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EFFICIENCY ANALYSIS OF REGIONAL GOVERNMENT EXPENDITURE ON DEVELOPMENT: EVIDENCE FROM INDONESIA

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Original article

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ABSTRACT

Regional governments are expected to be able to focus more on improving the welfare of the community in optimizing government administration in each region. This study aims to identify the factors that influence regional development as indicated by the human development index in that region. This study analyzes the efficiency level, productivity level, trade openness, degree of fiscal autonomy (DFA), and democracy on regional development in Indonesia during the period 2016-2020. The effectiveness and efficiency of government budget functions were evaluated using Data Envelopment Analysis. The research model was evaluated using panel data regression with E-views. Trade openness and Indonesian Democracy Index have a positive and insignificant effect on Regional Development. The Degree of Fiscal Autonomy has a negative and insignificant effect on Regional Development. Thus, the government needs to focus on the efficiency of budget use and democracy in its region in order to optimize regional development. This research also indicates that the level of the Degree of Fiscal Autonomy in a region must be managed properly. DFA that is too high can reduce the achievement of regional development in general. Thus, governments have to pay attention to elevate the degree of fiscal autonomy given to each region to spur economic growth.

Keywords: *Financial Efficiency, Fiscal Autonomy, Indonesian Democracy, Productivity, Regional Development, Trade Openness*

1. INTRODUCTION

Governance has been a venture to accomplish the original objectives of a country (Mihaiu, Opreana, and Cristescu, 2010). Indonesia organizes the government to achieve the objectives stated in the document of the Constitution of the Republic of Indonesia. The government aimed to protect the entire Indonesian nation and homeland, promote general welfare, educate the nation, and participate in the development of world order based on independence, lasting peace, and social justice. To accomplish these state objectives, the government implemented a budget function.

The Republic of Indonesia's administrative territory is organized into 34 provinces, spread across five major islands (Noorlaelasari et al., 2023). Indonesia's vast territory demands the establishment of an appropriate government policy for fiscal decentralization and regional autonomy. Regional autonomy is thought to promote better regional growth by making decisions based on the originality or accessibility of the resources owned by a region (Fauzi, 2019; Krmpotic, Ileš, and Bicvid, 2020). Empirical evidence from Indonesia demonstrates the impact of fiscal decentralization on economic growth. According Central Bureau of Statistics in Indonesia, Bali – tourism rich province, recorded economic growth rate of 5.71% significantly surpass West Nusa Tenggara's growh of 1.80% despite the similar characteristics of tourism rich province for year 2023. The evidence suggested that effectiveness of decentralization depends on governance capacity, thus studying regional budget efficiency become more important.

Decentralization systems have been implemented in many different regions around the world in response to regional eagerness for better public services. Broadly, centralized governance pays less attention to regional areas, resulting in slower development than in the central region. Promoting public welfare and economic development will be aided by optimizing decentralized policymaking (Arzaghi & Henderson, 2005; Zhang & Zou, 1998).

Local governments have the authority to organize and arrange budget functions to accomplish governance objectives (Wang et al., 2024). The government performs a budget function to allocate income sources and expenditures to various governance duties. Present budgetary control is anticipated to allow for better decisions in the allocation of financial resources to the region's development. In other words, the government will strive to improve the efficiency with which resources are used to undertake every governance function. The budget function allows the government to concentrate more on governance in areas such as education, health, and others where each region aims to develop. Local governments can achieve economies of scale in the provision of public goods because they can identify the needs of the community according to the aspirations of the people in the area. Fiscal decentralization and regional autonomy have both favorable and adverse consequences, based on regional governments' readiness to govern. Improper administration of local regulations hinders regional growth (Nguyen, D. Vo, Ho, and A. Vo, 2019). Additionally, the decentralization framework allows for waste and inefficiency in budgetary procedures due to specific concerns known only to local government officials. The problem arises as financial inclusion in Indonesia is relatively low (Hidayat & Sari, 2022).

The issues of fiscal decentralization are prevalent in local government administrations' budgeting and expenditure. The government must effectively manage its financial resources (Protsenko, 2023). In terms of local government expenditures, efficiency is defined as the point at which it is no longer feasible to redistribute resources to promote public welfare. In other words, the efficiency of local government expenditures is measured by the extent to which each money (rupiah) spent by the local government provides the greatest possible public benefit. Given that local governments have a better understanding of the demands and circumstances of their respective regions, fiscal decentralization should increase the effectiveness of government expenditure. The effectiveness of government spending has a considerable impact on macroeconomic policy objectives (Tashkinova, 2023). Efficiency demonstrates a government's capacity to use its revenue to provide public goods in the most effective manner (Martin & Edalatpanah, 2023). However, fiscal policy achievement indicates that the implementation remains suboptimal for many provinces. Data from ministry of finance Republic of Indonesia, for example, showed that only 87.19% of allocated budgets effectively translate into improved public services in Indonesia for year 2024, while inefficiencies persist in sectors such as infrastructure and social welfare. Regional government, such as North Kalimantan, effectively translate 86.61% of their allocated budget during that year. The efficiency of government spending plays a critical role in shaping macroeconomic policy objectives, as it reflects a government's ability to utilize revenue in the most effective manner to deliver public goods and services.

