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THE EFFECT OF LABOR FORCE PARTICIPATION, PER CAPITA INCOME, AND INDUSTRIALIZATION ON URBANIZATION IN INDONESIA

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Abstract

This study aims to analyze the influence of labor force participation, per capita income, and industrialization on urbanization in Indonesia in the short and long term. Rapid urban growth poses various social and environmental challenges. This study uses secondary data from the 1991–2023 time series and analyzes it using the Autoregressive Distributed Lag (ARDL) model to examine the dynamic relationships between variables. The results show that labor force participation has a significant effect on urbanization in the short term, although the direction of the influence is inconsistent. In the long term, the influence is insignificant. Per capita income also has a significant effect in the short term with varying directions, but is insignificant in the long term. Industrialization shows a negative effect in the current period and a positive effect in the previous period, but its long-term effect is also insignificant. Simultaneously, all three variables have a significant effect on urbanization in the short term, but not in the long term. These findings indicate that urbanization in Indonesia is more influenced by short-term socioeconomic dynamics than long-term structural factors.

Keywords: ***Urbanization*****, PAK, Per Capita Income, Industrialization, ARD.**

INTRODUCTION

Indonesia ranks third in Asia as the country with the largest urban area, after China and Japan. According to World Bank data (2024), urban growth in Indonesia is quite rapid, with an average annual growth rate of 4.1%, the highest rate compared to other Asian countries. It is estimated that by 2025, approximately 68% of Indonesia's population will live in urban areas. Urbanization is one of the driving factors for the rapid development of urban areas, many people urbanize because they consider job opportunities in cities to be much greater when compared to rural areas, however uncontrolled urbanization can cause various impacts and problems such as population density, increasing urban unemployment rates, increasing urban poverty rates, crime, environmental pollution, and the emergence of slums (Harahap, 2013; Malau, 2013; Hidayati, 2021). Urbanization has a variety of impacts, both positive and negative, not only for Indonesia but also for countries with economic ties to it. As explained by the World Bank (2024), many countries experience higher economic growth as urban areas expand, characterized by increased formal employment and productivity. Every 1% increase in urbanization is associated with a 13% increase in GDP per capita in India, 10% in China, and 7% in Thailand. However, in Indonesia, these positive impacts are not optimal due to a lack of investment in infrastructure, which causes various problems such as congestion, pollution, environmental damage, and natural disasters such as flooding. As a result, every 1% increase in urbanization in Indonesia is only able to drive GDP growth by 4%. The graph below shows the trend in urbanization rates in Indonesia from 2014 to 2023.

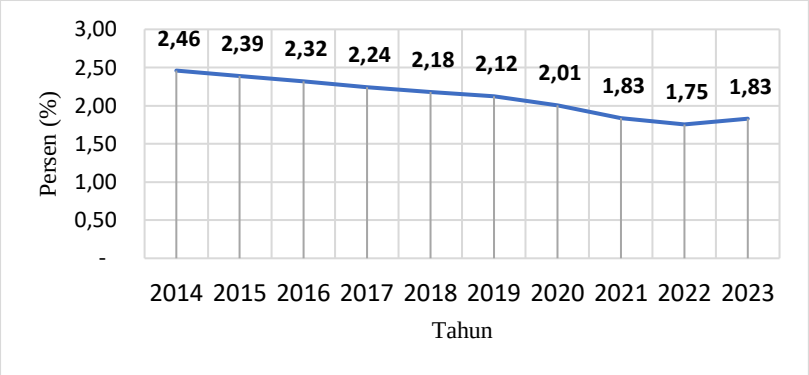

Figure 1.1 Indonesia's urbanization rate 2014-2023 (% Annual Growth)
Data source: World Bank (processed data), 2024

Based on the data displayed in the graph above, it can be explained that the urbanization rate in Indonesia has experienced a downward trend over a period of 10 years (2014-2023), with an average decrease of around 0.07%. In 2014, the urbanization rate in Indonesia reached around 2.46%, while in 2023 the figure decreased by around 0.63% until the urbanization rate changed to 1.83%, with the smallest urbanization rate occurring in 2022 because in this year Indonesia was still in the recovery phase after COVID-19, during the pandemic there was an urban exodus phenomenon, where many people returned to the village due to job losses in the city, the closure of economic activities, and the closure of transportation access such as stations, airports, and other transportation facilities, so that this made the rural-urban migration process take place slowly. A study by Anita & Sentosa (2021) found that the PAK in urban areas is higher than in rural areas, reflecting the presence of more job opportunities compared to rural areas. This has led to a significant increase in rural-urban migration, as productive-age residents seek jobs unavailable in their villages. Similarly, Sumbaga et al. (2023) stated that urban employment opportunities have a positive and significant effect on increasing urbanization. The more jobs available in cities, the greater the likelihood of rural residents migrating to urban areas in search of work.

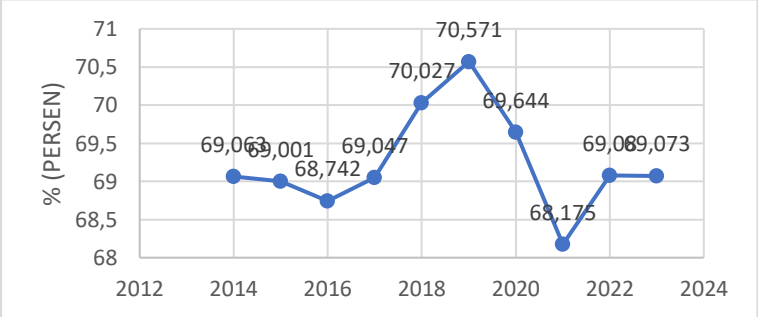

Figure 1.2 Labor force participation (PAK) in Indonesia 2014-2023 (% of Total Population Aged 15-64 Years)
Data source: World Bank (processed data), 2025

Based on the data displayed in the graph, labor force participation (FPP) in Indonesia during the period 2014 to 2023 shows a fluctuating pattern. In 2014, FPP was at 69.06% and experienced a slight decline in 2015 and 2016, to 69.00% and 68.74%, respectively. This decline indicates a tendency for the number of working-age people active in the labor market to decrease, either because they choose not to work or because they are not looking for work. Based on a report (Ministry of Manpower of the Republic of Indonesia, 2016) which states that low labor force participation during this period is caused by limited formal employment opportunities, especially for women and graduates of secondary education and above. In addition, the informal sector that dominates the national employment structure is also considered to provide less attractive economic incentives for new job seekers. Industrialization plays a significant role as a driver of rural-urban migration. The demand for labor in the rapidly growing industrial sector in urban areas has attracted rural communities to move and seek employment in urban areas. According to Mustapita & Khalikussabir (2019), the rapidly growing industrial sector in urban areas has led many residents to prefer migrating to urban areas, which offer greater employment opportunities in the industrial sector.

