IMPACT OF THE ENVIRONMENTAL QUALITY INDEX (IKLH), INFLATION, AND UNEMPLOYMENT RATE ON ECONOMIC GROWTH IN INDONESIA

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Abstract

This study aims to analyze the impact of the Environmental Quality Index, Inflation, and Unemployment Rate on Economic Growth in Indonesia. This study uses secondary panel data from 34 provinces in Indonesia for the period 2018–2022. This analysis uses panel data regression with the Fixed Effect Model (FEM) approach to examine the relationship between variables. The dependent variable is economic growth, measured by Gross Regional Domestic Product, while the independent variables include the Environmental Quality Index, inflation, and unemployment rate. The findings reveal that the Environmental Quality Index has no effect on economic growth in Indonesia. On the contrary, inflation has a negative and significant impact on economic growth, highlighting the importance of price stability in supporting household purchasing power and economic activity. Likewise, the unemployment rate has a negative and significant effect on economic growth in Indonesia. This underscores the important role of job creation to support economic progress. This study provides theoretical and practical contributions, especially in environmental management, economic stability, and unemployment reduction as a joint effort to encourage sustainable economic growth in Indonesia. These findings are also relevant for policymakers in designing economic development strategies that balance environmental preservation, price stability, and social welfare to achieve inclusive and sustainable development.
Keywords: Environmental Quality Index; Inflation; Sustainable Development; Economic Growth; Unemployment Rate

Abstrak

Penelitian ini bertujuan untuk menganalisis dampak Indeks Kualitas Lingkungan Hidup, Inflasi, dan Tingkat Pengangguran terhadap Pertumbuhan Ekonomi di Indonesia. Penelitian ini menggunakan data panel sekunder dari 34 provinsi di Indonesia untuk periode 2018–2022. Analisis ini menggunakan regresi data panel dengan pendekatan Fixed Effect Model (FEM) untuk memeriksa hubungan antar variabel. Variabel dependen adalah pertumbuhan ekonomi, diukur melalui Produk Domestik Regional Bruto, sedangkan variabel independen meliputi Indeks Kualitas Lingkungan Hidup, inflasi, dan tingkat pengangguran. Temuan ini mengungkapkan bahwa Indeks Kualitas Lingkungan Hidup tidak berpengaruh pada pertumbuhan ekonomi di Indonesia. Sebaliknya, inflasi berdampak negatif dan signifikan terhadap pertumbuhan ekonomi, sehingga menyoroti pentingnya stabilitas harga dalam menopang daya beli rumah tangga dan aktivitas ekonomi. Demikian pula, tingkat pengangguran memberikan pengaruh yang negatif dan signifikan terhadap pertumbuhan ekonomi di Indonesia. Hal ini menggarisbawahi peran penting pada penciptaan lapangan kerja untuk mendukung kemajuan ekonomi. Studi ini memberikan kontribusi teoritis dan praktis, terutama dalam pengelolaan lingkungan, stabilitas ekonomi, dan pengurangan pengangguran sebagai upaya bersama untuk mendorong pertumbuhan ekonomi yang berkelanjutan di Indonesia. Temuan ini juga relevan bagi pembuat kebijakan dalam merancang strategi pembangunan ekonomi yang menyeimbangkan pada pelestarian lingkungan, stabilitas harga, dan kesejahteraan sosial untuk mencapai pembangunan yang inklusif dan berkelanjutan.
Kata kunci: Indeks Kualitas Lingkungan Hidup; Inflasi; Pembangunan Berkelanjutan; Pertumbuhan Ekonomi; Tingkat Pengangguran

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INTRODUCTION

Economic growth is an important indicator in national development, which is measured through Gross Domestic Product (GDP). GDP reflects the added economic value of a region. This GDP growth is related to the welfare of the community and can be used to evaluate the performance of the country's economic development.[1]

Prasetyo explains that there are several factors that influence economic growth, according to the theory developed by economists Roy F. Harrod and Evsey D. Domar where economic growth is mainly influenced by capital, demand, and investment.[2] These three factors can have an effect in both the short and medium term. In addition, there are a number of other factors that influence economic growth. Some of them are the availability of natural resources and quality human resources. Technological advances and capital formation, such as infrastructure development and production facilities, are also the keys to growth. Not only pure economic factors, socio-political aspects, inflation, poverty, unemployment also play an important role in people's welfare.

The economic growth of a country is influenced by the economic activities that take place in that country. The higher the flow of economic activity, the more the economy grows. However, the high economic flow has a negative impact on environmental damage. Economic activities that do not pay attention to environmental conditions can hinder economic growth itself. So that environmental damage can cause economic decline in the long term.[3]

Spratt and Dunlop projected that the world in 2050 will experience very large natural disasters, such as lack of clean water, dirty and unhealthy air, forest fires, increasing needs for natural resources because the human population has grown about three times.[4] Therefore, in Indonesia, it is necessary to assess the environmental quality of a region using the Environmental Quality Index (IKLH).

