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Simultaneous Analysis Of Unemployment And Poverty In Aceh Province

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Abstract

This study aims to analyze the influence of the Human Development Index (HDI), Provincial Minimum Wage (PMW), and poverty rate on the unemployment rate in Aceh Province. Employing a multiple linear regression approach, the results reveal that only the poverty variable has a statistically significant impact on unemployment, while HDI and PMW do not exhibit meaningful effects. The estimated coefficient of determination (R^2) is 0.3296, indicating that the model explains approximately 32.96% of the variation in unemployment. These findings suggest that high poverty levels in Aceh substantially contribute to increased unemployment, primarily due to limited access among the poor to education, vocational training, and business capital. The non-significance of HDI and PMW may be attributed to a mismatch between educational outcomes and labor market demands, as well as the dominance of the informal sector, which remains largely unaffected by minimum wage policies. This research contributes to the formulation of labor and poverty reduction policies in underdeveloped regions, emphasizing the need for structural interventions tailored to local economic characteristics. Policy recommendations include strengthening vocational education based on local potential, empowering low-income households economically, and enhancing oversight and adaptation of minimum wage implementation

Keywords: Unemployment, Poverty, Human Development Index, Minimum Wage, Aceh.

INTRODUCTION

Poverty represents one of the structural disruptions within the economic system that must be addressed or at the very least, its impact minimized. It is a complex and multidimensional issue that requires a holistic approach, touching upon various aspects of community life simultaneously. The concept of poverty arises when individuals or groups are unable to achieve an economic standard of living that meets the minimum threshold for a decent life (Susanto, Rochaida, & Ulfah, 2017). According to Yacoub (2012), poverty is a fundamental issue as it concerns the fulfillment of basic human needs and remains a universal problem faced by many nations. The World Bank (2004) also emphasizes that one of the root causes of poverty lies in limited income and asset ownership, which hinders individuals' access to essential needs such as food, clothing, housing, healthcare, and quality education. In Indonesia, poverty remains a persistent issue that has not been fully resolved. As a challenge spanning multiple life dimensions, it has long been a central focus of national development agendas.

The government has launched various poverty alleviation programs through two key strategic approaches. First, by providing protection to poor households through the fulfillment of basic needs. Second, by equipping them with skills and training to prevent the emergence of new poor groups. These efforts are directed toward realizing the nation's vision of building a just and prosperous society (Royat, 2015).

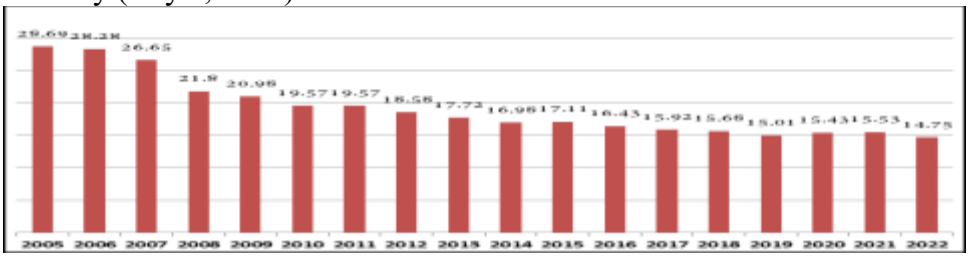

Figure 1. Poverty Rate in Aceh Province

The poverty rate in Aceh Province shows a downward trend, declining from 14.75% in September 2022 to 14.45% in March 2023. In rural areas specifically, there was also a slight decrease, from 17.06% to 16.92%, or a reduction of 0.14 percentage points. The Aceh Government continues to intensify various poverty alleviation initiatives as outlined in the Aceh Medium-Term Development Plan (RPJMA) 2007–2012, including the establishment of 160 targeted development intervention locations aimed at improving the quality of life and reducing unemployment (Government of Aceh, 2007). Historically, up to the late 1960s, economists believed that one of the main strategies to overcome development lag was to accelerate economic growth beyond the population growth rate. This strategy was expected to increase per capita income, thereby improving social welfare and reducing poverty levels (Agustina et al., 2018). Within this framework, stable and high economic growth contributes positively to job creation, thus reducing unemployment. Conversely, rising unemployment may result in decreased household income, leading to deteriorating social welfare and increased poverty rates (Sukirno, 2000). During the period 2008–2015, the unemployment rate in Aceh Province remained above the national average. Although a decline was recorded between 2008–2013, it began to rise again in 2014–2015. This fluctuation indicates that while job creation was relatively effective in absorbing new labor force entrants during certain years, it potentially stagnated in the subsequent period (Simreg Bappenas, 2015).