The industrialization figures in Indonesia have experienced various fluctuations, as shown in the following industrialization data presented in graphic form for the period 2014-2023.

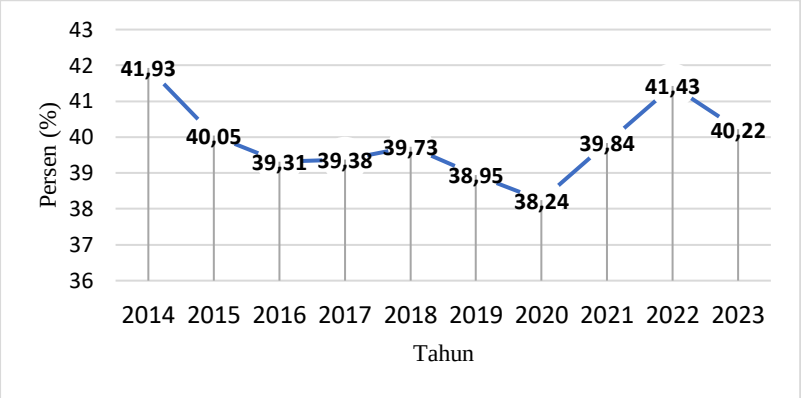

Figure 1.4 Indonesian Industrialization 2014-2023 (% of GDP value added)
Source: World Bank (processed data), 2025

Based on the data contained in Figure 1.4, it can be explained that industrialization in Indonesia experienced fluctuations during the 2014-2023 period, which was influenced by various economic dynamics. Based on the figure, the highest industrialization rate was recorded in 2014 with a figure of 41.93%, because based on what was conveyed by BPS, it shows that Indonesia's economic growth rate in 2014 was relatively stable, with a growth rate of 5.01%, this economic stability provided a positive boost to industrial and investment activities. Then the next largest industrialization figure is located in 2022, even though this year Indonesia has just experienced recovery after the COVID-19 pandemic, several government policies such as tax relief and providing assistance in the form of subsidies to industrial business actors, providing training and capital assistance, as well as the "proudly made in Indonesia" program which aims to encourage consumption of local products to support small and medium industries.

LITERATURE REVIEW

A. Theoretical basis

To strengthen the theory used in this research, a theoretical study is necessary to understand, explain, and formulate hypotheses. This subchapter serves to provide a solid theoretical context so that the research has a strong direction and foundation. Several theories will be discussed in this study: urbanization, labor force participation (FVP), per capita income, and industrialization.

B. Previous Research

Several previous studies that discuss the issues of urbanization, labor force participation (PAK), per capita income, and industrialization include the following:

Denyawan & Mustika (2024), through a study entitled Analysis of Factors Influencing the Level of Urbanization in Denpasar City 2006-2022, used semiannual time series data for 17 years with a multiple linear regression approach. The results showed that per capita income, average years of schooling, and the number of health facilities have a positive and significant influence on urbanization. Similarities with this study lie in the dependent variable (urbanization), one of the independent variables (per capita income), the type of data, and the number of variables. Differences include other independent variables, analysis methods, location, and data period.

C. Conceptual Framework

This conceptual framework serves as a theoretical guide that can summarize and connect the main factors in this research, namely PAK, per capita income, industrialization and its relationship to urbanization in Indonesia.

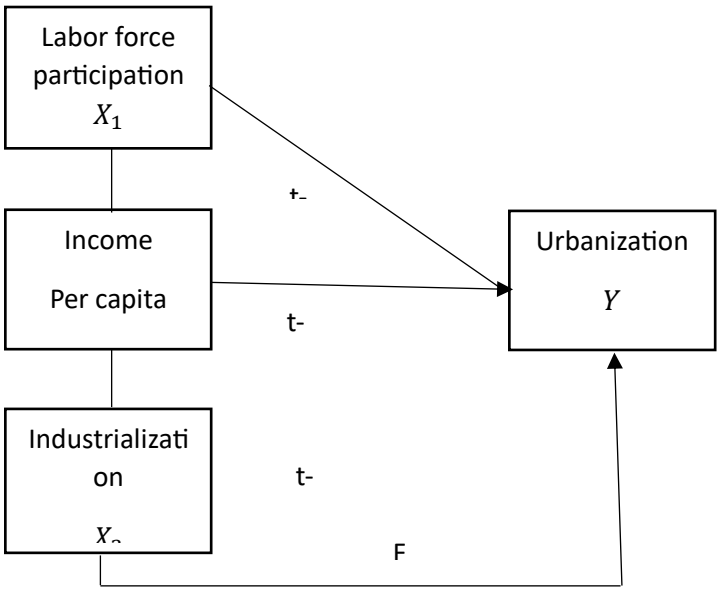

Figure 2.1 Conceptual framework

a) The Relationship of PAK to Urbanization

One of the reasons for someone to carry out the urbanization process is that the person wants to find a job that is more suitable than his job in his home area, a small PAK in rural areas can encourage urbanization, this is based on the opinion expressed by Diputra & Arsha (2023) a high PAK can create a greater demand for job opportunities in urban areas, where the diversity of economic activities such as industrial activities can provide more job choices when compared to rural areas, in this case if more individuals are involved in the labor market, urban areas that have diverse economic activities will become centers for job growth and increased labor force participation, so that this will encourage the creation of the urbanization process.

b) Relationship between Per Capita Income and Urbanization

Wulandari (2017) stated that high per capita income levels in urban areas can attract many newcomers to the urban area, the creation of high per capita income in urban areas is caused by high wage levels so that this can be an attraction for people to carry out the urbanization process, this statement is based on the opinion put forward by Jamaludin (2015:192) who stated that there are several things that are driving factors for urbanization, including:

METHOD

A. Research Objects and Locations

This research will examine what factors can influence the urbanization process, these factors include PAK, per capita income, and industrialization, the research location used in this research is Indonesia.