The objective of this study was to assess the factors that influence regional development as measured by the human development index. This study utilizes a regional autonomy policy framework to assess the accomplishment of research variables in 34 provinces across Indonesia. The evaluation is based on the effectiveness of governance as measured by the budget function, productivity, and other variables, including the degree of democracy in each region, trade openness, and fiscal autonomy of each region. This paper will contribute toward regional development based on decentralization governance such as in Indonesia. This paper provides empirical evidence on how well government expenditure efficiency contribute for regional growth.

This study provides a new insight through its methodological approach and empirical contribution. This study applies efficiency measurement of regional budget function to assess governance performance and extract the efficiency of fiscal autonomy and the impact of human development index within the region. The study also extends discussion on decentralization governance through democracy and trade openness as control variable which underexplored in existing literature. Additionally, the study employs advanced econometric techniques to assess how variations in fiscal autonomy impact HDI, offering new empirical insights into the efficiency of government expenditure at the subnational level

The structure of this paper follows logical progression based on evidence in Indonesia. This introduction section provides background information and our aim to evaluate regional governance in budget efficiency as well as evaluate its impact on regional development. The next section provides literature reviews and develop hypothesis based on relevant state of the arts. The methodology section detailed research design and our analytical approach. The result section presents our findings from efficiency to empiric result. In discussion section we highlight the implication of our present study as well as the limitation. The conclusion and recommendation section summarizes key insight and recommendation to improve decision making based on research evidence especially in decentralization governance.

2. LITERATURE REVIEW

2. 1. REGIONAL DEVELOPMENT

The efficiency of government spending is crucial to stimulate regional development, particularly in decentralized governance such as Indonesia. Fiscal Federalism Theory suggested that decentralization enhances efficiency by allowing subnational governments to allocate resources based on local needs, thereby improving development outcomes (Oates, 2005). Current literature has also supported the federalism theory while discussing today's global crisis and globalization (Agrawal, Brueckner, and Brülhart, 2025). Government can achieve budget efficiency to maximize public service delivery while minimizing waste. Moreover, New Institutional Economics suggest that governance effectiveness and fiscal transparency significantly influence development outcome (Oliver, 2000).

Regional development in Indonesia refers to a series of efforts to realize integration in the use of various resources, glue and balance national development and national territorial unity, improve harmony between regions, and integrate development sectors through the spatial planning process to achieve sustainable development goals. The main objective of regional development is to provide an equitable distribution of various physical and nonphysical socioeconomic aspects of an area. This goal is in line with the objectives of governance, which seek to provide a better quality of public services (Sow & Razafimahefa, 2015). In the concept of regional autonomy, as in Indonesia, regional development is needed to optimize and realize equitable development throughout the regional autonomy area while increasing efficiency in governance.

The local government is an organization with regional autonomy authority that performs its functions and duties to manage the local government system and establish policies aimed at achieving Indonesia's goals. The functions of the government include 1) public services, 2) order and security, 3) economy, 4) environment, 5) housing and public facilities, 6) health, 7) tourism and culture, 8) education, and 9) social protection. The implementation of these nine functions was intended to further optimize the implementation of regional development. In other words, the success of a region's development is highly dependent on the local government in formulating regional management and development policies.

2.1.1. HUMAN DEVELOPMENT INDEX AS AN INDICATOR OF REGIONAL DEVELOPMENT

To evaluate the implementation of regional development, an indicator that can reflect the success of regional development is needed. Many studies have used the human development index as a measure of the success of regional development (Hardianto, Tjahjadi, and Narsa 2017; Pourmohammadi, Valibeigi, and Sadrmousavi, 2014). The human development index is an index that measures three fundamental dimensions, including education, health and welfare. The HDI reflects the level of human development achievement as a result of development activities carried out by a country or region. The higher the HDI value of a country or region, the better its development achievements. HDI achievements in a region were grouped into four categories: 1) low (HDI < 60), 2) medium (60 < HDI < 70), 3) high (70 < HDI < 80), and 4) Very High (HDI > 80).

The human development index is a composite index that provides an overall reflection of its three constituent aspects. This index does not provide an overview of each aspect separately, but rather as a composite of the three main functions of local government administration: education, health, and the economy. Although this index measures only these three aspects, the nine functions of governance also have a direct or indirect influence on the development of the three indices. For example, the implementation of social functions seeks better education, health, and economic access for people who need it. Thus, using a human development index for regional development is appropriate.

2. 1. 2. HUMAN DEVELOPMENT INDEX AND REGIONAL AUTONOMY

The implementation of regional autonomy provides an obligation for local governments to achieve their objectives in each region. The main goal is equitable development. However, in practice, the government management of one administrative region is different from that of other administrative regions. The resources available in each region are different, including financial and human resources. Leaders in each administrative region have the authority to make the best decisions for the development of their region, based on their resources. With differences in available resources, the level of development achieved by each region will be different. In 2020, the HDI level in Indonesia reached 70.9, which is included in the high category. The HDI level for each administrative region ranged from 60 to 80. In 2020, the administrative region with the highest HDI was DKI Jakarta province, with an HDI of 80.77. On the other hand, Papua province has the lowest HDI, with an HDI level of 60.44. Over the past five years, the province with the largest HDI growth rate is DKI Jakarta province which grew by 3.94 points from 64.31 - 68.25. Meanwhile, the province that has the lowest HDI growth rate is North Kalimantan Province with a growth of 1.99 points from 68.64 - 70.63. In other words, the implementation of regional autonomy also plays a role in the growth of the human development index (Badan Pusat Statistik, 2021).