According to the Ministry of Environment, the Environmental Quality Index can be measured by three indicators, namely the Water Quality Index, Air Quality Index, and Land
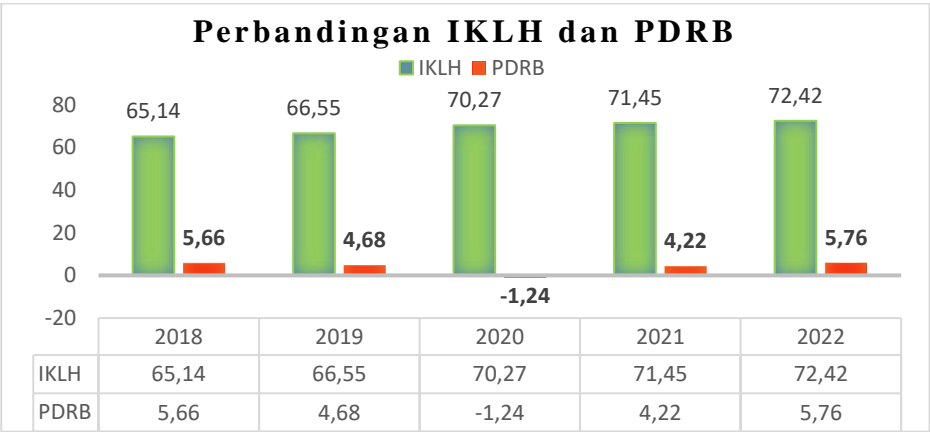
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[1] Badan Pusat Statistik, *Produk Domestik Bruto Indonesia Menurut Pengeluaran 2019–2023* (Jakarta: BPS, 2023), https://www.bps.go.id.

[2] P.E. Prasetyo, *Fundamental Makro Ekonomi* (Yogyakarta: Beta Offset, 2011).

[3] M.R. Setiawan and W. P. Primandhana, "Analisis Pengaruh Beberapa Sektor PDRB terhadap Indeks Kualitas Lingkungan Hidup di Indonesia," *KINERJA* 19, no. 1 (2022), https://doi.org/10.30872/jkin.v19i1.10830.

[4] David Spratt, Ian Dunlop, and A. C. Barrie, "Existential Climate-Related Security Risk: A Scenario Approach," 2019.

Cover Quality Index. The theory that can measure the relationship between economic growth and environmental quality is the Environmental Kuznet Curve (EKC). This theory shows that economic growth initially has a negative impact on the environment, but after reaching a certain point, economic growth can go hand in hand with improving environmental quality which can be done through policy implementation and public awareness that play an important role in changing the direction of this curve.

Perbandingan IKLH dan PDRB

IKLH ■ PDRB

	2018	2019	2020	2021	2022
IKLH	65,14	66,55	70,27	71,45	72,42
PDRB	5,66	4,68	-1,24	4,22	5,76

Figure 1. Comparison of IKLH and GRDP 2018-2022 (in %)

(Source: BPS and Environmental Statistics, 2023)

Based on the graph in Figure 1.1 above, from 2018 to 2020 the IKLH level increased, while the economic growth rate decreased in value. This is in line with the Kuznet Curve Theory which explains that an increase in economic growth is accompanied by a decrease in the level of environmental quality in a region. However, this condition changed in early 2020 to 2022 where the increase in the IKLH value was also followed by an increase in the value of economic growth.

In addition to the Environmental Quality Index factor, there are several factors and variables that are considered to influence GRDP which have been put forward by experts and have been studied by previous researchers.[5] John Maynard Keynes as the pioneer of Keynesian Macroeconomics, explained the macroeconomic theory of total expenditure (aggregate demand) in the economy and its impact on output and inflation. So according to this theory, inflation is one of the references used in measuring economic stability. Inflation is the percentage increase in the price of a number of goods and services that are commonly consumed by households so that it can also be interpreted as a decrease in the value of money against the value of goods and services in general. The continuous increase in prices will have an impact on the increase in the price of

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[5] Miftahul Hannyfah et al., "Analisis Pengaruh Inflasi, Kemiskinan Dan Pengangguran Terhadap Produk Domestik Regional Bruto (PDRB) Di Indonesia Era Pandemi Covid-19," *Journal of Economic Development* 1, no. 1 (2023): 34–45.

goods on the market, both the price of raw materials in the company's business operational process and the price of consumer goods. This will cause economic turmoil in a country. The direct impact of inflation on economic growth can be seen from people with fixed, low and non-fixed incomes so that this is very detrimental to society because it causes real income to decrease.

