Analyzing The Impact of Expenditure on Health and Education, Gross Regional Domestic Product, and Poverty on Human Development Index in Indonesia

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FAKULTAS BISNIS DAN EKONOMIKA

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2024

DECLARATION OF AUTHENTICITY

Herein, I declare the originality of this; I have not presented anyone else's work to obtain my university degree, nor have I presented anyone else's words, ideas, or expression without acknowledgement. All quotations are cited and listed in the bibliography of the thesis.

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Yogyakarta, 8 March 2024

Oktavia Dwi Fatmawati

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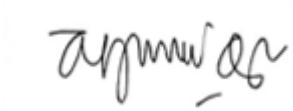

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Analyzing The Impact of Expenditure on Health and Education, Gross Regional Domestic Product, and Poverty on Human Development Index in Indonesia

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Bismillahirrahmaanirrahim

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1. **Passes** the examination **with revision**
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Yogyakarta, March 22, 2024

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1. As Soon as students pass the thesis/compre exams they have to applay for the completion the of the their study (if want to graduate) at the academic academics section of the FBE UII (see the procedure).
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MOTTO

Whatever passes me by was never meant to be my destiny, what is destined for me will not slip away.

(Umar bin Khattab)

Keberhasilan bukanlah milik orang pintar, melainkan milik mereka yang senantiasa berusaha.

(B.J. Habibie)

Allah does not burden a soul beyond that it can bear. It will have [the consequence of] what [good] it has gained, and it will bear [the consequence of] what [evil] it has earned.

(Al- Baqarah:286)

Sang juara bukanlah mereka yang tak terkalahkan, melainkan yang sanggup bangkit dari pahitnya kekalahan.

(Najwa Shihab)

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With perseverance, belief, enthusiasm, hard work, prayers, and support from various parties, the thesis entitled "**Analyzing the Impact of Expenditure on Health and Education, Gross Regional Domestic Product, and Poverty on Human Development Index in Indonesia**" can be completed. This thesis is a requirement to obtain a Bachelor's Degree (S1) in Economics from the Universitas Islam Indonesia.

During the writing process, the author realized the shortcomings and limitations of his knowledge. Therefore, guidance and assistance from various parties was very helpful in completing this thesis. With humility, the author would like to express his deepest gratitude to:

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the author wholeheartedly realizes that this thesis has not reached the level of perfection and still has shortcomings. Nevertheless, the hope is that this thesis can provide benefits and added value for readers. May the support, guidance and prayers received by the author will receive a good response from Allah SWT.

Yogyakarta, 6 March 2024

Author,

Oktavia Dwi Fatmawati

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ABSTRACT

This research aims to analyze the impact of government spending on health and education, gross regional domestic product (GRDP), and poverty levels on the Human Development Index (HDI) in 34 provinces in Indonesia from 2017 to 2021. Secondary data comes from the Central Statistics Agency, Directorate General of Fiscal Balance, Ministry of Finance, and other trusted sources. The panel data covers a wide period and area, namely the 2017-2021 period and 34 provinces in Indonesia. The data includes information on HDI, government spending on health and education, GRDP, and poverty levels. The analysis was carried out using EViews 12 software. The results showed that the poverty level had a significant negative impact on HDI. In contrast, GRDP, government spending on health and education had a significant positive impact on HDI in 34 Provinces in Indonesia during the 2017-2021 period. These findings provide important insights for policymakers in improving human development in Indonesia.

Keywords: Human Development Index (HDI), Government Expenditure on Health and Education, GRDP, Poverty, in 34 Provinces in Indonesia

ABSTRAK

Penelitian ini bertujuan untuk menganalisis dampak belanja pemerintah di bidang kesehatan dan pendidikan, produk domestik regional bruto (PDRB), dan tingkat kemiskinan terhadap Indeks Pembangunan Manusia (IPM) di 34 provinsi di Indonesia pada tahun 2017 hingga 2021. Data sekunder yang digunakan berasal dari Badan Pusat Statistik, Direktorat Jenderal Perimbangan Keuangan, Kementerian Keuangan, dan sumber terpercaya lainnya. Data panel mencakup rentang waktu dan wilayah yang luas yaitu periode 2017-2021 dan 34 provinsi di Indonesia. Data yang digunakan meliputi informasi mengenai IPM, pengeluaran pemerintah di bidang kesehatan dan pendidikan, PDRB, dan tingkat kemiskinan. Analisis dilakukan dengan menggunakan software EViews 12. Hasil penelitian menunjukkan bahwa tingkat kemiskinan memberikan dampak negatif yang signifikan terhadap IPM, sedangkan PDRB, pengeluaran pemerintah di bidang kesehatan dan pendidikan memberikan dampak positif yang signifikan terhadap IPM di 34 Provinsi di Indonesia selama periode 2017-2021. Temuan ini memberikan wawasan penting bagi pengambil kebijakan dalam upaya meningkatkan pembangunan manusia di Indonesia.

Kata Kunci: Indeks Pembangunan Manusia (IPM), Pengeluaran Pemerintah Bidang Kesehatan dan Pendidikan, PDRB, Kemiskinan di 34 Provinsi di Indonesia

CHAPTER I

INTRODUCTION

1.1 Research Background

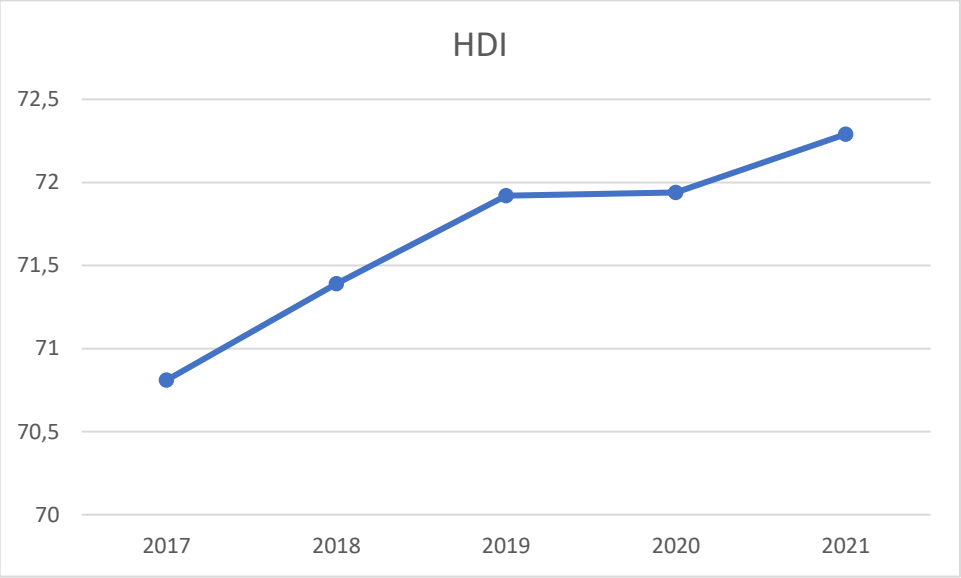
The primary objective of development is the enhancement of the well-being of the population. People are not only expected to be the objects of development but also required to become the subjects of development to contribute significantly to the advancement of a community, which in turn fosters the advancement of a nation (Mirza, 2017). The paradigm for development that is now emerging measures economic progress by the human development index, which is determined by the standard of living in each nation.

The Human Development Index (HDI) offers a comprehensive evaluation of a nation's human well-being, encompassing the following main factors: living standards, education, and health. Therefore, the Human Development Index (HDI) indicate of the degree of human well-being within a given nation. The life expectancy indicator assesses the overall health status of a population, while the literacy rate indicator focuses on the educational attainment of the adult population. Additionally, the average number of years of schooling serves as a measure of education. Lastly, the purchasing power indicator is utilized to gauge the standard of living (United Nations Development Programme., 1990).

The Central Statistics Agency (Badan Pusat Statistik, 2022) has modified specific indicators within the Human Development Index (HDI) deemed unsuitable for its calculation. Specifically, the Literacy Rate has been replaced with the Expected Years of Schooling Rate, and the Gross Domestic Product (GDP) per capita has been substituted with the Gross National Product (GNP) per capita. A more comprehensive understanding of education and its dynamics can be achieved by incorporating key metrics such as the mean duration of schooling and the projected length of educational attainment.

The process of human development in Indonesia is now advancing. Since 2016, Indonesia has steadily increased in its human development status, transitioning from a "medium" level to a "high" level. From 2010 to 2022, Indonesia

steadily improved its Human Development Index (HDI), with an average annual growth rate of 0.77 percent. The HDI value for Indonesia rose from 66.53 in 2010 to 72.91 in 2022 (Badan Pusat Statistik, 2022).



Data Sources: Badan Pusat Statistik

Figures 1.1 Graph of Average HDI In 34 Provinces of Indonesia from 2017 to 2021

Figure 1.1 indicates a consistent upward trend in the average human development index (HDI) of all 34 provinces in Indonesia between 2017 and 2021. The Human Development Index (HDI) experienced a growth from 70.81 in 2017 to 72.29 in 2021, indicating a continuous upward trend. The rise in HDI is a result of development initiatives throughout different provinces in Indonesia, encompassing advancements in education, healthcare, and the economy.

Additionally, establishing high-quality human resources requires the accessibility of various facilities and infrastructure. Hence, the allocation of funding is imperative to cultivate a skilled workforce, supporting investments in sectors such as health and education. The goal of education and the promotion of health are essential objectives for regional development. In order to provide adequate resources for education and health initiatives, it is essential to allocate sufficient

funds through a budgetary framework. As a result, government expenditure on health and education initiatives needs substantial backing from the government. Government expenditure indicate the policy decisions implemented by a government within a specific geographical area. Government expenditure is allocated towards funding vital public sectors, such as education and healthcare. The degree of poverty and the economic growth rate in the region are two additional variables besides the budget that are considered significant in raising HDI (Zulham et al., 2017).

The most frequently utilized indicator for evaluating a nation's economic performance is Gross Domestic Product (GDP). Similarly, Gross Regional Domestic Product (GRDP) serves as an essential indicator for analyzing the economic performance of a specific region or subnational area within a country. GRDP provides valuable insights into the current financial situation of the concerned region, which is the total amount of products and services generated by all economic entities in an area, also in a specific time frame. The evaluation can be conducted by considering current prices or employing a constant price foundation. Economic growth measured the rate at which economic activity will result in additional earnings for a given community within a specific time frame. According to Bappeda (Murdiyana & Mulyana, 2017), economic growth is characterized by an increase in overall real profits derived from the utilizing production factors within a given year, surpassing the levels observed in the year before. The indicator used to evaluate economic growth is the growth rate of Gross Regional Domestic Product (GRDP), assuming constant prices.

The amount of income undeniably influences the level of governmental expenditure in a positive standard of living indicator. As income rises, so does expenditure, which impacts one's quality of life. An increase in income leads to a rise in welfare, resulting in an increase in HDI achievement. Hudoyo & Mahmud (2014) said that the level of income within a community may be quantified using the Gross Regional Domestic Product (GRDP) per capita. The Gross Regional Domestic Product (GRDP) per capita is considered a significant determinant of

human well-being. A region's per capita income is strongly linked to the improvement in its economy.

Table 1.1 Average of GRDP In 34 Provinces of Indonesia for The Period of 2017-2021

Year	GRDP
2017	5.07%
2018	5.17%
2019	5.02%
2020	-2.07%
2021	3.70%

Data Sources: Badan Pusat Statistik

The Gross Regional Domestic Product (GRDP) declined nationally by -2.07% in 2020, falling from 10,949 billion to 10,723 billion based on constant prices in 2020. The decrease in numbers could be attributed to a variety of factors, one of which is the influence of the COVID-19 epidemic. Various economic sectors underwent a decrease as a result of the limitations placed on commercial and social activity in order to mitigate the spread of the virus. Additional reasons that led to the fall in Gross Regional Domestic Product (GRDP) in 2020 encompass global economic turbulence that reduced demand and supply chain disruption.

In addition, government intervention through its expenditure function is necessary to enhance the quality of human development. Health and education spending are forms of government expenditure that have a direct impact on human development. The allocation of health and education spending by the government can be influenced by factors such as public policy, community demands, and national economic conditions(Mongan, 2019). For development to occur as effectively as possible, the government is responsible for creating an atmosphere in which all societal levels can raise their standard of living and grow and develop. Health development is a strategic investment in the human capital of a country such as Indonesia. The expectation is that this investment in human capital would

ultimately result in a higher level of welfare for Indonesian society. Given the significance of health advancement in enhancing community well-being, financial assistance is provided through the revenue Budget.

Health spending refers to the allocation of funds by regions to support the implementation of government programs within the health sector at the provincial or district/city level. According to Law Number 36 of 2009, specifically in Article 171 paragraph (2), it is mandated that the government must allocate a minimum of 5 percent of the APBN and 10 percent of the APBD (excluding salaries) for the health budget.

Health is also one of the primary needs of society (Maulina & Andriyani, 2020). The 1945 Constitution states that health is a fundamental human right, so the central government is obliged to fulfill the community's health needs. Harjunadhi & Rahmawati said that health is an indicator of the welfare of a society. Astri et al. (2013) see human quality from the health side, where health is one of the factors that influence human resources, in other words the health dimension also influences the human quality of a country.

