

Rethinking Poverty Reduction: The Role of HDI Components and Labor Force Participation in Semarang

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ABSTRACT

This study investigates the influence of the Human Development Index (HDI) and its components—life expectancy and per capita expenditure—along with the labor force participation rate (LFPR), on poverty in Semarang City using time series data from 2010 to 2024. Two regression models were tested: Model 1 used HDI and LFPR, while Model 2 used life expectancy, per capita expenditure, and LFPR. The results show that per capita expenditure significantly reduces poverty, while life expectancy shows a positive and significant effect. HDI also has a negative and significant effect in the aggregate model. LFPR is not statistically significant in either model. Both models passed classical assumption tests, and Model 2 showed higher explanatory power than Model 1. These findings highlight the importance of income in poverty reduction and suggest further research into the demographic dimensions of poverty. Comparative modeling is recommended for broader policy insights.

Keywords: Human Development Index, Life Expectancy, Per Capita Expenditure, Labor Force Participation, Poverty, Regression Analysis, Semarang.

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INTRODUCTION

The Semarang City is experiencing a demographic bonus phenomenon, where the number of productive age population (15-64 years) is greater than the number of non-productive age population. Based on data from the 2020 Population Census, the population in the city of Semarang increased significantly, increasing by around 126 thousand people in the period 2010-2020. In 2023, the population of the city of Semarang was recorded at 1,693.74 thousand people, with 71.23 percent of them being of productive age.

This demographic bonus provides a great opportunity for the city of Semarang to improve its economy and development. However, the benefits can only be felt if the government focuses on improving the abilities and skills of the population to meet market needs. A demographic bonus that is well managed through investment in education, health, and job creation can drive significant economic growth (Bloom & Williamson, 1998).

Conversely, if not managed properly, the demographic bonus can actually become a burden on the region, one of which is the number of poor people.

Based on data from BPS, the number of poor people over the past 14 years (2010-2023) in Semarang City has not changed much. Even from the initial assessment year (2010) there was an increase compared to the final year (2023) of 0.82 thousand people. This should be anticipated by the Semarang City Government in order to be able to reduce the poverty rate in Semarang City.

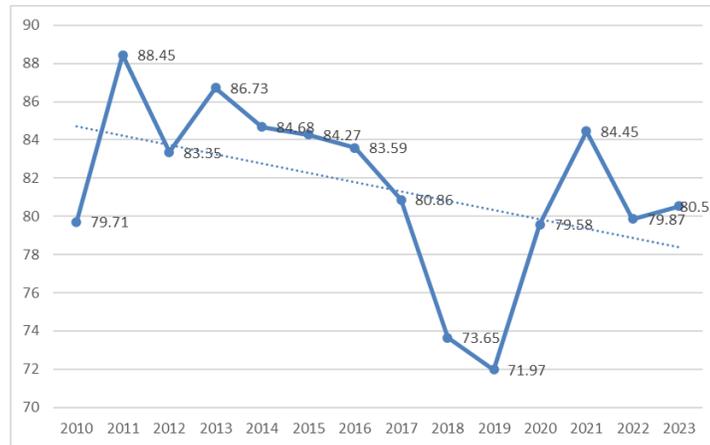


Figure 1: Number of Poor People in Semarang City 2010-2023 (In Thousands of People)

Source: Badan Pusat Statistik Semarang City

In the past five years, the Semarang City Government has implemented various policies to tackle poverty. One of the strategic steps taken is the implementation of Semarang City Regional Regulation Number 12 of 2016 concerning Poverty Alleviation. This policy aims to increase the capacity and skills of low-income communities, strengthen their participation in the formulation of public policies, and create an environment that supports the fulfillment of basic needs and sustainable welfare improvement (BPK, 2016).

In 2023, efforts to reduce poverty in Semarang will focus on seven sub-districts with high poverty rates, namely Muktiharjo, Tandang, Tanjungmas, Bandarharjo, Kemijen, Rejosari, and Muktiharjo Kidul. The local government is collaborating with various companies through the Corporate Social Responsibility (CSR) program to assist in the implementation of this program. In addition, the Integrated Social Welfare Data (DTKS) is updated to ensure the accuracy of beneficiary data and avoid targeting errors in social assistance policies.