B. Data Types and Sources

This study uses secondary time series data. Time series data is data collected, recorded, or observed continuously over a specific time period, such as daily, weekly, monthly, quarterly, or annually. In the context of this study, the data used is 33 years of annual data, covering the period from 1991 to 2023, obtained from the official World Bank website.

C. Method of collecting data

This research employs a documentation method to collect relevant data and information. This method utilizes various readily available documents, such as books, scientific journals, articles, and other written sources. The data and information used in this study were obtained from the official World Bank website, reference books, and scientific journals related to the research topic, both in print and electronic formats, and obtained from various sources.

D. Operational Definition of Variables

The operational definition of a variable is an explanation of how the variables in this study will be measured or observed. Where in the definition that will be presented in this section will provide concrete details about how the aspects of the variables that will be used in this study. Some independent variables in this study that will be used are PAK, per capita income, and industrialization, while the dependent variable that will be used in this study is urbanization.

E. Data Analysis Methods

This study uses dynamic analysis as the analytical method. The Autoregressive Distributed Lag (ARDL) analysis model is used, combining the Autoregressive (AR) approach with the Distributed Lag (DL) approach. According to Gujarati & Porter in Rahmasari et al., (2019), the AR approach involves one or more previous values of the dependent variable, while the DL approach uses current period data and past period data (lag) of the variables in the regression. Gujarati, in Rahmasari et al. (2019), explains that the ARDL model is highly useful in empirical econometric practice because it allows for the explicit integration of time aspects, allowing for dynamic analysis of typically static economic theory approaches. Meanwhile, according to Pesaran & Shin in Paramitha (2023), the ARDL approach is frequently applied in econometric studies due to its ability to explore short-term and long-term relationships and detect cointegration between variables.

RESULTS AND DISCUSSION

A. Research result

This section will discuss and include the researcher's thoughts and analysis of what has been done, observed, understood, and researched in the previous sections. Each finding obtained in this section will not only be explained but also examined in greater depth to explore its meaning and relevance. The discussion in this section will also be linked to relevant theories and previous research findings related to the topic under discussion, thus providing a theoretical foundation that can support and strengthen the results of this study.

B. Variable Development

In this sub-chapter, we will discuss the development of the variables that will be examined in this research, namely urbanization variables, labor force participation rate, per capita income and industrialization.

a) Development of Urbanization in Indonesia

The growing number of people living in Indonesian cities, coupled with uncontrolled urban development, has led to numerous problems in urban environments. Consequently, the need for land is increasing, and this is certainly an issue that truly requires careful attention. (Nanlohy et al., 2023) Urbanization is the increase in the proportion of people living in large cities. Global human population growth and urbanization have increased rapidly over the past 50 years. In Indonesia, urbanization has grown quite rapidly over the past 33 years. The following data shows the rate of urbanization growth in Indonesia for the period 1991-2023.

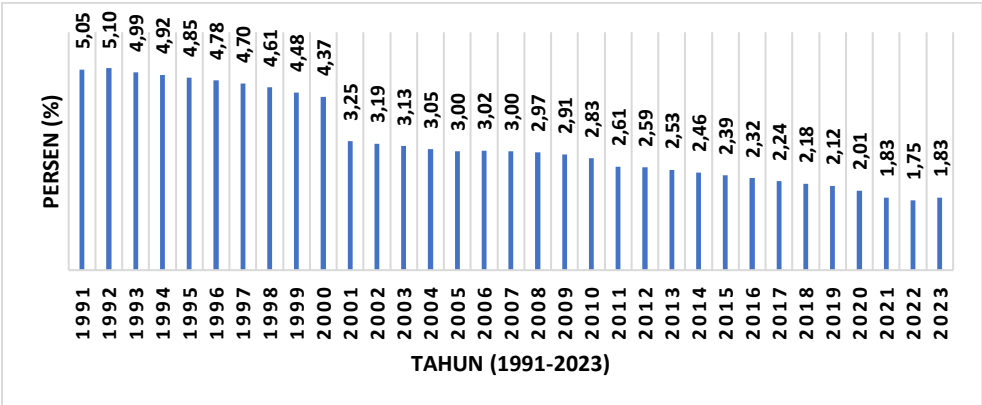

Figure 4.2 Urbanization (% Annual Growth)
Source: World Bank, 2024

Based on the data above, it can be concluded that the urbanization growth rate tends to decrease every year, with the lowest figure occurring in 2022 at 1.75 and the highest figure occurring in 1992 at 5.10 percent.

b) Development of Labor Force Participation in Indonesia

Labor force participation (LFPR) of a population group refers to the ratio between the number of labor force and the number of working-age population in that group (Haspa et al., 2023). Currently, the development of the Labor Force Participation Rate in Indonesia is experiencing fluctuations that tend to experience more declines than increases, this is certainly not a good thing because the increasingly low Labor Force Participation Rate is feared to prevent Indonesia from taking advantage of the demographic bonus in the future, the following is an overview of the development of the Labor Force for the period 1991-2023.