Keynes' theory also explains the relationship between inflation and economic growth. Keynes emphasized that inflation occurs because of people's desire to live beyond their economic capabilities. Hypothetically, the long-run relationship between inflation and economic growth is that increasing inflation causes economic growth to decline, while relatively low and stable inflation can encourage economic growth. This condition justifies empirical evidence from several studies related to the relationship between inflation and economic growth that high inflation causes economic growth to decline.[6]
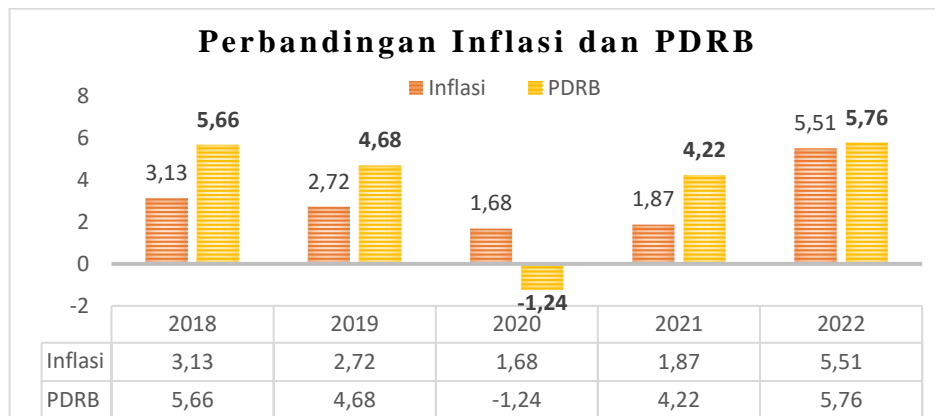
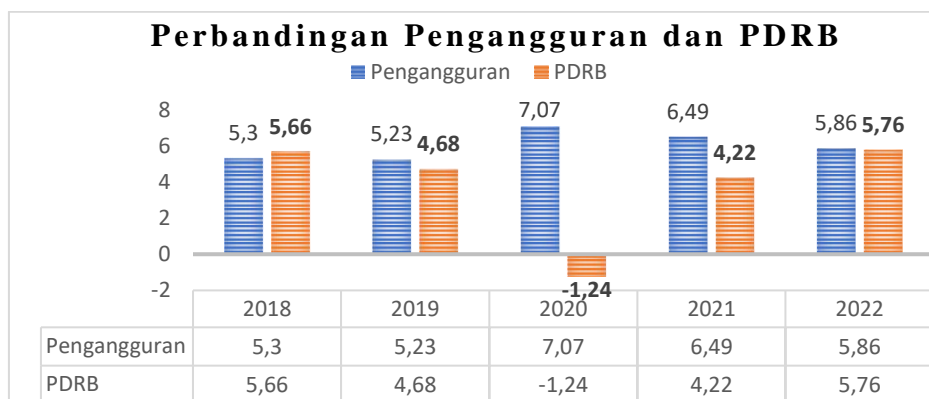**Figure 2. Comparison of Inflation Value and GRDP (in %)**

(Source: BPS, 2023)

Based on the graph in Figure 1.2 above, from 2018 to 2020 the inflation rate and economic growth rate experienced a decrease in value. Meanwhile, starting from 2021 to 2022, the increase in inflation was also accompanied by an increase in economic growth. This is inconsistent with Keynesian Theory which explains that an increase in inflation is accompanied by a decrease in the rate of economic growth in a region. This means that the high impact of inflation is not always accompanied by a decrease in the rate of economic growth. This causes a gap between Keynesian theory and the phenomena that occurred in Indonesia in 2018-2022.

Another factor that is considered to be able to affect GDP is unemployment. Unemployment is one of the impacts that inhibit economic growth, because if unemployment is

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[6] Irma Fadhilah Lubis, "Analisis Hubungan antara Inflasi dan Pertumbuhan Ekonomi: Kasus Indonesia," *QE Journal* 3, no. 1 (2013): 44.

not immediately addressed it will result in social vulnerability, and cause poverty.[7] The magnitude of unemployment is very important in measuring the success of economic development, because unemployment is one indicator to show the level of welfare as a result of economic development.

The relationship between economic growth and unemployment can be explained by Okun's law, named after Arthur Okun, the economist who first studied it (Demburg, 1985:53). This law states that there is an empirical influence between unemployment and output in the business cycle. The results of his empirical study show that adding 1 (one) point of unemployment will reduce GDP (Gross Domestic Product) by 2 percent. This means that there is a negative influence between economic growth and unemployment and vice versa. High unemployment rates can disrupt the national stability of a country, so that in order to maintain economic growth, policies are needed that are not only oriented towards economic growth, but also aimed at creating new jobs for the community to increase income for the state from the taxes it pays.[8]

Perbandingan Pengangguran dan PDRB

	2018	2019	2020	2021	2022
Pengangguran	5,3	5,23	7,07	6,49	5,86
PDRB	5,66	4,68	-1,24	4,22	5,76

Figure 3. Comparison of Unemployment Value and GRDP

(Source: BPS, 2023)

Based on the graph in Figure 1.3 above, it is known that the unemployment rate fluctuates from year to year. The phenomenon that occurred in 2018-2019 was a decrease in the unemployment rate accompanied by a decrease in the economic growth rate. When entering 2020, which was the beginning of the decline in the welfare of the community caused by the spread of Covid-19, the economic growth rate decreased drastically to negative numbers and the unemployment rate increased sharply. In 2021, the economic situation began to improve, marked by an increase in economic growth accompanied by a decrease in the unemployment rate and this continued until 2022.

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[7] L. Arsyad, *Ekonomi Pembangunan*, Edisi ke-5 (UPP STIM YKPN, 2015).

[8] Hannyfah et al., "Analisis Pengaruh Inflasi, Kemiskinan Dan Pengangguran Terhadap Produk Domestik Regional Bruto (PDRB) Di Indonesia Era Pandemi Covid-19."

Several previous relevant studies explain the relationship between the variables in this study. Research conducted by Ramadhan[9] found that economic growth and labor factors did not have a significant effect on environmental quality in Sumatra Province during 2016-2019. Meanwhile, Hannyfah et al.[10] showed that inflation had a positive effect on GRDP, but poverty and unemployment had a negative impact. Other studies, such as by Setiawan and Primandhana,[11] showed that certain sectors such as agriculture and manufacturing industry had a significant positive effect on environmental quality, while the mining sector had a significant negative effect.

Economic growth

Economic growth reflects the increase in the production of goods and services in a country in a certain period. Harrod-Domar's theory states that investment and capital play an important role in supporting economic growth. Meanwhile, Keynes' theory highlights the importance of aggregate demand in driving growth. In the context of Indonesia, environmental factors, inflation, and unemployment are the main concerns in achieving sustainable development.