Increasing the Labor Force Participation Rate (LFPR) is one of the effective strategies in poverty reduction efforts. According to the Assistant Deputy for Poverty Alleviation of the Coordinating Ministry for Human Development and Culture, Ade Rustama, increasing community income can be achieved through various empowerment programs, such as increasing access to capital, improving product quality and marketing access, developing skills and business services, and developing entrepreneurship and partnerships (Kemenko PMK, 2021).

Furthermore, LFPR can be used to measure the potential of the workforce in an area, where the percentage is directly proportional to the number of the workforce (Badan Pusat Statistik, 2021). Increasing LFPR also has an impact on economic diversification. The more people who are actively working, the greater the opportunity for the development of industrial sectors, both basic and non-basic sectors.

Community welfare can be achieved through the absorption of labor in various sectors, both agricultural and non-agricultural, by changing the existing economic structure (Hukom, 2014). The following is the LFPR of Semarang City for the last 14 years, namely 2010-2024:

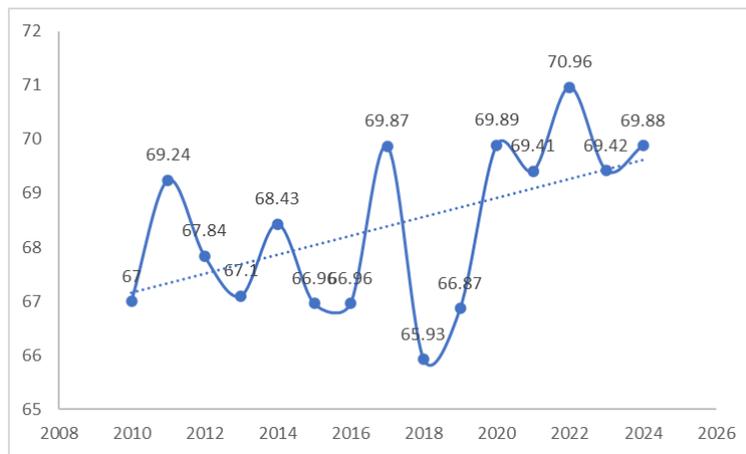


Figure 2: Labor Force Participation Rate of Semarang City 2010-2024
Source: Badan Pusat Statistik Kota Semarang

Based on data on the Labor Force Participation Rate (LFPR) of Semarang City from 2010 to 2024, in the last 15 years, LFPR has experienced quite high fluctuations with a not too significant upward trend. The low percentage of LFPR can be caused by various factors, both social and economic. One of the contributing factors is the lack of skills that match the needs of the labor market, which makes it difficult for individuals to get jobs. In addition, decreased job opportunities and uncertainty about national economic conditions can also encourage individuals to stop looking for work.

The labor force participation rate is an important factor in assessing how a country utilizes the existing workforce to increase economic growth (Todaro, 1997). The labor force participation rate can reflect how much the workforce contributes to the economy, as well as indicate the level of employment opportunities and welfare in a country (Sukirno, 2007).

This study reveals that the Labor Force Participation Rate (LFPR) has a positive and significant impact on poverty in Banten Province. This finding suggests that increasing labor force participation can contribute to increased income and decreased poverty rates (Desmawan et al., 2023). The Labor Force Participation Rate (LFPR) has a significant positive impact on poverty in Indonesia, indicating that increasing labor force participation plays a

role in reducing poverty levels, as evidenced by the findings in the study conducted (Langoday & Man, 2024).

United Nations Development Programme (UNDP), there are four composite indicators in the Human Development Index (HDI), namely health factors measured by Life Expectancy (LE), education factors measured by Average Years of Schooling (AYS) and Expected Years of Schooling (EYS), and economic factors measured by Per capita Expenditure (PE) of the community (Ravallion, 2010).

