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Harris–Todaro Migration Model Approach To Analyze The Effect Of Rural Gini Ratio, Urban Minimum Wage, And Rural Unemployment Rate On The Level Of Urbanization In Indonesia (2017–2023)

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Abstract

This study analyzes the effects of rural income inequality, urban minimum wage, and rural unemployment on urbanization in Indonesia from 2017 to 2023 using the Harris–Todaro Migration Model and the Generalized Method of Moments (GMM). The findings reveal that past urbanization significantly and positively affects current urbanization, indicating cumulative patterns. The rural Gini ratio shows a significant negative effect, suggesting that high inequality hinders migration due to limited economic mobility. Urban minimum wage also has a significant negative effect, as higher wages may reduce employment opportunities and decrease urban attractiveness. Likewise, rural unemployment negatively affects urbanization, reflecting financial and risk-related barriers to migration. These results highlight the need for equitable rural development and inclusive labor and migration policies.

Keywords: Urbanization, Harris–Todaro, Gini Index, Minimum Wage, Rural Unemployment, GMM.

INTRODUCTION

Urbanization is a complex process involving multiple dimensions such as demographic, social, economic, and geographical factors, characterized by an increasing concentration of population in urban areas. This process promotes modernization and

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economic growth through enhanced productivity and innovation but also brings challenges such as traffic congestion, increased housing demand, and social disparities between urban and rural areas (Hadijah & Sadali, 2020). Globally, urbanization rose from 36.6% in 1970 to 57% in 2023 and is projected to reach 68% by 2050 (United Nation, 2019; World Bank, 2023).

In Indonesia, urbanization occurs rapidly due to disparities in development between rural and urban areas (Chauvin et al., 2017). The Todaro migration model explains that despite limited urban job opportunities, rural populations migrate with the expectation of higher income(Todaro & Smith, 2020). Data from BPS indicates urbanization increased from 54% in 2017 to 58% in 2023, driven by economic growth and better employment opportunities in cities (Khan et al., 2023).

Economic inequality in rural areas, reflected in a relatively stagnant Gini ratio of around 0.31 (BPS, 2024), along with fluctuating unemployment rates, encourages migration to urban centers (Busso et al., 2021). Moreover, wage disparities between urban and rural areas also influence urbanization flows, where minimum wages in cities tend to be higher, attracting migrants seeking better economic prospects. Significant wage differentials between urban and rural areas also act as a major driver of urbanization (Chaplitskaya et al., 2024). However, rapid urbanization often outpaces job creation in cities, leading to increased urban unemployment (Todaro & Smith, 2012).

This study aims to analyze the effects of income inequality, unemployment rate, and wage differentials between rural and urban areas on urbanization levels in Indonesia during 2017–2023, using the Harris-Todaro Migration Model approach. The findings are expected to provide a basis for policies promoting balanced development between rural and urban areas, to reduce disparities and manage sustainable urbanization.

IMPLEMENTATION METHOD

This study uses secondary data with a quantitative descriptive approach and panel data analysis to examine the influence of the Rural Gini Ratio Index, City Minimum Wage, and Rural Unemployment Rate on the Urbanization Rate in Indonesia during 2017–2023. The data, obtained from the Central Statistics Agency (BPS), were analyzed using Stata 14 with a multiple regression model based on the Generalized Method of Moments (GMM). GMM was chosen because it provides more accurate estimates compared to the Pooled Least Squares (PLS) and Fixed Effect Model (FEM). The SYS-GMM model is considered the most appropriate as it meets three criteria: instrument validity, consistency

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of results (autocorrelation test), and unbiased estimation, with the lag coefficient of the dependent variable being more balanced than those in the FD-GMM and FEM models.

The following are the types of variables used in this study, along with their units and data sources, as presented in the table below:

Table 1. Type and Source of Data

Variable	Symbol	Unit	Data Source
Urbanization Rate	TU	Percent (%)	Statistics Indonesia (BPS)
Rural Gini Ratio Index	IGRD	Percent (%)	Statistics Indonesia (BPS)
Urban Minimum Wage	UMK	Million Rupiah	Statistics Indonesia (BPS)
Rural Unemployment Rate	TPD	Percent (%)	Statistics Indonesia (BPS)

The analysis uses Stata 14 with a multiple regression model estimated through the Generalized Method of Moments (GMM) developed by Hansen (1982). GMM is chosen for its ability to address endogeneity and heteroskedasticity in dynamic panel data.

