economic and employment policies in the area. In addition, the findings of this research are anticipated to serve as a reference for future studies and contribute to related parties in formulating effective strategies to increase LFPR in Kalimantan Barat.

METHODOLOGY

Panel Data Regression

Panel data regression is a statistical analysis method that combines two types of data, namely time series data and cross section data. Time series data includes information obtained from one or more units observed over a period of time, while cross section data provides an overview of information obtained from various components at a point in time (Alamsyah et al., 2022). Integrating these two types of data allows panel data regression to provide an opportunity for researchers to obtain a more comprehensive view of the dynamics that occur in a phenomenon, both in the context of time and between units, besides that it can also produce more informative, more diverse data and reduce the strong linear relationship between variables. Panel data regression also provides greater degrees of freedom and increases the efficiency of analysis (Ghozali, 2018). One of the benefits of using panel data is that it can reduce the occurrence of collinearity problems between variables. Collinearity is a problem that often occurs when performing regression analysis when there is a relationship between two or more independent variables, resulting in unstable or inaccurate coefficients, panel data regression also provides greater degrees of freedom and increases analysis efficiency (Ghozali, 2018). In general, the equation is as follows (Wicaksono et al., 2023):

$$y_{i,t} = \alpha_{i,t} + x'_{i,t}\beta + u_{i,t} \tag{1}$$

Where:

$y_{i,t}$: Observation Score
$x'_{i,t}$: Vector of independent variables
β : Coefficient vector of independent variable
$u_{i,t}$: Panel regression error

Dynamic Panel Data Regression

Dynamic panel regression is a regression analysis technique created to address the problem of variable changes in a system that evolves over time. The dynamic panel approach combines elements of time series and cross section data with the addition of the lag of the dependent variable as one of the independent variables in the model. That is to say, in dynamic panel data regression, the dependent variable at any given time is not only determined by the independent variables at the same time, but also depends on the value of the dependent variable in the previous period. This allows the model to capture time-linked effects that often occur in economic and social phenomena. In this context, dynamic means that changes in a variable cannot be understood through the direct influence of the independent variables in the same period, but also through the influence arising from the past conditions of the variable. For example, in the context of analyzing the Labor Force Participation Rate in a certain period, it may be influenced by labor market conditions in the previous period, as well as economic or social policies implemented in the previous period. The existence of a lag of the dependent variable among the independent variables characterizes this dynamic panel model that distinguishes it from the ordinary regression model or static panel data model. In the dynamic model, the value of the dependent variable is considered an important factor that affects the value of the variable in the period being analyzed. In general, the equation is as follows (Yuniar & Kusrini, 2021) :

$$y_{i,t} = \delta y_{i,t-1} + x'_{i,t}\beta + u_{i,t} \tag{2}$$

Where:

$y_{i,t}$: The i-th observation in period t
$y_{i,t-1}$: The lag value of a dependent variable at the previous time
$x'_{i,t}$: Vector variable independents
β : Independent variable coefficient vector
$u_{i,t}$: Panel regression error
i : Observation unit (1,2,..., n)

t : Unit period (1,2…,T)

If $y_{i,t}$ is a function of $u_{i,t}$ then $y_{i,t-1}$ is also a function of u, so the regressor on the right-hand side has a correlation or relationship with u. In static panel data models used in OLS, in dynamic panel equations this can lead to biased estimates. In the static panel data model used in OLS, in the dynamic panel equation this can cause the estimation to be biased and inconsistent.