The rate of economic growth is measured through the GDP development indicator from year to year. Measurement of economic growth is done by calculating the percentage increase in GDP. GDP measures the total expenditure of an economy on various goods and services produced in a certain period and the total income received by all production activities of goods and services.[12] Calculation of GDP and GRDP can be calculated using three approaches, namely the production approach, the income approach, and the expenditure approach.

If GDP is used to determine the rate of national economic growth, then GRDP can be used to determine regional economic growth. GRDP is the value of final goods and services produced by the economic system in a region or area within a certain period of time. The rate of regional economic growth can be calculated using the following equation:

$$\text{Economic Growth Rate} = \frac{PDRBt - PDRBt-1}{PDRBt-1} \times 100\%$$

Information:

GRDPt : Current year Gross Regional Domestic Product

PDRBt-1 : Gross Regional Domestic Product last year

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[9] A.M. Ramadhan, "Dampak Pertumbuhan Ekonomi terhadap Kualitas Lingkungan Hidup di Provinsi Pulau Sumatera," *Jurnal Penelitian Ekonomi Manajemen dan Akuntansi* 1, no. 2 (2023).

[10] Hannyfah et al., "Analisis Pengaruh Inflasi, Kemiskinan Dan Pengangguran Terhadap Produk Domestik Regional Bruto (PDRB) Di Indonesia Era Pandemi Covid-19."

[11] Setiawan and Primandhana, "Analisis Pengaruh Beberapa Sektor PDRB terhadap Indeks Kualitas Lingkungan Hidup di Indonesia."

[12] N.G. Mankiw, *Macroeconomics* (New York: Worth Publishers, 2007).

To determine economic growth accompanied by an increase in community welfare, real GDP per capita data is used, while to determine economic growth accompanied by an increase in welfare at the regional or provincial level, real GRDP per capita data is used.

Kuznet's Environmental Curve Theory

The Environmental Kuznet Curve (EKC) theory was first proposed by economist Simon Kuznets in 1955. This theory explains the relationship between economic growth and environmental quality in a country. According to the EKC, at the beginning of the economic development stage, growth tends to have a negative impact on the environment, which is marked by increasing pollution and exploitation of natural resources. This can be seen from the EKC curve which is rising upwards, indicating that the higher the economic growth, the greater the environmental damage.
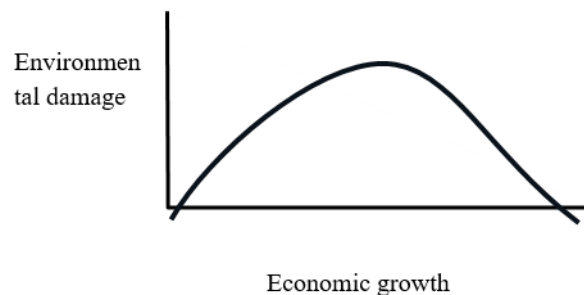
Figure 4. Environmental Kuznet Curve

However, once the economy reaches a certain level of per capita income, the relationship changes. At some point, environmental awareness begins to increase, and the government and society begin to implement environmentally friendly policies and technologies. As a result, environmental quality begins to improve, as indicated by a declining EKC curve. This indicates that in the next stage, economic growth can actually go hand in hand with improving environmental quality.[13]

So theoretically, according to Kuznet's theory, there is a relationship between the relationship between the Environmental Quality Index and economic growth, which has a dynamic nature. Initially it is negative, but after reaching a certain threshold point, it becomes positive. It is important for countries to take wise steps to ensure that economic growth goes hand in hand with environmental protection.

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[13] Setiawan and Primandhana, "Analisis Pengaruh Beberapa Sektor PDRB terhadap Indeks Kualitas Lingkungan Hidup di Indonesia."

Environmental Quality Index

The Environmental Quality Index (IKLH) is the performance of national environmental management which is used as information material to support the policy-making process related to environmental protection and management. The indicators used in calculating the IKLH are the Water Quality Index (IKA), Air Quality Index (IKU) and Land Cover Quality Index (IKTL).

In the calculation of IKLH 2019 (Indonesia IKLH Report, 2020) there is 1 index component that is returned to the calculation as in 2012-2014, namely the Water Quality Index (IKA) using 7 parameters, namely DO, COD, BOD, Total Phosphate, TSS, Fecal Coliform, and Total Coliform. The IKA calculation again uses the pollutant index method with the concept that the higher the pollutant index value, the worse the water quality. This method can determine the status of water quality monitored against water quality standards with one data series so that it does not require much cost and time.

While the Land Cover Quality Index, the parameters assessed only take into account land cover in the form of forest cover by adding shrub cover and swamp shrubs in forest areas or in areas that have a protective function such as river borders, lake borders, coastal borders, slopes> 25%. In addition, it also adds green open spaces such as botanical gardens, and biodiversity parks, city forests and city parks and considers the impact of forest and land fires and canals on peat ecosystems.

For the Air Quality Index (IKU), the parameters measured are SO2 and NO2. The following presents the parameters measured for each IKLH component and the weight of each component.