The model function analyzed:

$$TU = f\ (IGRD, UMK, TPD)$$

Then, the model is further specified as follows:

$$TU_{it} = \beta_0 + \beta_1 IGRD_{it} + \beta_2 UMK_{it} + \beta_3 TPD_{it} + e_{it}$$

Where:
TU = Urbanization Rate (%)
IGRD = Rural Gini Ratio Index (%)
UMK = City Minimum Wage (Million Rupiah)
TPD = Rural Unemployment Rate (%)
β_0 = Constant (intercept)
$\beta_1 - \beta_3$ = Regression coefficients of independent variables
e = Error term
i=1,2,…,ni = 1, 2, …, *n* =1,2,…,n, indicating provinces in Indonesia (cross-section)
t=1,2,…,tt = 1, 2, …, *t* =1,2,…,t, indicating the years studied (time series)

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Data Analysis

In dynamic panel data analysis, selecting the appropriate model is crucial to avoid biased estimates. Two common approaches are FD-GMM and SYS-GMM. Evaluating potential bias helps determine which model is more reliable. One way to assess bias is by comparing models. If the lag coefficient from FD-GMM or SYS-GMM lies between the lag coefficients of the Fixed Effect Model (FEM) and Pooled Least Squares (PLS), the model is considered unbiased and valid for use(Firdaus, 2020).

Table 2. SYS-GMM Model Estimation Results

Variabel	Koefisien	Std. Error	z-statistik	Prob.
TU	0,9177506	0,0232161	39,53	0,000
IGRD	**-1,1877128**	**0,1181123**	**-10.06**	**0,000**
UMK	-1,2283246	0,0113622	-10,81	0,000
TPD	**-0,02470669**	**0,0018223**	**-13,56**	**0,000**
Kontanta	2,5290962	0,205072	12,33	0,000

Table 3. Sargan Test Results

Chi2(19)	Prob > chi
223,18731	0,2292

The Sargan test yields a p-value of 0.2292 (> 0.05), indicating valid instruments. There is no evidence of correlation between instruments and residuals, confirming model reliability.

Table 4. Arellano-Bond Test Results

Order	*z*	Prob > *z*
1	-1,6755	0,0938
2	1,2498	0,2114

The Arellano-Bond test (order 2) gives a p-value of 0.2114 (> 0.05), indicating no autocorrelation. Hence, the GMM estimation is considered consistent.

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DISCUSSION

Effect of Previous Urbanization on Current Urbanization (2017–2023)

The study shows that previous urbanization significantly and positively influences current urbanization ($z = 39.53$, $p < 0.05$). Regions with high past urbanization tend to sustain or increase their urban growth, consistent with the Harris-Todaro Model where expected urban job opportunities attract migrants despite limited actual jobs (Todaro & Smith, 2020). This supports the cumulative nature of urbanization observed in earlier research (Shinta, 2024).

Effect of Rural Gini Ratio on Urbanization (2017–2023)

The results indicate a significant negative effect of income inequality in rural areas (IGRD) on urbanization ($z = -10.06$, $p < 0.05$). Under the Harris-Todaro model, expected urban income should drive migration. However, high inequality limits the migration of the poor due to resource constraints. According to Lee's model, this represents an intervening obstacle. NELM emphasizes that limited capital and high risks deter households from financing migration, thereby slowing urbanization. Consistent with prior findings (Prima & Khoirunurrofik, 2019; Saputra & Rahayu, 2015).

Effect of Urban Minimum Wage on Urbanization (2017–2023)

The urban minimum wage negatively impacts urbanization ($z = -10.81$, $p < 0.05$). Higher wages raise labor costs, potentially reducing employment and urban attractiveness, which slows migration. Urban minimum wages also show a significant negative effect. While the Harris-Todaro model suggests that higher wages raise expected income, they also increase urban unemployment due to higher labor costs. In Lee's model, although high wages attract migrants, barriers such as competition and living costs reduce migration. From the NELM perspective, households assess collective risks and costs. When migration costs are high and job opportunities are limited, migration is discouraged. Consistent with prior findings (Sadarman et al., 2022; Sari, 2022).

Effect of Rural Unemployment on Urbanization (2017–2023)

Rural unemployment negatively affects urbanization ($z = -13.56$, $p < 0.05$), contrary to traditional models predicting increased migration. Theoretically (Harris-Todaro), rural unemployment should encourage migration. In practice, however, high unemployment restricts migration due to financial limitations and risks. In Lee's model, while migration pressure increases, large obstacles prevail. NELM argues that unemployed households

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lack the resources to fund migration, weakening urbanization trends. This reflects previous studies showing unemployment may reduce migration flow (Mangara et al., 2024; Simanjuntak, 2023).

CONCLUSION

This study concludes that rural income inequality (IGRD), urban minimum wage (UMK), and rural unemployment rate (TPD) have a significant negative effect on urbanization in Indonesia during 2017–2023, both in the short and long term. Previous levels of urbanization positively influence current urbanization, indicating a cumulative effect. The findings suggest that high rural inequality and unemployment, along with rising urban minimum wages, can hinder migration due to limited mobility, economic barriers, and rising urban living costs. The best estimation model identified is the System Generalized Method of Moments (SYS-GMM), validated through Sargan and Arellano-Bond tests. Simultaneously, all independent variables significantly affect urbanization, reinforcing the importance of integrated and inclusive rural-urban development policies. Which partly diverges from neoclassical migration theories but can be explained by intervening obstacles in Lee's model and risk considerations in the New Economics of Labor Migration (NELM) theory.

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