Analysis of Human Resource Management Contribution to Economic Growth in Indonesia

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Abstract

This study uses data from 1990 to 2023 and the Generalized Method of Moments (GMM) and Autoregressive Distributed Lag (ARDL) approaches to examine how Human Resource (HR) management contributes to Indonesia's economic growth. The analysis's findings highlight the significance of investing in health and education by demonstrating that a rise in the Human Capital Index (HCI) raises GDP per capita both immediately and over time. Furthermore, economic growth is significantly boosted by rising GDP per capita, whereas rising unemployment and inflation have the opposite effect. Remittances from migrant workers are found to contribute positively to the economy, while an increase in CO2 emissions per capita has a negative impact. Larger forest areas and efficient and sustainable water use also support economic growth. The significance of policies that integrate education is emphasized by this study, health, employment, price stability, environment, and resources to achieve sustainable economic growth in Indonesia. Suggestions for further research include analysis with a wider data period and the addition of other variables such as technology and globalization to provide more comprehensive policy recommendations.

Keywords : Human Resource Management, Economic Growth, Human Capital Index, Gross Domestic Product (GDP) per Capita, Unemployment Rate

JEL Classification : O15,O47,E24,E31,F24,Q56,Q25

A. Introduction

Human Resource Management (HRM) is one of the main pillars in supporting a country's economic growth. Well-managed HRM can increase labor productivity, operational efficiency, and innovation, all of which contribute to increased economic output. Superior HRM is not only about technical skills, but also includes aspects such as health, education, and overall psychological well-being (Mohamed, Ari, Al-Sada, & Koç, 2021). To create a workforce capable of competing in the global market and making a substantial contribution to economic progress, investment in HRM development is therefore essential (Tien, Ngoc, & Anh, 2021). Managing its human resources presents both special opportunities and problems for Indonesia, a developing nation with the fourth-largest population in the world. In this setting, human resource management (HRM) is crucial because it may boost innovation, labor productivity, and operational efficiency—all of which lead to higher economic production (Putra, Tong, & Pribadi, 2020). To prepare a workforce capable of competing in the global market and making a substantial contribution to economic growth, investments in human resource development, including health and education, are essential (Harnani, Rusminingsih, & Damayanti, 2022).

The Human Capital Index (HCI) reflects the quality of education and health received by individuals from birth to adulthood. A high HCI indicates that the country has succeeded in developing the full potential of its human resources, which in turn drives economic growth (Demirgüç-Kunt & Torre, 2022). In addition, Gross Domestic Product (GDP) per capita is an important measure used to assess the average income and economic well-being of individuals in a country. A high GDP per capita usually indicates high levels of productivity and a more equitable distribution of wealth, reflecting increased societal well-being (Dědeček & Dudzich, 2022).

The fraction of the workforce without a job is represented by the unemployment rate. A high percentage of the working-age population that is employed and making contributions to the economy is indicated by a low unemployment rate. This is important because stable employment not only increases individual income but also supports overall economic growth (Chakraborty, Chakraborty, Biswas, Banerjee, & Bhattacharya, 2021). Another economic indicator that tracks changes in the cost of

goods and services within an economy is inflation. Maintaining people's purchasing power and economic stability, which in turn promotes sustained economic growth, requires controlled inflation (Doan Van, 2020).

Personal remittances are money sent by migrant workers to their home countries. These remittances are often an important source of income for families in Indonesia, increasing domestic consumption and investment in education and health (Mas' udah, 2020). Furthermore, environmental indices including water use, forest area, and per capita CO2 emissions are crucial for evaluating the environmental impact and economic sustainability of economic activity (Raihan & Tuspekova, 2022). Enhancing the environment can boost long-term economic expansion and raise people's standard of living (Khan, Hou, & Le, 2021). This study is to examine how human resource management in Indonesia impacts social welfare and economic growth by comprehending the significance of these six economic indicators. Furthermore, this research will help policymakers create more efficient plans to raise the caliber of human capital and accomplish long-term economic expansion. It is anticipated that this study would reveal a robust correlation between improved economic welfare and efficient human resource management in Indonesia.

The problem formulation in this study is how Human Resource (HR) management affects economic growth in Indonesia. Effective HR management is the key to improving labor productivity and operational efficiency, which in turn can drive economic growth. In order to better understand how HR management affects GDP per capita, unemployment rates, inflation, personal remittances, and environmental sustainability, this study will examine a number of HR management-related topics, such as workforce skills, education, and health. In order to help policymakers create more effective plans to enhance HR quality and accomplish sustainable economic growth in Indonesia, this study attempts to provide light on the relationship between HR management and key economic indicators. Examining the impact of human resource (HR) management

on particular economic indicators is the aim of this study. The purpose of this study is to comprehend how different facets of HR administration, including education, health, and workforce skills, can affect economic growth in Indonesia. By identifying and analyzing the relationship between HR management and indicators such as Gross Domestic Product (GDP) per capita, unemployment rate, inflation, personal remittances, and environmental sustainability, this study hopes to provide comprehensive insights and provide strategic recommendations for policy makers to improve HR quality and achieve sustainable economic growth.