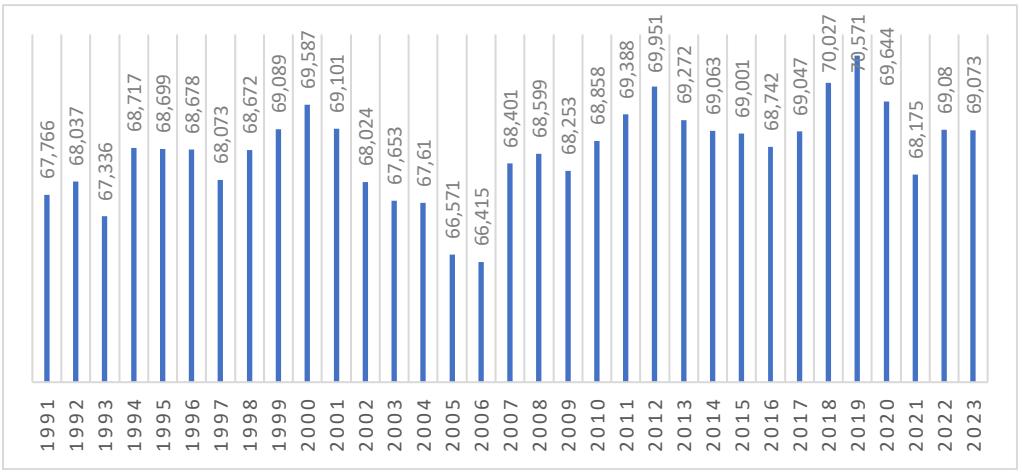

Figure 4.3 Labor Force Participation (% of total population aged 15-64 years)
Source: World Bank, 2024

In the period 1991–2023, Indonesia's PAK peak was reached in 2019 with a value of around 70.57%. This increase is in line with the growth of the workforce supported by increased job absorption in the construction and education sectors in early 2020, as reported by the Central Statistics Agency (2019). reported that the number of the workforce in February 2019 reached 136.18 million, with an increase in PAK of 0.12 points compared to the previous year. This condition is also driven by the prospect of economic improvement and the intensification of investment in infrastructure and the education sector which creates new job opportunities and expands workforce participation.

c) Development of Per Capita Income in Indonesia

Per capita income, often referred to as income per individual, is a measure of the average income received by each resident in a country over a specific period, generally one year. This term can also be interpreted as the average value of goods and services accessible to each person in a country during a specific period. (Oktarina & Yuliana, 2023). When viewed through per capita income data based on constant prices in 2015, Indonesia's per capita income has been stable and tends to increase annually. The following is the development of per capita income figures over the last 33 years, from 1991 to 2023.

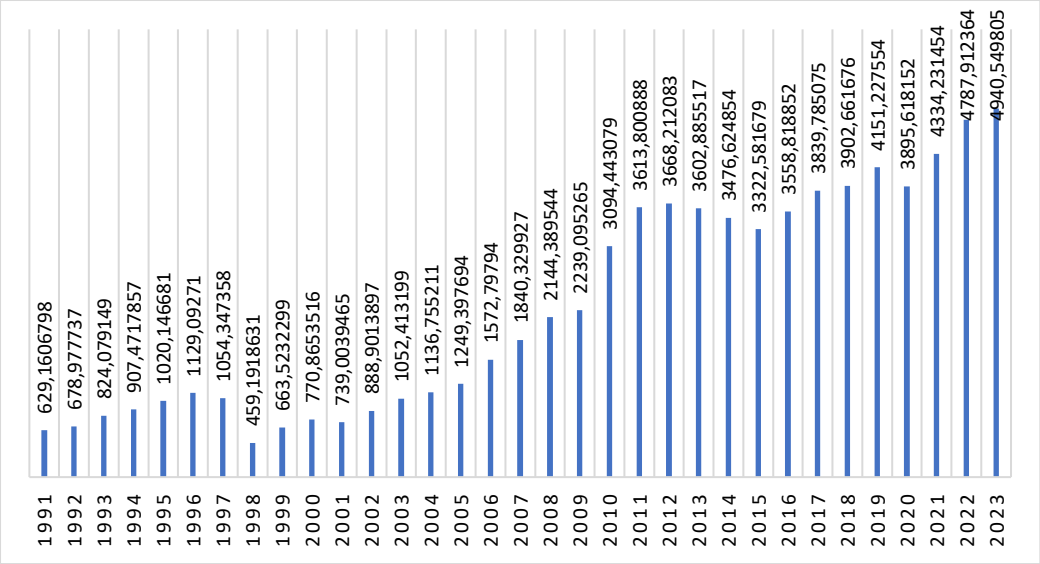

Figure 4.4 Indonesia's Per Capita Income (US$)
Source: World Bank, 2024

Based on the graph of Indonesia's per capita income for the period 1991 to 2023, it can be seen that fluctuations occurred in response to domestic and global economic dynamics. The lowest per capita income value occurred in 1998, at US$459, which was a direct impact of the Asian monetary crisis. The crisis caused the rupiah exchange rate to plummet drastically against the US dollar, so that although GDP in rupiah remained stable, its value in US dollars declined sharply. According to (World Bank., 1991) Indonesia experienced a GDP contraction of -13.1% in 1998, which was the deepest contraction in Indonesia's modern history. This crisis triggered a wave of inflation, the collapse of the financial sector, and a significant increase in poverty and unemployment rates.

d) Development of Industrialization in Indonesia

Industrialization is a process of social and economic change, in which society experiences a shift from pre-industrial conditions with relatively low per capita income levels to the industrial stage. Based on this, industrialization does not merely reflect changes in the economic sector, but can also include changes in social structure (Pramesti et al., 2023). Indonesia has experienced quite diverse industrialization developments recently. In the last 33 years (1991-2023), the development of industrialization as seen through industrial data based on Industrialization data (% of GDP value added) is as follows.