Autoregressive Model

The dynamic autoregressive model is an approach in regression analysis that incorporates an autoregressive component, where the lag value of the dependent variable appears as an independent variable on the right side of the equation. The equation for the autoregressive dynamic model can be expressed as follows (Setyorini, 2017):

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \ldots + \beta_k X_{kt} + \delta_1 y_{t-1} + \varepsilon_t \quad (3)$$

Where:

Y_t : The t-th period of the dependent variable

Y_{t-1} : The lagged dependent variable

$x_{i,t}$: The i-th independent variable of period t

ε_t : Error

K : Number of dependent variables

δ : The delayed coefficient of the dependent variable

In this model, there is a correlation between x_k and u (error) because the covariance between x_k and u is not zero. As a result, the estimate of β coefficient using OLS method will be distorted and inaccurate. In solving this problem, the instrument variable approach is used, which aims to find instruments that have no relationship with the error, but are related to the explaining endogenous variables. Instrument variables must fulfill the following criteria in order to be considered valid for x_k :

a. Instrument variable not related to u.

b. Instrument variables relate to endogenous variables that are explanatory.

Generalized Method of Moment

The Generalized Method of Moment (GMM) estimation method, also known as First Difference GMM (FD-GMM), is one of the approaches in econometric analysis used to obtain unbiased, consistent and effective regression model parameter estimates, especially when the model being analyzed involves dynamic panel data (Putriyanti, 2018). One primary advantage offered by the GMM approach is its ability to overcome the endogeneity problem in the model, which is when the independent variable has a correlation involving the disturbance term within the regression equation. In some cases, this endogeneity can lead to inconsistent and biased estimates when using estimation methods such as Ordinary Least Squares (OLS).

In the context of dynamic panel models, GMM is often used to overcome problems that arise due to the presence of lag dependent variables that can cause endogeneity problems. One of the most commonly used approaches in GMM in dynamic panel models is the Arellano-Bond GMM. This approach relies on the first difference of the model to eliminate unobserved fixed effects, and uses instruments that are lags of the dependent and independent variables. The results of the Arellano-Bond GMM estimation with a one-step approach can be expressed in the form of the following equation (Suprayogi, 2023):

$$\left(\frac{\delta}{\beta}\right) = \left[\left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)'Z_i\right) w \left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)\right)\right]^{-1}$$

$$\left[\left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)'Z_i\right) w \left(N^{-1}\sum_{i=1}^{N}Z_i'\Delta y_i\right)\right] \tag{4}$$

Where:
Z_i : The right instrument matrix
W : The estimation is undistorted and consistent for $\boldsymbol{W}_{(L\times L)}$ with L as the total instrument variables.

A consistent two-step estimate for the value of $\boldsymbol{W}$ is an unbiased and consistent estimate of the matrix, $\boldsymbol{W}_{(L\times L)}$ where L is the total instrument variables used in the equation. The weights can be expressed through the resulting estimate of the value of Δ^{-1} which is written in the form of the following equation:

$$\left(\frac{\delta}{\beta}\right) = \left[\left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)'Z_i\right) \Delta^{-1} \left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)\right)\right]^{-1}$$

$$\left[\left(N^{-1}\sum_{i=1}^{N}(\Delta y_{it-1},\Delta x_i)'Z_i\right) \Delta^{-1} \left(N^{-1}\sum_{i=1}^{N}Z_i'\Delta y_i\right)\right] \tag{5}$$

Parameter Significance Test

Parameter significance testing aims to identify any meaningful relationship between the independent variable and the dependent variable. Significance testing is important to determine whether the variables included in the model have an influence on the dependent variable. One of the common methods used to test the significance of parameters in the model is the Wald test. The Wald test is conducted to determine how significant the independent and dependent variables are simultaneously (Angelika et al., n.d.). Wald test hypothesis:

H_0: $\beta_1 = \beta_2 = \cdots = \beta_p = 0$ (No coefficient in the model is statistically significant)
H_1: There is at least one $\beta j \neq 0$, j=1,2,...,p (The model contains at least one statistically significant coefficient)

For the Wald test equation as follows (Febrianti & Setiawan, 2022):

$$w = \beta \tilde{V}^{-1} \beta \sim X^2(K) \tag{6}$$

Where:
$\tilde{V}^{-1}$: The inverse matrix of the covariance matrix
K : The quantity of independent variables

The decision is that H_0 is rejected if the test value of w exceeds the value of the Chi-square table (χ^2) or p-value < α.