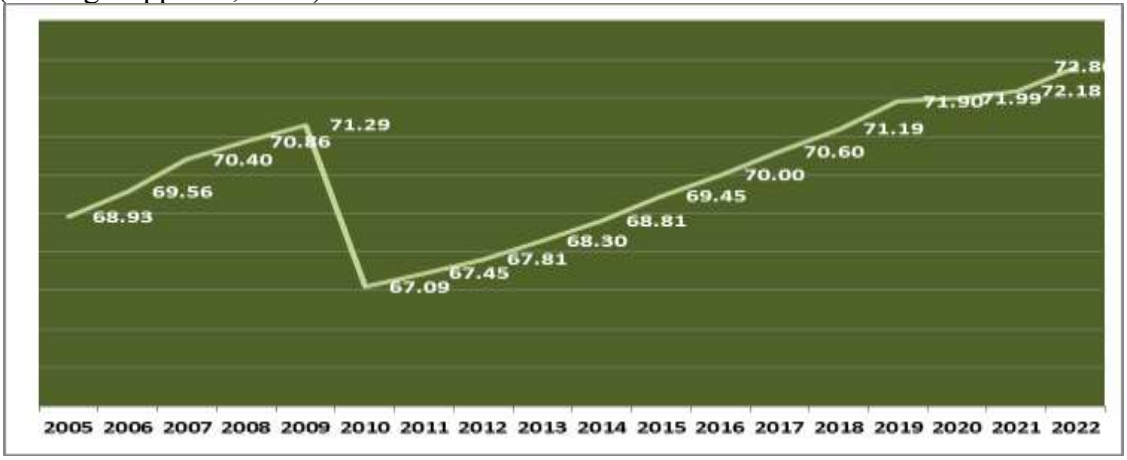

Figure 2. Human Development Index (HDI) in Aceh Province

Human development in Aceh Province has shown an encouraging trend, as reflected in the increase of its Human Development Index (HDI). In 2022, Aceh's HDI reached 72.80, an increase of 0.62 points, or a 0.86% growth compared to the previous year, which stood at 72.18. This improvement was evenly distributed across all HDI components life expectancy, education level, and expenditure per capita as an indicator of a decent standard of living. Previous research, such as that by Chalid and Yusuf (2014) in Riau Province, indicates that economic variables like poverty rate, unemployment, minimum wage, and economic growth significantly influence HDI. From the perspective of development economics, Arsyad (1997) argued that there is a strong correlation between unemployment and poverty. People who lack stable employment or only work part-time tend to fall into the poverty category, while those with formal employment and regular income generally belong to the middle or upper class.

However, not all unemployed individuals are poor. Some may voluntarily remain unemployed while waiting for a job that matches their educational background or income expectations. They are classified as unemployed but not necessarily poor, as they may have other financial support. Conversely, many full-time workers in the informal sector, despite working hard every day, remain below Poverty and Unemployment. Theoretically and empirically, poverty and unemployment are strongly interrelated and mutually reinforcing. High unemployment levels reduce household income due to the absence of stable earnings, directly increasing poverty rates. Conversely, impoverished individuals generally lack access to quality

education and skills training, limiting their ability to secure decent employment and thereby reinforcing the cycle of unemployment. Studies by Arsyad (1997) and Todaro & Smith (2015) argue that poverty is often a direct consequence of long-term unemployment. In regions with high joblessness, households face greater difficulty in affording basic needs such as food and education, exacerbating poverty, inequality, and declining living standards. Furthermore, structural unemployment caused by a mismatch between labor skills and market demands intensifies chronic poverty. For example, if job opportunities predominantly require higher education, communities with low educational attainment are more likely to remain trapped in poverty.

Unemployment and Minimum Wage (UMP). Provincial Minimum Wage (UMP) policies are intended to act as a social safety net, ensuring that workers earn a decent livelihood. However, the effects of UMP on unemployment remain ambiguous. Classical economic theory posits that minimum wage hikes not accompanied by productivity gains raise production costs, potentially leading to layoffs and higher unemployment. Lestari (2018) found that in several regions of Indonesia, increases in UMP could exacerbate unemployment, particularly in labor-intensive and small-scale businesses with limited operational capacity. In contrast, Rahmawati and Junaidi (2021) observed that higher minimum wages could reduce unemployment by boosting purchasing power and aggregate demand, thus encouraging job creation. These contrasting findings indicate that the impact of UMP on unemployment is highly dependent on regional economic structures and the dominant sectors involved.