2. 2. HYPOTHESIS BUILDING

2. 2. 1. EFFICIENCY

Efficiency is the ability to use resources in a better and more efficient way to achieve desired results using fewer resources. In this case, efficiency can be measured by comparing the output or results with the amount of resources or inputs used. The more efficient a system or process, the fewer resources are needed to achieve the same results, or the higher the results produced with the same resources. Efficiency can be applied to various aspects of life, such as production, natural resource use, financial management, and technology use, and is very important because it can help increase productivity, reduce production costs, and reduce negative environmental impacts. Efficiency measurement generally refers to the calculation of outputs and inputs from a comparison between the budget and realization. However, in this study, efficiency calculation used the Data Envelopment Analysis (DEA) method. DEA measures efficiency by considering input and output. DEA is a mathematical program optimization method used to measure the technical efficiency of an Economic Activity Unit and compare it with other Economic Activity Units.

Previous research has examined the relationship between Human Development and Regional Financial Responsibility using the DEA approach (Ferraz, Mariano, Rebelatto, and Hartmann, 2020). The results of his study indicate that efficiency can be a strong variable that helps increase the human development index. In addition, a study in the eastern region of Indonesia showed that financial efficiency from each region improved HDI within the region (Gousario & Dharmastuti, 2015), specifically in East Java Province (Mukti & Auwalin, 2020). Similar results were also shown in Iran (Sabermahani, Barouni, Seyedin, and Aryankhesal, 2013) and other developing countries (Tekin, 2020) in which efficiency was positively correlated with HDI. Efficiency analysis is essential (Despotis, 2005).

H_1: Efficiency has a positive and significant effect on the Human Development Index

2. 2. 2. PRODUCTIVITY

Productivity is generally defined as increased efficiency and technical change, with inputs being converted into outputs in the production process. Productivity is a universal concept that aims to provide more goods and services to humans using fewer resources. Productivity is the relationship between output and input in a production process. Productivity is measured by comparing GRDP as the output with the amount of labor as the input. Previous research suggests a positive relationship between productivity and GRDP. To achieve higher productivity, it is necessary to improve human capital (Hendarmin & Kartika, 2019). In accordance with previous evidence, a region with higher productivity attracts firms and investments, thus improving regional development (Xu, Xue and Wu, 2022). Therefore,

H_2: Productivity has a positive and significant effect on Human Development Index

2. 2. 3. FISCAL DECENTRALIZATION

Fiscal decentralization is a manifestation of regional autonomy in the financial sector. It is generally defined as the process of transferring decision-making power to local governments. The measurement of fiscal decentralization can be seen in the degree of fiscal autonomy of a region, which is the local revenue obtained by the local government. According to the Central Bureau of Statistics in Indonesia, fiscal decentralization is the ratio of regional-owned revenue to total regional revenue. Evidence shows that fiscal decentralization supports better economic growth (Arzaghi & Henderson, 2005) in Croatia (Krmpotic et al., 2020) and Vietnam (Nguyen et al., 2019). Fiscal decentralization also granted local governments the action required for the region's prosperity, which invited the conlict of interest (Liu, Gong, and Song, 2022). Fiscal decentralization has been in use in many countries for more than 20 years ago (Zhang & Zou, 1998). Previous evidence has shown that the level of fiscal decentralization could improve human development, such as in Pakistan (Mehmood, Sadiq, and Khalid, 2010), Nigeria (Udoh, Afangideh, and Udeaja, 2015) and some European countries (Pasichnyi, Kaneya, Ruban and

Nepytaliuk, 2019; Wichowska, 2021) in, ultimately leading to economic growth. However, the effect of fiscal decentralization also depends on the extent to which the region has fiscal autonomy in financing its regional needs. Therefore,

H_3: The Degree of Fiscal Autonomy has a positive and significant effect on the HDI.

2. 2. 4. TRADE OPENNESS

Trade openness can be defined as a country's ability to integrate into the global economy through international trade, investment, and technology transfer. The open economic system is based on Smith's idea that, although everyone is encouraged to pursue their own self-interest, free competition ensures that society as a whole will receive benefits so that general welfare will be achieved (Hye, 2012). Free trade results in cooperation between countries to cover each other's shortcomings and meet the needs of a good. According to the Central Bureau of Statistics, trade openness is measured as the ratio of the value of exports and imports to GRDP. Trade openness is believed to be key to regional development.

The relationship between trade openness and the human development index has been studied in many regions, such as developing countries (Hossain, 2022; Qayyum, Younas, and Bashir, 2018; Saragih, Wardati, and Pratama, 2020). The results show that openness has a positive and significant effect on the human development index. Many developing countries still face issues of poverty, lack of sanitation facilities, and low education, so trade openness will help accelerate the growth of the human development index (Bareke et al., 2021).

H_4: Trade Openness has a positive and significant effect on the HDI.

2. 2. 5. DEMOCRACY

Democracy is the right to choose who governs a country. Democracy is closely related to the level of welfare in a country. Democratic systems encourage economic growth. Freedom, which is the main point in democracy, is considered to increase economic growth because production and trade activities can be carried out without state interference and restrictions. The effect of democracy on human development is nonlinear, and varies depending on the level of growth and democracy (Spaiser, Ranganathan, Mann, and Sumpter, 2014). The results confirm that the interaction effect of the democracy-growth nexus has a positive impact on human development, but the effect is sensitive to the democratization process and the level of a country's economic development (Saha & Zhang, 2017). Another study also suggested that a higher level of democracy is related to higher levels of human development (Amate-Fortes, Guarnido-Rueda, and Molina-Morales, 2017). In Indonesia, the regional level of democracy is measured using the Democracy Index. which is an index issued by the Central Statistics Bureau based on aspects that support democratic indicators.