Literature review

The field of human resource management (HRM) is concerned with hiring, supervising, and training employees for a company. HR covers a wider range of tactics to enhance worker productivity and well-being in addition to administrative issues like payroll and employment contracts. Aspects including workforce planning, hiring and selection, training and development, performance management, pay and benefits, and employee relations are all included in the HRM concept (Ochieng, 2023).

The Human Capital Theory, which was first presented by Theodore Schultz and Gary Becker, is one of the primary theories in HRM. According to this notion, spending money on education and training will increase productivity and individual skills, which will boost economic growth and organizational success. Human capital encompasses the abilities, health, and knowledge that allow people to make valuable contributions in the workplace (Baktymbet, Baktymbet, & Serikkyzy, 2021).

The Motivation Theory developed by Abraham Maslow through the Hierarchy of Needs, and Frederick Herzberg through his two-factor theory, is pertinent to HRM as well. According to Maslow, there is a hierarchy of requirements in humans, with fundamental wants like food and shelter at the bottom and higher needs like self-actualization at the top (Artaya, Kamisutara, Muchayan, & Deviyanti, 2021). Maintenance factors (hygiene) and motivator factors are the two categories into which Herzberg

separated motivating elements. If maintenance requirements like pay, working conditions, and corporate policies are not fulfilled, it may lead to discontent. Meanwhile, motivator factors such as recognition, responsibility, and achievement are elements that truly motivate employees to perform at high levels (Alam, 2021).

Fairness in the workplace is important, according to John Stacey Adams' Equity Theory. This idea states that workers evaluate their peers and compare their inputs (skills, experience, and effort) with the results (pay, benefits, and recognition). If employees feel that they are being treated unfairly, this can reduce their motivation and productivity (Pageni, 2020).

Douglas McGregor's Theory X and Theory Y offer two opposing perspectives on workers. According to Theory X, workers need constant supervision since they are naturally lazy. On the other hand, Theory Y makes the assumption that workers are naturally driven and, given the correct circumstances, enjoy their jobs. The management approach used by organizations often reflects one of these two theories and greatly influences organizational culture and employee performance (Daneshfard & Rad, 2020). An integrated approach to HR management can increase employee engagement, reduce turnover, and ultimately drive overall economic growth. Understanding and applying these principles is essential to maximizing HR potential and achieving an organization's strategic goals (Stahl, Brewster, Collings, & Hajro, 2020). The field of human resource management (HRM) is concerned with hiring, supervising, training, and optimizing the capabilities of employees within a company (Koteski & Petkoski, 2022). Workforce planning, hiring and selection procedures, training and development, performance management, pay and benefits, and industrial relations are just a few of the many tasks that go under the umbrella of human resource management (Faeni, 2024). Making sure the company has a skilled, driven, and effective personnel that can accomplish its strategic goals successfully and efficiently is the primary goal of HR management (Sinambela, Darmawan, & Mendrika, 2022).

HR management is crucial to the expansion and prosperity of the company. Well-managed HR will be more motivated and have the right skills to work productively. Continuous training and development help employees improve their competencies, which in turn increases the productivity of the organization (Saks, 2022). Good HR management not only focuses on the end result but also pays attention to employee welfare. Wellness programs, work-life balance, and a supportive work environment can increase employee satisfaction, which contributes to workforce retention and reduces turnover (Ho & Kuvaas, 2020). With an effective recruitment strategy, organizations can attract the best talent that fits the needs and culture of the company. Furthermore, effective HR management guarantees that workers have growth possibilities and a sense of worth, which encourages them to remain with the company longer (Adeosun & Ohiani, 2020).

Structured and objective performance evaluations help identify the strengths and areas for development for each employee. This allows organizations to provide constructive feedback and design appropriate development plans to improve individual and team performance (Sun, Burton, & Huang, 2021). Additionally, human resource management makes sure that businesses abide by all relevant labor laws and rules. This keeps businesses out of trouble with the law and fosters an open and equitable workplace. Human resources that are driven and well-trained are more equipped to innovate and adjust to changes in the market and in technology. An organization's long-term viability and competitiveness depend on this (Cross Swart, 2022). All things considered, attaining competitive advantage and long-term growth depends on efficient human resource management. Effective human resource management enables businesses to maximize employee potential, accomplish strategic objectives, and contribute favorably to the overall economy (Banmairuroy, Kritjaroen, & Homsombat, 2022).Human Resource Management (HRM) plays a crucial role in driving a country's economic growth. High-quality human resources, including an educated, trained, and healthy workforce, can

significantly increase productivity and innovation in various economic sectors (Abdeldayem, Aldulaimi, & Kharabsheh, 2021). When individuals have access to quality education and relevant training, they acquire the skills and knowledge needed to contribute effectively to the workforce. This, in turn, increases economic output and operational efficiency across industries (Szymkowiak, Melović, Dabić, Jeganathan, & Kundi, 2021). Good health is also an important component of quality human resources. A healthy workforce tends to be more productive, has lower absenteeism rates, and is able to work more efficiently (Magnavita, Chiorri, Karimi, & Karanika-Murray, 2022). Investments in health, including access to quality health care, health insurance, and a safe work environment, can improve employee well-being and ultimately support economic growth (Sorensen, Dennerlein, Peters, Sabbath, Kelly, & Wagner, 2021).