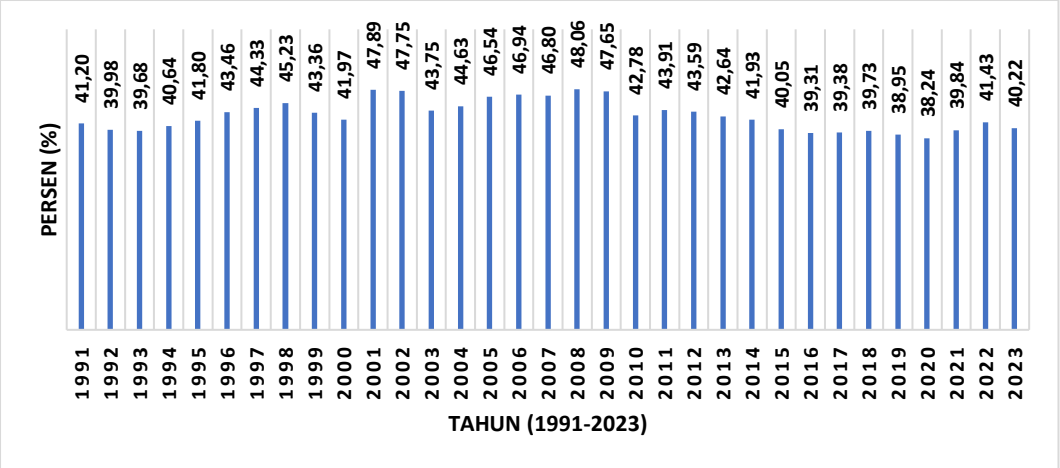

Figure 4.5 Industrialization (% of GDP value added)
Source: World Bank, 2024

Based on the data contained in Figure 4.5 above, it can be concluded that the industrialization figures above show a fluctuating trend that tends to experience an average decline of 0.90% per year and an average

increase of 0.66% per year, based on the data displayed, it can be seen that the smallest industrialization figure was recorded in 2020 due to the impact of the COVID-19 pandemic which caused several industrial sector commodities to experience a slump, due to the economic slowdown, while the highest figure was recorded in 2002, namely 48.06%. This decline in the original industrialization figure occurred not only due to the COVID-19 pandemic, this decline in the industrialization figure was also caused by several other things such as early deindustrialization, changes in economic structure and dependence on raw commodity exports and lack of innovation in the manufacturing industry sector.

D. Descriptive Statistics

Table 4.1 Descriptive Statistics

Variables	Mean	Max	Min	Std. Dev	*Obs*
Urbanization (URB)	3.244966	5.099975	1.754390	1.112411	33
Labor force participation (PAK)	68.64161	70.57100	66.41500	0.915064	33
Per Capita Income (LOGPDP)	2278.463	4940.550	459.1919	1477.443	33
Industrialization (IND)	42.83804	48.06074	38.23839	2.984214	33

Source: Data processing results (Eviews 10), 2025

Based on the results of descriptive statistics, it is known that the average urbanization rate (URB) during the observation period is 3.244966 with a maximum value of 5.099975 and a minimum of 1.754390. The standard deviation value of 1.112411, or around 34.27% of the average, indicates that the urbanization data is included in the fluctuating category, meaning that urbanization development is not linear and there are periods of significant spikes.

E. Stationarity Test Results

Table 4.2 Stationarity Test Results

Variables	Unit root	ADF t-Statistic	*Critical Value (5%)*	Prob.ADF	Note
Urbanization (URB)	Level	-1.039749	-2.957110	0.7267	Non-Stationary
	1st	-5.350391	-2.960411	0.0001	Stationary
Labor force participation (PAK)	Level	-2.492221	-2.957110	0.1267	Non-Stationary
	1st	-5.095764	-2.963972	0.0003	Stationary
Per Capita Income (LOGPDP)	Level	-0.752839	-2.957110	0.8188	Non-Stationary
	1st	-5.732266	-2.960411	0.0000	Stationary
Industrialization (IND)	Level	-1.052098	-2.963972	0.7211	Non-Stationary
	1st	-6.299882	-2.963972	0.0000	Stationary

Source: Appendix 2 Data processing results (*Eviews 10), 2025*

Based on the results of the stationarity test in Table 4.2 above, it can be seen that the variables urbanization, labor force participation, per capita income, and industrialization are stationary at the first level of differentiation. Therefore, it can be confirmed that further testing can be continued, because the ARDL model does not require stationarity at different levels.

F. Lag Length Determination Results

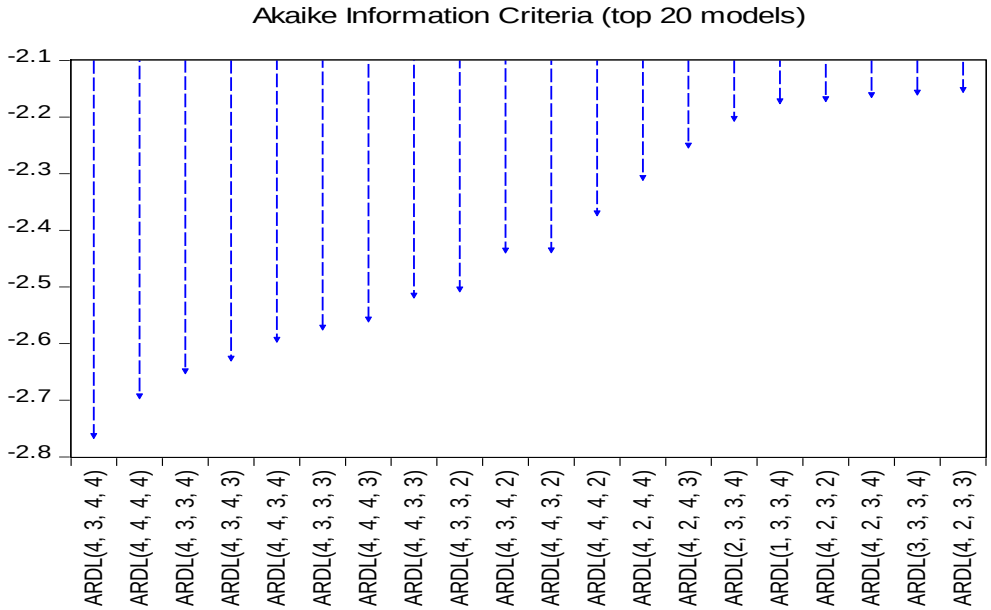

Figure 4.6 Results of Determining Lag Length

Source: Appendix 3, data processing results (Eviews 10), 2025

Figure 4.6 shows the results of selecting the optimal lag length for the ARDL model using the Akaike Information Criteria (AIC). This graph displays the 20 best ARDL model combinations based on the AIC value, with the vertical axis showing the AIC value and the horizontal axis showing the combination of lag lengths of each variable in the model. Based on the graph, the ARDL model (4,3,4,4) was selected as the best model because it has the lowest AIC value (around -2.762526), compared to the other models.