Table 1. Components of the Environmental Quality Index

No.	Indicator	Parameter	Weight
1.	Water Quality	TSS	34%
		pH	
		DO	
		BOD	
		COD	
		Total Phosphate	
		Fecal Coliform	
		NO3-N	
2.	Air Quality	SO2	42.8%
		NO2	
3.	Land Cover	Area of Forest Cover, thickets and swamp thickets located in	13.3%

	Quality	forest areas and protected areas (river, lake and coastal boundaries, slopes >25%), Green Open Spaces such as Botanical Gardens, Biodiversity Parks, City Forests and City Parks as well as forest and land fire incidents and the existence of peat ecosystem canals.	
4.	Sea Water Quality	TSS	9.9%
		DO	
		Oils and Fats	
		Total Ammonia	
		Ortho-Phosphate	

Source: 2021 Environmental Quality Index Report

Based on the assessment of the expert panel in the weighting of IKLH indicators using the paired comparison method, the issue of air quality and water quality is considered very important from a health and environmental perspective so that the weight given increases quite significantly. The importance of the IKU weight is higher because of the risk to human health, which is 42.8%. Air is directly inhaled by humans at all times, so if the air is polluted, the risk will be very high. If the water is polluted, it is still possible to process it first. The weights produced by this expert panel are presented in the following Provincial IKLH formula:

Provincial IKLH = (34% x IKA) + (42.8% x IKU) + (13.3% x IKL) + (9.9% x IKAL)

Information:

IKLH_Province = Provincial Level Environmental Quality Index

IKA   = Water Quality Index

IKU   = Air Quality Index

IKL   = Land Quality Index

CURLY   = Sea Water Quality Index

After obtaining the Provincial IKLH, the National IKLH is calculated using the following formula:

$$IKLH = \sum_{i=1}^{34} IKLH\ Provinsi_i \times \left(\frac{Populasi\_Provinsi_i}{Populasi\_Indonesia} + \frac{Luas\_Provinsi_i}{Luas\_Indonesia} \right) \div 2$$

IKLH is prepared with the following objectives:

1. As a source of information that can be used in the decision-making process at the central and regional levels relating to environmental protection and management.

2. As a form of government accountability to the public regarding the achievement of performance targets for environmental protection and management programs carried out by the central and regional governments.

3. As an instrument and indicator of the success of the central and regional governments in managing and controlling environmental pollution and damage.

Inflation

Inflation is defined as a condition where prices rise sharply and continuously over a long period of time. The theory that links inflation and economic growth is the Keynesian Theory put forward by John Maynard Keynes. This theory states that inflation that is too high can inhibit economic growth because it reduces people's purchasing power.

The calculation of the national product deflator figure uses the formula:

$$In = \frac{DF_n - DF_{n-1}}{DF_{n-1}} \times 100\%$$

Information:

In : Inflation

DF_n : Deflator next year

DF_{n-1} : Deflator previous year

Unemployment

Unemployment is a macroeconomic problem that affects people directly and is the most severe. For most people, losing a job means a decline in living standards and psychological

distress. So it is not surprising that unemployment has become a topic in political debates among politicians who claim that their policies will create jobs.[14]

To measure the level of open unemployment in a region, it can be obtained from the percentage by dividing the number of unemployed by the number of workers and expressed as a percentage, with the following formula:

$$\text{Open Unemployment Rate} = \frac{\text{Jumlah Pengangguran Terbuka}}{\text{Jumlah Angkatan Kerja}} \times 100\%$$

RESEARCH METHODS

The study focuses on the impact of the Environmental Quality Index, Inflation, and Unemployment Rate on Economic Growth in Indonesia as measured by Gross Regional Domestic Product (GRDP) in 34 provinces in Indonesia. The study was conducted using data from 2018 to 2022. The population in this study were all provinces in Indonesia. The sample consisted of 34 provinces. The data collection technique used secondary data from various official agencies such as the Central Statistics Agency, the Ministry of Environment and other related literature sources.

The data analysis method uses the panel data regression method, which combines cross-section and time-series data). There are three main approaches used in panel data regression analysis, namely Pooled Least Square (PLS) which assumes that the behavior of all individuals (provinces) is the same without differences in characteristics. Then the Fixed Effect Model (FEM), which accommodates differences between provinces through variations in intercept. Then the Random Effect Model (REM) which assumes that differences between provinces are random and is included in the error component.

Several statistical tests such as the Chow test, the Hausman test, and the Lagrange Multiplier test are used to determine the panel data regression model that best fits the research data. This study also applies the classical assumption test to ensure that there are no violations of the assumptions, namely normality, multicollinearity, heteroscedasticity, and autocorrelation in the regression model. Other statistical techniques such as descriptive statistics, F test, t test, and coefficient of determination are used to evaluate the effect of independent variables on dependent variables and assess the significance of the results in the study.

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[14] N.G. Mankiw, *Teori Makroekonomi*, Edisi Kelima (Jakarta: Erlangga, 2003).

RESULTS AND DISCUSSION

Descriptive Statistics

According to Ghozali descriptive statistics describe data seen from the minimum, maximum, average (mean) and standard deviation values.[15] To provide an overview of the following descriptive analysis will be explained in the table below:

Table 2. Descriptive Statistics Results

	PDB__Y_	IKLH__X1_	INFLASI__X2_	PENGANG...
Mean	4.00	69.88	3.05	5.20
Median	4.69	70.96	2.58	4.75
Maximum	22.94	84.22	7.73	10.95
Minimum	-9.34	39.06	0.14	1.4
Std. Dev.	4.08	8.07	1.68	1.79
Skewness	0.87	-1.00	0.89	0.85
Kurtosis	7.69	4.30	2.77	3.76
Jarque-Bera	177.63	40.40	23.23	24.96
Probability	0.00	0.00	0.00	0.00
Sum	680.41	11880.66	520.09	884.25
Sum Sq. Dev.	2819.18	11024.49	482.36	545.90
Observations	170	170	170	170

(Source: Eviews Processed Data, 2024)

From the data, it can be seen that Economic Growth (Y) has an average value of 4.00 with the highest value of 22.94 occurring in North Maluku in 2022, while the lowest value was -9.34 in Bali province in 2020 with a standard deviation value of 4.08. The value of North Maluku's GRDP in 2022 reached 40.25 trillion rupiah, an increase of 7.51 trillion rupiah from 2021. This means that during 2022 there was economic growth of 22.94%.