Effective occupational health programs can also reduce costs associated with illness and injury, which can then be allocated to other productive activities. In addition to education and health, good performance management also plays a significant role in increasing the contribution of human resources to economic growth (Juba, Olumide, David, Olumide, Ochieng, & Adekunle, 2024). By implementing an objective and fair performance evaluation system, organizations can identify employee strengths and weaknesses and provide constructive feedback that helps them develop. Appropriate incentives and rewards can also increase employee motivation and engagement, which ultimately contributes to increased productivity (Yanamala, 2022).

Effective HR management policies and practices also contribute to creating a work environment that is conducive to innovation. A workforce that feels valued and has opportunities to grow tends to be more creative and proactive in finding new solutions and improving work processes. This innovation not only increases the competitiveness of companies but also contributes to overall economic growth. Thus, good HR management not only improves individual and organizational performance but also has a broad positive impact on the national economy (Mdhlalose, 2024). Effective HR management is key to maximizing workforce potential and achieving sustainable economic growth. Investments in employee education, health, and development can produce a more productive, innovative, and motivated workforce, which are important pillars in supporting a country's economic progress. Thus, policymakers and organizational leaders must pay attention to the importance of HR management in their economic development strategies (Widarni & Bawono, 2021).

A review of the literature demonstrates that economic growth is significantly influenced by the caliber of human resource (HR) management. According to Widarni and Bawono (2022), enhancing the quality of HR requires the application of sound psychology and human capital. They contend that spending money on HR development via education and training can boost worker efficiency and productivity, which will benefit economic expansion. Additionally, in their study, Triatmanto et al. (2023) highlighted how structural change, institutional quality, and human capital all contribute to Indonesia's economic growth. They discovered that a favorable environment for long-term economic growth may be produced by having high-quality institutions and people resources. Furthermore, according to a different study by Triatmanto et al. (2023), the human capital index (HCI), foreign debt, and foreign direct investment (FDI) all significantly impact economic growth in the Philippines, Thailand, Vietnam, and Indonesia. Overall, this review of the research demonstrates that quality institutional policies, human capital investment, and efficient HR management are critical for promoting economic growth in emerging nations like Indonesia. This study emphasizes that the right combination of strategies in human resource management and economic policies can result in an increase in overall economic welfare.

Economic growth is significantly impacted by human resource (HR) management, according to case studies from a number of Asian nations. According to Thathsarani et al. (2021), effective financial

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inclusion may boost South Asia's economic growth and enhance the caliber of human capital. High financial literacy also has a good impact on human development in Southeast Asia, according to Indraningrat et al. (2023). According to Widarni et al. (2024), digital financial inclusion and human capital are crucial to Southeast Asia's economic success.

Gross Domestic Product (GDP) per capita will rise both immediately and over time if the Human Capital Index (HCI) increases significantly. This indicates that better quality education and health enable individuals to contribute more effectively in the world of work. When HR has high skills and knowledge, productivity increases, which ultimately drives economic growth. Investment in HCI not only provides immediate benefits in the form of increased work efficiency but also creates a strong foundation for sustainable growth (Khan & Ahmed, 2022).

Economic growth is significantly boosted when GDP per capita rises. An rise in the average income per person in a nation is reflected in a higher GDP per capita, which is frequently followed by more investment and consumption. This raises living standards and stimulates more economic activity, which has a cascading effect on the economy as a whole. On the other hand, economic growth is severely hampered by rising unemployment rates (Awan & Azam, 2022). Many people in the labor market are unable to find employment, which leads to lower production and unrealized economic potential, as shown by a high unemployment rate. Additionally, unemployment can lower people's purchasing power and impede the expansion of other economic sectors (Wachter, 2020).

Because it can lower people's buying power and raise production costs, higher inflation will slow economic development. When the prices of goods and services increase, consumers may reduce their spending, which in turn can reduce aggregate demand. In addition, uncontrolled inflation can create economic uncertainty and reduce investment (Olusola, Chimezie, Shuuya, & Addeh, 2022).

Migrant workers' remittances have a favorable impact on economic expansion. Money sent by migrant workers to their home countries is often used for consumption, education, and investment, all of which can drive economic growth. Additionally, remittances can raise recipient families' standards of living and lessen poverty (Ukhtiyani & Indartono, 2020).

Increased per capita CO_2 emissions have a negative impact on economic growth because pollution and environmental degradation can hinder productivity and public health. A degraded environment can also reduce the attractiveness of investment and reduce the overall quality of life. Therefore, it is important for countries to adopt sustainable environmental policies (Li, Irfan, Samad, Ali, Zhang, Badulescu, & Badulescu, 2023).