G. Bound Test Cointegration Test Results

Table 4.3 Results of Cointegration Bound Test

F-Bounds Test			*Null Hypothesis: No level relationship*	
Test Statistics	*Value*	*Significant.*	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.770470	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	28		*Finite Sample:*n=35	
		10%	2,618	3,532
		5%	3,164	4,194
		1%	4,428	5,816
			*Finite Sample:*n=30	
		10%	2,676	3,586
		5%	3,272	4,306
		1%	4,614	5,966

Source: Appendix 4, data processing results, (*Eviews 10), 2025*

Referring to Table 4.3 regarding the results of the cointegration test using the Bound Test method, the F-statistic value obtained is 6.770470, because the number of observations in this study is 29, then the Bound Test critical table is used for small sample sizes (finite sample, n ≈ 30). Based on the table, at the significance level of 10%, 5%, and 1%, the upper limit values are 3,586, 4,306, and 5,966, respectively. The F-statistic value obtained (6.770470) is greater than all upper limit values at all significance levels.

H. ARDL Stability Test Results

Table 4.4 ARDL Models

Dependent Variable: D(URB)
Method: ARDL
Date: 07/02/25 Time: 15:52
Sample (adjusted): 1996 2023
Included observations: 28 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): D(PAK) D(LOGPDP) D(IND)
Fixed regressors: C
Number of models evaluated: 500
Selected Model: ARDL(4, 3, 4, 4)

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.**
D(URB(-1))	0.663688	0.194058	3.420054	0.0076
D(URB(-2))	-0.027731	0.103206	-0.268698	0.7942
D(URB(-3))	-0.021151	0.089621	-0.236007	0.8187
D(URB(-4))	0.304030	0.096279	3.157797	0.0116
D(PAK)	-0.064221	0.022436	-2.862431	0.0187
D(PAK(-1))	-0.012236	0.022224	-0.550565	0.5953
D(PAK(-2))	-0.109741	0.020530	-5.345403	0.0005
D(PAK(-3))	-0.057640	0.023064	-2.499104	0.0339
D(LOGPDP)	-0.069338	0.055482	-1.249751	0.2429
D(LOGPDP(-1))	0.220257	0.062593	3.518911	0.0065
D(LOGPDP(-2))	-0.204315	0.075919	-2.691221	0.0247
D(LOGPDP(-3))	0.796441	0.085682	9.295282	0.0000
D(LOGPDP(-4))	-0.229622	0.169384	-1.355631	0.2083
D(IND)	-0.041710	0.009567	-4.359702	0.0018
D(IND(-1))	0.049060	0.010300	4.762909	0.0010
D(IND(-2))	-0.046940	0.012074	-3.887555	0.0037
D(IND(-3))	0.021319	0.010475	2.035171	0.0723
D(IND(-4))	-0.011612	0.008046	-1.443155	0.1829
C	-0.033269	0.035391	-0.940028	0.3717

R-squared	*0.976519Mean dependent variable*	*-0.107978*
Adjusted R-squared	*0.929556SD dependent var*	*0.204986*
SE of regression	*0.054406Akaike info criterion*	*-2.762526*
Sum squared residual	*0.026640Schwarz criterion*	*-1.858530*
Log likelihood	*57.67536Hannan-Quinn criter.*	*-2.486165*
F-statistic	*20.79362Durbin-Watson stat*	*2.383315*
Prob(F-statistic)	*0.000032*	

Source: Appendix 5, data processing results, (*Eviews 10), 2025*

Based on the results of model selection using the Akaike Information Criterion (AIC), it was found that the ARDL (4, 3, 4, 4) model is the most optimal model, indicated by the smallest AIC value compared to other models. Because the model reflects the balance in the long-term and short-term relationships between the analyzed variables,

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two stages of estimation were then carried out, namely the estimation of the long-term relationship and the estimation of the short-term relationship.

I. Short Term Estimation Results

Table 4.5 Short-Term Estimation Results

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(URB(-1), 2)	-0.255148	0.093415	-2.731340	0.0232
D(URB(-2), 2)	-0.282879	0.069716	-4.057615	0.0029
D(URB(-3), 2)	-0.304030	0.057057	-5.328571	0.0005
D(PAK, 2)	-0.064221	0.015121	-4.247194	0.0022
D(PAK(-1), 2)	0.167381	0.021679	7.720727	0.0000
D(PAK(-2), 2)	0.057640	0.018868	3.054843	0.0137
D(LOGPDP, 2)	-0.069338	0.041578	-1.667685	0.1297
D(LOGPDP(-1), 2)	-0.362503	0.086670	-4.182569	0.0024
D(LOGPDP(-2), 2)	-0.566818	0.083668	-6.774603	0.0001
D(LOGPDP(-3), 2)	0.229622	0.087094	2.636481	0.0271
D(IND, 2)	-0.041710	0.006617	-6.303195	0.0001
D(IND(-1), 2)	0.037233	0.009068	4.106008	0.0027
D(IND(-2), 2)	-0.009707	0.006764	-1.434996	0.1851
D(IND(-3), 2)	0.011612	0.005887	1.972575	0.0800
CointEq(-1)*	-0.081164	0.011607	-6.992699	0.0001

Source: Appendix 6, data processing results (*Eviews 10), 2025*

Short-term estimate summary:

$$\Delta URB_t = -0.081184ECM_{t-1} - 0.255148\Delta URB_{t-1} - 0.282879\Delta URB_{t-2} - 0.304300\Delta URB_{t-3} - 0.084221\Delta PAK_t + 0.167381\Delta PAK_{t-1} + 0.067840\Delta PAK_{t-2} - 0.362053\Delta LOGPDP_t - 0.356818\Delta LOGPDP_{t-1} + 0.562188\Delta LOGPDP_{t-2} - 0.042171\Delta IND_t + 0.011126\Delta IND_{t-1} + 0.008220\Delta IND_{t-2} + 0.011812\Delta IND_{t-3} \quad (4.1)$$

Based on the short-term estimation results of the ARDL model, the CointEq(-1) value of -0.081184, significant at the 1% level, indicates the presence of a long-term cointegration relationship in the model. This coefficient is used to measure the speed of adjustment toward long-term equilibrium. Its negative and significant value indicates that this model will correct deviations from long-term equilibrium by 8.12% in one period. Although the adjustment process is slow, the long-term relationship between variables remains valid.