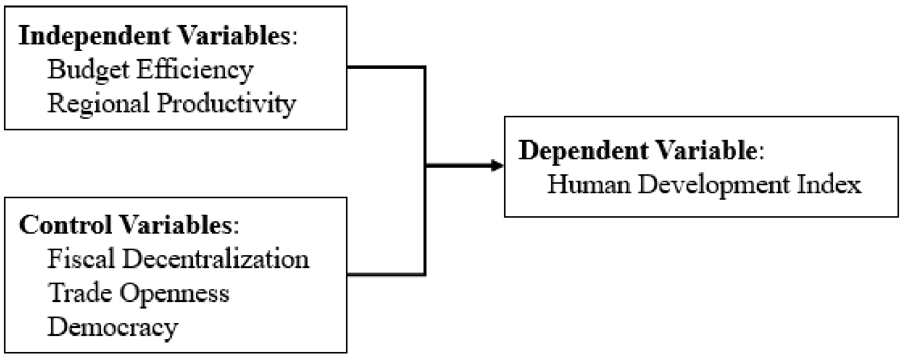
A previous study concluded that democracy rises with the nation's gross domestic product level (Barro, 1999). The impact of democracy on improving the human development index in countries that were once socialist in Eastern Europe has been studied (Liotti, Musella, and D'Isanto, 2018). The results show that democracy has a positive and significant effect on the human development index. This study states that the welfare of the population in a democratic political system causes policymakers to be more responsible for their political choices toward the people, so that when they are not responsible, the people will not re-elect them.

H_5: Democracy level has a positive and significant effect on the Human Development Index.

2. 3. CONCEPTUAL FRAMEWORK

This study uses two independent variables with three control variables to predict their influence toward human development index. The two independent variables include factors such as regional government budget efficiency and regional productivity. We use region's fiscal decentralization level, trade openness and democracy level as control variables. Figure 1 summarized the conceptual framework of this study.

Figure 1. Research Conceptual Framework



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3. METHODS

3. 1. SCOPE OF THE STUDY

This study sought to evaluate the factors that influence regional development in 34 provincial administrative regions in Indonesia. The measurement of regional development was based on the level of HDI achievement in each province. This study also measured the level of efficiency and productivity of government administration in 34 provinces in Indonesia as a predictor of regional development. In addition to these two variables, this study also evaluates the degree of fiscal decentralization, trade openness, and the democracy index as part of the autonomy administration that affects the level of HDI in each region. The period of this research spans five years, from 2016 to 2020. Indonesia has been expanded from 33 provincial administrative to 34 by the addition of North Kalimantan in 2012. There is no complete data to support this study until 2016, thus we start the data collection from historical data of 2016. The first Covid-19 case in Indonesia was detected in March 2020, when budgeting implementation for that year was already underway. The year 2020 was still included in the evaluation before economic anomalies due to the impact of Covid-19 occurred.

3. 2. DATA AND DATA SOURCES

The data used in this study are secondary data obtained from two trusted databases, namely the Central Bureau of Statistics and the Directorate General of Fiscal Balance, which publish data on budgeting for government implementation as a manifestation of government bureaucratic transparency. Data were collected cross-sectionally based on 34 provinces and a period of 5 years of government administration. The data used in this study include: 1) human development index per province for the period 2016-2020; 2) budget for the implementation of government functions per province from the to 2016-2020 period; 3) performance of local government functions for the 2016-2020 period; 4) Gross Domestic Income and Total Labor per province for the 2016-2020 period to measure the level of productivity; 5) Regional Original Revenue and Total

Regional Revenue per province for the 2016-2020 period; 6) Export and Import Value of each province for the 2016-2020 period; and the Indonesian Democracy Index.

3. 3. VARIABLE MEASUREMENT

This study used one dependent variable, namely, the level of the human development index, as a measure of regional development. The HDI is widely recognized as composite index that capture education, health and welfare within a region. HDI can be used as indicator for social and economic development at regional level. In addition, HDI is used in regional governance in Indonesia as main target of public services. The study uses five independent variables: the level of efficiency of budget use, productivity, degree of regional financial autonomy, trade openness, and democracy in a region. The human development index is a composite index related to the level of education, health, and human welfare. Data were obtained from the Central Bureau of Statistics (Badan Pusat Statistik) of Indonesia. The level of efficiency is measured using nine inputs, which are the value of the budget for organizing local government functions, with the representative outputs for each budget function. Productivity was measured by using labor productivity as we calculate the GRDP per labor. The degree of local financial autonomy is measured by the degree of fiscal autonomy, which is the proportion of local own-source revenue to all local revenue. Trade openness is measured by the level of international trade (exports and imports) to the GRDP. Democracy was measured using the Democracy Index for each region which also published by Central Bureau of Statistics of Indonesia. The measurement of the research variables is presented in Table 1.