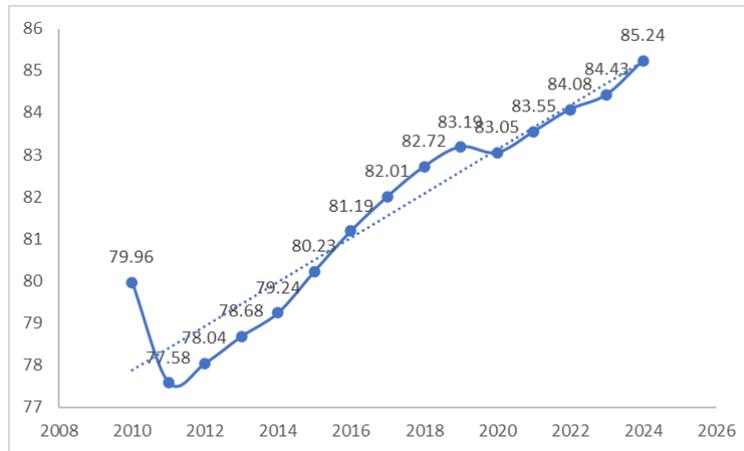


Figure 3: Human Development Index of Semarang City 2010-2024
Source: Badan Pusat Statistik Kota Semarang

Based on data from the Badan Pusat Statistik (BPS), the Human Development Index in Semarang City has shown an increasing trend over the past 15 years, from 2010 to 2024. There were two decreases, namely by 2.38 percent in 2010 to 2021 and by 0.14 in 2020 to 2021. This increasing trend in the Human Development Index reflects that public access to various development outcomes, such as in the fields of health, education, and income, tends to increase. The Human Development Index can also be used to rank government performance achievements at the regional level.

Over the past 15 years, the percentage of the Human Development Index of Semarang City was included in the high category because it has an average value above 80 (UNDP, 2002). This shows that the level of human development in Semarang City is very good, with wide access for the community to education, adequate health services, and a high level of economic welfare. When compared to regencies/cities in Central Java Province, Semarang City ranks second with the highest HDI after Salatiga City, followed by Surakarta City and Magelang City. Meanwhile, Pemalang Regency is in last place with the lowest HDI in Central Java Province.

The HDI assessment can be measured through three main components: getting a decent living (living standard), having a healthy life (longevity), and mastering or gaining knowledge (knowledge) (Mersiana & Satria, 2020). These three components are measured using the following indicators: Health: Life Expectancy (LE), Education: Average Years of

Schooling (AYS) and Expected Years of Schooling (EYS), Economy: per capita Expenditure of the community (PE).

Human Development Index (HDI) is a tool for measuring the success of human development that includes a decent quality of life, guaranteed public health, and adequate education. The higher the value of these three aspects, the greater the success of human development in a region, which directly impacts the development and economy of the country.

Previous study examined the impact of population, Human Development Index (HDI), and provincial minimum wage on extreme poverty rates in 34 provinces in Indonesia. The results of the study revealed that HDI has a negative and significant relationship with extreme poverty, indicating that an increase in HDI contributes to a decrease in the number of people living in extreme poverty (Rahmawati & Sebayang, 2023).

Others study showed the same results, they analyzed the impact of the Human Development Index (HDI), open unemployment rate, and population on poverty in the Special Region of Yogyakarta Province. The results showed that the HDI had a significant negative effect on the poverty rate, which means that an increase in the HDI contributed to reducing poverty rates in the area (Bella & Huda, 2023).

Life Expectancy or LE is a statistical indicator that reflects the average age expected by a person based on the current mortality rate. Life expectancy is an estimate of the average life expectancy of a person if the current mortality pattern applies throughout his/her life (United Nation, 2020). Life Expectancy describes the average life expectancy by considering the mortality rate and age structure. Furthermore, Life Expectancy according to epidemiological theory is also influenced by the distribution of diseases, lifestyle habits (smoking or drinking alcohol), and unhealthy eating patterns (Coale et al., 1983).

Life expectancy has a positive impact on economic growth and helps reduce the negative impact of poverty in Nigeria. The study found that the minimum threshold of life expectancy required to effectively reduce poverty and promote sustainable economic growth is 64.4 years, which is much higher than the current average of 47.8 years (Lawanson & Ikoh, 2021).