In a broad sense, education significantly create fundamental changes in society's lives and acts. Education is also an investment in the future because, with education, people can adjust their way of thinking to develop all the potential they have and play a role in life. Education is an asset in bringing together countries and communities to interact on a global scale when facing increasingly complex world challenges. We can see this in the last few years, the government has continued to increase the amount of its spending allocation, especially on spending that is in line with the Health and Education functions, as illustrated in the table:

Table 1. 2 The Budget Allocation of Government Expenditure in Health and Education Sectors 2017-2021 (in Billion)

Year	Budget Allocation on Health Expenditure	Budget Allocation on Education Expenditure
2017	61 724,00	143 134,00
2018	65 066,00	147 562,00
2019	62 758,00	152 690,00
2020	61 148,00	156 894,40
2021	111 666,70	175 236,50

Data Sources: Badan Pusat Statistik

The table demonstrates a consistent annual growth in the budget allocated to the education function over the past five years. Conversely, government expenditure in the health sector witnessed a decline in 2019 and 2020 but experienced a subsequent gain in the following year.

The 2015-2019 RPJMN states that enhancing the standard of living is not simply reflected via the availability of job opportunities and financial stability but also by ensuring that individuals have access to a satisfactory education, which is their fundamental right. The allocation of funds for education is regulated by specific provisions in the 1945 Constitution, specifically Article 31 paragraph 4, and Article 49 of the National Education System Law. According to these regulations, the education budget must be at least of 20% of the APBD (Regional Budget). Meydiasari & Soejoto state that the budget is intended to improve educational facilities and provide financial assistance for education, such as through the BOS funds and smart Indonesian cards, among other means. The government must ensure that every individual attains an education. One practical approach to enhance individuals' living conditions is through the implementation of government policies that focus on establishing high-quality educational institutions and promoting the pursuit of further education.

In addition to economic growth and government spending, various other factors may influence the development of the Human Development Index. This

factor is the root cause of poverty. Pudijanto & Syawie (2015) argue that poverty hinders human growth. Poverty leads to a decline in an individual's quality of life, resulting in poorer levels of education, health, and purchasing power across all components of the Human Development Index (HDI).

Poverty is defined as a condition in which a person or a group is unable to meet their basic needs required for a decent and progressive life. Poverty is defined as the state of not having the ability to fulfill basic needs, such as nourishment, attire, education, shelter, and healthcare. Poverty can be attributed to a dearth of resources required to meet fundamental necessities, and difficulties in accessing education and employment prospects(Diyah & Adawiyah, 2020). Hence, the extent of poverty can influence the value of the Human Development Index (HDI). The issue of poverty is characterized by its intricate and multifaceted nature. Insufficient education and inadequate access to nutritious food contribute to poverty, resulting in detrimental effects on individual health.

In 2021, numerous provinces in Indonesia still need to address the issue of poverty within their regions effectively. Based on the Main Development Indicator Achievement (SIMREG) data, Papua Province had the highest poverty rate in 2021, at 27.38%. It was followed by Papua Barat with, a poverty rate of 21.82% and Nusa Tenggara Timur, with a poverty rate of 20.44%. The government must confront this circumstance as a formidable obstacle in its endeavors to enhance the quality of human development in Indonesia. The study aims to examine the correlation between government spending on healthcare and education, the gross regional domestic product, and the poverty rate regarding to the human development index in 34 provinces of Indonesia.

1.2 Problem Formulation

Based on the study background above, the problem formulation of this research may be identified as follows:

1. How does government expenditure on health affect the human development index in 34 provinces in Indonesia?

2. How does government expenditure on education affect the human development index in 34 provinces in Indonesia?
3. How does Gross Regional Domestic Product affect the human development index in 34 provinces in Indonesia?
4. How does the Poverty Rate affect the human development index in 34 provinces in Indonesia?

1.3 Research Objectives

This study aims to examine the potential impact of government expenditure on health, government expenditure on education, gross regional domestic product, and poverty rate on the Human Development Index (HDI). Based on the problem formulation above, the objectives of this study are as follows:

1. The objective of this study is to analyzing the impact of government expenditure health sectors on the human development index across 34 provinces in Indonesia.
2. The objective of this study is analyzing the impact of government expenditure on education sectors on the human development index across 34 provinces in Indonesia.
3. The objective of this study is to analyzing the impact of Gross Regional Domestic Product on the human development index across 34 provinces in Indonesia.
4. The objective of this study is to analyzing the impact of poverty levels on the human development index across 34 provinces in Indonesia.

1.4 Research Contributions

This research offers valuable insights into development planning and policies for district and city governments in the provinces of Indonesia. The benefits of this research lie in its potential to provide valuable information for formulating economic strategies related to human development, particularly in terms of improving human resources. To enhance the Human Development Index, local governments must prioritize their efforts to improve regional expenditure allocation

policies in the domains of health and education. In addition to the mentioned before, it is anticipated that the outcomes of this study will include the following: The government should engage in collaborative activities to address poverty and GRDP, understanding the essential function of the last aspect in driving efforts to enhance the Human Development Index (HDI) throughout all provinces in Indonesia.

1.5 Problem Limitation

The scope of the problem refers to the extent or range of the issue being discussed or analyzed. The title above relates to a comprehensive examination of the issue surrounding the analysis of the impact of government expenditure in the health and education sectors, gross regional domestic product, and poverty rate on the human development index. However, due to the extensive nature of this topic, the discussion will be constrained to:

1. The scope of this study is limited to research related exclusively to the Human Development Index (HDI) within the context of the 34 provinces in Indonesia.
2. The scope of this study is limited to examining research relating only to government expenditures in the health sector across the 34 provinces of Indonesia.
3. The scope of this study is limited to examining research specifically focused on government expenditures within the education sector throughout all 34 provinces in Indonesia.
4. The focus of this study is only on studies that relate to the Gross Regional Domestic Product (GRDP) across the 34 provinces of Indonesia.
5. The scope of this study is limited to conducting research just on poverty rates in the 34 provinces of Indonesia.

1.6 Systematics of Writing

The writing of this research work follows a structure consisting of five chapters, which will be explained in detail in the following sections:

Chapter 1: INTRODUCTION

This chapter provides an overview of the contextual background of the topic, the formulation of the problem, the research aims, the potential advantages of the research, and systematic writing.

Chapter II: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter presents a comprehensive analysis of the findings from prior research, which served as references in the development of the thesis. It also encompasses the theoretical framework employed to address the research problem, along with the formulated hypotheses.

Chapter III: RESEARCH METHODS

This chapter encompasses a comprehensive discussion on the various types and sources of data utilized in the study, as well as the strategies employed for data collecting. Additionally, it outlines the operational definitions of variables, the methods employed for data collection, and the analysis methodologies employed to address the research questions posed in the issue formulation.

Chapter IV: RESULTS AND DISCUSSION

This chapter elucidates the process of presenting data and research findings, as well as the outcomes of problem analysis, with the aim of attaining optimal analytical results.

Chapter V: CONCLUSIONS AND IMPLICATIONS

This chapter elucidates two subsections, specifically the conclusions and suggestions derived from the analysis that has been conducted.

CHAPTER II
LITERATURE REVIEW

2.1 Literature Review

Previous researchers aim to provide a reference for researchers in conducting research. The result of previous research that are relevant to this research are as follows:

1. Zulham et al. examine the "Analisis Pengaruh Belanja Pendidikan, Belanja Kesehatan, Tingkat Kemiskinan dan PDRB Terhadap IPM Di Provinsi Aceh." This study seeks to determine the influence of government expenditure on education and healthcare, the poverty rate, and the gross regional domestic product (GRDP) on the human development index in Aceh Province. This research uses the analytical method to estimate the parameters of the panel data regression model utilizing a random effects model (REM). In this sense, panel data analysis refers to the use of data gathered from several units of analysis (such as geographic areas) throughout multiple time periods. The regression model is employed to ascertain the correlation between the independent variables (government expenditure on education, healthcare expenditure, poverty rate, and gross regional domestic product) and the dependent variable (human development index). The outcome of this investigation is that Government spending on education and health does not substantially impact the human development index. However, poverty variables have a significant adverse effect on the human development index. The Gross Regional Domestic Product (GRDP) has significant and immediate effects on the Human Development Index (HDI), indicating that, the HDI will also increase as the GDP rises. In summary, this study offers a valuable understanding of the variables that could impact the human development index in Aceh Province. It emphasizes the need to tackle poverty to enhance the degree of human development.
2. Agustina et al. investigate "Pengaruh Pengeluaran Pemerintah Daerah Sektor Pendidikan dan Kesehatan Terhadap Produk Domestik Regional

Bruto Serta Indeks Pembangunan Manusia di Kalimatan Timur. The objective of this study is to figure out the relationship among four factors. This research measures the dependent variables using the Gross Regional Domestic Product (GRDP) and Human Development Index (HDI). In contrast, government spending on education and government spending on health are considered as the independent factors. This study aims to investigate the influence of regional government expenditure in the education and health sectors on the Gross Regional Domestic Product (GRDP) and Human Development Index (HDI) in Kalimantan Barat. The findings of this investigation are that The government's expenditure on education in Kalimantan Barat has a favorable impact. However, it is not statistically significant about the Gross Regional Domestic Product (GRDP). The government's expenditure on healthcare in Kalimantan Barat has a favorable and substantial impact on the Gross Regional Domestic Product (GRDP). The augmentation of governmental expenditure on education in Kalimantan Barat has a favorable impact, but it is deemed insignificant in terms of the Human Development Index (HDI). The augmentation of government expenditure on healthcare in Kalimantan Barat has a negligible and adverse impact on the Human Development Index (HDI). A strong positive correlation exists between the Gross Regional Domestic Product (GRDP) growth and the Human Development Index (HDI) in Kalimantan Barat. The findings have significant implications that can serve as the foundation for local government policies to augment investment in the health sector to bolster economic growth and foster human development in the region.

3. Hadinata et al. explore “Pengaruh Produk Domestik Regioanl Bruto dan Belanja Pemerintah Fungsi Pendidikan terhadap Indeks Pembangunan Manusia di Provinsi Kepulauan Bangka Belitung”. This study aims to examine the impact of GRDP (Gross Regional Domestic Product) and government expenditure in the education sector on the Human Development Index in the province of Bangka Belitung Islands. The data analysis

approaches employed in this study involved panel data regression analysis with fixed effect models. Panel data regression methodology enables researchers to ascertain the impact of independent variables (GRDP and government spending in education) on the dependent variable (Human Development Index) while considering variations over time and across units (provinces). The study found that the gross regional domestic product and government spending in the education sector have a significant and beneficial impact on the human development index in the Bangka Belitung Islands Province. This implies that government funding in education significantly enhances society's quality of life and well-being.

4. Suhendi & Ismadiyanti Purwaning Astuti conducted an analysis on "Analisis Pengaruh Tingkat Kemiskinan, PDRB,dan Pengeluaran Pemerintah Bidang Kesehatan dan Pendidikan Terhadap IPM di Provinsi Papua Tahun 2017-2022". This study aims to examine the determinants of the Human Development Index (HDI) in Papua Province from 2017 to 2022. The data utilized in this study is classified as secondary data. The analytical approach is multiple linear regression, conducted using EViews 10 software. The variables employed include the Human Development Index (Y), Poverty (X1), Gross Regional Domestic Product (X2), Government Expenditure in the Health Sector (X3), and Government Expenditure in the Education Sector (X4). This study evaluates the impact of poverty rates, Gross Regional Domestic Product (GRDP), government expenditure on healthcare, and education on the Human Development Index (HDI). The findings suggest that the poverty rate substantially adversely affects the Human Development Index (HDI). However, the Gross Regional Domestic Product (GRDP), government expenditure on healthcare, and government expenditure on education have a notable beneficial impact on the HDI in Papua.
5. Mahendra carried out a research project focusing on "Analisis Pengaruh Pengeluaran Pemerintah Sektor Pendidikan dan Kesehatan, Inflasi dan Kemiskinan Terhadap Indeks Pembangunan Manusia Dengan Pertumbuhan

Ekonomi Sebagai Variabel Moderating Di Indonesia". The researchers seek to determine and evaluate the impact of several variables on Indonesia's Human Development Index (HDI), including inflation, poverty, and government spending on health and education. In addition, this study aims to examine the potential influence of economic growth as a moderating factor in this association. Multiple regression analysis was used to determine how much changes in the dependent variable (in this case, the Human Development Index) can be explained by changes in one or more independent variables (poverty, government spending, and inflation). The study used secondary data from 2000-2019, including Government Expenditure, Inflation, and Poverty in relation to the human development index. The variables employed in this study comprise the Human Development Index (Y), Government Expenditure in the Education and Health Sector (X1), Inflation (X2), and Poverty (X3). As a result, the relationship between government spending, inflation, and poverty, as measured by the human development index, is unaffected by economic growth variables. This implies that the correlation between these variables is unaffected by economic growth.

2.2 Theoretical Framework

2.2.1 Human Development Index

The Human Development Index (HDI) compares the life expectancy, level of education, and standard of living across all nations. The Human Development Index (HDI) is a tool used to evaluate the quality aspects of development, categorize nations as developed, developing, or undeveloped, and gauge how economic policies affect people's quality of life. In 1990, UNDP introduced an indicator that it had developed, namely an indicator that could describe human development in a measurable and representative manner, called the Human Development Index (HDI). This publication defines human development as a process that improves aspects of people's lives. The most important aspects of life are a long and healthy life, an adequate level of education, and a decent standard of living. Specifically,

UNDP determines four main human development elements: productivity, equity, sustainability, and empowerment. ·

- Productivity refers to the ability of a society or individual to produce high-value results or services. It covers the economic and productivity aspects of work. High productivity can help improve the standard of living and welfare.
- Equity or equality emphasizes the importance of distributing development results fairly among all members of society. This involves reducing economic, social, and educational inequalities so that all levels of society can enjoy the benefits of development.
- Sustainability refers to the ability of a society to maintain and improve the quality of life without destroying the environment or depleting natural resources. It covers ecological, economic, and social aspects and aims to ensure that development does not harm future generations.