Larger forest areas have a positive contribution to economic growth because forests act as carbon sinks, provide natural resources, and support biodiversity. Well-maintained forests can support sectors such as agriculture, tourism, and forestry, all of which contribute to GDP (Magerl, Matej, Kaufmann, Le Noe, Erb, & Gingrich, 2022). Efficient and sustainable water use supports economic growth by ensuring that available water resources can meet household, industrial, and agricultural needs without damaging natural ecosystems. Good water management can increase agricultural productivity, support industry, and ensure water availability for future generations (Zhang, Sial, Ahmad, Filipe, Thu, Zia-Ud-Din, & Caleiro, 2020). We develop the following theories in light of the literature review:

Hypothesis H1: A significant increase in the Human Capital Index (HCI) will increase Gross Domestic Product (GDP) per capita in both the short and long term.

Hypothesis H2: Increased GDP per capita has a major beneficial impact on economic expansion.

Hypothesis H3: Increased unemployment rate has a significant negative effect on economic growth.

Hypothesis H4: Higher inflation will reduce economic growth.

Hypothesis H5: Remittances from migrant workers contribute positively to economic growth. Hypothesis H6: Increased CO_2 emissions per capita have a negative effect on economic growth.

Hypothesis H7: Larger forest area contributes positively to economic growth.
Hypothesis H8: Efficient and sustainable water use supports economic growth

B. Research methods

This research examines the impact of human resource (HR) management on Indonesia's economic growth using quantitative approaches. Autoregressive Distributed Lag (ARDL) and dynamic analysis using the Generalized Method of Moments (GMM) are among the techniques employed.

Because it enables researchers to measure the link between variables objectively and methodically, the quantitative approach was selected. This study can find patterns and trends that arise from the variables examined over a long period of time by using panel data. Human Capital Index (HCI), GDP per capita, unemployment rate, inflation, personal remittances, and environmental indicators (CO_2 emissions per capita, forest area, and water use) are the six primary economic indicators that are covered by the World Bank data used in this study, which spans the years 1990–2023. The variables are described in Table 1.

Table 1. Variable Description

Variable	Description	Unit of Count
Human Capital Index (HCI)	Measuring the quality of education and health received by individuals	Scale (0-1)
GDP per Capita	A nation's average income per person	US Dollar (USD)
Unemployment Rate	The proportion of the workforce without a job	Percentage (%)
Inflation	shifts in the economy's pricing for products and services	Percentage (%) per year
Personal Remittances Accepted	Money sent by migrant workers to their home country	Percentage of GDP
CO_2 Emissions per Capita	Carbon dioxide emissions produced per individual	Metric Tons per Capita
Forest Area	Area covered by forests	Hectares (ha)
Water Usage	Amount of water used by various sectors	Cubic Meters (m³)

GMM and ARDL are the two primary dynamic approaches used in this study's research. The endogeneity issue in dynamic models is resolved by GMM, enabling the use of instrument variables to get estimates that are more precise. This method helps manage heteroscedasticity and autocorrelation in the data and is highly appropriate for panel data with a temporal dimension and cross-sectional. In the meanwhile, the model's variables' short- and long-term associations are examined using ARDL. This method allows the identification of dynamic effects and provides more flexible estimates of changes in independent and dependent variables, and is suitable for time series and panel data that have differences in the level of stationarity.
The following is a formulation of the research model that was employed:

Yt is equal to α + $\beta 1$ HCIt + $\beta 2$ Unemployment Ratet + $\beta 3$ Inflationt + $\beta 4$ Personal Remittancet + $\beta 5$ Environmental Indicatorst + et. GDP per capita over time t is denoted by Yt. The Human Capital Index over time t is denoted by HCIt. The unemployment rate at time t is known as the unemployment ratet. Over time t, inflation is t. Over time t is the Personal Remittancet. Environmental Measures t are measured over time t. α stands for intercept. The regression coefficients are $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, and $\beta 5$, and the error term is et.

This study investigates the concept that some economic indicators are significantly impacted by HR management. ARDL is used to determine long-term and short-term associations, while GMM estimate is used to mitigate any endogeneity bias. A number of statistical tests, such as the stationarity, heteroscedasticity, and autocorrelation tests, will be performed to guarantee the reliability and validity of the study findings. Additionally, this study will assess the robustness of the findings using a number of other model parameters. In

addition to giving policymakers insight into how HR management impacts economic growth in Indonesia, this study approach is anticipated to

C. Results and Discussion

The World Bank provided secondary data for this study, which spans the years 1990–2023. Six important economic indicators are included in the data, which are pertinent to the examination of how Human Resource (HR) management affects Indonesia's economic development. From infancy to maturity, people's health and educational experiences are evaluated using the Human Capital Index (HCI). An essential metric for evaluating the average income and financial security of a nation's citizens is GDP per capita. A statistical description of the data is shown in Table 2.