Model Specification Test

a. Arellano Bond Test

The Arellano-Bond test is one of the test methods in the context of dynamic panels used to test the consistency of estimates generated through the Generalized Method of Moments (GMM) process. This test is designed to test for autocorrelation in the residuals of the model under consideration, particularly in the first difference residuals of panel data. The Arellano-Bond test focuses on identifying errors in the model that have a structured pattern over time that affects the validity and consistency of parameter estimates. Autocorrelation in residuals is a problem that often arises in the analysis of time series data or panel data. Autocorrelation occurs when residuals in a certain period are related to residuals in the previous period. The occurrence of autocorrelation in the model indicates that the model used cannot fully explain the dynamics that occur in the data, resulting in biased or inconsistent parameter estimates. Therefore, it is important to test for the presence of autocorrelation in the residuals to ensure that the estimates are valid and reliable. The hypothesis for the Arellano and Bond test is as follows (Nabilah & Setiawan, 2016):

H_0: The i-th order first difference residuals do not exhibit autocorrelation
H_1: The i-th order first difference residuals show autocorrelation

Arellano-Bond Test Steps:

1. Calculating residuals
2. Make the first difference
3. Testing for autocorrelation
   - First-order autocorrelation tests whether the difference in period t is related to the difference in period t-1.
   - Second-order autocorrelation tests whether the difference in period t is related to the difference in period t-2 and beyond.
4. Using test statistics: the test statistic for Arellano-Bond is a statistic that follows the chi-square distribution which is compared to the critical value of the chi-square distribution at the specified significance level.

The Arellano-Bond test equation is as follows:

$$m(2) = \frac{\Delta\tilde{V}'_{i,t-2}\Delta\tilde{V}*}{(\Delta\tilde{V})^{\frac{1}{2}}} \sim N(0,1) \tag{7}$$

Where:

$\Delta\tilde{V}'_{i,t-2}$: Second lag error vector at the $q = \sum_{i=1}^{n} T_i$- 4
$\Delta\tilde{V}*$: The error vector that is cut by placing $\Delta\tilde{V}'_{i,t-2}$: which has a size of q × 1

Decision making :
H_0 is rejected if Z_{hitung} > Z_{tabel} indicating the accuracy of the GMM is characterized by the statistical magnitude being insignificant (failing to rejectH_0) at m(2).

b. Sargan Test

The Sargan test is one of the tests used in econometric analysis, especially in estimation models that include the Generalized Method of Moment (GMM) approach. It is designed to test the validity of the instruments used in the model, especially when the number of instrument variables exceeds the number of estimated parameters. This situation is known as overidentifying restriction. In this context, the sargan test aims to evaluate whether the instruments used actually fulfill the assumptions necessary to produce consistent estimates. An invalid instrument can lead to biased estimates, even though the method used (such as GMM) should produce consistent estimates. Therefore, the sargan test acts as a diagnostic tool to ensure that the instruments used do not violate the basic assumptions in the instrument model that affect the quality of the estimation results. The hypothesis for the sargan test is:

H_0: The instrumental variable conditions in the tested estimation model are appropriate
H_1: The condition of the instrumental variables in the tested estimation model is not correct

$$S = \tilde{V}'Z\left(\sum_{i=1}^{N} Z'_i \tilde{V}_i \tilde{V}'_i Z_i\right)^{-1} Z'\tilde{V} \sim X^2_{L-(k+1)} \quad (8)$$

The decision taken is to reject H_0 if the magnitude of the test statistic S exceeds the value in the Chi-square table (χ^2) or if p-value is not more than α.

The analysis steps that will be applied in this study are as follows:

1. Perform parameter estimation using GMM Arellano-Bond estimation;
2. Performing model specification test using Arellano-Bond test;
3. Performing the Sargan test;
4. Performing the Wald test;
5. Performing interpretation on the model; and
6. Make conclusions based on the results of the analysis.