- Empowerment involves giving individuals and societal groups the power to control and improve their lives. This includes access to education, health, employment, and participation in decision-making. Empowerment aims to create a more inclusive and competitive society.

These four elements form the basis for a more comprehensive approach to Human Development, not only considers economic indicators but also emphasizes social, environmental, and participatory aspects in improving the overall quality of human life.

In line with this approach involving various aspects, the Human Development Index (HDI) number ranges from 0 to 100, where closer to 100 indicates better human development. UNDP uses HDI values to classify the human development status of a country or region into three groups, namely HDI < 50 (low), 50 ≤ HDI < 80 (medium/medium), and HDI ≥ 80 (high). This comparison provides a comprehensive picture of the progress of human development covering many aspects, such as economic, social, environmental, and participatory.

Since first releasing the HDI in 1990, UNDP has used three dimensions to form the HDI. These three dimensions are the chosen approach in describing the quality of human life and have not changed to date. These dimensions are: a long and healthy life, knowledge, and a decent standard of living. Next, these dimensions are measured using several indicators. The health dimension is measured through Life Expectancy (UHH). The dimension of knowledge or education is measured by Expected Years of Schooling (HLS) and Average Years of Schooling (RLS). Meanwhile, a decent standard of living is measured through adjusted per capita expenditure. The following is an explanation of the components of the Human Development Index:

- Life Expectancy at Birth: HDI measures health using life expectancy at birth. This figure reflects the estimated average years an individual has lived at birth. Life expectancy reflects public health and access to health services.
- Mean Years of Schooling reflects the average number of years of schooling that a population of a certain age has completed.
- Expected Years of Schooling reflects the years of schooling children currently entering the education system are expected to complete.
- Gross National Income per Capita: The third dimension of HDI includes gross national income per capita as a standard of living. This measure reflects people's ability to meet basic needs like food, clothing, and housing.

HDI provides a more comprehensive picture of a country's progress because it covers broader aspects than just economic income. In addition, HDI pays special attention to health and education as essential indicators for human well-being. The higher the HDI value of a country, the higher the level of human development.

2.2.2 Government Expenditure on Health

Kahang et al. said that investment in education is necessary, so the government must be able to build an excellent educational facility and system. The government's budget allocation for education is a concrete manifestation of investment to increase community productivity. Development expenditure in the development sector can be allocated to provide educational infrastructure and services to the entire population of Indonesia evenly. The education budget of 20 percent of the APBN is a form of the government's realization of improving education.

Pake et al. (2018) argue that government spending in the health sector is an effort to fulfill one of the people's fundamental rights, namely the right to obtain health services by with the 1945 Constitution Article 28 H paragraph (1) and Law Number 23 of 1992 concerning health. According to Todaro & Smith, increasing community productivity requires government spending in the health budget sector, which is used to fulfill one of the fundamental rights to health services in the form of medical facilities and services.

Improving health services is an investment in human resources for a prosperous society. The level of public health will significantly influence the level of community welfare because the level of health is closely related to poverty. Meanwhile, the poverty level will be related to the level of welfare. Therefore, health is the main factor in the welfare of society that the government wants to realize, so health must be the government's main concern as a public service provider. The government must guarantee the people's right to health by providing fair, equitable, adequate, affordable, and quality health services.

2.2.3 Government Expenditure on Education

Based on the Law of the Republic of Indonesia Number 20 of 2003 concerning the education system, education is a planned, conscious effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, as well as the skills needed by himself, society, nation, and state.

To achieve sustainable economic development, the education sector plays a very strategic role, especially in encouraging capital accumulation to support the production process and other economic activities. In this context, education is considered a tool to achieve sustainable targets because, with education, development activities can be achieved so that opportunities to improve the quality of life in the future will be better. Improving education is expected to provide opportunities for higher growth because, with improved education, workers will have better abilities in operating and exploiting modern economic resources and manipulating physical capital. These improvements should especially be prioritized in primary education.

2.2.4 Gross Regional Domestic Product

One important indicator to determine the economic conditions in a country in a certain period is data on Gross Regional Domestic Product (GRDP), both based on current and constant prices. GRDP is the amount of added value produced by all business units in a particular country or the total value of final goods and services produced by all economic units. GRDP, based on current prices, describes the added value of goods and services calculated using the prices applicable each year. In contrast, GRDP based on constant prices shows the added value of these goods and services, calculated using the prices valid in a particular year as the basis. GRDP based on current prices can be used to see economic shifts and structure, while constant prices determine economic growth from year to year.

According to Sadorno Sukirno (2004), the method for calculating Gross Regional Domestic Product (PBRB) can be used through three approaches, namely:

- Expenditure approach: In this way, national income is calculated by adding up the expenditure value or spending on goods and services produced in a country.

- Production approach: In this way, national income is calculated by adding up the production value of goods and services realized by various economic business sectors.

- Income approach: In this way, national income is calculated by adding up the income received by the factors of production used to realize national income.

2.2.5 Poverty Rate

According to Soerjono Soekanto, poverty can be defined as a situation where a person cannot maintain himself according to the standard of living that applies in a community group. In other words, individuals classified as poor cannot reach the average standard of living that applies to a community group. Soerjono Soekanto also stated that those who cannot utilize their energy and mental and physical potential to achieve the standard of living that applies to this group can also be classified as individuals who experience poverty.

ccording to BPS, poverty is an economic inability to meet basic food and non-food needs measured in expenditure. The situation is different with the poverty line. The poverty line is the minimum expenditure value needed to meet a person's monthly basic living needs, both food and non-food. The poverty line is the sum of the food and non-food poverty lines. A population whose average monthly per capita expenditure is below the poverty line will be categorized as poor.

The food poverty line is the minimum food expenditure value, equivalent to 2100 kilocalories per capita per day. The commodity package of basic food needs

is comprised of 52 types of commodities (grains, tubers, fish, meat, eggs and milk, vegetables, nuts, fruit, oils and fats, etc.). The Non-Food Poverty Line (GKNM) is the minimum need for housing, clothing, education, and health. The basic non-food commodity package is represented by 51 types of commodities in urban areas and 47 types of commodities in rural areas.

2.3 Relationship between Dependent Variable and Independent Variables

2.3.1 Relationship between Government Expenditure on Health and Human Development Index

The human development index (HDI) of a nation is significantly impacted by government spending in the health sector. According to Todaro and Smith (2003), government spending on healthcare satisfies a fundamental right to healthcare through facilities and services, a prerequisite for raising community productivity. The Indonesian Constitution guarantees the people's fundamental right to health care, particularly in Article 28H, Paragraph 1 of the 1945 Constitution. The government is in charge of ensuring that all citizens have fair and equal access to health care. Fulfilling the right to health is crucial in ensuring the community's quality of life. Access to quality health services can support the productivity and welfare of society. Providing equitable access to health services can improve the community's quality of life and productivity, which will ultimately contribute to increasing HDI.

2.3.2 Relationship between Government Expenditure on Education and Human Development Index

Education will be an opportunity for the community to compete for opinions and a decent living so that they can be empowered to the maximum (Riski Sapitri Siregar et al., 2022). Human capital is a productive investment in people, including knowledge, skills, abilities, and ideas. Education is vital in developing the capacity to realize sustainable growth and development. The government spending in the education sector will determine how much development results will be achieved. The education budget of 20% of the APBN is a form of the government's realization of improving education.

2.3.3 Relationship between Gross Regional Domestic Product and Human Development Index

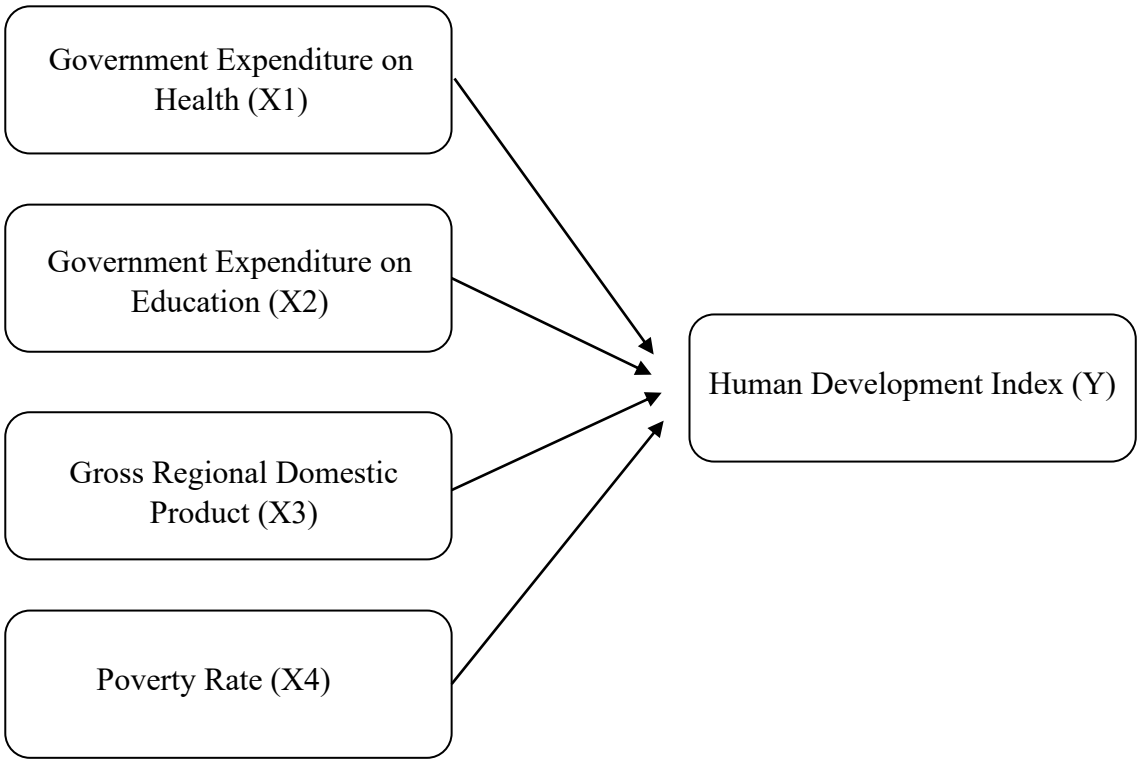
A high increase in GRDP can have a positive impact on reducing poverty levels, along with optimizing development which improves people's welfare. On the other hand, low GRDP tends to increase the amount of poverty because development is not optimal in achieving prosperity (Rapika et al., 2020). This is relevant to the Human Development Index, which reflects society's quality of life and includes dimensions of income, health, and education. Economic growth that positively impacts welfare, such as increasing job opportunities, can contribute to increasing HDI.

2.3.4 Relationship between Poverty Rate and Human Development Index

A significant problem that can hinder human development is the level of poverty. Although several countries experience high economic growth, many face the challenge of low human development, as reflected in the Human Development Index (HDI). One indicator of poverty, according to the Central Statistics Agency (BPS) in 2008, one indicator of poverty was the inability of people to access basic needs such as health and education. This means that poor people's low level of welfare is caused by their inability to meet their basic needs.

2.4 Research Framework

Based on the framework and research objectives that have been described, the research hypothesis can be formulated as follows:



Figures 2.1 Research Framework

This study uses a framework that explains the dependent variable (Human Development Index) and the independent variables (Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Level). From Figure 2.1, this study aims to find out how the Human Development Index in thirty-four provinces in Indonesia is impacted by government expenditure on health, government expenditure on education, gross regional domestic product, and poverty level. The study's findings will complement the results of the research's theoretical interpretations.

2.5 Hypothesis Formulation

A hypothesis is a temporary outcome or conclusion produced to address a research topic, which needs to be empirically tested. In the context of this field of study, the following hypothesis will be put forward:

1. It is hypothesized that the variable Government Expenditure on Health has a positive effect on the human development index in 34 provinces in Indonesia
2. It is hypothesized that the variable Government Expenditure on Education has a positive effect on the human development index in 34 provinces in Indonesia
3. It is hypothesized that the variable Gross Regional Domestic Product has a positive effect on the human development index in 34 provinces in Indonesia
4. It is hypothesized that the variable Poverty Rate has a negative effect on the human development index in 34 provinces in Indonesia

CHAPTER III

RESEARCH METHODS

3.1 Data and Data Source

The type of data used in this research is panel data, a combination of cross-sectional and time series data. According to Gujarati (2012), panel data is a collection of cross-sectional and time series data. Time series data is data collected from one item over several predetermined time periods, while cross-sectional data is information collected from one or more research subjects within the same time period.

The title of this research is "Analyzing the Impact of Expenditure on Health and Education. Gross Regional Domestic Poverty on Human Development Index in Indonesia." This research aims to evaluate the potential impact of Government Expenditures on Health and Education, Gross Regional Domestic Product, and Poverty Levels on the Human development index. The author used secondary data from the Central Statistics Agency, the Directorate General of Fiscal Balance, the Ministry of Finance, and various related agencies to support this research. Secondary data is information obtained indirectly from credible sources. The author uses panel data covering the 2017-2021 period and 34 provinces in Indonesia. The data type used involves Human development index data, government spending in health and education, GRDP, and poverty levels from 2017 to 2021. Apart from that, this research data was processed using EViews 12 software.