Table 1. Variable Measurement

Variable	Description	Measurement	Formula	Data Source
Regional Development (HDI)	The index is measured from the geometric mean of the health index, knowledge index, and expenditure index.	Human Development Index	The HDI data of this study was taken from secondary data published by National Statistical Bureau of Indonesia	National Statistical Bureau of Indonesia*
Efficiency (EFF)	Use of provincial government spending to achieve expected performance indicators	DEA (CCR)	Efficiency Measurement based on PyDEA using Government Spending as Input	National Statistical Bureau of Indonesia, Director General of Budget
Productivity (PRO)	Comparison between GRDP Based on Current Prices (output) and input (Labor)	Labor Productivity	Productivity = (GRDP Per Capita)/ Number of Labor	National Statistical Bureau of Indonesia*
Trade Openness (TO)	Nominal percentage of international trade transactions with GDP	Trade Openness	TO = (Export + Import)/ GDP x 100%	National Statistical Bureau of Indonesia*
Degrees of Fiscal Autonomy (DFA)	Proportion of local revenue compared to total regional income	Degrees of Fiscal Autonomy		National Statistical Bureau of Indonesia*
Democracy (DI)	The level of democracy is measured based on aspects of democracy.	Indonesian Democracy Index	The value of the Indonesian Democracy Index is obtained from secondary data that has been published by BPS	National Statistical Bureau of Indonesia*

*National Statistical Bureau of Indonesia can be obtained from bps.go.id

Source: Created by authors

3. 4. RESEARCH MODEL AND ANALYSIS METHOD

This study measure relative budget efficiency of each province to provide government services using Data Envelopment Analysis (DEA). Regional efficiency is measured by linear programming technique which is using series of separately optimization for each province. We employed model to observe for each output with minimum level of inputs. The model optimized efficiency level based on two stages of maximum reduction in inputs then moving towards efficiency frontier. DEA linear programming model for efficiency is measured as follow:

$$\text{Max } E_0 = \frac{\sum_{r=1}^{s} W_r O_{ro}}{\sum_{r=1}^{s} V_r I_{io}} \tag{1}$$

whereas I represent for inputs, O represent for outputs and their respective weight, W and V. Each weight is non-negative and the maximum value of efficiency E_0 is 1 or 100%. The result of efficiency for each province and year then used for econometric calculation with panel regression.

This study uses panel regression to examine the effect of research variables on the human development index in each region during the 2016-2020 period. This study was modeled as follows:

$$HDI_{it} = \beta_0 + \beta_1 EFF_{it} + \beta_2 PRO_{it} + \beta_3 DFA_{it} + \beta_4 TO_{it} + \beta_5 DI_{it} + e_{it} \tag{2}$$

This study uses chow, Haussman, and Lagrange multiplier tests to evaluate the form of influence that occurs in panel data regression. The level of efficiency was obtained using PyDEA by using data envelopment analysis (Raith et al., 2019). We use nine inputs outputs of the government administration functions to evaluate the efficiency level.

4. RESULT

4. 1. EFFICIENCY MEASUREMENT

Efficiency measurement is based on data on the use of nine budget inputs of government administration, with each output on the use of the budget. The budget functions include 1) public services, 2) order and security, 3) economy, 4) environment, 5) housing and public facilities, 6) health, 7) tourism and culture, 8) education, and 9) social protection. The results of the efficiency level evaluation using PyDea are summarized in Table 2.

The range of efficiency in using the budget to achieve governance output ranges from 11% to 100%, with 100% being the most efficient level of governance. On average, over the five-year research period, the most efficient regions for administering government include the provinces of Central Java, Bali, North Sulawesi, Gorontalo, and West Papua.

Table 2. DEA Frontier Efficiency Output

Province	2016	2017	2018	2019	2020
Aceh	11.94	98.87	100.00	100.00	90.65
North Sumatra	95.96	65.73	52.53	100.00	70.67
West Sumatra	23.84	87.09	66.71	85.59	69.13
Riau	19.06	72.76	83.30	91.73	65.17
Riau Archipelago	45.14	100.00	100.00	100.00	89.05
Jambi	36.97	100.00	74.91	85.58	84.07
South Sumatra	33.70	100.00	81.00	100.00	82.12
Bangka Belitung	34.44	100.00	100.00	100.00	100.00
Bengkulu	40.48	100.00	96.75	100.00	100.00
Lampung	22.57	100.00	100.00	100.00	75.92
Banten	41.87	83.51	95.72	100.00	100.00
DKI Jakarta	7.83	88.21	56.66	25.69	27.84
West Java	67.74	100.00	100.00	100.00	100.00
Central Java	100.00	100.00	100.00	100.00	100.00
DI Yogyakarta	50.11	100.00	100.00	100.00	100.00
East Java	67.50	100.00	100.00	100.00	78.81
Bali	100.00	100.00	100.00	100.00	100.00
West Nusa Tenggara	100.00	61.14	70.98	89.01	66.33
East Nusa Tenggara	100.00	100.00	94.84	90.42	69.10
West Kalimantan	21.99	100.00	100.00	100.00	100.00
Central Kalimantan	100.00	100.00	66.75	82.35	99.14
South Kalimantan	18.47	75.99	100.00	100.00	75.84
East Kalimantan	47.63	100.00	100.00	100.00	87.06
North Kalimantan	94.95	100.00	100.00	100.00	100.00
North Sulawesi	100.00	100.00	100.00	100.00	100.00
Central Sulawesi	38.34	100.00	100.00	100.00	100.00
Southeast Sulawesi	43.73	100.00	100.00	100.00	100.00
South Sulawesi	63.40	90.41	96.97	99.88	53.93
West Sulawesi	74.05	100.00	100.00	100.00	100.00
Gorontalo	100.00	100.00	100.00	100.00	100.00
Maluku	39.19	98.37	95.29	100.00	100.00
North Maluku	36.49	100.00	100.00	100.00	100.00
Papua	25.37	59.55	44.40	67.54	100.00
West Papua	100.00	100.00	100.00	100.00	100.00