The Environmental Quality Index variable (X1) shows an average value of 69.88, the highest value of 84.22 which occurred in West Papua province in 2022, while the lowest value was 39.06 in DKI Jakarta province in 2018 with a standard deviation value of 8.07. The Inflation variable (X2) shows an average value of 3.05 with the highest value of 7.73 in Southeast Sulawesi province in 2022, while the lowest value was 0.14 in West Papua province in 2020 with a standard deviation value of 1.68. The Unemployment variable (X3) shows an average value of 5.20 with the highest value of 10.95 in DKI Jakarta province in 2020, while the lowest value was 1.4 in Bali province in 2018 with a standard deviation value of 1.79.

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[15] Imam Ghozali, *Aplikasi Analisis Multivarite dengan SPSS*, Cet–4 (Semarang: Badan Penerbit Universitas Diponegoro, 2016), 19.

Classical Assumption Test

Normality Test

This test is conducted with jarque bera (JB). The assumption of normality can be met when the statistical probability value of the value (JB) > 0.05 and the following data is obtained:
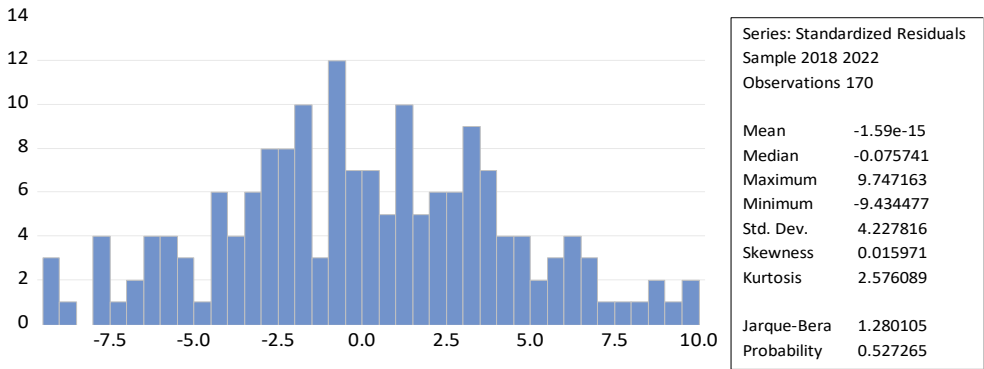

Figure 5. Normality Test Results

(Source: Eviews Processed Data, 2024)

Based on the image above, the probability value of the Jarque Bera Statistic Value is 0.527265 > 0.05. This means that it can be concluded that the data used is normally distributed.

Autocorrelation Test

In this case, to test whether or not there is autocorrelation in the research, one of them is by conducting the Durbin-Watson d Test. If the probability value is between 1 and 3 or (1 < d < 3). It is said that the model is free from autocorrelation or vice versa.

Table 3. Autocorrelation Test Results

Log likelihood	-462.2340	Hannan-Quinn criter.	5.515046
F-statistic	12.80985	Durbin-Watson stat	1.570951
Prob(F-statistic)	0.000000		

(Source: Eviews Processed Data, 2024)

Based on the image above, the value of Durbin Wattson is 1.570951. So the value of the Durbin Wattson statistic lies between 1 and 3, namely 1 < 1.570951 < 3 so it can be said that H0 is rejected and Ha is accepted, so it is free from the problem of Autocorrelation.

Multicollinearity Test

In this study, the multicollinearity test is said to look at the Tolerance and Variance Inflation Factor (VIF) values. If the tolerance is 0.10 or VIF <10.00, it is said that there is no multicollinearity problem between the independent variables.

Table 4. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	11.08915	103.5944	NA
IKLH__X1_	0.001755	81.15223	1.063405
INFLASI__X2_	0.038418	4.377673	1.018371
PENGANGGURAN_...	0.035474	10.03020	1.064179

(Source: Eviews Processed Data, 2024)

Based on the table above, the results of all variance values are below 10. Or the VIF value <10, so it can be concluded that there is no multicollinearity value between the independent variables.

Heteroscedasticity Test

Heteroscedasticity Test, tests whether the disturbance variables that appear in the regression function have the same variance or not. A good analysis model is if the disturbance variance is the same (homoscedastic). The assumption of homoscedasticity of random shocks is the difference or spread or scedasticity is the same or equal or homo or the same variance $[\sigma^2]$.

Table 5. Heteroscedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IKLH__X1_	0.153466	0.091864	1.670591	0.0972
INFLASI__X2_	0.276993	0.201149	1.377053	0.1708
PENGANGGURAN__X3_	0.100472	0.516262	0.194614	0.8460
C	-10.96931	5.471540	-2.004793	0.0470

(Source: Eviews Processed Data, 2024)

In the table above, it can be seen that the probability value is greater than 0.05 so it can be concluded that the three variables are free from the heteroscedasticity test.

Panel Data Regression Model Selection

Panel data regression can be done by testing three analysis models, namely the Common Effects Model, Fixed Effects Model and Random Effects Model. The first thing to do is to choose the right model from the three existing models.