RESULTS AND DISCUSSION

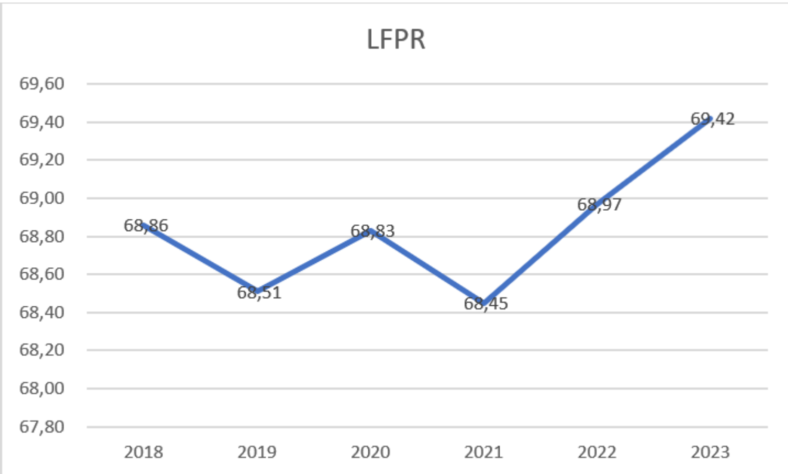

Figure 1: Labor Force Participation Rate (LFPR) of Kalimantan Barat Province 2018-2023
Source: Processed from BPS-Statistics Kalimantan Barat Province, 2024

Descriptive Data

This study uses data in quantitative form with a dynamic panel data approach applied to evaluate the factors that affect the LFPR in the regency/city of Kalimantan Barat Province during the period 2018 - 2023. Data is obtained from two sources, namely the BPS-Statistics Kalimantan Barat Province and the Kalimantan Barat Manpower and Transmigration Office. BPS provides data related to demographics, economy and employment while the Manpower and Transmigration Office provides information related to minimum wages, employment policies and various programs aimed at supporting increased labor force participation. The observation unit used is the regency/city of Kalimantan Barat Province and the year used starts from the period 2018 to 2023.

The Labor Force Participation Rate (LFPR) in Kalimantan Barat in 2023 was recorded at 69.42%, which increased by 0.45% compared to the previous year. Although this figure shows an increase, Kalimantan Barat's position is still 19th among all provinces in Indonesia, based on a comparison of the highest to the lowest LFPR. In detail, the LFPR in districts/cities in Kalimantan Barat shows significant variations. Some districts, such as Sintang, have a high LFPR among other regions. The LFPR in Sintang district in 2023 is 74.12%. When compared to the LFPR of the Kalimantan region, in 2023 the region with the highest LFPR is North Kalimantan with a LFPR of 74.26%. Although the LFPR in Kalimantan Barat shows an increasing trend, there are still challenges in increasing labor force participation, especially in areas dominated by the informal sector. Local governments need to focus on policies that can reduce this gap by encouraging the development of economic sectors capable of creating more jobs.

Table 1. Research variables

Symbol	**Variable**	**Unit**
(1)	**(2)**	**(3)**
Y	The Labor Force Participation Rate (LFPR)	Percent
X1	Human Development Index (HDI)	Percent
X2	Total Population	Soul
X3	Regency/City Minimum Wage (MSW)	Rupiah

Table 2. Estimation using GMM Arellano-Bond

Predictor	**Coeffisien**	**Standard Error**	**t**	**P-value**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
$LFPR_{i,t-1}$	-2.5812364	0.2171246	-2.5812364	0.0098447
$HDI_{i,t}$	-0.579332	0.1859543	-3.1154056	0.0018369
$TP_{i,t}$	-0.0035809	0.0105847	-0.3383064	0.7351323
$MSW_{i.t}$	-00360220	0.1954450	-0.1843077	0.8537720