3.2 Definition of Operational Variables

The dependent variable used is the Human development index in 34 provinces in Indonesia. The independent variables used are government expenditure on health, education, gross regional domestic product, and poverty rate. The operational definition is as follows:

The list of variables used in this research is presented in Table 3.1. These variables are classified into dependent and independent

Table 3.1 lists Research Data and Data Sources

Data	Unit	Symbol	Source
Human Development Index	Percentage	HDI	Badan Pusat Statistik (BPS)
Government Expenditure on Health	Billion IDR	LOG_GEH	Direktorak Jendral Perimbangan Keuangan (DJPK)
Government Expenditure on Education	Billion IDR	LOG_GEE	Direktorak Jendral Perimbangan Keuangan (DJPK)
Gross Regional Domestic Product	Billion IDR	LOG_GRDP	Badan Pusat Statistik (BPS)
Poverty	Thousand People	LOG_PR	Badan Pusat Statistik (BPS)

3.2.1 Dependent Variable

According to Hardani et al. (2020), a dependent or endogenous variable is a variable whose changes are influenced by other factors. The Human development index is the dependent variable considered in this research.

3.2.1.1 Human Development Index Variable (Y)

The human development index (HDI) is a measuring tool to see the quality of life of people in an area. HDI can see the level of community quality starting from the health and education sectors and whether the community can meet their needs. Data comes from the Central Statistics Agency (BPS) in 34 Provinces in Indonesia for the 2017-2021 period using percent (%).

3.2.2 Independent Variable (X)

Variables that can influence changes in other variables are called exogenous or independent variables (Hardani et al., 2020). The variables listed below will be used in this research as independent variables.

3.2.2.1 Government Expenditure on Health Variable (X1)

The government allocates funds to the health sector to fulfill the population's fundamental health requirements because the health sector directly influences the character of a nation's human resources. Therefore, establishing priorities in this area is perceived as crucial.

According to Law Number 9 of 2009 regarding Health, the government is obliged to allocate 5% of the national budget to the healthcare sector. The funding is allocated for multiple objectives, such as enhancing enrollment in the National Health Insurance (JKN) program and enhancing the quality of services rendered by the program. Therefore, the government is dedicated to allocating sufficient and appropriate resources to facilitate projects to uphold and enhance public health. This aligns with the government's objective to enhance the well-being and standard of living of individuals by meeting fundamental needs, particularly in the healthcare field. The data utilized is sourced from the Ministry of Finance's DJPK in 34 provinces across Indonesia, encompassing the period from 2017 to 2021, and is measured in billions of rupiah.

3.2.2.2 Government Expenditure on Education Variable (X2)

Educational development is achieved by increasing the distribution of educational facilities and improving educational quality, relevance, and competitiveness. Allocation of the education sector budget is a sign of the government's seriousness in providing educational services to the community as part of fulfilling the constitutional mandate. Law Number 20 of 2003 explains the allocation of education budgets to at least 20 percent of state spending. The data used comes from the Ministry of Finance's DJPK in 34 provinces in Indonesia for the 2017-2021 period using units of billions of rupiah.

3.2.2.3 Gross Regional Domestic Product Variable (X3)

GRDP is the amount of added value produced by all production units in an area or also the total value of final goods and services produced by all economic units. The data used comes from BPS JATENG in 35 districts/cities in Central Java Province for the 2016-2020 period using units of millions of rupiah.

3.2.2.4 Poverty Rate Variable (X4)

Chamber quoted in Suradi (2007) defines poverty as "a state of poverty and disadvantage, a state of deprivation", when put in a certain context, it is related to "a lack of income and assets, physical weakness, isolation, fragility, and helplessness". Then Amartya Sen in Suradi (2007) revealed that there is an absolute core of poverty. The hunger that struck them became a perspective of poverty, as well as the inability to face social humiliation and the inability to educate children (education) and care for children's health.

3.3 Analysis Methods

This research uses quantitative analysis in data management. It uses a panel data regression method using EViews 12. Widarjono (2018) provides an explanation of the unique panel data method, which consists of two types of data: time series and rectangular. Cross-section data is a collection of data that comes from a variety of samples or objects. In contrast, time series data is a collection of data arranged in a certain time sequence based on days, months, quarters, or years. Panel data will be created within a certain period after the two are combined.

Widarjono (2018) stated that processing data using panel data has advantages compared to processing data only with cross-sections or time series. This is because panel data, which is a combination of cross-sections and time series, can produce a larger amount of data, which results in a higher degree of freedom. Furthermore, problems that arise due to variable refinement can be solved by combining time series data and cross-section data.

To find out whether the hypothesis used in this research is accepted or not, the F test is used. Apart from that, to find out how each independent variable has an impact on the human development index as a dependent variable, a one-sided test is carried out with a significance level or alpha of 1% or 0.01. Widarjono (2018) states that there are several methods or approaches that can be used to estimate panel data regression. These methods include the common effect model (CEM), fixed effect model (FEM), and random effect model (REM), each of which is used to evaluate the model as a whole. In the next step, additional testing is carried out to determine which model is most suitable for use during the research process. An explanation of the model to be used is given below:

3.3.1 Common Effects Model (CEM)

The common effect model is the simplest model because it assumes that the object under study has the same characteristics in the individual and time dimensions. However, the objects studied are different. The easiest method to estimate panel data is to combine time series and cross-section data without paying attention to differences between time and individuals. The use of Ordinary Least Squares (OLS) in this approach produces a Common Effect Model (CEM), which assumes the existence of general or constant effects that affect all units or individuals in the population. This approach does not consider significant individual or time variations and is appropriate when it is assumed that these general effects are the main factor in explaining the variation in panel data.

$$Y_{it} = \beta_0 + \beta_1 lnX_{1it} + \beta_2 lnX_{2it} + \beta_3 lnX_{3it} + \beta_4 lnX_{4it} + eit$$

Where:

Y_{it}	= Human Development Index
β_0	= Intercept
$\beta_0\ \beta_1\ \beta_2\ \beta_3\ \beta_4$	= Coefficient regression of X1, X2, X3, X4
$logX_{1it}$	= Log of Government Expenditure on Health
$logX_{2it}$	= Log of Government Spending on Education Sectors
$logX_{3it}$	= Log of Gross Regional Domestic Product

$logX_{4it}$ = Log of Poverty Rate

i = Cross-section

t = Time Series (2017-2021)

eit = error term or residual

3.3.2 Fixed Effect Model (FEM)

The fixed effect model technique is a technique for estimating panel data using dummy variables to capture intercept differences. The fixed effect model is based on the idea that there are differences in intercept between companies, but the intercept is fixed or does not change over time. In addition, this model assumes that the regression coefficient (slope) is constant between individuals and over time. This estimation technique is often referred to as the LSDV (least squares dummy variable) technique.

$$Y_{it} = \beta_0 + \beta_1 lnX_{1it} + \beta_2 lnX_{2it} + \beta_3 lnX_{3it} + \beta_4 lnX_{4it} + \alpha_1 lnD_{1it} + \cdots + \alpha_{33} lnD_{33it} + eit$$

Y_{it} = Human Development Index

β_0 = Intercept

$\beta_0\ \beta_1\ \beta_2\ \beta_3\ \beta_4$ = Coefficient regression of X1, X2, X3, X4

lnX_{1it} = Log of Government Expenditure on Health

lnX_{2it} = Log of Government Spending on Education Sectors

lnX_{3it} = Log of Gross Regional Domestic Product

lnX_{4it} = Log of Poverty Rate

$\beta_5, \beta_6, \beta_n$ = Intercept Dummy

$D_1 \ldots, D_{33}$ = Dummy variables

i = Cross-section

t = Time Series (2017-2021)

eit = Error Term or Residual

3.3.3 Random Effect Model (REM)

The random effect model is an approach used to overcome our ignorance about the actual model in the context of panel data. As an alternative to using dummy variables in fixed effect models, the random effect model utilizes error terms as an estimation method. In this model we estimate panel data by assuming that disturbance variables (error terms) can be interconnected across time and individuals. The application of GLS (generalized least squares) in random effect models can help increase the accuracy and precision of regression model estimates.

$$Y_{it} = \beta_{0i} + \beta_1 lnX_{1it} + \beta_2 lnX_{2it} + \beta_3 lnX_{3it} + \beta_4 lnX_{4it} + \alpha_1 lnD_{1it} + \cdots + \alpha_{33} lnD_{33it} + eit$$

Y_{it} = Human Development Index

β_{0i} = $\bar{\beta}_0 + \mu_i$

$\bar{\beta}_0$ = the mean of population which the parameter is unknown

$\beta_0\ \beta_1\ \beta_2\ \beta_3\ \beta_4$ = Coefficient regression of X1, X2, X3, X4

$logX_{1it}$ = Log of Government Expenditure on Health

$logX_{2it}$ = Log of Government Spending on Education Sectors

$logX_{3it}$ = Log of Gross Regional Domestic Product

$logX_{4it}$ = Log of Poverty Rate

μ_i = error terms between individual but same in time

i = Cross-section

t = Time Series (2017-2021)

eit = error term or residual

3.4 Selection on Estimation Model

Panel data regression can be estimated using three different methods: the Random Effect Model, the Fixed Effect Model, and the Common Effect Model. To achieve an efficient estimation, it is necessary to choose a model for an analysis based on statistical considerations. A few of the most effective methods to employ are:

1. **Chow Test,** The Chow Test is a tool used to assess if a model approach is a fixed effect or a common effect. The following hypothesis is tested in this experiment:

   $H0$: Decide on the Common Effect Model (CEM)

   $H1$: Decide on the Fixed Effect Model (FEM)

   The test is carried out by looking at the p-value, if the p-value is significant (less than 1%) then the best model to use is fixed effect model. On the other hand, if the p-value is not significant (more than 1%) then the Common Effect Model is the most appropriate model to apply.
2. **Lagrange Multiplier (LM),** The Lagrange multiplier test is needed if the results of the Chow test show common effects as the appropriate model, while the Hausman test shows random effects are suitable.

   $H0$: Decide on the Common Effect Model (CEM)

   $H1$: Decide on the Random Effect Model (FEM)

   Using the Random Effect Model is the best fit when the test is run and the p-value is significant (less than 1%). By contrast, the Common Effect Model is the most appropriate model to apply if the p-value is not significant (greater than 1%). If, on the other hand, the Fixed Effect Model is selected for the Chow Test, then this test will be abandoned.
3. **Hausman Test,** In choosing which approach suits our equation model and data, fixed effects or random effects can be used using the specifications developed by Hausman. The Hausman test uses the Chi-square value so that the decision to choose the panel data method can be found statistically. Assuming that individual errors are not correlated with each other and

neither are the combination errors. In addition, the Hausman test is carried out with the following hypothesis:

$H0$: Decide on the Random Effect Model (REM)

$H1$: Decide on the Fixed Effect Model (FEM)

The test is performed by examining the p-value; if the p-value is significant (less than 1% or 0.01), then the Fixed Effect Model estimation model is employed. However, Random Effect Model Estimation is the best model to use if the p-value is greater than 1% or 0.01 and not significant.

3.5 Statistical Testing

In this test, the aim of carrying out statistical tests is to be able to determine the regression output obtained. The statistical tests used are the coefficient of determination (R2), simultaneous test (F test), and partial test (T-test).

3.5.1 Coefficient of Determination (R2)

The Determination Coefficient (R2) is used to find out how large a portion of the independent variable is used to explain the dependent variable in the model. The remaining portion outside the model is explained by other variables outside the model that has been created. The formula for finding the R2 value:

$$R^2 = 1 - \frac{RSS}{TSS}$$

Where:

R^2 = The Coefficient of Determination

TSS = Total Sum of Squares

RSS = Residual Sum of Squares

Based on the value of the adjusted R-square, the value of R^2 lies between zero and one ($0<R^2<1$). The greater the associated variable that can be explained by the other independent variable becomes greater when R^2 is close to the value of one.

3.5.2 F-Test

This test was carried out to find out how the independent variables together influence the dependent variable in the research. This was done by comparing the calculated F value with the critical F value. This critical F value can be seen in the F distribution column based on the α value and df numerator (degree of freedom). The following is the hypothesis in the F-statistic test:

$H0 = \beta1 = \beta2 = \beta3 = \beta4 = 0$ (There is no influence between the independent variables on the dependent variable).

$H1 = \beta1 \neq \beta2 \neq \beta3 \neq \beta4 \neq 0$ (There is an influence between the independent variables on the dependent variable).

By looking at the magnitude of the calculated F value and the critical F value, we can decide, if the calculated F value is greater than the critical F value then reject H0 or accept H1. This means that the independent variable simultaneously influences the dependent variable. However, if the calculated F value is <critical F value then the decision fails to reject H0, or simultaneously the dependent variable is not influenced by the independent variable. Next, the way to get the F-statistic value is by looking at the probability value of the F statistic and then comparing it with the degree of confidence value, namely α (1%, 5%, or 10%) according to what was determined when conducting the research. If the F-statistic probability value is < confidence level α α (1%, 5%, or 10%) then this indicates that all independent variables have a significant influence on the dependent variable. Meanwhile, if the F-statistic probability value is > the degree of confidence α (1%, 5%, or 10%) then this indicates that all independent variables have no significant influence on the dependent variable.