Life expectancy in Malaysia is strongly influenced by poverty levels. The study showed that every 1% reduction in poverty can add about 17.9 days to life expectancy at birth. In the last ten years, Malaysia has managed to reduce poverty from 6% in 2002 to 0.6% in 2014, with poverty reduction contributing to improvements in public health. Elimination of remaining poverty has the potential to further increase life expectancy, especially in areas with high poverty rates (Tafran et al., 2020).

Per capita expenditure is one indicator that reflects the total expenditure made by individuals in a country in a certain time. Measuring community per capita expenditure is done by dividing the total national expenditure by the population in a region or country (Samuelson & Nordhaus, 1995). Per capita expenditure can also be used to measure the level of community consumption and functions as an indicator of community welfare, because it can describe the community's standard of living (Mankiw, 2007). Adam Smith, stated that production and consumption managed by the community reflect (Arifin, 2003).

Income per capita has a significant negative relationship on poverty rates in Sumatra, while capital expenditure does not have a significant effect (Septiani et al., 2019). This finding suggests that increasing income per capita can play a role in reducing poverty rates in the region. Per capita expenditure has a significant negative relationship on poverty rates in West Java, indicating that increasing per capita expenditure can contribute to reducing poverty rates in the region in the period 2010 to 2022, as shown in the research results (Akbar & Amaliah, 2024).

Research on the determinants of poverty has been widely conducted in various regions in Indonesia, using social and economic factors as concerns in the form of education, health, and income. However, based on the literature review that has been conducted, no research has been found that explicitly compares the effect of the human development index (HDI) as a whole on poverty with the effect of each of its components—such as life expectancy and per capita income—which are tested separately. This kind of comparative analysis is important to gain a more detailed understanding of the effectiveness of each indicator in explaining poverty levels.

This study aims to test the effect of the HDI as a whole on poverty, as well as to separately test the components of the HDI, namely life expectancy and per capita expenditure. In addition, this study also analyzes the effect of the labor force participation rate (LFPR) on poverty as a variable that represents the conditions of the labor market. The test was conducted by building two regression models and comparing the results of both to assess the effectiveness and stability of each approach.

The analysis draws upon secondary data sourced from BPS Semarang City covering the years 2010 to 2024. With a geographical focus on the city of Semarang and a comparative approach of two models, it is hoped that the results of this study can contribute to the formulation of more targeted poverty alleviation policies, especially through efforts to increase the human development index.

METHOD

This study uses a quantitative approach with an explanatory method. Two linear regression models were developed to examine and compare the influence of different variables on poverty. First model includes The Human Development Index (HDI) and The Labor Force Participation Index (LFPR) as independent variables. The second models separate the components of HDI, The Life Expectancy (LE) and Per capita Expenditure (PE), and uses LFPR as independent variables.

First model:

$$Poverty = \beta_0 + \beta_1HDI + \beta_2LFPR + \varepsilon$$

Second model:

$$Poverty = \beta_0 + \beta_1LE + \beta_2PE + \beta_3LFPR + \varepsilon$$

The comparative approach uses to identify whether HDI as composite index provides explanatory power than its individual in explaining poverty rate. This study can be

categorized as a time series data study, because it uses secondary data collected over a certain period to see trends and changes in variables. The data are obtained from the Badan Pusat Statistik (BPS), which provides data needed from previous years (2010-2024).

The analytical methods used in this study include statistical and econometric techniques to identify causal relationships between the variables studied. Time series regression models are used to see how independent variables affect poverty levels from year to year. The validity and reliability of the regression result ensured by classical assumption test, including multicollinearity, heteroscedasticity, and autocorrelation. The multicollinearity test was conducted using the Variance Inflation Factor (VIF) to detect the presence of high correlations among independent variables. The heteroscedasticity test employed the Breusch-Pagan-Godfrey method, while Breusch-Pagan-Godfrey Serial Correlation LM Test was used to examine the presence of serial correlation in the residuals.