Inflation and Unemployment (Phillips Curve). The relationship between inflation and unemployment is commonly described by the Phillips Curve, which proposes a trade-off between the two. When unemployment is low, inflation tends to rise due to increased labor demand driving wages and prices up. Conversely, high unemployment leads to lower inflation due to reduced consumer purchasing power. Nugroho (2017) found a short-term negative correlation between inflation and unemployment in Indonesia, supporting Phillips Curve theory. However, in the long term, this relationship weakens as inflation expectations influence wage adjustments. Moreover, Setiawan and Wibowo (2020) noted that in provinces with large informal economies, the inflation unemployment link becomes statistically insignificant due to wage and price inflexibility. In Aceh, where the informal sector dominates, inflation does not always translate to increased income, suggesting that the Phillips Curve may not universally apply especially in labor markets with structural imperfections.

Minimum Wage and Inflation. Rising minimum wages can trigger cost-push inflation, particularly if wage hikes occur simultaneously across sectors without matching productivity gains. Hidayat and Sari (2016) reported that UMP increases in Indonesia have contributed to rising prices of goods and services especially essentials due to higher production costs. However, some scholars argue that in the long run, higher minimum wages can have positive inflationary effects. Increased household income improves purchasing power, which can stimulate economic growth. If growth is aligned with productivity, inflation remains manageable. Yuliana et al. (2021) emphasize the importance of coordinating wage policy, productivity measures, and price controls to prevent excessive inflation triggered by UMP increases.

Human Development Index (HDI) and Labor Market. The Human Development Index (HDI) and labor force dynamics are deeply interconnected. A high HDI indicates better quality of life, education, and health factors that enhance labor productivity and economic competitiveness. Research by Sari and Kurniawan (2018) in West Java found that improvements in HDI positively influence labor force participation and reduce unemployment, as higher educational attainment expands job opportunities. Nugroho and Lestari (2020) further showed that longer schooling years and higher incomes encourage labor mobility into formal and productive sectors. However, this relationship is not always linear. Firdaus et al. (2019) observed that in Central Sulawesi, rising HDI does not always correlate with higher employment due to

skill mismatches between graduates and labor market needs. Formal education alone is insufficient; vocational training and job market connectivity are also crucial. Arsyad (2010) emphasized that human development without job creation leads to educated but unemployed labor. Therefore, HDI improvements must be integrated with proactive employment policies such as vocational training, entrepreneurship incubators, and the development of locally rooted industries the poverty line due to their insufficient earnings.

RESEARCH METHODS

This study applies a simultaneous equation model to capture the bidirectional relationship between key variables, particularly the unemployment rate and poverty level. The Two-Stage Least Squares (2SLS) method is employed as the estimation technique because Ordinary Least Squares (OLS) would produce biased and inconsistent results due to the endogeneity problem inherent in simultaneous systems. The simultaneous model consists of two structural equations as follows:

Equation 1: : Log(PNG)=C(10)+C(11)*log(IPM)+C(12)*log(UMP)+C(13)*log(KMS).
Equation 2 : : Log(KMS)=C(20)+C(21)*log(TK)+C(22)*log(INF)+C(23)*log(PNG).
Reduced-Form Equations:
Reduced-form equations are derived from the system to explain each endogenous variable (PNG and KMS) using only exogenous variables. Reduced Form for Unemployment (PNG): Includes: IPM, UMP, KMS Used to estimate PNG based on exogenous predictors like IPM and UMP. Reduced Form for Poverty (KMS): Includes: TK, INF, PNG Used to estimate KMS based on labor and inflation as exogenous inputs.
2SLS Estimation Steps:

1. First Stage: Regress each endogenous explanatory variable (e.g., KMS in Equation 1 or PNG in Equation 2) on all exogenous variables in the system to obtain fitted values (predicted values).
2. Second Stage: Replace the original endogenous variable with its fitted value in the structural equation and perform OLS to estimate consistent coefficients.

Equation 1:
HDI=C(10)+C(11)*GRDP+C(12)*NOI+C(13)*DR+C(14)*EO+e1
Where:
HDI = Human Development Index
GRDP = Gross Regional Domestic Product
NOI = Number of Industries
DR = Dependency Ratio
EO = Employment Opportunities
C = Constant
α_0–α_3 = Regression coefficients
e_1 = Error term
Equation 2:
EO=C(20)+C(21)*POP+C(22)*MW+C(23)*HDI+e1
EO = Employment Opportunities
POP = Population
MW = Minimum Wage
HDI = Human Development Index
C = Constant
α_0–α_3 = Regression coefficients
e_1 = Error term

RESULT AND DISCUSSION

Estimation to determine the variables that mutually influence each other in the two equations was carried out using the 2SLS model as follows:

System: FDR
Estimation Method: Two-Stage Least Squares
Date: 04/05/25 Time: 23:56
Sample: 2022M01 2023M12
Included observations: 96
Total system (balanced) observations 192

	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	712.4321	452.2364	1.551689	0.1321
C(11) IPM	-7.457464	35.46356	-0.206053	0.7864
C(12) UMP	-3.449862	107.56388	-1.268601	0.1154
C(13) KMS	-0.476322	86.05895	-1.499434	0.0214
C(20)	3.842563	0.325799	10.657433	0.0000
C(21) TK	7.757422	8.786444	0.098554	0.8976
C(22) INF	-0.498645	0.064997	-7.167544	0.0000
C(23) PNG	0.176442	0.024455	4.754256	0.0000

Determinant residual covariance 16807.08

Equation: GG=C(10)+C(11)*GSDG'+C(12)*GB+C(13)*GC
Instruments: GI GB GF KMM GC C
Observations: 96

R-squared	0.329606	Mean dependent var	-29.1862
Adjusted R-squared	0.102037	S.D. dependent var	365.4336
S.E. of regression	373.7973	Sum squared resid	13267754
Durbin-Watson stat	2.065908		

Equation: KPB=C(20)+C(21)*GI+C(22)*GF+C(23)*KMM
Instruments: GI GB GF KMM GC C
Observations: 96

R-squared	0.768543	Mean dependent var	1.445643
Adjusted R-squared	0.612764	S.D. dependent var	0.567543
S.E. of regression	0.365643	Sum squared resid	12.12754
Durbin-Watson stat	0.095796		

Equation 1 : LogPNG=a0+a1log(IPM)+a2log(UMP)+a3log(KMS)+e2
Unemployment =712.4321-7.457464*(IPM)-3.449862*(UMP)-0.476322*(KMS).

Regression Results and Policy Implications

The regression analysis using the simultaneous equation model yielded a coefficient of determination (R^2) of 0.3296, indicating that approximately 32.96% of the variation in the unemployment rate can be explained by labor force, inflation, and poverty variables, while the remaining 67.04% is attributed to other unobserved factors. The estimation further reveals that only poverty has a statistically significant simultaneous effect on unemployment in Aceh Province, while the Human Development Index (HDI) and Provincial Minimum Wage (UMP) show no significant influence.

1. Human Development Index (HDI) and Unemployment

Theoretically, a higher HDI reflects improved quality of human capital in terms of education, health, and living standards, often associated with lower unemployment. However, the findings show no significant relationship between HDI and unemployment in Aceh. This can be attributed to the mismatch between the education system and local labor market needs. Firdaus et al. (2019) in Central Sulawesi reported similar results, where increased HDI did not correspond to higher employment due to the dominance of informal employment. Suryani and Siregar (2020)

also noted that higher education indices do not necessarily translate into job readiness, especially in regions with low levels of industrialization. In contrast, Ghozali et al. (2018) found a significant negative relationship in East Java, highlighting the role of industrial access and infrastructure, which are relatively lacking in Aceh.

2. Provincial Minimum Wage (UMP) and Unemployment

UMP is theoretically designed to protect workers and serve as a benchmark for labor costs. Classical economic theory suggests that wage hikes can reduce labor demand if not matched by productivity gains. However, this relationship is not always linear. The results of this study indicate that UMP has no significant effect on unemployment in Aceh, likely due to the predominance of informal and subsistence agriculture sectors, where UMP regulations do not apply. Lestari (2018) found similar results in East Java, arguing that minimum wage regulations primarily affect formal employment sectors, limiting their reach and impact in informally dominated regions such as Aceh.

3. Poverty and Unemployment

In contrast to the previous two variables, poverty has a significant positive relationship with unemployment. This is a bidirectional relationship: poverty reduces access to education, training, and capital, limiting employment opportunities. Daryanto and Rizal (2019) in South Kalimantan demonstrated that poverty correlates with unemployment, especially in rural areas, where poor households are more vulnerable to job losses due to economic instability and lack of adaptability to technological change. Similarly, Chowdhury et al. (2017) in Bangladesh found that poverty alleviation efforts are more effective when complemented by skills training programs and access to microfinance.

4. Research Contribution and Policy Recommendations

This study offers valuable insights into the determinants of unemployment in Aceh, a region with distinct socio-economic characteristics. First, improving HDI must be accompanied by curriculum reform and stronger linkages between education and employment opportunities. Second, the effectiveness of UMP as a labor market tool should be reassessed in regions dominated by informal employment. Third, poverty reduction remains the most direct and impactful strategy to address unemployment in this context. Therefore, tackling unemployment in Aceh requires policies that are not only macroeconomic in nature but also responsive to the region's structural economic and social realities.