3.5.3 T-Test

The t-statistical test is carried out to determine the meaning of each variable, namely whether the independent variable partially influences the dependent variable quite significantly. This can be known by comparing the results of the calculated t value with the critical t value or at the significance level α with the

probability value (p-value). The critical t value is obtained by looking at the t distribution table, by looking at the degree of confidence, namely (α) 1% 5% 10% which has been determined and determining df (degree of freedom) using the formula df = n – k. With the following hypothesis:

$H0: \beta = 0$, the independent variable partially has no effect on the dependent variable

$H1: \beta < 0$, the independent variable partially has a negative effect on the dependent variable

$H1: \beta > 0$, the independent variable partially has a positive effect on the dependent variable

The decision is taken after comparing the calculated t value with the critical t value. If the calculated t value > t is critical, then reject H0 or accept H1. This means that the independent variable has a significant effect on the dependent variable, and vice versa. If the calculated t value <t is critical, then it fails to reject H0, meaning the independent variable has no significant effect on the dependent variable. On the other hand, t-statistic testing can be done by comparing the probability value with the degree of confidence (α) value of 1%, 5%, 10% which was determined when conducting the research. If the probability value t < α means the decision to reject H0 or accept H1, so that the independent variable has a significant effect on the dependent variable and vice versa. If the probability value t > α then the decision to accept H1 means that the independent variable is not significant and has an effect on the dependent variable.

CHAPTER IV

DATA ANALYSIS AND DISCUSSION

4.1 Data Description

This study examines the impact of government spending on healthcare and education, as well as the gross regional domestic product and poverty rate, on the Human Development Index throughout all 34 provinces of Indonesia from 2017 to 2021. This study covers 34 provinces in Indonesia, spanning the period from 2017 to 2021. The explanatory variables consisted of government expenditure on health (X1), government expenditure on education (X2), gross regional domestic product (X3), and poverty rate (X4). In contrast, the variable explained is the Human Development Index (Y). This analysis utilizes the approaches of the *Common Effect Model*, the *Fixed Effect Model*, and the *Random Effect Model*. To evaluate the best-chosen model, utilize the Chow and Hausman tests, following the previously mentioned models. The analysis involved applying EViews 12 to process the program and implementing panel data regression.

This study investigates the factors that impact the Human Development Index. Descriptive statistics describe the variables used to explain the data utilized in the research. Statistics offer a comprehensive analysis or representation of data, encompassing metrics such as the mean (average), standard deviation, median, maximum, and minimum values. Descriptive statistics provide a comprehensive summary of the distribution and attributes of the data for each variable. The Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Human Development Index are examined, and their average (mean), standard deviation, median, maximum, and minimum values are determined using data from BPS and DJPK publications. Table 4.1 will display the statistical results of descriptive variables.

Table 4. 1 Result of Descriptive Statistics Variable Analysis

Variable	N	Mean	Maximum	Minimum	Std. Dev.
Human Development Index	170	70.72	81.11	59.09	3.96
Government Expenditure on Health	170	982433.3	10770301	114043	1641501
Government Expenditure on Education	170	2731414	16117147	345545	2863746
Gross Regional Domestic Product	170	315716.9	1856076	23210.9	446888.2
Poverty Rate	170	771.16	4585.97	48.56	1072.4

Data source: Data processed using EViews 12

The test results are shown in Table 4.1, along with the mean, maximum, minimum, and standard deviation values for each variable. The following conclusions can be made considering the data analysis results previously mentioned.

The study consisted of 170 observations, with the variable Human Development Index having an average value (mean) of 70.72 and a standard deviation of 3.96. Between 2017 and 2021, the province of Jawa Tengah had the highest Human Development Index, at 81.11%. Kalimantan Utara Province had the lowest Human Development Index from the 2017–2021, at 59.09%.

On the Government Expenditure on Health's variable, the total number of observations is 170. This variable shows the lowest value of government expenditure on health care happened in Papua Barat Province, with 114.043 billion in 2020, while the highest the amount of 10,770,301 billion spent on Government Expenditure on Health at DKI Jakarta Province in 2021, and has a mean value of 982,433.3 billion with a standard deviation of 1,641,501.

The variable Government Expenditure on Education (X2) has 170 observations. It has an average or mean value of 2731414 billion with a standard deviation of 2,863,746. Java Barat Province received the highest share of the government's education spending, totaling 16117147 billion between 2017 and 2021. With a government expenditure on education of 345,545 billion for 2017–2021, Sulawesi Barat Province has the least amount.

The Gross Regional Domestic Product Variable (X3) has 170 observations. The independent variable, the Gross Regional Domestic Product has an average value of 315716.9 billion and a standard deviation of 446888.2. At 1,856,076 billion for 2017–2021, the Gross Regional Domestic Product (GRDP) of Jawa Tengah Province is the highest. Between 2017 and 2021, the Papua Barat Province had the lowest Gross Regional Domestic Product (GRDP) of 23210.9 billion.

The poverty Rate (X4) variable has 170 observations. As the independent variable, the Poverty Rate variable shows the lowest poverty rate happened at Nusa Tenggara Timur in 2021, with a value of 48.56 thousand people, while the highest Poverty Rate was achieved by Kalimantan Tengah in 2020, with 4585.97 thousand people living there. It Has an average value of 771.16 billion and a standard deviation of 1072.4.

4.2 Regression Results

4.2.1 *Common Effect Model* (CEM)

The Common Effect Model analysis results for the variables Gross Regional Domestic Product, Government Expenditure on Education, Government Expenditure on Health, and Poverty Rate to the Human Development Index from 2017 to 2021 across all Indonesian provinces are provided in Table 4.2.

Table 4.2 *Common Effect Model* Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.75373	4.077685	7.787194	0.0000
Government Expenditure on Health	0.190108	0.307579	0.618078	0.5374
Government Expenditure on Education	1.4264	0.385336	3.701704	0.0003
Gross Regional Domestic Product	2.385565	0.30295	7.874442	0.0000
Poverty Rate	-2.111627	0.285324	-7.40082	0.0000
R-squared	0.50565			
F-statistic	42.19287			
Prob(F-statistic)	0.00000			

Data source: Data processed using EViews 12

4.2.2 *Fixed Effect Model* (FEM)

The Fixed Effect Model is a statistical technique for analyzing data where the effects of some variables are taken to be constant and unchanging across observations. The results of the Fixed Effect Model analysis are shown in Table 4.3. The study examined the relationship between the Human Development Index and the variables of Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate for every province in Indonesia between 2017 and 2021.

Table 4.3 *Fixed Effect Model* Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.91767	8.19219	-4.506447	0.0000
Government Expenditure on Health	0.376525	0.15273	2.465196	0.0150
Government Expenditure on Education	0.785107	0.19889	3.947371	0.0001
Gross Regional Domestic Product	7.36252	0.63406	11.61162	0.0000
Poverty Rate	0.540591	0.64726	0.835193	0.4051
R-squared	0.992836			
F-statistic	494.3894			
Prob(F-statistic)	0.00000			

Data source: Data processed using EViews 12

4.2.3 *Random Effects Model* (REM)

In all Indonesian provinces from 2017 to 2021, the variables of Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate were analyzed statistically using a Random Effect Model to determine how these factors affected the Human Development Index. The results are shown in Table 4.3.

Table 4.4 Result of *Random Effect Model* Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.30936	4.438146	2.548216	0.0117
Government Expenditure on Health	0.723815	0.140485	5.152259	0.0000
Government Expenditure on Education	1.087149	0.187582	5.795583	0.0000
Gross Regional Domestic Product	3.937667	0.393004	10.0194	0.0000
Poverty Rate	-2.157287	0.401588	-5.37189	0.0000
R-squared		0.559272		
F-statistic		52.34522		
Prob(F-statistic)		0.00000		

Data source: Data processed using EViews 12

4.3 Selection of the Estimation Model

The *Common Effect Model*, *Fixed Effect Model*, and *Random Effect Model* are the three separate models that make up the panel data regression model. Next, the optimal model selection was tested after regression analysis on these three models. According to the test results, the following models were chosen: the Chow test used to compare the Common Effect Model with the Fixed Effect Model, the Hausman Test used to compare the Fixed Effect Model and Random Effect Model, and the Lagrange Multiplier used to compare the Random Effect Model with the Common Effect Model.

4.3.1 Chow-Test

The Chow Test's statistical test assesses whether a time series regression model has a structural break. To estimating panel data, the *Fixed Effect Model* or the *Common Effect Model* is chosen based on the results of the Chow test. By analyzing the p-value, it take a look at the estimation from the Fixed Effect Model and the Common Effect Model can be compared. In cases where the significance level is below 0.10, the *Fixed Effect Model* is deemed the most optimal model. The *Common Effect Model* would be the most suitable choice if the p-value exceeds 0.10, indicating a lack of statistical significance.

The test is carried out by checking out the p-value; if the p-value is significant (less than 1%), then the best model to use is the *Fixed Effect Model*. On the other hand, if the p-value is not significant (greater than 1%), then the best model to use is the *Common Effect Model*. Table 4.5 presents the F test.

Table 4.5 Result of F-Test

Redundant Fixed Effects Tests Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	272.00333	-33,132	0.0000
Cross-section Chi-square	719.80015	33	0.0000

Data sourced: Data processed using EViews 12

According to Table 4.5's estimation results using the Chow test, there is a probability value of Cross-section F with 0.0000, which shows that the probability value is less than the alpha used ($0.0000 < \propto 1\%$). In light of the Chow test result, the conclusion that could be taken is to reject the null hypothesis (H0), and Ha is accepted, which means that the most appropriate model to use in this research is the Fixed Effect Model.

4.3.2 Lagrange Multiplier Test

The Lagrange Multiplier test, developed by Breusch-Godfrey, is a general method for detecting autocorrelation problems. The LM test ensures appropriate model selection, especially when the test results for the fixed and random models are inconsistent. For example, the Chow test may be suitable for a fixed effects model, but the Hausman test may be suitable for a random model. In situations like this, the LM test is used to decide which model is more appropriate.

Table 4.6 Result of LM – Test

Lagrange Multiplier Tests for Random Effects Test Hypothesis			
	Cross-section	Time	Both
Breusch-Pagan	3.194.144 (0.0000)	0.484573 (0.4864)	3.198.990 (0.0000)

Data sources: Data Processed using Eviwes 12

The LM test results show that the Breusch-Pagan probability is 0.0000, which means this value is lower than the alpha (α) significance level of 0.01. Therefore, it can be concluded that the decision was to reject the null hypothesis (H0). This means that the panel data estimation model using the random effect model is considered more appropriate than the expected effect model using the OLS method.

4.3.3. Hausman Test

An appropriate fixed effects or random effects model for regression analysis can be ascertained through the statistical test known as the Hausman Test. The Hausman test is used to identify the optimal model, either the Fixed Effect Model or the Common Effect Model, for estimating panel data. The p-value can be used to compare the estimates from the fixed effect and common effect models. The Fixed Effect Model is considered better if the p-value is less than 0.01. Nonetheless, the Common Effect Model is the most suitable if the p-value is greater than 0.01 and hence not statistically significant. Table 4.7 exhibits the Hausman test.

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Table 4.7 Result of Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	49.812408	4	0.0000

Data sources: Data Processed using Eviwes 12

Table 4.7 presents the results of the Hausman test, which yielded a probability value of $0.0000 < \propto 0.01$. Therefore, H0 is rejected statistically, and Ha is accepted because the probability is less than the alpha applied. This shows that, according to the Hausman test, the Fixed Effect Model is the best.

By comparing the results of the Chow test, LM test, and Hausman test, the researcher chose to use the Fixed Effect Model to estimate the data of this research.

4.4 Regression Analysis

The Fixed Effect Model, as shown in Table 4.7, is the ideal regression model for analyzing the relationship between government spending on health, education, the gross regional product, the poverty rate, and the Human Development Index for the 34 provinces of Indonesia between 2017 and 2021. Table 4.8 reveals the fixed effect model.

Table 4. 8 Result of Panel Regression with *Fixed Effect Model*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.91767	8.19219	-4.50644	0.0000
Government Expenditure on Health	0.376525	0.152737	2.465196	0.0150
Government Expenditure on Education	0.785107	0.198894	3.947371	0.0001
Gross Regional Domestic Product	7.36252	0.634065	11.61162	0.0000
Poverty Rate	0.540591	0.647264	0.835193	0.4051
R-squared	0.992836			
F-statistic	494.3894			
Prob(F-statistic)	0.00000			

Data source: Data processed using EViews 12

Based on the data processing, the coefficient of determination showed an $\mathbf{R^2}$ value of 0.992836. This number indicates that 99.2% of the independent and dependent variables can be explained by the other variable, with the remaining percentage being explained by variables not part of the model.

4.4.1 Coefficient of Determination (R^2)

A statistical metric known as the coefficient of determination ($\mathbf{R^2}$) quantifies the percentage of the dependent variable that can be explained by the independent variable (or variables). The coefficient of determination ($\mathbf{R^2}$) calculates how government spending on health, education, the gross regional product, and the poverty rate impacts changes in the dependent variable, the Human Development Index.

The obtained $\mathbf{R^2}$ value is 0.992836. This suggests that the Human Development Index can be explained by government spending on health, education, the gross regional product, and the poverty rate, which account for 99.2% of the variation in the human development index. Additionally, variables not included in the model can account for the remaining 0.008%.