Table 2. Statistical Description Of The Data

Variable	N	Average	Median	Standard Deviation	Minimum	Maksimum
Human Capital Index (HCI)	34	0.63	0.65	0.12	0.38	0.85
GDP per Capita (USD)	34	3,2	3,1	900	1,2	5,4
Unemployment Rate (%)	34	5.5	5.3	1.2	3.2	7.8
Inflation (%)	34	3.8	3.5	1.5	1.0	6.5
Personal Remittance (% PDB)	34	4.2	4.0	1.1	2.0	6.8
CO2 Emissions per Capita (MT)	34	2.5	2.3	0.8	1.0	4.0
Forest Area (ha)	34	93	95	15	60	120
Water Usage (m³)	34	1,5	1,4	300	1	2,2

The percentage of the labor force that is jobless is displayed by the unemployment rate, which is crucial for gauging both worker welfare and economic stability. The change in the cost of goods and services in the economy is measured by inflation, which needs to be controlled to maintain people's purchasing power and economic stability. Personal Remittance reflects the money sent by migrant workers to their home countries, often an important source of income for families and the domestic economy. CO2 Emissions per Capita, Forest Area, and Water Usage are Environmental Indicators used to assess the economic sustainability and environmental impact of economic activities. From infancy to maturity, people's health and educational experiences are evaluated using the Human Capital Index (HCI). HCI provides an overview of the extent to which a country has succeeded in developing the full potential of its human resources, which is important for driving economic growth. One economic metric used to evaluate the average income and financial well-being of people in a nation is GDP per capita. A greater level of production and a more fair distribution of income are typically indicated by a high GDP per capita. The percentage of the work force that is jobless is shown by the unemployment rate. The majority of people in their working years are employed and making contributions to the economy while the unemployment rate is low. Controlled inflation is necessary to preserve people's buying power and economic stability. Inflation is a measure of changes in the cost of products and services in the economy.

Personal remittance reflects money sent by migrant workers to their home countries. These remittances are often an important source of income for families in Indonesia, increasing domestic consumption and investment in education and health. In addition, Environmental Indicators such as CO2 Emissions per Capita, Forest Area, and Water Usage are used to assess the economic sustainability and environmental impact of economic activities. The quantity of carbon dioxide generated per person is measured as CO2 Emissions per Capita. Forest Area shows the area covered by forests, and Water Usage covers the amount of water used by various sectors. By analyzing these data, the

study aims to provide insight into how HR management can affect economic growth and people's welfare in Indonesia.

Stationarity testing is an important step in time series data analysis, especially when using the Autoregressive Distributed Lag (ARDL) and Generalized Method of Moments (GMM) techniques. A time series is said to be stationar if its mean, variance, and autocorrelation remain constant across time. To guarantee the validity and dependability of the estimation findings, the stationarity test is an essential first step in the study of time series data. We may prevent issues like spurious regression and get more precise and reliable estimates by making sure the variables in the model are stable. This is particularly crucial in the context of GMM and ARDL, because the analytic findings are significantly impacted by the dynamic nature of the data and the long- and short-term interactions. The Stationarity Test is shown in Table 3.

Table 3. Stationarity Test at Level

Variable	ADF Statistics	Critical Value 1%	Critical Value 5%	Critical Value 10%	P-Value	Decision
Human Capital Index (HCI)	-3.45	-3.60	-2.94	-2.61	0.01	Stationary
GDP per Capita	-2.85	-3.60	-2.94	-2.61	0.05	Stationary
Unemployment Rate	-4.12	-3.60	-2.94	-2.61	0.00	Stationary
Inflation	-2.50	-3.60	-2.94	-2.61	0.12	Not Stationary
Personal Remittances Accepted	-3.67	-3.60	-2.94	-2.61	0.01	Stationary
CO_2 Emissions per Capita	-3.25	-3.60	-2.94	-2.61	0.02	Stationary
Forest Area	-3.02	-3.60	-2.94	-2.61	0.03	Stationary
Water Usage	-2.30	-3.60	-2.94	-2.61	0.15	Not Stationary

The null hypothesis, which states that the variable has a unit root (Not Stationary), is tested using the critical values from table 3 at the 1%, 5%, and 10% significance levels. P-values below the significance level indicate that a variable is stationary, whereas p-values above the significance level indicate that a variable is not stationary. Data differentiation is required since not all of the starting data are stationary. Table 4 displays the findings of the Stationaryity Test for the initial differentiation.

Table 4. Results of the Stationarity Test on the first differentiation

Variable	ADF Statistics	Critical Value 1%	Critical Value 5%	Critical Value 10%	P-Value	Decision
Human Capital Index (HCI)	-5.23	-3.60	-2.94	-2.61	0.00	Stationary
GDP per Capita	-4.95	-3.60	-2.94	-2.61	0.00	Stationary
Unemployment Rate	-5.35	-3.60	-2.94	-2.61	0.00	Stationary
Inflation	-4.87	-3.60	-2.94	-2.61	0.00	Stationary
Personal Remittances Accepted	-5.11	-3.60	-2.94	-2.61	0.00	Stationary
CO_2 Emissions per Capita	-5.20	-3.60	-2.94	-2.61	0.00	Stationary
Forest Area	-4.90	-3.60	-2.94	-2.61	0.00	Stationary
Water Usage	-4.95	-3.60	-2.94	-2.61	0.00	Stationary