The population in this study includes all data related to poverty, Human Development Index (HDI), Life Expectancy (LE), Per capita Expenditure (PE), Labor Force Participation Rate (LFPR) in Semarang City in a certain period. This population is aggregate because it consists of data obtained from official sources.

Because this study is based on secondary data (time series), the sample used is annual data from the variables studied in a certain period. The sample is selected based on time period: the last 15 years to see trends. The data used only comes from Semarang City, without comparing it with other areas (not panel research). Purposive sampling was chosen because it allows the study to focus on the period and data that are most relevant to the purpose of the analysis.

This approach also helps in understanding the social and economic trends that are developing in the city of Semarang in a certain period. By comparing data from various years that meet the criteria, this study can identify patterns of change in the variables studied. The results of this purposive sampling technique are expected to provide deeper insights into the effectiveness of government interventions in reducing poverty.

The research procedure includes preparation, data collection, data analysis, and preparation of conclusions and recommendations. In the preparation stage, the research begins with problem identification, objective determination, and the preparation of a theoretical framework that supports the analysis. Secondary data is collected from official sources such as the Badan Pusat Statistik (BPS) and regional policy documents. This process aims to ensure that the data used is valid, accurate, and in accordance with research needs. In addition, supporting literature is also reviewed to understand the context and trends related to the variables studied.

After the data is collected, analysis is carried out using statistical software such as EViews to process and interpret the research results. The analysis techniques used include descriptive and inferential statistical tests to identify the relationship between the variables studied. The results of this analysis are then used as a basis for compiling conclusions and policy recommendations. By following this systematic research procedure, it is hoped that the research results can provide useful insights for local governments in designing strategies to improve community welfare and alleviate poverty.

RESULT

The results of the analysis show that the first model has R Value of 0.855, indicating 85% of the variation in the poverty rate is explained by the selected variables. The Second Model show that, R value has 0.941, indicating 94% of the variation in the poverty rate is explained by the selected variables. The result in the second model has larger R Value than the first model. The Model 1 adjusted R² value of 0.83, with F statistics of 35.40 and Prob(F-statistics) of 0.000009 suggesting overall model significance. The second model has adjusted R² value of 0.925, with F statistics of 59.22 and Prob(F-statistics) of 0.0000, indicating a statistically significant regression model.

Table 1: Regression Analysis Results

Variabel	Model 1			Model 2		
	Koefisien	t-statistik	Prob.	Koefisien	t-statistik	Prob.
C	18.34530	6.446995	0.0000	-33.48964	-2.090925	0.0605
HDI	-0.215324	-8.133331	0.0000			
LE				0.524771	2.364519	0.0375
PE				-0.000417	-10.28497	0.0000
LFPR	0.057268	1.337263	0.2059	0.052004	1.696220	0.1179
R-squared	0.855082			0.941693		
Adjusted R-squared	0.830930			0.925791		
F-statistic	35.40286			59.21868		
Prob(F-statistic)	0.000009			0.000000		

Source: Processed by author with EViews, 2025

This study estimates two regression models to evaluate and comparing the influence of human development and labor market variables on poverty in Semarang City. Time series data from 2010 to 2024 uses to finding the result. The First model uses HDI and LFPR as independent variables. Second Model uses disaggregates HDI into LE and PE along with LFPR variable as labor market.

HDI variable in the first model showing statistical significance with t-statistic of -8.133, and p-value of 0.000 below 0.05, it shows negative relationship on poverty with coefficient of -0.215. However, LFPR have not statistical significance with t-statistic of 1.337, and p-value of 0.205 above 0.05, positive relationship of LFPR on poverty show from coefficient of 0.0572.

In second model, LE and PE have statistical significance. LE showing regression coefficient 0.524, which shows positive relationship, t-statistic of 2.364, and p-value of 0.0375 below 0.05. PE showing regression coefficient -0.0004, which shows negative relationship, t-statistic of -10.284, and p-value of 0.000 below 0.05. LFPR have not statistical significance as the first model, with t-statistic of 1.696, and p-value of 0.117 above 0.05, positive relationship of LFPR on poverty show from coefficient of 0.0520.