4.4.2 F-Test

The F-statistic test is employed to evaluate the significance of the independent variables to each other, specifically their impact on the dependent variable. Government Spending on Health, Education, Poverty Rate, and Gross Regional Domestic Product statistically affects the Human Development Index in 34 Indonesian Provinces.

The F-statistic value is 494.3894, and the probability value is 0.00000 less than the alpha used ($0.0000 < 0.01(\propto = 1\%)$), which means that the H0 is rejected. It can be concluded that with fixed effect model estimation, all independent variables jointly affect the dependent variable.

4.4.3 T-Test

Table 4.8 presents the outcomes of the T-test conducted on the following variables: Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate. These factors impacted the Human Development Index for the years 2017–2021. Table 4.8 presents the t-test.

Table 4. 9 Result of T-Test

Variable	t-Statistic	t-Table	Prob.	α	Description
Government Expenditure on Health	2.465196	2.35493	0.0075	0.01	Significant
Government Expenditure on Education	3.947371	2.35493	0.00005	0.01	Significant
Gross Regional Domestic Product	11.61162	2.35493	0.0000	0.01	Significant
Poverty Rate	0.835193	2.35493	0.20255	0.0x1	Not Significant

Data source: Data processed using EViews 12

1. Evaluating the Impact of Government Expenditure on Health on the Human Development Index

   Based on the significance test, the regression coefficient obtained was 0.0150/2=0.0075, which shows that the probability is smaller than the alpha 1% (0.0075 < α = 0.01). The value of t-Statistic 2.465196, which is bigger than the t-Table 2.35493, indicates that the null hypothesis was rejected. The data indicated a strong correlation between government expenditures on health and the human development index, indicating a beneficial impact in 34 Provinces in Indonesia.

2. Evaluating the Impact of Government Expenditure on Education on the Human Development Index

   According to the significance test, the regression coefficient is 0.0001/2=0.00005 less than alpha 1% (0.00005 < α = 0.01). The t-Statistic 3.947371 was more significant than the t-Table 2.35493, suggesting that the

null hypothesis was rejected. It can be inferred that government expenditure on education significantly impacts the human development index in 34 Provinces in Indonesia.

3. Evaluating the Impact of Gross Regional Domestic Product on the Human Development Index

   The significance test indicates the regression coefficient is 0.0000/2=0.0000, smaller than alpha 1% (0.0000<0.01). The result of the t-statistic of 11.61162 compared to the t-table of 2.35493 concluded that the t-statistic was greater than the t-table, pointing to the null hypothesis being rejected. There is an enormous connection and significant impact of the gross regional product on the human development index in 34 Provinces in Indonesia.

4. Evaluating the Impact of Poverty Rate on the Human Development Index

   Based on the significance test, the regression coefficient is 0.4051/2=0.20255, greater than alpha 1% (0.20255 < 0.1). In addition to the outcome of the t-table with 2.35493, which is more extensive than the t-statistic with 0.835193, concluding that the null hypothesis failed to be rejected. The poverty rate does not significantly impact the human development index of 34 provinces in Indonesia.

4.5 Discussion

4.5.1 Analyzing the Relationship of Government Expenditure on Health towards Human Development Index

The data analysis and hypothesis testing conducted in this research reveal that the coefficient of government expenditure on health variables has a significant and positive impact on the human development index. The coefficient value of the Government Expenditure on Health variable is 0.376525. Therefore, a billion IDR increase in government expenditure on health will lead to an estimated 37.7% increase in the Human Development Index. This follows the research hypothesis,

which states that there is a positive influence on the rise of the human development index.

This research results follow the theoretical findings of previous research from Soleha and Fathurrahman. Health is a fundamental requirement for humans. With a healthy population, a country can achieve productivity (Soleha & Fathurrahman, 2017). Conversely, economic activity can thrive if the community is assured of good health. This statement is supported further by Deviyanti Patta's research on establishing public infrastructure and improving healthcare standards in the industry, which also contributes to the efficient functioning of economic activities. It can be inferred that increasing government spending on healthcare in Indonesia will lead to higher levels of human development (Patta Deviyanti, 2012).

4.5.2 Analyzing the Relationship of Government Expenditure on Education towards Human Development Index

The data analysis and statistical testing conducted in this research indicate that the coefficient of the government expenditure on education variable, which is 0.785107, has a significant and positive impact on the human development index. The data indicates that a billion IDR rise in Government Expenditure on Education results in a proportional increase of 78.6% in the Human Development Index.

These findings align with research indicating that investing in education significantly and positively impacts the Human Development Index (HDI). This conclusion is consistent with the initial hypothesis in the journal article "Analysis of Factors that Influence the Human Development Index" (Nur Isa Pratowo, 2013). Additionally, the research by Rahima and Ika Chandriyanti (Rahimah, 2020)) shows that government investment in the education sector significantly impacts the human development index in Banjarmasin. Consequently, an increase in government expenditure in the education sector will result in a corresponding rise in the human development index of Banjarmasin City.

4.5.3 Analyzing the Relationship of Gross Regional Domestic Product towards the Human Development Index

The statistical analysis conducted in this research and the results of hypothesis testing indicate that the coefficient of the Gross Regional Domestic Product variable has a significant and positive impact on the human development index. The coefficient value for gross regional domestic product is 7.36252. According to the data, a billion IDR increase in gross regional domestic product is expected to lead to an approximate 7.36% increase in the Human Development Index.

This is consistent with previous studies showing that in 34 Indonesian provinces, the gross regional product positively affects the HDI. If sustainable development occurs, which involves improving and resolving the population's welfare, the rise in GRDP will impact the increase in HDI (Bhakti et al., n.d.). The findings of this study align with Kuznet's argument that a key feature of contemporary economic growth is a substantial increase in output per capita (Michael P. Todaro & Stephen C. Smith, 2006). Rising economic growth directly impacts consumption patterns by increasing people's ability to buy things, which in turn leads to an increase in the Human Development Index (HDI). People's purchasing power, a composite indicator in the HDI, determines the increase.

4.5.4 Analyzing the Relationship of Poverty Rate towards Human the Development Index

Despite having a positive relationship with the Human Development Index, the coefficient of the Poverty Rate variable does not have a significant effect, according to the results of hypothesis testing and the panel data estimation carried out in this study. The coefficient value for the variable representing the Poverty Rate is 0.54059. This suggests no direct correlation between the Poverty Rate and the Human Development Index.

In some cases, poverty can encourage people to be more creative in finding solutions to improve their standard of living. This can result in an increase in several aspects measured by the Human Development Index (HDI), such as income or access to certain resources, which makes the relationship positive although not significant. This is because poverty still has a strong negative impact on other aspects measured by the HDI, such as limited access to education, inadequate health services, and instability in living standards (Ramdhani et al., 2022)

The decrease in poverty leads to a rise in HDI. The result above demonstrates the negative and considerable impact of poverty on HDI. According to a study, poverty negatively and substantially impacts the Human Development Index (HDI). In addition, this discovery aligns with Todaro's thesis of absolute poverty, which asserts that the population lacks the means to acquire adequate resources to meet their fundamental requirements. In addition, the population also resides below the international poverty threshold or below the minimum level of actual income (Padang et al., 2022).

4.5.5 Intercept Difference

Table 4.9 presents the fixed effect coefficients of various variables in provinces of Indonesia. This study examines the specific effects of Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate on the Human Development Index in every province of Indonesia.

Table 4. 10 *Fixed Effect Model* Coefficient

Cross ID	C	Konstanta Provinsi	Intercept
Aceh	-36.91767	0.797164	-36.120506
Sumatera Utara	-36.91767	-9.689546	-46.607216
Sumatera Barat	-36.91767	0.581592	-36.336078
Riau	-36.91767	-7.167646	-44.085316

Jambi	-36.91767	1.159416	-35.758254
Sumatera Selatan	-36.91767	-6.696834	-43.614504
Bengkulu	-36.91767	10.25128	-26.66639
Lampung	-36.91767	-5.362003	-42.279673
DKI Jakarta	-36.91767	8.334605	-28.583065
Jawa Barat	-36.91767	2.462306	-34.455364
Jawa Tengah	-36.91767	-9.420854	-46.338524
DI Yogyakarta	-36.91767	-16.00303	-52.9207
Jawa Timur	-36.91767	-15.91957	-52.83724
Kalimantan Barat	-36.91767	12.22388	-24.69379
Kalimantan Tengah	-36.91767	-17.49281	-54.41048
Kalimantan Selatan	-36.91767	-6.597621	-43.515291
Kalimantan Timur	-36.91767	4.838287	-32.079383
Sulawesi Utara	-36.91767	0.878725	-36.038945
Sulawesi Tengah	-36.91767	-0.026884	-36.944554
Sulawesi Selatan	-36.91767	-2.87799	-39.79566
Sulawesi Tenggara	-36.91767	4.447499	-32.470171
Bali	-36.91767	1.599648	-35.318022
Nusa Tenggara Barat	-36.91767	-2.470469	-39.388139
Nusa Tenggara Timur	-36.91767	8.157805	-28.759865
Maluku	-36.91767	7.340902	-29.576768
Papua	-36.91767	-0.253185	-37.170855

Maluku Utara	-36.91767	-3.903403	-40.821073
Banten	-36.91767	3.812456	-33.105214
Bangka Belitung	-36.91767	11.67079	-25.24688
Gorontalo	-36.91767	8.417659	-28.500011
Kepulauan Riau	-36.91767	11.33908	-25.57859
Papua Barat	-36.91767	12.33605	-24.58162
Sulawesi Barat	-36.91767	2.498597	-34.419073
Kalimantan Utara	-36.91767	-9.265899	-46.183569

Data source: Data processed using EViews 12

Table 4.9 consists of thirty-four provinces in Indonesia which show negative intercept, namely, Aceh -36.120506, Sumatera Utara -46.607216, Sumatera Barat -36.336078, Riau -44.085316, Jambi -35.758254, Sumatera Selatan -43.614504, Bengkulu -26.66639, Lampung -42.279673, DKI Jakarta -28.583065, Jawa Barat -34.455364, Jawa Tengah -46.338524, DI Yogyakarta -52.9207, Jawa Timur -52.83724, Kalimantan Barat -24.69379, Kalimantan Tengah -54.41048, Kalimantan Selatan -43.515291, Kalimantan Timur -32.079383, Sulawesi Utara -36.038945, Sulawesi Tengah -36.944554, Sulawesi Selatan -39.79566, Sulawesi Tenggara -32.470171, Bali -35.318022, Nusa Tenggara Barat -39.388139, Nusa Tenggara Timur -28.759865, Maluku -29.576768, Papua -37.170855, Maluku Utara -40.821073, Banten -33.105214, Bangka Belitung -25.24688, Gorontalo -28.500011, Kepulauan Riau -25.57859, Papua Barat -24.58162, Sulawesi Barat -34.419073, Kalimantan Utara -46.183569.

From the analysis carried out, it can be concluded that each province has a different intercept value. This can be seen in the table above. For example, if you sort the regions that have an influence on the Human Development Index which occurs in 34 provinces in Indonesia, namely the three best positions with the largest intercept value, it reveals that Papua Barat Province is at -24.58162, Kalimantan

Barat Province is at -24.69379, and Bangka Belitung Province is at -25.24688. This indicates that the total Human Development Index for the provinces of Papua Barat, Kalimantan Barat, and Bangka Belitung will be -24.58162, -24.69379, -24.69379, and -25.24688 if the variables Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate have no influence or have a value of zero.

The three regions with the lowest cross-section values are Kalimantan Tengah Province at -54.41048, DI Yogyakarta Province at -52.9207, and Jawa Timur Province at -5283724. The Human Development Index for Kalimantan Tengah Province, DI Yogyakarta Province, Jawa Timur Province will be -54.41048, -52.9207, -5283724 if the variables Government Expenditure on Health, Government Expenditure on Education, Gross Regional Domestic Product, and Poverty Rate have no effect or have a value of zero.

CHAPTER V
CONCLUSION

5.1 Conclusion

The following conclusion can be drawn from the regression results on four variables, which include government expenditure on health, government expenditure on education, gross regional product, and poverty rate as the independent variables and the human development index as the dependent variable in 34 Indonesian provinces from 2017 to 2021:

1. From 2017 to 2021, the Human Development Index (HDI) in 34 provinces of Indonesia was significantly impacted positively by the government's expenditures on health. The research statement that health positively influences HDI is true. As a result, an estimated 37.7% rise in the Human Development Index can be credited to a 1% boost in government expenditure on health. The rise of both variables is because a high level of health will enhance communal productivity, hence improving the HDI.
2. The study's findings demonstrate that, from 2017 to 2021, government spending on education had a favorable and noteworthy impact on the Human Development Index (HDI) in 34 provinces of Indonesian. The research hypothesis also states that educational indicators substantially impact the Human Development Index (HDI). The positive relationship between HDI and government expenditure on education is illustrated by the fact that the Human Development Index rises by 78.6% for every 1% increase in government spending. This correlation arises from the fact that individuals with a higher level of education are better equipped to compete in the labor market, resulting in increased income, which subsequently boosts welfare and, ultimately the HDI value.
3. Based on the conducted research, it has been found that the Gross Regional Domestic Product variable has a significant and positive influence on the Human Development Index. An increase in the Gross Regional Domestic

Product figure will lead to a corresponding increase in the value of the Human Development Index. This is because a rise in the well-being of individuals accompanies economic development. Based on the data, a 1% rise in gross regional domestic product is projected to result in an estimated 7.36% increase in the Human Development Index.