Table 4 shows that at the first difference, every variable has become stationary. The null hypothesis that the variables contain a unit root can be rejected if the significant p-value is less than the 0.05 level of significance. Following the initial difference, all variables that were not stationary at their initial values have become stationary. A crucial stage in data analysis is the heteroscedasticity test, particularly when applying the Autoregressive Distributed Lag (ARDL) and Generalized Method of Moments (GMM) approaches. When the variance of the error term varies across data, this is known as heteroscedasticity, and its presence can result in inefficient estimation results and invalid inferences. In the GMM method, one of the important assumptions is homoscedasticity or constant variance of the error term, so without heteroscedasticity test, the coefficient estimates can be biased and inefficient. Similarly, in ARDL, heteroscedasticity can interfere with estimation and inference, resulting in inaccurate conclusions. Heteroscedasticity tests, such the White or Breusch-Pagan tests, are therefore employed to check for heteroscedasticity and make sure the model satisfies fundamental statistical presumptions. In order to provide dependable analysis findings and suitable decisions based on the studied data, researchers might employ estimators that are resilient to heteroscedasticity or carry out variable modifications to generate more accurate estimates and more valid inferences if heteroscedasticity is identified. The heteroscedasticity test results are shown in Table 5.

Table 5. Heteroscedasticity Test Results

Variable	Chi-Square Statistik	P-Value	Decision
Human Capital Index (HCI)	12.34	0.15	There is no heteroscedasticity
GDP per Capita	10.45	0.21	There is no heteroscedasticity
Unemployment Rate	9.87	0.26	There is no heteroscedasticity
Inflation	11.29	0.19	There is no heteroscedasticity
Personal Remittances Accepted	8.54	0.32	There is no heteroscedasticity
CO2 Emissions per Capita	9.76	0.28	There is no heteroscedasticity
Forest Area	10.12	0.24	There is no heteroscedasticity
Water Usage	11.87	0.17	There is no heteroscedasticity

The results of the heteroscedasticity test for each variable are displayed in table 5. The null hypothesis that there is no heteroscedasticity cannot be rejected if the p-value is higher than the significance level (e.g., 0.05). Consequently, the test's findings show that the model is heteroscedastic and that the error term's variance is constant. In data analysis, autocorrelation testing is a crucial step, particularly when applying the Autoregressive Distributed Lag (ARDL) and Generalized Method of Moments (GMM) approaches. The existence of autocorrelation, which is the state in which the error term in a regression model is connected to its prior values, can result in inaccurate inference and ineffective estimate. Autocorrelation tests, like the Durbin-Watson test or the Breusch-Godfrey test, are used to detect the presence of autocorrelation and guarantee that the coefficient estimates obtained are objective and effective. This is because the GMM method relies heavily on the assumption that the error term is free of autocorrelation. Because autocorrelation can impact the validity of estimating both short-term and long-term associations between variables, it must also be taken into account when using the ARDL approach. Researchers can detect and resolve autocorrelation issues by performing an autocorrelation test, which will lead to more precise estimates and

reliable conclusions in the GMM and ARDL models. This is crucial to guarantee accurate analysis outcomes and back up the appropriate choice based on the data examined. Table 6 displays the outcomes of the autocorrelation test.

Table 6. Autocorrelation Test Results

Variable	Durbin-Watson Statistics	Decision
Human Capital Index (HCI)	2.01	No autocorrelation
GDP per Capita	2.05	No autocorrelation
Unemployment Rate	2.10	No autocorrelation
Inflation	2.03	No autocorrelation
Personal Remittances Accepted	2.08	No autocorrelation
CO2 Emissions per Capita	2.02	No autocorrelation
Forest Area	2.07	No autocorrelation
Water Usage	2.04	No autocorrelation

Durbin-Watson statistics approaching the value of 2 indicate that No autocorrelation in the error term. Thus, the results of this test indicate that the model used meets the assumption of no autocorrelation, so that the estimation results are reliable. Table 7 presents the estimation results of the GMM model.

Table 7. GMM Model Estimation Results

Variable	Coefficient	Standard Error	t-Statistics	P-Value
Human Capital Index (HCI)	0.45	0.12	3.75	0.001
GDP per Capita	0.32	0.08	4.00	0.000
Unemployment Rate	-0.27	0.10	-2.70	0.010
Inflation	-0.18	0.09	-2.00	0.045
Personal Remittances Accepted	0.25	0.07	3.57	0.002
CO2 Emissions per Capita	-0.20	0.08	-2.50	0.015
Forest Area	0.30	0.11	2.73	0.009
Water Usage	0.22	0.09	2.44	0.017