Multicollinearity test was conducted on both regression model using the Variance Inflation Factor (VIF) method in EViews. The result shown in table 2

Table 2: Multicollinearity Test

No	Variable	Model 1	Model 2
		Centered VIF	Centered VIF
1	HDI	1.198239	-
2	LE	-	3.304907
3	PE	-	2.791899
4	LFPR	1.198239	1.490820

Source: Processed by author with EViews, 2025

VIF values on both models are below the commonly used threshold of 10. All independent variables are indicating free from multicollinearity issues. All variables were tested based on centered VIF as reported by EViews.

A normality test was conducted on the residuals of Model 1 and Model 2 using the Jarque-Bera Method. The histogram are shown in Figure 4 and Figure 5

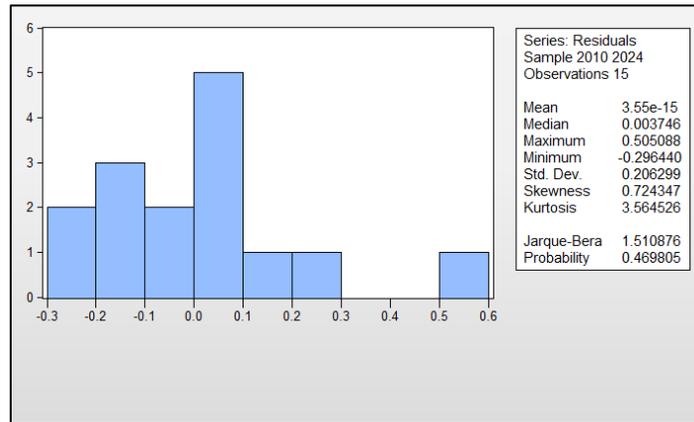


Figure 4: Histogram – Normality Test Model 1

Source: Processed by author with EViews, 2025

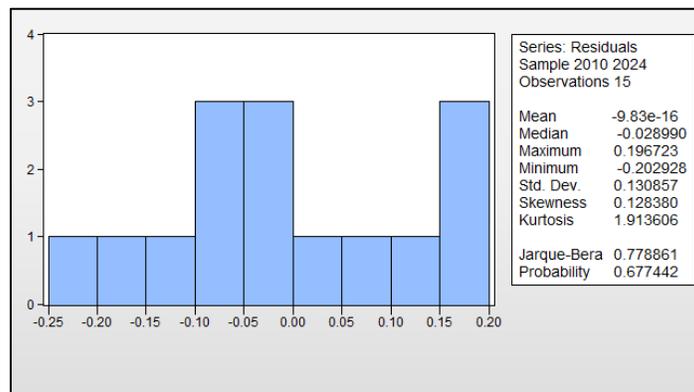


Figure 5: Histogram – Normality Test Model 2

Source: Processed by author with EViews, 2025

The Jarque-Bera probability value and the shape of the histogram are used to evaluate the normality of residuals in this model. The Model 1 Jarque-Bera probability value of 0.469 and The Model 2 probability value of 0.677 are greater than 0.05, indicate the residuals of all model meet the normality assumption.

Table 3: Breusch-Pagan-Godfrey Serial Correlation LM Test

Description	Model 1	Model 2	α
Prob.Chi-Square	0.4802	0.3213	0.05

Source: Processed by author with Eviews, 2025

The Breusch-Godfrey Serial Correlation LM Test was conducted to assess the presence of serial correlation in the residuals of Model 1 and Model 2. The result shown in Table 3. The conclusion is all models have probability value greater than 0.05 as threshold, indicates there is no evidence of serial correlation was detected of either model.

Table 4: Heteroskedasticity Test

Description	Model 1	Model 2	α
Prob.Chi-Square	0.3431	0.4887	0.05

Source: Processed by author with Eviews, 2025

The Breusch-Godfrey method used to examine the presence of heteroskedasticity in the Model 1 and Model 2. The result shown in Table 4. The conclusion is all models have probability chi square value greater than 0.05 as threshold, indicates there is no evidence of heteroskedasticity was detected of either model.