Table 6. Results of Panel Data Regression Test of Common Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.823501	3.005755	2.270145	0.0245
IKLH__X1_	-0.038848	0.037816	-1.027277	0.3058
INFLASI__X2_	0.895779	0.176919	5.063229	0.0000
PENGANGGURAN__X3_	-0.582890	0.170004	-3.428682	0.0008
R-squared	0.197125	Mean dependent var		3.817235
Adjusted R-squared	0.182615	S.D. dependent var		4.258891
S.E. of regression	3.850436	Akaike info criterion		5.557498
Sum squared resid	2461.092	Schwarz criterion		5.631282
Log likelihood	-468.3873	Hannan-Quinn criter.		5.587439
F-statistic	13.58563	Durbin-Watson stat		1.592557
Prob(F-statistic)	0.000000			

(Source: Eviews Processed Data, 2024)

Table 7. Results of Panel Data Regression Test of Fixed Effects Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.07264	4.402625	4.332106	0.0000
IKLH__X1_	-0.077669	0.073917	-1.050757	0.2953
INFLASI__X2_	0.667520	0.161853	4.124247	0.0001
PENGANGGURAN__X3_	-2.281973	0.415405	-5.493366	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.559388	Mean dependent var		3.817235
Adjusted R-squared	0.440125	S.D. dependent var		4.258891
S.E. of regression	3.186708	Akaike info criterion		5.345699
Sum squared resid	1350.629	Schwarz criterion		6.028196
Log likelihood	-417.3844	Hannan-Quinn criter.		5.622648
F-statistic	4.690359	Durbin-Watson stat		2.254112
Prob(F-statistic)	0.000000			

(Source: Eviews Processed Data, 2024)

After the regression results are obtained, an estimation test is carried out between the common effect model and the fixed effect model. So the chow test is used as a selection of panel data regression models. The chow test hypothesis is that if the probability chi-square <0.050, the fixed effect model is selected, but if the probability chi-square> 0.050, the common effect model

is selected.

If the test results determine the common effect model, then the Lagrange Multiplier Test is carried out to determine the common model with random. However, if the Chow Test results are fixed effect or random, then a further test is carried out, the Hausman Test.

Table 8. Chow Test Results

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.313644	(33,133)	0.0000
Cross-section Chi-square	102.005921	33	0.0000

(Source: Eviews Processed Data, 2024)

The results in the table above show the probability of the cross-section chi-square of 0.0000 < 0.050. Therefore, the Fixed Effect Model is used. So it is necessary to conduct a further test, namely the Hausman Test, to determine the fixed or random model used.

Table 9. Results of Random Model Panel Data Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.28785	2.976536	4.464199	0.0000
IKLH__X1_	-0.073802	0.039811	-1.853837	0.0655
INFLASI__X2_	0.644632	0.131309	4.909279	0.0000
PENGANGGURAN__X3_	-1.172720	0.192112	-6.104348	0.0000

Effects Specification				
			S.D.	Rho
Cross-section random			1.974447	0.3335
Idiosyncratic random			2.791072	0.6665

Weighted Statistics				
R-squared	0.277901	Mean dependent var		2.138713
Adjusted R-squared	0.264851	S.D. dependent var		3.530723
S.E. of regression	3.027272	Sum squared resid		1521.286
F-statistic	21.29507	Durbin-Watson stat		2.001865
Prob(F-statistic)	0.000000			

Unweighted Statistics				
R-squared	0.133244	Mean dependent var		4.002412
Sum squared resid	2443.547	Durbin-Watson stat		1.246307

(Source: Eviews Processed Data, 2024)

Table 10. Hausman Test Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	27.884997	3	0.0000

(Source: Eviews Processed Data, 2024)

The table above shows the random cross-section probability value of 0.0000 < 0.050, meaning that the Hausman Test results chose to use the fixed effect model.

Hypothesis Testing

Partial Test (t-Test)

In this case, the test used is by comparing the calculated t value with the t table value a = 5% or 0.05 and (df = 170-4 = 164) which is 1.974. With the following criteria:

H0 = accepted if the probability value > error level (a) 0.05

Ha = accepted if the probability value > error level (a) 0.05

Table 11. Partial Test (t-Test) using Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.62864	3.856031	4.571706	0.0000
IKLH__X1_	-0.029707	0.064740	-0.458859	0.6471
INFLASI__X2_	0.456575	0.141758	-3.220796	0.0016
PENGANGGURAN__X3_	-2.489101	0.363832	-6.841348	0.0000

(Source: Eviews Processed Data, 2024)

The results of the partial test of the independent variables on the dependent variables are as follows:

1. The Environmental Quality Index variable (X1) has a t-value of -0.458859, the result of processing the Environmental Quality Index data (X1) has a probability value of 0.6471. Then to see the comparison of t count with t table as follows: (-0.458859 < 1.974) meaning that it can be concluded that the Environmental Quality Index Variable (X1) has no effect on Economic Growth (Y).

2. The Inflation variable (X2) has a t-value of -3.220796, the results of processing the Inflation data (X2) have a probability value of 0.0016. To see the comparison of t count with t table as follows: (-3.220796 < 1.974) meaning that the Inflation Variable (X2) has a negative and significant effect on Economic Growth (Y).

3. The Unemployment variable (X3) has a t-value of -6.841348, the results of the Unemployment data processing (X3) have a probability value of 0.0000. To see the comparison of t count with t table as follows: (6.841348 < 1.974) meaning that Unemployment (X3) has a negative and significant effect on Economic Growth (Y).