Based on the table, it can be seen that the HDI variable has a p-value <0.05, so the decision fails to reject H_0 which shows that HDI is significant to LFPR. Total Population and Minimum Wage have a p-value > 0.05, so the decision fails to reject H_0 indicating that these two variables are not significant to LFPR. More specifically, the p-value for each variable is as follows:

1. Labor Force Participation Rate (LFPR) lag has a p-value of 0.0098447 which is less than the value of 0.05 so that it has a meaningful effect on LFPR in the current period.
2. The Human Development Index (HDI) has a p-value of 0.0018369 which is less than 0.05, indicating that HDI has a meaningful effect on the LFPR.
3. Total Population has a p-value of 0.7351323 which indicates that total population does not have a meaningful effect on labor force participation in the region.
4. Minimum Wage has a p-value of 0.8537720 which exceeds 0.05, indicating that the minimum wage of each district/city in Kalimantan Barat Province does not have a meaningful effect on the LFPR.

In this case, the model used cannot significantly explain the variation in LFPR based on the variables tested.

After completing the parameter significance test, the next phase is to examine the model criteria using the Arellano-Bond test.

Table 3. Arellano-Bond Test

	Statistical value	P-value
m(1)	-2.442819	0.0146
m(2)	-0.697029	0.4858

Reffering to the table, it can be seen that the statistical value of m(1) in the model is -2.442819 with a p-value of 0.0146. Based on the p-value that does not exceed 0.05, the decision taken is to reject the H_0 hypothesis. Then for the statistical value of m(2) in the model is -0.0697029 with a p-value of 0.4858. Because the p-value exceeds 0.05, the conclusion is to fail to reject the H_0 hypothesis. Based on this, it can be concluded that the Arellano bond test for the first lag shows that the model still does not fully capture the dynamics that occur in panel data and further improvements need to be made to the model to overcome these problems. Then for the second lag there is no significant autocorrelation in the model, this indicates that after the differencing process to overcome autocorrelation in the first lag, the model does not experience autocorrelation problems again in the second lag and parameter estimates can be considered more valid.

The next test carried out is the sargan test, the test decision is to reject H_0 if the p-value> 0.05.

Table 4. Sargan Test

Statistical value	P-value
12.10425	0.0597

Based on table 4, the p-value is 0.0597, using $\alpha = 5\%$, it can be concluded that it fails to reject H_0. This indicates that there is no relationship between the difference and over identifying restrictions, or it can be expressed that the instrument variables used do not exceed the number of parameters estimated. Thus, it can be concluded that there are no problems related to the validity of the instrument.

Table 5. Wald Test

Statistical Value	P-value
8.0855	0.00008332

The results from Table 5 show that the Wald test value is 8.0855 with a p-value of 0.00008332. In this Wald test, the significance level is set at 5%. Based on the hypothesis, the final result is to reject H_0, this implies that there is at least one statistically significant coefficient for the variable in the model.

Table 6. Multicollinearity Test

Variable	VIF value
HDI	1.12690
Total Population	1.14396
Minimum Wage	1.04700

Based on table 6, it is known that the overall VIF value of the variables is not more than 10, it means that there is no significant multicollinearity problem in the model. Or it can be said that the variables in the model do not experience high correlation with each other.

CONCLUSIONS AND SUGGESTIONS

Based on the circuits that have been run, the following equation model can be taken:

$$LFPR_{i,t} = -2{,}5812364 LFPR_{i,t-1} - 0{,}579332 HDI_{i,t}$$

From this, it can be concluded that the model applied in this study found one variable that affects LFPR. This can be seen from the projection results obtained using the GMM (Generalized Method Of Moment) Arellano-Bond method, namely:

1. HDI variable has a negative and meaningful effect on LFPR

An increase in HDI reflects an improvement in the quality of education, health, and purchasing power. With an improved quality of life, people tend to have more choices regarding work and life, possibly some choosing not to work such as taking care of the household. An increase in HDI is not always followed by growth in employment that matches the skills of the community. When available jobs are not commensurate with education and skill levels, many individuals are reluctant to enter the labor market. In addition, an increase in HDI is often accompanied by changes in the structure of the local economy. If the traditional labor-absorbing sectors are reduced (for example, agriculture), while the modern sector is still not developed enough to accommodate the labor force, then this may result in a decline in LFPR.