All classical assumption test were examining performance of both model regression, include normality, multicollinearity, serial correlation, and heteroskedasticity test. The results indicate all model clear adequate the classical assumption. The residuals in both models are normally distributed, no multicollinearity was detected among independent variables, and there is no indication of serial correlation or heteroskedasticity. These results shows both models adequate assumptions for linear regression analysis.

DISCUSSION

The results of the regression analysis indicate that in first model, the Human Development Index (HDI) has statistically significant negative relationship on poverty. Increasing HDI value could reduce poverty rate. In second model, when HDI is disaggregated into its components, the Per Capita Expenditure (PE) shows a strong negative and significant relationship on poverty, while Life Expectancy (LE) shows a positive and statistically significant effect. The LFPR in Models remains statistically insignificant.

Comparatively, Model 2 shows a better overall fit than Model 1, as indicated by a higher R-squared and adjusted R-squared. This suggests that disaggregating HDI into its components may provide a more detailed and explanatory model in the context of poverty

in Semarang City. The validity and reliability of both models have adequate by classical assumption test.

The findings from HDI in model 1, consistent with the result from previous study, HDI could reducing poverty rate (Bella & Huda, 2023; Rahmawati & Sebayang, 2023). Key determinant in reducing poverty from this result is the PE variable, align with previous study, which increasing PE could contribute reducing poverty (Akbar & Amaliah, 2024; Septiani et al., 2019). However, the positive and significant effect of life expectancy on poverty in Model 2 contrasts with most previously find literature. They find LE can reduce poverty, vice versa (Lawanson & Ikoh, 2021; Tafran et al., 2020). This may reflect contextual nuances in Semarang during the period of 2010–2014, such as aging population dynamics or access to social protection.

Insignificant effect of LFPR in both model is also notable and contrast with previous. They find LFPR have significantly positive impact to reduce poverty study (Desmawan et al., 2023; Langoday & Man, 2024).

Limitation of this study is using of only one city as a case study. Additionally, the interpretation of LE's positive effect on poverty requires further investigation, possibly with additional control variables such as dependency ratios or healthcare access.

CONCLUSION

The findings indicate that disaggregating the Human Development Index into its individual components may provide more detailed insights for policy development. Considering the strong influence of per capita expenditure, strategies aimed at reducing poverty should emphasize efforts to boost income and economic capacity. The surprising positive effect of life expectancy in Model 2 highlights the importance of further interdisciplinary studies to explore the demographic and social aspects of poverty. Future research is recommended to apply this comparative modeling framework in different regions and across extended time periods.

REFERENCES

- Akbar, R. A., & Amaliah, I. (2024). Pengaruh Pengeluaran Per Kapita, Angka Kesakitan, Angka Perceraian, dan Persentase Penerima Kredit Usaha Rakyat terhadap Tingkat Kemiskinan di Jawa Barat Tahun 2010-2022. *Bandung Conference Series: Economics Studies*, Vol. 4(1). <https://doi.org/https://doi.org/10.29313/bceses.v4i1.10398>
- Arifin, M. (2003). *Ekonomi Pembangunan*. BPFE.
- Badan Pusat Statistik. (2021). *BOOKLET SAKERNAS Survai Angkatan Kerja Nasional Fungsi Statistik Ketenagakerjaan*. Badan Pusat Statistik.
- Bella, P. C., & Huda, S. (2023). Analisis Pengaruh Indeks Pembangunan Manusia, Tingkat Pengangguran Terbuka, dan Jumlah Penduduk Terhadap Tingkat Kemiskinan di Provinsi Daerah Istimewa Yogyakarta. *EKOMA Jurnal Ekonomi Manajemen Akuntansi*, 2(2), 480–488. <https://doi.org/10.56799/ekoma.v2i2.1752>
- Bloom, D. E., & Williamson, J. G. (1998). Demographic Transitions and Economic Miracles in