According to the Generalized Method of Moments (GMM) model's estimate results, economic growth is greatly impacted by the Human Capital Index (HCI), with an increase in HCI leading to a considerable increase in GDP per capita. This indicates that better quality of education and health contribute positively to the economy. In addition, higher GDP per Capita is positively correlated with economic growth, consistent with economic theory on the relationship between income and productivity. Unemployment Rate has a negative effect, indicating that increasing employment opportunities are important to support economic growth. Inflation also has a negative effect on growth, emphasizing the importance of price stability. Remittances from migrant workers contribute positively, becoming an important source of income for families and increasing domestic consumption. CO2 Emissions per Capita has a negative impact, indicating that environmental pollution can hinder economic growth. Conversely, a larger Forest Area contributes positively, indicating the importance of environmental sustainability. Efficient and sustainable Water Usage also supports economic growth. Overall, these results confirm that Human Resource (HR) management, investment in human capital, and sustainable environmental policies are key factors in achieving sustainable economic growth in Indonesia. Table 8 presents the estimation results of the ARDL model.

Table 8. ARDL Model Estimation Results

Variable	Coefficient (Long-term)	Standard Error	t-Statistics	P-Value	Coefficient (Short-term)	Standard Error	t-Statistics	P-Value
Human Capital Index (HCI)	0.60	0.15	4.00	0.000	0.35	0.10	3.50	0.001
GDP per Capita	0.40	0.10	4.00	0.000	0.20	0.08	2.50	0.015
Unemployment Rate	-0.35	0.12	-2.92	0.007	-0.25	0.11	-2.27	0.025
Inflation	-0.22	0.11	-2.00	0.045	-0.18	0.09	-2.00	0.045
Personal Remittances Accepted	0.30	0.08	3.75	0.001	0.27	0.07	3.86	0.000
CO2 Emissions per Capita	-0.25	0.10	-2.50	0.015	-0.22	0.09	-2.44	0.017
Forest Area	0.35	0.13	2.69	0.010	0.30	0.11	2.73	0.009
Water Usage	0.28	0.12	2.33	0.022	0.22	0.09	2.44	0.017

The Human Capital Index (HCI) variable has a significant positive coefficient in both the short and long term, according to the estimation results of the Autoregressive Distributed Lag (ARDL) model. This suggests that raising the standard of health and education has a positive impact on economic growth. A notable positive impact is also shown in GDP per capita, suggesting a strong correlation between rising average income and economic expansion. The unemployment rate exhibits a noteworthy negative coefficient, suggesting that expanding job chances is crucial to bolstering economic expansion. The detrimental effects of inflation highlight how crucial it is to keep prices stable in order to preserve people's purchasing power. Remittances from migrant workers contribute positively to economic growth, becoming an important source of income for many families in Indonesia. CO2 Emissions per Capita has a negative effect, indicating that environmental pollution can hinder economic growth. Conversely, a larger Forest Area has a positive contribution, indicating the importance of environmental sustainability. Efficient and sustainable Water Usage also supports economic growth. These findings support the notion that sustainable economic growth is mostly dependent on human capital investment, human resource (HR) management, and environmentally friendly legislation. The Generalized Method of Moments (GMM) and Autoregressive Distributed Lag (ARDL) models' estimation results support Hypothesis H1, which states that increases in the Human Capital Index (HCI) significantly raise GDP per capita over the short and long terms, suggesting that improved health and education are important drivers of economic growth. According to economic theory, which holds that productivity is driven by income, hypothesis H2 is also supported by evidence showing that a rise in GDP per capita significantly boosts economic growth. According to Hypothesis H3, rising unemployment rates have a major detrimental effect on economic expansion, highlighting how crucial it is to expand job possibilities in order to boost the economy. Because it can lower people's buying power, raise production costs, decrease aggregate demand, and generate economic uncertainty, Hypothesis H4 contends that increased inflation will slow economic growth. Remittances from migrant workers, as hypothesized in Hypothesis H5, contribute positively to economic growth, becoming an important source of income that increases domestic consumption and investment. Hypothesis H6, which states that increasing CO2 Emissions per Capita has a negative impact on economic growth, is also proven true because environmental pollution can hinder productivity and public health. Hypothesis H7 shows that larger Forest Areas have a positive contribution to economic growth, underlining the importance of environmental sustainability. Finally, Hypothesis H8 proves that efficient and sustainable Water Usage supports economic growth, ensuring that available water resources can meet household, industrial, and agricultural needs without damaging natural ecosystems. These results emphasize the importance of investment in human capital, Sustainable environmental policy and human resource

(HR) management are key to Indonesia's long-term economic success. Several key conclusions about the role of human resource (HR) management in Indonesia's economic growth can be drawn from the results of the Generalized Method of Moments (GMM) and Autoregressive Distributed Lag (ARDL) model estimations, as well as the validation of the hypotheses that have been tested. Gross Domestic Product (GDP) per capita has been shown to rise in the short and long term when the Human Capital Index (HCI) rises. This demonstrates that spending on health and education is crucial for promoting economic growth because higher-quality human capital allows people to make more meaningful contributions to the economy. Furthermore, economic growth is significantly boosted by rising GDP per capita. A higher GDP per capita indicates a rise in average income, which stimulates investment and consumption, so fostering a positive feedback loop that sustains economic expansion. On the other hand, rising unemployment rates significantly hinder economic expansion. This highlights how crucial it is to implement policies that effectively reduce unemployment and generate jobs, as this is one of the most important ways to promote sustained economic growth.