4. In this research it was found that increasing the Poverty Rate did not have a significant effect on the Human Development Index.

5.2 Suggestion

The author's suggestions and implications, derived from the previous conclusions and research on the Human Development Index in 34 Provinces of Indonesia, those are as follows:

1. Seeing the large influence of government expenditure on the health sector in 34 provinces in Indonesia towards human development index, it is hoped that the government can increase the realization of government expenditure in the health sector. This improvement can be done through several things, including providing adequate health facilities, improving the quality of health services, providing health education, and providing free medical treatment for the poor.
2. Seeing the large influence of government expenditure on education on the human development index in 34 provinces in Indonesia, the government is expected to increase the realization of government expenditure in the education sector. Increasing government spending in the education sector can be done through several things, including providing educational assistance in the form of scholarships, repairing inadequate school buildings, and adding educational facilities such as reading books in every educational institution in the country. every province in Indonesia.
3. By increasing gross regional domestic product which is balanced with an increase in the human development index, the government can strengthen economic growth by focusing on sustainable economic sector development

and creating employment opportunities. Steps that could involve investing in improving human resources through education and skills training. Support for small and medium businesses, and community empowerment regarding the economy are also important aspects in achieving this goal. The importance of regular monitoring and evaluation of the relationship between GRDP and the HDI can also help the government measure the effectiveness of the policies implemented.

4. Poverty reduction programs need to be improved or introduced to ensure that increasing HDI to lowering poverty rate. The government is expected to respond to the finding that increasing poverty levels does not have a significant effect on the HDI with concrete steps. It is recommended to carry out further research by adding other variables or indicators that can provide a more complete picture. With the example of increasing in number of public facilities that align with the concept to lowering poverty rate in order to increasing people's welfare and increasing in HDI. At last, Intersectoral cooperation and education and health systems empowerment are the focus, while continuing to evaluate existing policies.

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APPENDICES

Appendix 1 The Human Development Index (HDI) for the provinces of Indonesia throughout the period ranging from 2017 to 2021

No	Province	2017	2018	2019	2020	2021
1	Aceh	70.60	71.19	71.90	71.99	72.18
2	Sumatera Utara	70.57	71.18	71.74	71.77	72.00
3	Sumatera Barat	71.24	71.73	72.39	72.38	72.65
4	Riau	71.79	72.44	73.00	72.71	72.94
5	Jambi	69.99	70.65	71.26	71.29	71.63
6	Sumatera Selatan	68.86	69.39	70.02	70.01	70.24
7	Bengkulu	69.95	70.64	71.21	71.40	71.64
8	Lampung	68.25	69.02	69.57	69.69	69.90
9	DKI Jakarta	69.99	70.67	71.30	71.47	71.69
10	Jawa Barat	74.45	74.84	75.48	75.59	75.79
11	Jawa Tengah	80.06	80.47	80.76	80.77	81.11
12	DI Yogyakarta	70.69	71.30	72.03	72.09	72.45
13	Jawa Timur	70.52	71.12	71.73	71.87	72.16
14	Kalimantan Barat	78.89	79.53	79.99	79.97	80.22
15	Kalimantan Tengah	70.27	70.77	71.50	71.71	72.14
16	Kalimantan Selatan	71.42	71.95	72.44	72.45	72.72
17	Kalimantan Timur	74.30	74.77	75.38	75.50	75.69
18	Sulawesi Utara	66.58	67.30	68.14	68.25	68.65
19	Sulawesi Tengah	63.73	64.39	65.23	65.19	65.28
20	Sulawesi Selatan	66.26	66.98	67.65	67.66	67.90
21	Sulawesi Tenggara	69.79	70.42	70.91	71.05	71.25
22	Bali	69.65	70.17	70.72	70.91	71.28
23	Nusa Tenggara Barat	75.12	75.83	76.61	76.24	76.88
24	Nusa Tenggara Timur	69.84	70.56	71.15	70.63	71.19

25	Maluku	71.66	72.20	72.99	72.93	73.30
26	Papua	68.11	68.88	69.50	69.55	69.79
27	Maluku Utara	70.34	70.90	71.66	71.93	72.24
28	Banten	69.86	70.61	71.20	71.45	71.66
29	Bangka Belitung	67.01	67.71	68.49	68.68	69.00
30	Gorontalo	64.30	65.10	65.73	66.11	66.36
31	Kepulauan Riau	68.19	68.87	69.45	69.49	69.71
32	Papua Barat	67.20	67.76	68.70	68.49	68.76
33	Sulawesi Barat	62.99	63.74	64.70	65.09	65.26
34	Kalimantan Utara	59.09	60.06	60.84	60.44	60.62

Data sources: Badan Pusat Statistik

Appendix 2 Data of All Independent and Dependent Variable

Provinces	Years	Y	X1	X2	X3	X4
Aceh	2017	70.6	1,718,797	3,559,084	121240.98	829.8
Aceh	2018	71.19	1,957,056	3,736,314	126824.37	831.5
Aceh	2019	71.9	2,369,495	4,387,080	132069.62	809.76
Aceh	2020	71.99	2,019,099	3,909,952	131580.97	833.91
Aceh	2021	72.18	2,429,821	4,193,484	135251.19	850.26
Sumatera Utara	2017	70.57	489,802	5,353,735	487531.23	1326.57
Sumatera Utara	2018	71.18	585,556	5,277,487	512762.63	1291.99

Sumatera Utara	2019	71.74	540,117	5,784,900	539513.85	1260.5
Sumatera Utara	2020	71.77	543,841	6,253,454	533746.36	1356.72
Sumatera Utara	2021	72	865,343	6,233,338	547651.82	1273.07
Sumatera Barat	2017	71.24	609,821	1,922,225	155984.36	359.99
Sumatera Barat	2018	71.73	714,428	2,967,171	163996.19	353.24
Sumatera Barat	2019	72.39	711,590	3,185,363	172205.57	343.09
Sumatera Barat	2020	72.38	653,547	3,029,424	169426.61	364.79
Sumatera Barat	2021	72.65	623,380	3,030,706	175000.5	339.93
Riau	2017	71.79	865,020	3,157,985	470983.51	496.39
Riau	2018	72.44	779,745	2,920,229	482064.63	494.26
Riau	2019	73	919,416	3,071,278	495607.05	483.92
Riau	2020	72.71	935,082	3,345,645	489995.75	491.22
Riau	2021	72.94	1,026,560	2,405,268	506471.91	496.66
Jambi	2017	69.99	407,741	1,385,111	136501.71	278.61
Jambi	2018	70.65	472,012	1,507,813	142902	281.47

Jambi	2019	71.26	487,782	1,653,980	149111.09	273.37
Jambi	2020	71.29	436,254	1,681,741	148354.25	288.1
Jambi	2021	71.63	572,128	1,688,986	153825.49	279.86
Sumatera Selatan	2017	68.86	372,597	1,597,165	281571.01	1086.76
Sumatera Selatan	2018	69.39	479,333	2,957,807	298484.07	1076.4
Sumatera Selatan	2019	70.02	349,042	3,024,481	315464.75	1067.16
Sumatera Selatan	2020	70.01	378,897	3,293,576	315129.22	1119.65
Sumatera Selatan	2021	70.24	528,108	3,361,667	326411.27	1116.61
Bengkulu	2017	69.95	356,574	679,960	42073.52	302.62
Bengkulu	2018	70.64	364,880	1,034,084	44164.11	303.55
Bengkulu	2019	71.21	375,499	1,070,755	46345.45	298
Bengkulu	2020	71.4	329,098	1,152,608	46338.43	306
Bengkulu	2021	71.64	350,420	872,127	47853.78	291.79
Lampung	2017	68.25	586,894	2,530,950	220626.1	1083.74
Lampung	2018	69.02	596,219	2,693,360	232165.99	1091.6

Lampung	2019	69.57	550,208	2,757,056	244378.31	1041.48
Lampung	2020	69.69	730,904	3,003,290	240319.59	1091.14
Lampung	2021	69.9	853,684	2,927,972	246966.49	1007.02
DKI Jakarta	2017	69.99	7,744,407	1,461,432	49985.15	76.2
DKI Jakarta	2018	70.67	9,016,873	1,270,300	52208.04	69.93
DKI Jakarta	2019	71.3	8,894,089	1,286,706	53941.9	67.37
DKI Jakarta	2020	71.47	9,389,559	1,749,092	52705.94	72.05
DKI Jakarta	2021	71.69	10,770,301	2,350,389	55369.65	69.7
Jawa Barat	2017	74.45	872,110	7,979,214	166081.68	128.43
Jawa Barat	2018	74.84	1,036,868	13,254,583	173498.75	125.36
Jawa Barat	2019	75.48	1,034,107	13,968,049	181877.67	127.76
Jawa Barat	2020	75.59	1,170,106	15,193,143	174959.21	142.61
Jawa Barat	2021	75.79	2,877,973	16,117,147	180952.44	137.75
Jawa Tengah	2017	80.06	2,401,342	5,203,800	1635359.15	393.13
Jawa Tengah	2018	80.47	403,071	6,402,280	1735208.29	372.26

Jawa Tengah	2019	80.76	1,907,323	7,115,769	1836240.55	362.3
Jawa Tengah	2020	80.77	2,129,044	7,389,845	1792291.09	496.84
Jawa Tengah	2021	81.11	2,923,883	11,543,456	1856075.82	498.29
D.I Yogyakarta	2017	70.69	169,423	1,461,432	1343662.14	3774.41
D.I Yogyakarta	2018	71.3	170,906	1,270,300	1419624.14	3539.4
D.I Yogyakarta	2019	72.03	176,183	1,286,706	1490959.69	3375.89
D.I Yogyakarta	2020	72.09	177,229	1,749,092	1453380.72	4188.52
D.I Yogyakarta	2021	72.45	235,308	2,350,389	1507746.39	4004.86
Jawa Timur	2017	70.52	3,664,956	9,894,461	893750.3	4197.49
Jawa Timur	2018	71.12	3,633,639	9,549,135	941091.14	3867.42
Jawa Timur	2019	71.73	4,145,424	10,668,364	991516.54	3679.4
Jawa Timur	2020	71.87	4,352,442	11,013,785	965227.27	4119.93
Jawa Timur	2021	72.16	5,101,243	12,721,760	997345.05	3934.01
Kalimantan Barat	2017	78.89	480,058	1,759,504	92300.24	466.33
Kalimantan Barat	2018	79.53	437,539	1,764,804	98024.01	450.25

Kalimantan Barat	2019	79.99	446,382	2,094,662	104485.46	440.89
Kalimantan Barat	2020	79.97	512,293	2,349,016	101698.52	503.14
Kalimantan Barat	2021	80.22	675,410	1,486,774	107372.56	474.49
Kalimantan Tengah	2017	70.27	387,428	1,171,983	1482299.58	4405.27
Kalimantan Tengah	2018	70.77	463,901	1,237,622	1563441.82	4292.15
Kalimantan Tengah	2019	71.5	433,698	1,468,033	1649895.64	4056
Kalimantan Tengah	2020	71.71	519,263	1,604,310	1611392.55	4585.97
Kalimantan Tengah	2021	72.14	491,720	1,549,186	1668749.44	4259.6
Kalimantan Selatan	2017	71.42	1,280,433	2,067,142	410137	699.83
Kalimantan Selatan	2018	71.95	1,047,966	1,269,264	433782.71	668.74
Kalimantan Selatan	2019	72.44	1,089,009	1,459,460	456620.03	641.42
Kalimantan Selatan	2020	72.45	1,098,162	1,439,695	441148.58	857.64
Kalimantan Selatan	2021	72.72	1,058,318	2,008,865	460963.02	852.28
Kalimantan Timur	2017	74.3	1,113,464	1,671,270	144933.31	176.48
Kalimantan Timur	2018	74.77	1,069,951	1,684,708	154072.66	168.34

Kalimantan Timur	2019	75.38	1,273,659	2,350,865	162693.36	156.91
Kalimantan Timur	2020	75.5	1,241,712	1,855,301	147498.94	196.92
Kalimantan Timur	2021	75.69	1,287,724	2,100,208	143864.97	211.46
Sulawesi Utara	2017	66.58	248,222	1,317,869	94608.21	748.12
Sulawesi Utara	2018	67.3	279,205	1,299,003	90349.13	735.62
Sulawesi Utara	2019	68.14	529,874	1,429,562	93872.44	705.68
Sulawesi Utara	2020	68.25	705,682	1,491,340	93288.87	746.04
Sulawesi Utara	2021	68.65	553,489	1,417,112	95437.86	735.3
Sulawesi Tengah	2017	63.73	381,951	1,286,840	62725.41	1134.74
Sulawesi Tengah	2018	64.39	424,151	1,243,943	65929.19	1134.11
Sulawesi Tengah	2019	65.23	503,776	1,392,631	69389.02	1129.46
Sulawesi Tengah	2020	65.19	523,638	1,677,097	68809.61	1173.53
Sulawesi Tengah	2021	65.28	519,234	1,576,453	70540.66	1146.28
Sulawesi Selatan	2017	66.26	614,158	3,868,224	124289.17	388.81
Sulawesi Selatan	2018	66.98	917,840	3,897,205	130596.32	369.73