Equation 2 . Poverty =C(20)+C(21)*log(TK)+C(22)*log(INF)+C(23)*log(PNG). Poverty =3.842563 + 7.757422 * (TK) - 0.478925* (INF) + 0.176442 * (PGG)

Simultaneous Equation Estimation and Policy Implications

The estimated coefficient of determination (R^2) for the poverty equation is 0.768, indicating that approximately 76.8% of the variation in poverty levels can be explained by the variables of labor force, inflation, and unemployment. The remaining 23.2% is attributable to other unobserved factors. The results of the simultaneous equations model show that inflation and unemployment significantly affect poverty in Aceh Province, whereas the labor force variable does not exhibit a significant impact.

1. Human Development Index (HDI) and Unemployment

Theoretically, a high HDI reflects improved human capital, including better education, health, and living standards. In various studies, a higher HDI is generally associated with lower unemployment, as healthier and more educated individuals tend to have greater employment opportunities. However, the regression results in Aceh suggest that HDI does not significantly influence unemployment. This may be due to a mismatch between educational output and labor market demand. For example, Firdaus et al. (2019) found that although HDI increased in Central Sulawesi, it was not followed by a corresponding rise in employment, largely because the majority of the population worked in the informal sector. Similar findings were reported by Suryani and Siregar (2020), who noted that a higher education index does not necessarily result

in job-ready graduates, especially in regions with limited industrial development. In contrast, Ghozali et al. (2018) observed a significant negative relationship between HDI and unemployment in East Java, where better industrial access and infrastructure facilitated labor market absorption.

2. Provincial Minimum Wage (UMP) and Unemployment

The UMP is theoretically designed as a social safety net to ensure fair compensation for workers while signaling labor costs to employers. Classical economic theory posits that raising the minimum wage without corresponding productivity increases could lead to reduced labor demand and higher unemployment. In practice, however, this relationship is not always linear. In this study, the UMP was found not to have a significant effect on unemployment in Aceh. This can be explained by the predominance of informal employment and self-subsistence agriculture, which are not covered by minimum wage regulations. Lestari (2018) found similar results in East Java, where the UMP had no significant impact on unemployment due to its limited applicability to formal sectors. Nevertheless, Rahmawati and Junaidi (2021) in West Sumatra reported that UMP increases contributed to reduced unemployment by stimulating purchasing power and aggregate demand, thereby creating new jobs.

3. Poverty and Unemployment

Unlike the previous two variables, poverty shows a significant positive relationship with unemployment. This bidirectional relationship suggests that poverty can lead to unemployment and vice versa. Poor individuals typically have limited access to education, training, and capital, resulting in lower skills and productivity. Daryanto and Rizal (2019), in their study in South Kalimantan, confirmed that poverty levels were positively correlated with unemployment, particularly in rural areas. Poor households are more vulnerable to job loss due to economic instability and their inability to adapt to technological changes. Chowdhury et al. (2017) also supported this finding in their study in Bangladesh, emphasizing that poverty reduction programs are more effective when combined with skills training and microcredit access.

4. Research Contribution and Policy Implications

This study contributes to a deeper understanding of the determinants of unemployment in regions with unique social and economic characteristics such as Aceh. First, it highlights the need to align HDI-improvement policies with curriculum reform and stronger education-to-employment linkages. Second, the effectiveness of UMP as a labor market policy tool should be revisited in areas dominated by informal sectors. Third, poverty reduction strategies appear to be the most direct and effective approach to addressing unemployment at the local level. These findings suggest that unemployment reduction policies in Aceh must go beyond macro-level interventions and focus on tailored, context-sensitive strategies that reflect the region's socioeconomic realities.

CONCLUSION

Based on the regression analysis, it can be concluded that unemployment in Aceh Province is more significantly influenced by poverty than by other factors such as the Human Development Index (HDI) and the Provincial Minimum Wage (UMP). The poverty variable demonstrates a statistically significant impact on rising unemployment, indicating a strong correlation between economic deprivation and limited access to employment opportunities. Conversely, HDI and UMP do not show significant effects, which can be attributed to regional characteristics such as the dominance of the informal sector, weak linkages between education and labor markets, and uneven enforcement of minimum wage policies.

This study underscores that efforts to reduce unemployment in Aceh cannot rely solely on educational or wage policies, but must also address structural poverty and the

development of productive economic sectors. Therefore, future development strategies should emphasize strengthening the economic capacity of poor households, promoting skills training tailored to local economic potential, and reforming education and training systems to be more responsive to labor market demands.

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