J. Long-Term Estimation Results

Table 4.6 Long-Term Estimation Results

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(PAK)	-3.004249	9.306435	-0.322814	0.7542
D(LOGPDP)	6.325707	18.03545	0.350737	0.7339
D(IND)	-0.368183	1.083135	-0.339924	0.7417
C	-0.409891	0.836318	-0.490114	0.6358

Source: Appendix 7 data processing results, (*Eviews 10), 2025*

The following is a summary of the long-term estimates in this study.

$$URB_t = -3.004249PAK_t + 6.325707LOGPDP_t - 0.368183IND_t - 0.409891$$

Based on the long-term estimation results in Table 4.6, it appears that no independent variables are statistically significant for long-term urbanization. This is indicated by the probability values (p-values) for all variables being greater than 0.05. The labor force participation (FVP) variable has a coefficient of -3.004249 with a probability value of 0.7542, indicating that in the long run, a 1% increase in labor force participation is expected to reduce the urbanization rate by 3%. However, because the p-value is well above 0.05, this effect is not statistically significant and cannot be concluded conclusively.

K. Model Stability Test Results

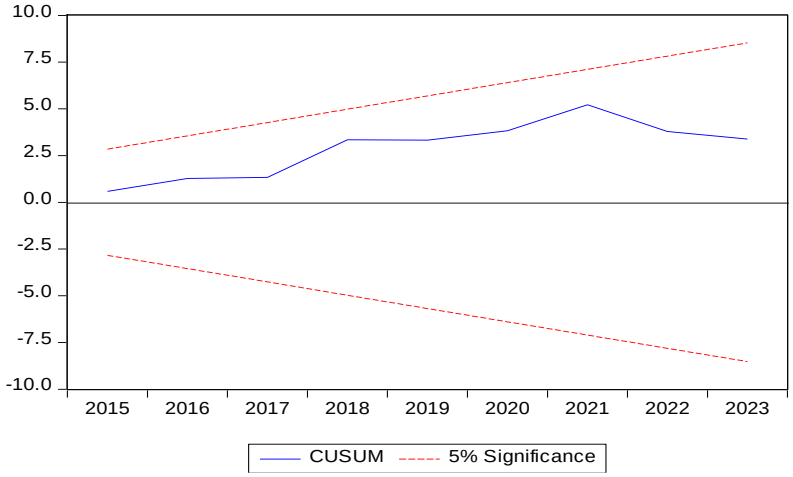

Figure 4.7 CUSUM Test Results
Source: Appendix 8, data processing results (Eviews 10), 2025

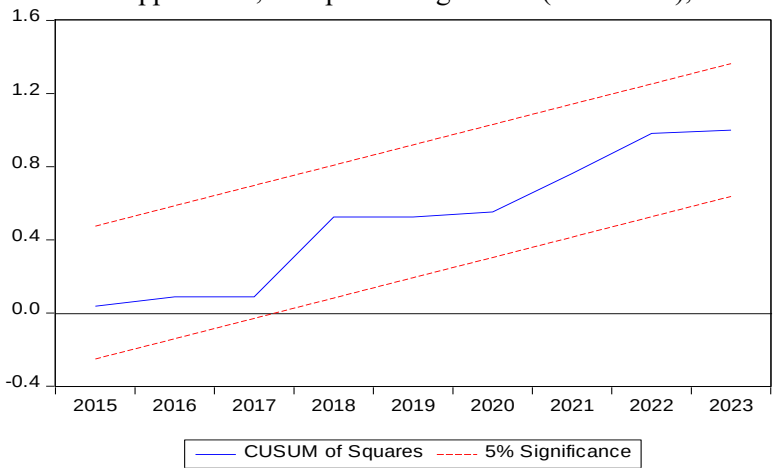

Figure 4.8 CUSUM Of Square Test Results
Source: Appendix 8, data processing results, (Eviews 10), 2025

Based on Figure 4.7 and Figure 4.8, the CUSUM test results show that the Wr quantity plot does not cross the critical limit marked by the dotted red line at the 5% significance level. Meanwhile, the CUSUM of Squares (CUSUM Q) test results show that the Sr quantity plot is also within the same critical limit and forms a linear pattern. Both test results indicate that the regression coefficients in the model are stable throughout the observation period. Thus, it can be concluded that the model used has not experienced significant structural changes, so the estimation results obtained can be considered reliable and consistent.

L. Normality Test Results

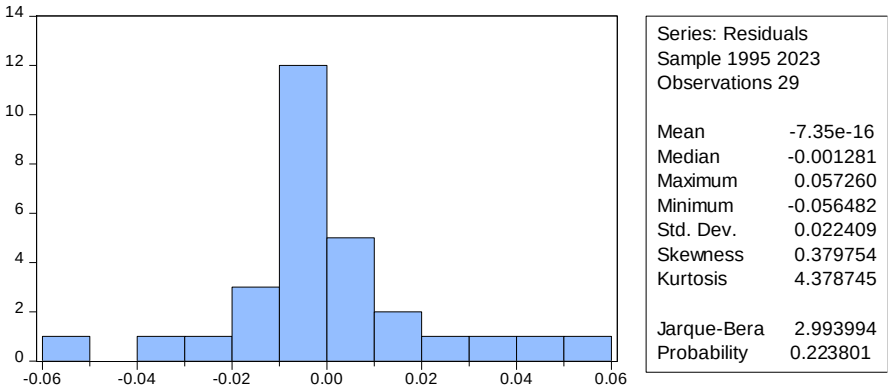

Figure 4.9 Normality Test Results

Source: Appendix 9, data processing results (Eviews 10), 2025

Based on Figure 4.9, the Jarque-Bera test results obtained a statistical value of 2.993994 with a probability of 0.223801>0.05. This value is smaller than the chi-square value of 5.991 at 2 degrees of freedom and a significance level of 5%. Therefore, it can be concluded that the residuals are normally distributed.