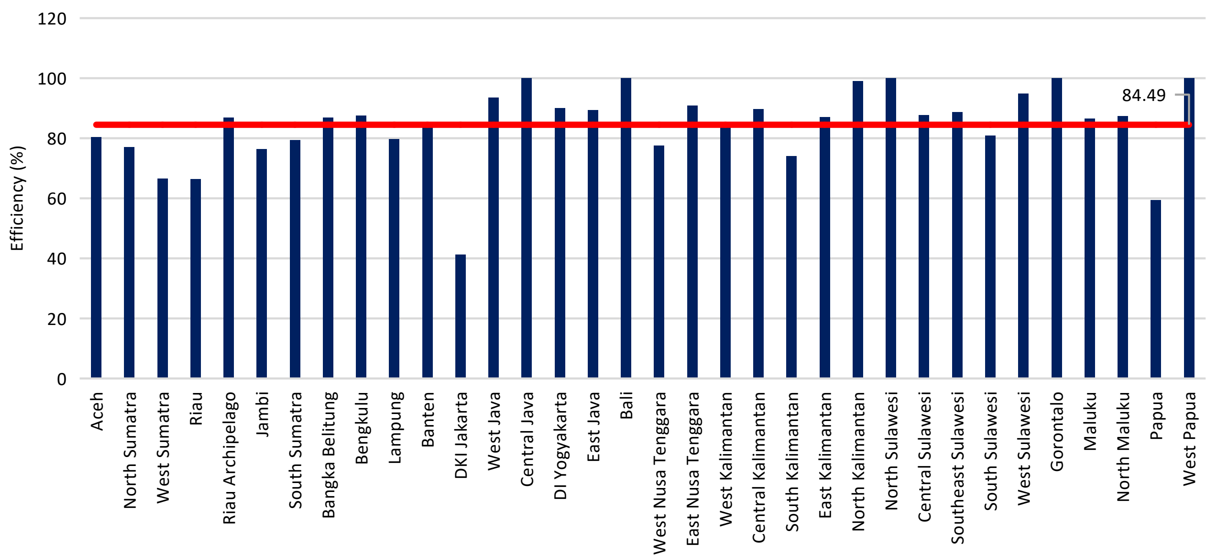
Source: Author`s calculation

Figure 1 shows that the average efficiency of governance in Indonesia was 84.49%. With reference to this average value, 20 provinces operated with above-average efficiency. Thus, 14 provinces operate below the average. Provinces with above-average efficiency include the Riau Archipelago, Bangka Belitung, Bengkulu, West Java, Central Java, Yogyakarta, East Java, Bali, East Nusa Tenggara, Central Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, Southeast Sulawesi, West Sulawesi, Gorontalo, Maluku, North Maluku, and West Papua.

4. 2. PANEL REGRESSION ANALYSIS

A panel data regression analysis was performed by evaluating the form of influence that occurs in the research model. This study used a panel data regression test tool in the Eviews 12 program. A model selection test was first carried out to select the estimation model. The test results are listed in Table 3.

Figure 1. Average Regional Efficiency Level



Source: Author`s calculation

Table 3. Model Selection Test Estimation

	Chow-Test	Hausman-Test
Prob.	0,0000	0,0000
Model Selection	FEM	FEM

Source: Author`s calculation

This study states that the appropriate form of influence is the fixed effects model. This study formulate equation based on fixed effect model as follow:

$$HDI_{it} = \beta_0 + 1.087\ EFF_{it} + 0.023\ PRO_{it} + 0.001\ DFA_{it} - 0.040\ TO_{it} + 0.020\ DI_{it} + {}_{ei}t \quad (3)$$

The estimation results show that the Efficiency Level has a positive and significant influence on regional development (this study uses the Human Development Index). A coefficient value of 1.087 indicates that any increase in efficiency by 1 percent, ceteris paribus, will have an impact on regional development (HDI) in Indonesia by 1.087 points, applied for every province during the study period. The productivity also resulted in positive and significant influence on the Human Development Index (HDI). Trade openness variable shows a positive however not significant effect on the Human Development Index (HDI). The degree of fiscal autonomy (DFA) shows a negative and insignificant effect on the Human Development Index (HDI). Finally, the Democracy Index (IDI) shows a positive and insignificant effect on the Human Development Index (HDI).

4. 3. HYPOTHESIS TESTING

This study used five hypotheses to predict the influence of independent variables on regional development. The hypothesis-testing results are summarized in Table 4.