- Emerging Asia. World Bank Economic Review. *World Bank Economic Review*, 12, 419–455. <https://doi.org/https://doi.org/10.1093/wber/12.3.419>
- BPK. (2016). *Perda Kota Semarang No. 12 Tahun 2016*.
- Coale, A. J., Demeny, P., & Vaughan, B. (1983). *Regional Model Life Tables and Stable Populations*. Elsevier Inc. <https://doi.org/https://doi.org/10.1016/C2013-0-07295-7>
- Desmawan, D., Salsabila, A. K., Amalia, L., Anargya, R. A., Kirana, R. S., & Valentina, V. (2023). Analisis Pengaruh Tingkat Partisipasi Angkatan Kerja dan Upah Minimum Provinsi Terhadap Kemiskinan Di Provinsi Banten. *Jurnal Manajemen Akuntansi (JUMSI)*, 3(2).
- Hukom, A. (2014). Hubungan Ketenagakerjaan Dan Perubahan Struktur Ekonomi terhadap Kesejahteraan Masyarakat. *Jurnal Ekonomi Kuantitatif Terapan*, 7(2), 120–129.
- Kementerian koordinator bidang pembangunan manusia dan kebudayaan republik indonesia. (2021). *Strategi Pengentasan Kemiskinan Melalui Sinergi Program Pemberdayaan Masyarakat*. <https://www.kemenkopmk.go.id/strategi-pengentasan-kemiskinan-melalui-sinergi-program-pemberdayaan-masyarakat>
- Langoday, T. O., & Man, S. (2024). The Role Of Population Growth, Education Level, Labor Force Participation Rate On Poverty Level In Indonesia. *Journal of Law and Sustainable Development*, 12(2), e3011. <https://doi.org/https://doi.org/10.55908/sdgs.v12i2.3011>
- Lawanson, O. I., & Ikoh, U. D. (2021). The life expectancy-economic growth nexus in Nigeria: the role of poverty reduction. *SN Bus Econ*, 1(10), 127. <https://doi.org/10.1007/s43546-021-00119-9>
- Mankiw, N. G. (2007). *Macroeconomics* (6th ed). Worth Publishers.
- Mersiana, B., & Satria, D. (2020). *Analysis of the effect of gross regional domestic product, education, open unemployment, minimum wages and human development index on poverty of West Nusa Tenggara Province in 2012-2017 (Case study of 10 districts/cities)* [Universitas Brawijaya]. <https://repository.ub.ac.id/id/eprint/187869/>
- Programme, U. N. D. (2002). *Human Development Report 2002: Deepening democracy in a fragmented world*. <https://hdr.undp.org/content/human-development-report-2002>
- Rahmawati, D., & Sebayang, A. F. (2023). Pengaruh Jumlah Penduduk, Indeks Pembangunan Manusia dan Upah Minimum Provinsi terhadap Kemiskinan Ekstrem. *Jurnal Riset Ilmu Ekonomi Dan Bisnis*, 3(2). <https://doi.org/10.29313/jrieb.v3i2.2871>
- Ravallion, M. (2010). The Developing World's Poverty Measurement Problem. *World Development*, 38(5), 622–636. <https://doi.org/https://doi.org/10.1016/j.worlddev.2009.11.010>
- Samuelson, P. A., & Nordhaus, W. D. (1995). *Economics* (15th ed.). McGraw-Hill.

- Septiani, W. T., Zamzami, Z., & Mustika, C. (2019). Analisis pengaruh pendapatan perkapita dan belanja modal terhadap tingkat kemiskinan di Pulau Sumatera. *E-Jurnal Perspektif Ekonomi Dan Pembangunan Daerah*, 8(3). <https://doi.org/https://doi.org/10.22437/pdpd.v8i3.7351>
- Sukirno, S. (2007). *Ekonomi pembangunan: Proses, masalah, dan dasar kebijakan*. Kencana.
- Tafran, K., Tumin, M., & Osman, A. F. (2020). Poverty, Income, and Unemployment as Determinants of Life Expectancy: Empirical Evidence from Panel Data of Thirteen Malaysian States. *Iran J Public Health.*, Feb;49(2), 294–303.
- Todaro, M. P. (1997). *Economic development* (6th ed.). Addison-Wesley.
- United Nation. (2020). *Life expectancy at birth*. <https://www.un.org>