M. Autocorrelation Test Results

Table 4.7 Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.311436Prob. F(2,7)	0.7420
Obs*R-squared	2.287903Chi-Square Prob.(2)	0.3186

Source: Appendix 9, data processing results (*Eviews 10), 2025*

Based on table 4.7 which shows the results of the autocorrelation test, it can be concluded that the P-Value value of the Bruensch-Godfrey Serial Correlation LM test in this study is 0.3186, then the Prob. Chi-Square (2) value has a value greater than the 5% significance limit or 0.3186>0.05 so it can be concluded that the data contained in this study does not have an autocorrelation problem.

N. Heteroscedasticity Test Results

Table 4.8 Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.676899*Prob. F(18,10)*	0.7738
*Obs*R-squared*	15.92763*Chi-Square Prob.(18)*	0.5976
Scaled explained SS	3.199487*Chi-Square Prob.(18)*	1,0000

Source: Appendix 9, data processing results (Eviews10), 2025

Table 4.8 shows the results of the heteroscedasticity test which can be concluded that the P-Value value is indicated by the Chi-Square probability value. Because the value is greater than the 5% or 0.05 significance level (0.5976 > 0.05), it can be concluded that there is no heteroscedasticity problem.

DISCUSSION

A. Long-Term and Short-Term Effects of Labor Force Participation on Urbanization in Indonesia

The short-term estimation results show that labor force participation (FPP) has a significant effect on urbanization, although the direction of the effect varies depending on the period. In the current period, the FPP coefficient is -0.084221 (p = 0.0000), indicating that an increase in labor force participation actually significantly reduces urbanization. However, in the previous one and two years, FPP(-1) and FPP(-2) are 0.167381 and 0.067840,

respectively, with a significant probability value (<0.05), indicating that an increase in FPP in the past can encourage urbanization in the current period.

B. The Long-Term and Short-Term Effects of Per Capita Income on Urbanization in Indonesia

In the short run, per capita income (as the logarithm of LOGPDP) shows a significant effect on urbanization, but the direction of the effect varies across periods. In the current period and the previous year, LOGPDP has negative coefficients (–0.362053 and –0.356818), both significant, indicating that increasing per capita income can actually reduce urbanization. This may be due to the rising cost of living in urban areas or a preference to remain in one's hometown when prosperity increases.

C. Long-Term and Short-Term Effects of Industrialization on Urbanization

Based on short-term estimation results, industrialization (IND) has varying effects on urbanization. In the current period, the IND coefficient is –0.042171 (p = 0.0021), indicating that increased industrial activity actually significantly reduces urbanization in the short term. This could be due to industrial growth remaining concentrated outside large cities or the relocation of industry to suburban areas.

D. The Short-Term and Long-Term Effects of PAK, Per Capita Income, and Industrialization on Urbanization in Indonesia (Simultaneously)

Simultaneously, the ARDL estimation results show that the three independent variables, namely labor force participation, per capita income, and industrialization, have a statistically significant influence on urbanization in the short term, but are not significant in the long term. The existence of the CointEq(-1) coefficient which has a negative and significant value of -0.081184 is evidence that there is a long-term cointegration relationship between these variables, even though the adjustment speed is quite slow (around 8.12% per period).

CONCLUSION

Based on data analysis using the Autoregressive Distributed Lag (ARDL) model, this study successfully examined the influence of PAK, per capita income, and industrialization on urbanization in Indonesia, both in the short and long term. Testing was conducted both partially and simultaneously, in accordance with the research problem and hypotheses. The following are the main conclusions of this study:

1) The short- and long-term effects of labor force participation (FVP) on urbanization in Indonesia show that in the short term, FVP has a significant effect on urbanization, although the direction of the effect is inconsistent. In the current period, an increase in FVP actually reduced urbanization, whereas in the previous one and two years, FVP significantly boosted urbanization. However, in the long term, FVP has no significant effect on urbanization, as indicated by the high probability value.
2) The short- and long-term effects of per capita income on urbanization in Indonesia also show significant results only in the short term. Increases in per capita income in the first two years have a negative effect on urbanization, while in the third year (two years prior), the effect changes to a positive and significant one. In the long term, although the direction of the relationship between per capita income and urbanization is positive, the effect is not statistically significant.
3) The short- and long-term effects of industrialization on urbanization in Indonesia show that industrialization has a negative short-term effect in the current period, but begins to show a positive effect in the previous one to three years, albeit with a small coefficient value. In the long-term, the effect of industrialization on urbanization is also statistically insignificant.
4) Overall, the three independent variables of PAK, per capita income, and industrialization significantly influence urbanization in the short term, but do not show a significant effect in the long term. This indicates that urbanization dynamics in Indonesia tend to be more influenced by short-term socio-economic changes, while in the long term, other structural factors are more dominant, such as spatial planning policies, equitable development, and the attractiveness of urban centers.

Suggestion

Based on the findings of this study regarding the influence of workforce participation, per capita income, and industrialization on urbanization in Indonesia, several suggestions can be put forward as follows:

1) The government needs to optimize economic development and create equitable employment opportunities, particularly in non-urban areas. This is crucial to prevent growth in labor force participation from driving

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urbanization to large cities. Equalizing employment opportunities across regions can control urban migration and reduce development disparities.

2) Strategies to increase community income in rural areas must be accompanied by improvements in infrastructure and public services. Although increasing income can reduce urbanization in the short term, it is only effective if accompanied by improvements in the quality of life and adequate access to the local economy.
3) Industrialization should be directed in a planned manner to areas outside urban areas, the government can encourage the spread of new industrial areas to undeveloped areas, so that economic growth is not concentrated in large cities alone and can restrain the rate of urbanization.
4) Policymaking related to urbanization should consider the interrelationships between variables holistically. Urbanization is not simply a matter of migration, but also a reflection of economic and employment dynamics. Therefore, an integrated approach between the labor sector, economic development, and regional planning is essential.

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