Sulawesi Selatan	2019	67.65	810,808	3,968,671	137243.09	370.47
Sulawesi Selatan	2020	67.66	991,172	4,112,630	134743.38	370.71
Sulawesi Selatan	2021	67.9	729,005	2,907,974	141212.04	354
Sulawesi Tenggara	2017	69.79	273,267	1,359,515	89544.9	137.88
Sulawesi Tenggara	2018	70.42	311,735	1,468,313	94566.25	136.45
Sulawesi Tenggara	2019	70.91	404,458	1,599,396	100349.29	131.24
Sulawesi Tenggara	2020	71.05	447,034	1,698,388	98933.61	141.78
Sulawesi Tenggara	2021	71.25	363,869	1,163,073	102481.47	141.03
Bali	2017	69.65	507,840	1,836,536	121858.52	194.56
Bali	2018	70.17	385,323	1,822,706	128052.58	195.01
Bali	2019	70.72	561,047	1,864,571	133283.85	190.29
Bali	2020	70.91	420,840	1,897,584	130864.32	206.92
Bali	2021	71.28	618,258	2,675,143	135422.59	197.76
Nusa Tenggara Barat	2017	75.12	509,043	1,841,069	452741.91	218.67
Nusa Tenggara Barat	2018	75.83	556,015	1,828,177	464694.43	222.39

Nusa Tenggara Barat	2019	76.61	685,097	1,934,350	486523.18	220.91
Nusa Tenggara Barat	2020	76.24	746,862	2,016,610	472393.33	243.99
Nusa Tenggara Barat	2021	76.88	792,578	2,026,909	484438.88	233.13
Nusa Tenggara Timur	2017	69.84	251,675	2,180,849	54537.31	48.56
Nusa Tenggara Timur	2018	70.56	319,038	2,271,036	57459.31	49.59
Nusa Tenggara Timur	2019	71.15	338,810	2,720,581	61417.79	48.61
Nusa Tenggara Timur	2020	70.63	406,204	3,004,543	60746.21	52.7
Nusa Tenggara Timur	2021	71.19	467,354	2,793,969	63162.97	49.49
Maluku	2017	71.66	269,227	1,228,554	79484.03	194.85
Maluku	2018	72.2	254,343	1,398,980	84249.72	189.05
Maluku	2019	72.99	262,799	838,775	89009.26	188.6
Maluku	2020	72.93	262,315	1,302,193	88126.37	195.85
Maluku	2021	73.3	246,400	1,172,579	91790.93	186.55
Papua	2017	68.11	703,463	2,476,781	97474.86	423.27
Papua	2018	68.88	818,059	2,620,312	117555.83	413.49

Papua	2019	69.5	1,051,868	3,361,939	127935.06	404.03
Papua	2020	69.55	967,284	3,203,024	134152.69	403.74
Papua	2021	69.79	1,005,533	1,467,639	149848.82	381.21
Maluku Utara	2017	70.34	178,790	706,712	288814.17	825.97
Maluku Utara	2018	70.9	202,639	761,190	309156.19	779.64
Maluku Utara	2019	71.66	260,735	888,436	330506.38	759.58
Maluku Utara	2020	71.93	269,665	904,285	328154.57	800.24
Maluku Utara	2021	72.24	347,596	636,310	343395.41	765.46
Banten	2017	69.86	386,280	3,329,905	83001.69	313.16
Banten	2018	70.61	370,616	3,536,085	88310.05	301.85
Banten	2019	71.2	595,944	3,922,492	94053.52	299.97
Banten	2020	71.45	686,607	4,297,646	93445.72	317.32
Banten	2021	71.66	892,635	4,198,950	97276.36	323.26
Bangka Belitung	2017	67.01	216,810	671,381	25090.13	200.91
Bangka Belitung	2018	67.71	246,205	692,530	26719.27	188.3

Bangka Belitung	2019	68.49	242,318	832,045	28429.97	184.71
Bangka Belitung	2020	68.68	231,252	994,127	28425.38	185.31
Bangka Belitung	2021	69	261,901	820,823	29110.05	184.6
Gorontalo	2017	64.3	137,130	600,300	29282.49	149.47
Gorontalo	2018	65.1	131,606	601,642	31114.14	152.83
Gorontalo	2019	65.73	154,056	643,894	32843.81	151.87
Gorontalo	2020	66.11	170,147	693,770	32074.02	159.05
Gorontalo	2021	66.36	214,446	665,051	32898.23	165.99
Kepulauan Riau	2017	68.19	282,729	959,555	27814.05	320.42
Kepulauan Riau	2018	68.87	308,061	984,223	29457.13	317.84
Kepulauan Riau	2019	69.45	365,910	1,043,952	31049.45	319.51
Kepulauan Riau	2020	69.49	382,976	1,031,111	30765.89	322.4
Kepulauan Riau	2021	69.71	385,538	1,232,798	31702.75	294.97
Papua Barat	2017	67.2	115,452	763,169	23210.86	78.28
Papua Barat	2018	67.76	127,010	930,041	25034.08	81.93
Papua Barat	2019	68.7	246,289	1,005,759	26597.55	87.18
Papua Barat	2020	68.49	114,043	1,017,782	28031.44	87.52

Papua Barat	2021	68.76	251,269	772,597	32739.16	81.18
Sulawesi Barat	2017	62.99	224,507	400,576	56907.96	212.86
Sulawesi Barat	2018	63.74	174,963	345,545	60465.52	213.67
Sulawesi Barat	2019	64.7	156,208	441,196	62074.52	207.59
Sulawesi Barat	2020	65.09	187,482	783,221	61604.13	215.22
Sulawesi Barat	2021	65.26	149,164	525,451	61289.4	221.29
Kalimantan Utara	2017	59.09	273,820	434,501	148818.29	910.42
Kalimantan Utara	2018	60.06	309,722	477,104	159711.85	915.22
Kalimantan Utara	2019	60.84	319,423	428,743	134565.89	900.95
Kalimantan Utara	2020	60.44	381,266	511,259	137787.29	912.23
Kalimantan Utara	2021	60.62	378,922	651,651	158674.3	944.49

Unit of Descriptions:

Human Development Index (HDI)	= Percentage
Government Expenditure on Health	= Billion
Government Expenditure on Education	= Billion
Gross Regional Domestic Product (GRDP)	= Billion
Poverty Rate	= Thousand People

Appendix 3 Estimated Results from Common Effect Model (CEM) Regression

Dependent Variable: HDI__Y_
Method: Panel Least Squares
Date: 11/22/23 Time: 10:42
Sample: 2017 2021
Periods included: 5
Cross-sections included: 34
Total panel (balanced) observations: 170

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.75373	4.077685	7.787194	0.0000
LOG(HEALTH__X1_)	0.190108	0.307579	0.618078	0.5374
LOG(EDUCATION__X2_)	1.426400	0.385336	3.701704	0.0003
LOG(GRDP__X3_)	2.385565	0.302950	7.874442	0.0000
LOG(POVERTY__X4_)	-2.111627	0.285324	-7.400816	0.0000

Root MSE	2.776504	R-squared	0.505650
Mean dependent var	70.72412	Adjusted R-squared	0.493666
S.D. dependent var	3.960610	S.E. of regression	2.818259
Akaike info criterion	4.939086	Sum squared resid	1310.526
Schwarz criterion	5.031315	Log likelihood	-414.8223
Hannan-Quinn criter.	4.976512	F-statistic	42.19287
Durbin-Watson stat	0.026170	Prob(F-statistic)	0.000000

Appendix 4 Estimated Results from Fixed Effect Model (FEM) Regression

Dependent Variable: HDI__Y_

Method: Panel Least Squares

Date: 12/04/23 Time: 00:33

Sample: 2017 2021

Periods included: 5

Cross-sections included: 34

Total panel (balanced) observations: 170

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.91767	8.192190	-4.506447	0.0000
LOG(HEALTH__X1_)	0.376525	0.152737	2.465196	0.0150
LOG(EDUCATION__X2_)	0.785107	0.198894	3.947371	0.0001
LOG(GRDP__X3_)	7.362520	0.634065	11.61162	0.0000
LOG(POVERTY__X4_)	0.540591	0.647264	0.835193	0.4051

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.334250	R-squared	0.992836
Mean dependent var	70.72412	Adjusted R-squared	0.990827
S.D. dependent var	3.960610	S.E. of regression	0.379323
Akaike info criterion	1.093203	Sum squared resid	18.99290
Schwarz criterion	1.794146	Log likelihood	-54.92223
Hannan-Quinn criter.	1.377637	F-statistic	494.3894
Durbin-Watson stat	1.287168	Prob(F-statistic)	0.000000

Appendix 5 Estimated Results from Random Effect Model (REM) Regression

Dependent Variable: HDI__Y_

Method: Panel EGLS (Cross-section random effects)

Date: 12/04/23 Time: 00:34

Sample: 2017 2021

Periods included: 5

Cross-sections included: 34

Total panel (balanced) observations: 170

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.30936	4.438146	2.548216	0.0117
LOG(HEALTH__X1_)	0.723815	0.140485	5.152259	0.0000
LOG(EDUCATION__X2_)	1.087149	0.187582	5.795583	0.0000
LOG(GRDP__X3_)	3.937667	0.393004	10.01940	0.0000
LOG(POVERTY__X4_)	-2.157287	0.401588	-5.371890	0.0000

Effects Specification		
	S.D.	Rho
Cross-section random	2.963866	0.9839
Idiosyncratic random	0.379323	0.0161

Weighted Statistics			
Root MSE	0.422408	R-squared	0.559272
Mean dependent var	4.041313	Adjusted R-squared	0.548588

S.D. dependent var	0.638158	S.E. of regression	0.428761
Sum squared resid	30.33287	F-statistic	52.34522
Durbin-Watson stat	1.093623	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.300951	Mean dependent var	70.72412
Sum squared resid	1853.183	Durbin-Watson stat	0.017900

Appendix 6 Chow Test Estimate Result

Redundant Fixed Effects Tests

Equation: FIXED

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	272.003326	(33,132)	0.0000
Cross-section Chi-square	719.800154	33	0.0000

Cross-section fixed effects test equation:

Dependent Variable: HDI__Y_

Method: Panel Least Squares

Date: 03/06/24 Time: 12:54

Sample: 2017 2021

Periods included: 5

Cross-sections included: 34

Total panel (balanced) observations: 170

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.75373	4.077685	7.787194	0.0000
LOG(HEALTH__X1_)	0.190108	0.307579	0.618078	0.5374
LOG(EDUCATION_ _X2_)	1.426400	0.385336	3.701704	0.0003
LOG(GRDP__X3_)	2.385565	0.302950	7.874442	0.0000
LOG(POVERTY__X4_)	-2.111627	0.285324	-7.400816	0.0000
Root MSE	2.776504	R-squared		0.505650

Mean dependent var	70.72412	Adjusted R-squared	0.493666
S.D. dependent var	3.960610	S.E. of regression	2.818259
Akaike info criterion	4.939086	Sum squared resid	1310.526
Schwarz criterion	5.031315	Log likelihood	-414.8223
Hannan-Quinn criter.	4.976512	F-statistic	42.19287
Durbin-Watson stat	0.026170	Prob(F-statistic)	0.000000

Appendix 7 Lagrange Multiplier Results

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided
(all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	319.4144	0.484573	319.8990
	(0.0000)	(0.4864)	(0.0000)
Honda	17.87217	-0.696113	12.14531
	(0.0000)	(0.7568)	(0.0000)
King-Wu	17.87217	-0.696113	5.218924
	(0.0000)	(0.7568)	(0.0000)
Standardized Honda	19.19240	-0.443878	9.238351
	(0.0000)	(0.6714)	(0.0000)
Standardized King-Wu	19.19240	-0.443878	2.944891
	(0.0000)	(0.6714)	(0.0016)
Gourieroux, et al.	--	--	319.4144
			(0.0000)

Appendix 8 Hausman Estimation Result

Correlated Random Effects - Hausman Test

Equation: RANDOM

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	49.812408	4	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(HEALTH__X1_)	0.376525	0.723815	0.003592	0.0000
LOG(EDUCATION_ _X2_)	0.785107	1.087149	0.004371	0.0000
LOG(GRDP__X3_)	7.362520	3.937667	0.247586	0.0000
LOG(POVERTY__X4_)	0.540591	-2.157287	0.257678	0.0000

Cross-section random effects test equation:

Dependent Variable: HDI__Y_

Method: Panel Least Squares

Date: 03/06/24 Time: 12:54

Sample: 2017 2021

Periods included: 5

Cross-sections included: 34

Total panel (balanced) observations: 170

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-36.91767	8.192190	-4.506447	0.0000
LOG(HEALTH__X1_)	0.376525	0.152737	2.465196	0.0150
LOG(EDUCATION__X2_)	0.785107	0.198894	3.947371	0.0001
LOG(GRDP__X3_)	7.362520	0.634065	11.61162	0.0000
LOG(POVERTY__X4_)	0.540591	0.647264	0.835193	0.4051

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.334250	R-squared	0.992836
Mean dependent var	70.72412	Adjusted R-squared	0.990827
S.D. dependent var	3.960610	S.E. of regression	0.379323
Akaike info criterion	1.093203	Sum squared resid	18.99290
Schwarz criterion	1.794146	Log likelihood	-54.92223
Hannan-Quinn criter.	1.377637	F-statistic	494.3894
Durbin-Watson stat	1.287168	Prob(F-statistic)	0.000000