2. Total Population variable has no meaningful effect on LFPR

The insignificance of Total Population on LFPR in Kalimantan Barat is due to the fact that the region has a diverse proportion of working-age population. The total population does not always reflect the size of the working-age population that is the focus of the LFPR calculation. There are groups of non-working-age population (children and elderly) or working-age people who are not included in the labor force in Kalimantan Barat who choose not to work or are not looking for work.

3. The Minimum Wage variable does not have a meaningful effect on LFPR

In many cases, high wages may influence a company's decision to hire, but not directly encourage individuals to enter the labor market. The prevailing Minimum Wage is more relevant to formal workers, while Kalimantan Barat is still dominated by the informal sector, such as agriculture. In areas with a dominant informal sector, the Minimum Wage is irrelevant as most workers in the informal sector are not bound by wage requirements.

Recommendations that can be given for policy making are the government must broaden access to education and skills training while improving their quality., so that people can better compete in the labor market and to increase LFPR, the government needs to encourage investment that can create more formal employment opportunities, especially in strategic sectors. In addition, it is necessary to strengthen policies that support the transition of labor from the informal economy to the formal economy.

LITERATURE

Aini, Z., Wijimulawiani, B. S., & Satarudin. (2022). Analisis Faktor-Faktor Yang Mempengaruhi Tingkat Partisipasi Angakatan Kerja Di Kabupaten/Kota Provinsi Nusa Tenggara Barat Tahun 2016-2020. Journal of Economics and Business, 8(2), 304–317.

Alamsyah, I. F., Esra, R., Awalia, S., & Nohe, D. A. (2022). Analisis Regresi Data Panel Untuk Mengetahui Jumlah Penduduk Miskin Di Kalimantan Timur. Prosiding Seminar Nasional Matematika dan Statistika, 2.

Angelika, A., Amelia, L., Maharani, N., Oktaviani, N., Farhan, M., Pratama, M. T., & Nurmayangsari, R. D. (2024). Dinamika Kebijakan Moneter dan Fiskal: Pengaruhnya terhadap Kemiskinan di ASEAN. *Innovative: Journal Of Social Science Research*, *4*(4), 2802-2811.

Badan Pusat Statistik Provinsi Kalimantan Barat. (2024). Data Indeks Pembangunan Manusia (IPM) Menurut Kab/Kota. Diakses pada tanggal 31 Oktober 2024, dari https://kalbar.bps.go.id/

Badan Pusat Statistik Provinsi Kalimantan Barat. (2024). Data Jumlah Penduduk Menurut Kab/Kota diakses dari https://kalbar.bps.go.id/ pada tanggal 31 Oktober 2024.

Badan Pusat Statistik Provinsi Kalimantan Barat. (2024). Data Tingkat Partisipasi Angkatan Kerja Menurut Kab/Kota diakses dari https://kalbar.bps.go.id/ pada tanggal 31 Oktober 2024.

Dika Pramana Aditiya, & Wildana, M. D. A. (2023). Analisis Pengaruh Sektor Informal, Produk Domestik Regional Bruto, Indeks Pembangunan Manusia, Dan Upah Terhadap Tingkat Partisipasi Angkatan Kerja Di Jawa Timur Tahun 2018-2021. Journal of Development Economic and Social Studies, 2(3), 505–521.

Dinas Tenaga Kerja Dan Transmigrasi Provinsi Kalimantan Barat. (2024). Data Upah Minimum Kab/Kota/Provinsi. Diakses pada tanggal 31 Oktober 2024, dari https://sudahi.nakertrans.kalbarprov.go.id/

Febrianti, N. T. S., & Setiawan, S. (2022). Pemodelan Ekspor ASEAN Data Panel Dinamis dengan Pendekatan Generalized Method of Moments Arellano-Bond. Jurnal Sains dan Seni ITS, 11(2), D212-D219.