Simultaneous Test (F Test)

This test is conducted to see whether all independent variables simultaneously affect the dependent variable. In this case, hypothesis testing is conducted by comparing the Fcount value with the Ftable value a = 5% and df1 = k-1 (df1 = 4-1 = 3), df2 = nk (df2 = 170-4 = 166) which is 2.66. Decision-making criteria:

H0 = accepted if the probability value > error level (a) 0.05

Ha = accepted if the prob. value > error level (a) 0.05

Table 12. Simultaneous Test (F-Test)

R-squared	0.632489	Mean dependent var	4.002412
Adjusted R-squared	0.533013	S.D. dependent var	4.084308
S.E. of regression	2.791072	Akaike info criterion	5.080573
Sum squared resid	1036.081	Schwarz criterion	5.763071
Log likelihood	-394.8487	Hannan-Quinn criter.	5.357523
F-statistic	6.358172	Durbin-Watson stat	2.359186
Prob(F-statistic)	0.000000		

(Source: Eviews Processed Data, 2024)

Based on the table above, it shows that the results of data processing using the fixed effect model obtained the F count value (6.358172> F table (2.66) with a probability of 0.00000 <0.05, meaning that it can be concluded that there is an influence of the Environmental Quality Index (X1), Inflation (X2) and Unemployment (X3) together on the Economic Growth Variable (Y).

Determination Coefficient Test (R2 Test)

The value of the determination coefficient R2 is 0 to 1 (0 < R2 < 1). If R2 approaches 1, it means that the independent variable has less influence than the dependent variable.

Table 13. Test of Determination Coefficient using Fixed Effect Model

R-squared	0.632489	Mean dependent var	4.002412
Adjusted R-squared	0.533013	S.D. dependent var	4.084308
S.E. of regression	2.791072	Akaike info criterion	5.080573
Sum squared resid	1036.081	Schwarz criterion	5.763071
Log likelihood	-394.8487	Hannan-Quinn criter.	5.357523
F-statistic	6.358172	Durbin-Watson stat	2.359186
Prob(F-statistic)	0.000000		

(Source: Eviews Processed Data, 2024)

Based on the results of data processing using the fixed effect model, it can be seen with an R-squared value of 0.632489 or 63.24%, the remaining 36.76% is influenced by other variables that are not included in the variables in this study.

Discussion of Research Results

The Influence of Environmental Quality Index on Economic Growth

The Environmental Quality Index variable has a probability value of 0.6471 with a t-count value of -0.458859. Therefore, it is concluded that the Environmental Quality Index variable does not have a significant effect on Economic Growth in Indonesia. This means that an increase or decrease in the Environmental Quality Index value does not affect the value of economic growth in Indonesia.

The Effect of Inflation on Economic Growth

Inflation variable with a probability value of 0.0016 with a calculated t value of -3.220796. This means that if there is an increase in the Inflation variable, it will reduce economic growth in Indonesia. This explains that inflation has a negative and significant effect on economic growth. So suppressing the inflation rate is important to increase economic growth. Maintaining the percentage of the inflation rate is a step for every country to maintain economic stability.

The Impact of Unemployment on Economic Growth

The Unemployment variable with a probability value of 0.0000 has a t-value of -6.841348. This means that it can be concluded that the Unemployment variable has a significant negative effect on the Economic Growth variable. This happens because unemployment needs special attention. Unemployment causes people to stop producing goods and services which will later hamper economic growth. Hampered economic growth as a result of unused existing resources because people are unemployed and do not have jobs.

The Influence of Environmental Quality Index, Inflation and Unemployment on Economic Growth

The variables of Environmental Quality Index, Inflation and Unemployment together affect Economic Growth which shows the results of data processing using the fixed effect model

obtained the F count value (6.358172> F table (2.66) with a probability of 0.00000 <0.05. This means that it can be concluded that there is a relationship between the Environmental Quality Index, Inflation and Unemployment Rate on Economic Growth. In addition, the research variables have an influence of 63.24% while the remaining 36.76% is influenced by other variables not included in this study.

CONCLUSION

Based on the results of the analysis conducted on the impact of the Environmental Quality Index, Inflation, Unemployment Rate on Economic Growth in Indonesia, it was concluded that there is no significant influence between the Environmental Quality Index on Economic Growth in Indonesia. Then the variables Inflation and Unemployment have a negative effect on Economic Growth in Indonesia. While together there is a positive and significant influence between the Environmental Quality Index, Inflation and Unemployment on Economic Growth in Indonesia.

SUGGESTIONS and RECOMMENDATIONS

The increase in economic growth in Indonesia as measured by Gross Domestic Product (GDP) will reduce the value of the Environmental Quality Index. Therefore, it is necessary to implement a green economy so that economic development can be in line with the increasing quality of the environment. The government needs to increase the implementation of green industry by using fuel produced from waste recycling, utilizing renewable energy and using low-carbon technology. The government needs to increase the provision of credit loans so that economic sector actors can update more environmentally friendly tools and machines. The government also needs to conduct socialization about going green to the population in its country.

The government is also expected to be able to suppress inflation rates through various macroeconomic policies (fiscal, monetary, and supply side) and other government policies that are expected to increase Gross Domestic Product in Indonesia. This is because the smaller the inflation rate will be able to increase Economic Growth in Indonesia.

It is hoped that the government can reduce unemployment rates by increasing the ability and knowledge of the community to succeed in the world of work. In addition, the community also needs to be involved in government policies and other programs.

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