Table 4. Hypothesis Testing

Hypothesis		Coefficient	T-statistic	Probability	Conclusion
H_1	Efficiency → HDI	1.087	4.005	0.000	Accepted
H_2	Productivity → HDI	0.023	5.205	0.000	Accepted
H_3	Trade Openness → HDI	0.001	0.335	0.738	Rejected
H_4	Fiscal Autonomy → HDI	-0.040	-1.481	0.141	Rejected
H_5	Democracy → HDI	0.020	1.099	0.274	Rejected

Source: Author`s calculation

Based on Table 4, regional budget efficiency exhibits positive and significant effect on HDI ($\beta_1 = 1.087$; p-value < 0.05) thus we accept the alternative hypothesis that regional budget efficiency has a positive and significant effect on HDI. Productivity also has a positive and significant effect on HDI ($\beta_2 = 0.023$; p-value < 0.05), thus the second hypothesis is accepted. The model also evaluates control variable including trade openness, fiscal autonomy and democracy. Trade openness has a positive but insignificant effect on HDI ($\beta_3 = 0.001$; p-value > 0.05) thus we accept null hypothesis. Statistically, there is not enough evidence to support that trade openness has a positive and significant impact on HDI. The third hypothesis is rejected. The result showed that fiscal autonomy has a negative insignificant effect on HDI ($\beta = -0.040$; p-value > 0.05) that lead to our conclusion to reject the fourth hypothesis. The result also showed that democracy within the region has a positive but insignificant effect on HDI ($\beta = 0.020$; p-value > 0.05). There is not enough evidence that the higher level of democracy lead to higher level of HDI. Thus, we reject the fifth hypothesis.

5. DISCUSSION

5. 1. EFFECT OF EFFICIENCY ON REGIONAL DEVELOPMENT

The results showed that the level of efficiency of budget use by local governments had a positive and significant effect on the level of the human development index in each region. This suggests that if the government can increase the level of efficiency in the implementation of government functions, the level of HDI in the region or province will tend to increase. The implementation of government functions by utilizing existing inputs and creating optimal outputs will help the development of the human development index, such as establishing and maintaining health facilities, implementing education, and various other functions, which will encourage an increase in the HDI in the area (Gousario & Dharmastuti, 2015). This study also examines the measurement model of regional development in each region.

In this study, the level of efficiency is the efficiency obtained from local governments in managing local budgets to carry out government duties and functions. The government will use the available budget to carry out various functions of governance, which are reviewed in nine functions: public service functions, order and tranquillity, environmental, economic, housing and public facilities, health, tourism, education, and social protection functions. The expected condition is that the government can manage its budget to provide optimal results for all governance functions (Despotis, 2005). The efficiency measurement is performed by comparing the output produced and input used. Budget efficiency is the ability to produce an optimal output by minimizing budget use. Expenditure efficiency means that when every allocation spent by the government can produce optimal public welfare, that is, when the budget spent produces the appropriate output, it can be said to be efficient (Kurniawan & Murtala, 2020). The results indicate that the increase in efficiency in each region in each period is in line with the increase in HDI in the region. This supports the positive effect of efficiency on HDI development in a region. Previous studies have emphasized how the allocation of resources owned by a region affects the adjustment of the level of the human development index in the region. The more efficiently resources are used, the higher the human development outcomes in the region (Arcelus, Sharma, and Srinivasan, 2006; Vierstraete, 2012). Recent study conducted comparative analysis of the efficiency of the decentralization reform implementation across Ukrainian regions has shown that, currently, there isn't any consistent relationship between the organizational, budgetary, and socio-economic results of the reform in the regions (Irtyshcheva, Boiko, Kramarenko, Voit, and Popadynets, 2022).

The government performs its budget function to allocate the budget as one of the inputs to produce the expected output of each government function. The budget as an input is needed to drive various support programs in an effort to achieve the expected outputs and outcomes. For example, the government has a health function with the goal of creating a health status that continues to improve. In this case, the government must arrange health function expenditures to run various support programs to improve their health status. The proxy used to measure the output of the health budget function was life expectancy. However, previous evidence showed that health expenditure via the moderating effect of government effectiveness reduces life expectancy (Bunyaminu, Mohammed, Yakubu, Shani, and Abukari, 2022). Another study on cross-country indicated that the expenditures significantly help regional development, especially in lower-middle income country (Jaba, Balan, and Robu, 2014). Therefore, in Indonesia, government budget efficiently is important to help improve HDI on each province.

5. 2. EFFECT OF PRODUCTIVITY ON REGIONAL DEVELOPMENT

The results of this study provide empirical evidence that the productivity level of a region has a positive and insignificant influence on the development of the human development index in the region. This result indicates that an increase in the level of productivity can reduce the level of human development index in a region.

Productivity is generally defined as increased efficiency and technical change, with inputs being converted into outputs in a production process (Katti, Pratiwi and Setiahadi, 2019). Productivity is a universal concept that aims to provide more goods and services to people using fewer resources. Productivity involves the integrated utilization of human resources and skills, technology, management, information, energy, and other resources aimed at developing and improving living standards through the concept of total productivity. Productivity is the relationship between output and input in a production process. The productivity measure in this study uses a comparative measure between GRDP and Labor. Productivity in a region has an impact on development outcomes that move in the same direction as productivity. A study on OECD countries showed that labor productivity significantly supports human development. The higher level of productivity in households has an impact on higher income, which leads to better health, education and welfare to improve human development index (Akinyele, 2024). other evidence also showed importance labor productivity to support economic growth in long-term (Varona & Gonzales, 2025). On average, there were only nine provinces with above-average productivity. Essentially, if the productivity of a region increases, economic factors will increase. Economic improvements encourage better access to health and education, resulting in an increase in the human development index. The government in this case intervenes to carry out government functions in building a better HDI.