Ghozali, Imam. 2018. Aplikasi Analisis Multivariate Dengan Program IBM SPSS. Semarang: Bandan Penerbit Undip.

Hardiani, H., Siregar, S., & Zulfanetti, Z. (2020). Analisis Determinan Tingkat Partisipasi Angkatan Kerja Wanita Di Sumatera. Jurnal Ekonomi dan Pembangunan, 11(1), 70–87.

Mulyadi, S. (2014). *Ekonomi sumber daya manusia dalam perspektif pembangunan* (Edisi 1-3). Jakarta: Rajawali Pers.

Nabilah, D., & Setiawan, S. (2016). Pemodelan Pertumbuhan Ekonomi Indonesia Menggunakan Data Panel Dinamis dengan Pendekatan Generalized Method of Moment Arellano-Bond. Jurnal Sains dan Seni ITS, 5(2).

Putriyanti, Y. (2018). Perbandingan Pendugaan Parameter Dengan Metode Arellano-Bond Gmm Dan Metode Blundell-Bond Gmm Pada Analisis Regresi Panel Dinamis (Studi Kasus: Pertumbuhan Ekonomi ASEAN) [Sarjana, Universitas Brawijaya].

Rahmany, S. (2018). Analisis Faktor-Faktor Yang mempengaruhi Tenaga Kerja Bekerja di Luar Negeri Serta Implikasinya Terhadap Kesejahteraan Keluarga Dilihat Dari Perspektif Islam. IQTISHADUNA: Jurnal Ilmiah Ekonomi Kita, 7(1), 51-73.

Ramadhan, B. A., & Setyowati, E. (2023). Analisis Pengaruh Populasi Penduduk, Upah Minimum, Pertumbuhan Ekonomi, Dan Indeks Pembangunan Manusia Terhadap Tingkat Partisipasi Angkatan Kerja Provinsi Banten Tahun 2017-2021. Primanomics : Jurnal Ekonomi & Bisnis, 21(3), 82–89.

Sari, C. P. M., & Susanti, P. (2018). Pengaruh pertumbuhan ekonomi dan pertumbuhan penduduk terhadap tingkat partisipasi angkatan kerja di Kota Lhokseumawe periode 2007-2015. *Jurnal Ekonomi Indonesia, Fakultas Ekonomi dan Bisnis Universitas Malikussaleh*, *7*(2), 33-44.

Setyorini, M. W. (2017). *Pemodelan Pertumbuhan Ekonomi Di Indonesi Menggunakan Regresi Data Panel Dinamis*. (Tugas Akhir, Institut Teknologi Sepuluh Nopember). Departemen Statistika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Institut Teknologi Sepuluh Nopember.

Siswati, E., & Hermawati, D. T. (2018). Analisis indeks pembangunan manusia (IPM) Kabupaten Bojonegoro. Jurnal Ilmiah Sosio Agribis, 18(2).

Suprayogi, M. A. (2023). Analisis Data Panel Dinamis Pertumbuhan Ekonomi Di Indonesia Dengan Metode Fd-Gmm Dan Sys-Gmm. Jurnal Bayesian: Jurnal Ilmiah Statistika dan Ekonometrika, 3(1), 38-47.

Wicaksono, M. E., Maruddani, D. A. I., & Utami, I. T. (2023). Model Regesi Data Panel Dinamis Dengan EStimasi Parameter Arellano-Bond Pada Pertumbuhan Ekonomi Di Indonesia. Jurnal Gaussian, 12(2), 266–275.

Yuniar, I. A., & Kusrini, D. E. (2021). Penerapan Regresi Data Panel Dinamis untuk Pemodelan Ekspor dan Impor di Asean. Seminar Nasional Official Statistics, 2021(1), 111–119.