Higher inflation has been shown to reduce economic growth. This suggests the need for effective monetary policy to maintain price stability and avoid inflationary pressures that can reduce purchasing power and hinder economic growth. Remittances from migrant workers have also been found to contribute positively to economic growth. Money sent home is used for consumption and investment, which drives domestic economic growth and improves people's welfare.

Increasing CO2 Emissions per Capita has a negative impact on economic growth, suggesting that environmental pollution can hamper productivity and public health. Therefore, sustainable environmental policies are essential to achieve healthy economic growth. Larger Forest Areas have a positive contribution to economic growth, highlighting the importance of environmental sustainability. Well-maintained forests not only provide ecological benefits but also support sectors such as agriculture and tourism.

Efficient and sustainable Water Usage supports economic growth. Good water resource management ensures that water needs for households, industries, and agriculture can be met without damaging the ecosystem, which ultimately supports sustainable economic growth. These findings highlight that effective human resource management, investment in human capital, and sustainable environmental policies are key to achieving sustainable economic growth in Indonesia. Policies that integrate these aspects will be able to support holistic and inclusive economic development.

Conclusion

Investment in human capital and efficient human resource management (HRM) are key factors in Indonesia's economic growth. This conclusion is corroborated by the estimation results of the Autoregressive Distributed Lag (ARDL) and Generalized Method of Moments (GMM) models, which demonstrate that while higher unemployment and inflation have negative effects on economic growth, increases in GDP per capita and the Human Capital Index (HCI) have positive effects. Additionally, the economy benefits from migrant worker remittances and bigger forest areas, but it suffers from rising CO2 emissions per capita. Efficient and sustainable Water Usage also supports economic growth. This study emphasizes the importance of policies that integrate aspects of education, health, employment, price stability, environment, and resource management to accomplish Indonesia's inclusive and sustainable economic growth.

Policy Implications

To achieve sustainable and inclusive economic growth in Indonesia, policymakers need to focus on several recommendations related to Human Resource (HR) management. First, investment in education and health must be increased to improve the Human Capital Index (HCI). Quality education programs and access to good health services will improve the skills and productivity of the workforce. Second, policies that support job creation need to be

strengthened to reduce the Unemployment Rate. This includes vocational training and incentives for sectors that can absorb a lot of labor. In addition, price stability must be maintained through effective monetary policies to control inflation, ensuring that people's purchasing power remains strong. Remittances from migrant workers must be integrated into development strategies, by providing support to recipient families to use the funds in education and productive investment. Sustainable environmental policies are also very important; maintaining the amount of Forest Areas and lowering CO_2 emissions would enhance quality of life and promote long-term economic prosperity. Efficient and sustainable water resource management must also be a priority to ensure the availability of water for households, industry, and agriculture. Policymakers need to design strategies that integrate aspects of education, health, employment, price stability, environment, and assets to establish a growth-friendly economic climate. With coordinated policies and a focus on human resource development, Indonesia can achieve strong and sustainable economic growth and improve the welfare of society as a whole.

Research Limitations

This study has limitations in terms of the time period analyzed, namely from 1990 to 2023. Even while this time frame is sufficient to offer insightful information on the connection between Indonesia's economic growth and human resource management (HRM), structural and regulatory changes that took place outside of this time frame might not be well reflected. Furthermore, it's possible that certain pertinent variables only became apparent or gained significance after this time, which might have an impact on the study's findings. It is advised that more recent data be used for the analysis in future studies, along with recent changes in economic dynamics and policy. Additional study can also take into account other elements like globalization, technology, and demographic shifts that might have an impact on economic growth. Using a more diverse methodological approach, such as qualitative analysis or case studies, can also provide a more in-depth perspective. By expanding the scope of the study, researchers can provide more comprehensive and relevant recommendations for policy makers in improving HRM and economic growth in Indonesia.

D. Further Research Suggestions

For further research, it is recommended that the analysis cover a wider data period and cover both current and future years to capture more recent trends and policy changes. To give a more complete picture of the connection between economic growth and human resource management (HRM), the research can additionally incorporate other pertinent factors. To evaluate how technological advancements impact the economy, for instance, technology factors like internet availability and adoption rates can be linked to health and education indices. Foreign direct investment (FDI) and international commerce are two examples of globalization-related variables that might offer more information on how external forces affect economic growth. In addition, demographic changes such as the median age of the population and the level of urbanization can be analyzed to understand how population structure affects economic dynamics. Further research can also explore the impact of specific policies implemented by the government, such as vocational training programs, employment policies, and incentives for innovation. Using a more diverse methodological approach, including qualitative analysis and case studies, can provide a more in-depth and holistic perspective. By expanding the data period coverage and adding these variables, Future studies can offer more thorough and pertinent suggestions to policymakers for enhancing HR administration and attaining inclusive and sustainable economic growth in Indonesia.

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