5. 3. EFFECT OF TRADE OPENNESS ON REGIONAL DEVELOPMENT

The results show that trade openness in Indonesia has a positive but insignificant effect on the human development index. The level of trade openness is less relevant for measuring regional development in this study. The results of this study indicate that trade openness in the region has no impact on the human development index in the region.

The trade openness policy regulates the flow of trade in goods, services, and capital. Trade openness is formed to increase economic growth (Golub, 2009). With the opening of an economy, the integration of goods and capital markets in the world has increased. Trade openness allows a country to have broad access to increasing development and reducing barriers to development. It is suggested that there is a bidirectional relationship between trade openness and regional development (Wang, Jin, Li, Zhang, and Chen, 2022). The opening of a country's economy provides an opportunity for foreign countries to invest in the country, and *vice versa*, where the investment can reduce unemployment due to the opening of job vacancies for the community, companies have the right to sell their products to other countries or buy products from other countries, and expand to various countries. Trade openness is the extent to which an economy maintains its outward trade orientation. Trade openness helps accelerate the development of a country (Fujii, 2019).

The results of this study suggest that trade openness does not directly affect HDI. In accordance with previous studies, it was suggested that there is a unidirectional relationship, that is, from regional development toward trade openness in India (Satyanarayana-Murthy, Kumar-Patra, and Samantaraya, 2014). The level of trade openness was measured based on the value of foreign trade (export and import values) and gross regional domestic income (GRDP) in the region. In other words, a higher level of trade openness reflects higher international trade activities than domestic economic activities. Trade openness has a strong interaction with international trade access. This encourages wider economic development potential and attracts investment to develop the region further. High trade openness centers the economy on export-import activities or foreign trade. A previous study also suggested a positive relationship between trade openness and human development index, as international trade has created a better living standard (Monyela & Saba, 2024). Another evidence from Balkan Countries also suggests a positive relationship between trade openness and economic growth or HDI (Kurteš et al., 2023). Local residents may gain new jobs from these export-import activities, but will not absorb the majority of the population. However, the regions in Indonesia are still not fully supported by foreign trade. Under these conditions, high trade openness can actually reduce human development to a certain extent, where the economy is concentrated in certain groups, and access to education and health is also increasingly difficult due to inequality caused by foreign trade or foreign intervention. Therefore, the relevance of regional trade openness is less appropriate for predicting regional development.

5. 4. EFFECT OF FISCAL AUTONOMY ON REGIONAL DEVELOPMENT

The results show that the degree of fiscal autonomy had a negative and insignificant effect on the human development index. If the level of regional independence, as measured by the degree of fiscal autonomy, is higher, this will reduce the human development index in the region. These results indicate that local governments must pay attention to the degree of fiscal autonomy in supporting regional development, as measured by the human development index in the region.

In the implementation of regional autonomy, a region must be able to maximize its financial resources by exploring the potential of the region. The level of fiscal independence can be measured using the degree of fiscal autonomy or degree of fiscal decentralization (Sow & Razafimahefa, 2015). Decentralization is basically a policy-structuring mechanism with greater authority given to local governments, with the assumption that local governments are more familiar with and know the needs of their regions. The degree of fiscal autonomy is an important aspect in the implementation of regional autonomy because it describes the ability of a region to obtain revenue sources to increase local revenue. A high degree of fiscal autonomy indicates a good financial autonomy. If a region has a high Degree of Regional Fiscal Autonomy, then the region's ability to obtain local revenue is very good, which means that the economic level of the region is good and can encourage an increase in the quality of the region, as measured using the Human Development Index.

This study shows that the degree of fiscal autonomy negatively affects the human development index. Previous evidences indicate fiscal decentralization supports better economic growth (Arzaghi & Henderson, 2005), for example in Croatia (Krmpotic et al., 2020) and Vietnam (Nguyen et al., 2019). Previous results support that DFA shows regional independence in financing its own activities through higher local revenues. Local governments can focus more on carrying out their activities to fulfil government functions. In other words, in theory, a high DFA supports the human development index. Research in developing countries shows that DFA has a negative effect on GRDP growth in the country (Enikolopov & Zhuravskaya, 2007). However, the effects of the DFA in each country will differ from one another. At a certain level, DFA will provide an increase in regional development. Other evidence indicate that when DFA is too high, it will result in a decrease in regional development with a lack of control over regional spending on governance (Tumay, 2021). In this study, DFA generally had a negative effect on the HDI. The higher the DFA, the less efficient the use of the budget for governance, and the more likely it is to hamper development in the region.

5. 5. EFFECT OF DEMOCRACY ON REGIONAL DEVELOPMENT

The results showed that the Democracy Index (DI) has a positive and insignificant effect on regional development, as measured by the human development index (HDI). This indicates that the government needs to pay attention to the level of the Democracy Index in each region to support regional development in the area.

Democracy is people's freedom to voice their opinions and engage in politics. A democratic country can provide space for the community to provide criticism and suggestions to the government regarding development policies and programs that have been and will be implemented to help the growth of the country (Jaunky, 2013). Democracy is expected to improve the welfare of the community because people have the right to organize their own lives the way they want so that prosperity is more likely to be achieved. This freedom is considered to improve the economy because businesses and financiers have the freedom to advance and expand their businesses to other countries.

The presence of democracy in a region supports various individual freedoms in conducting economic activities in the market to gain access to information, which can create a healthy economy. A democratic economic system is beneficial for economic development (Gerring, Thacker, and Alfaro, 2012). The welfare of the community is described by the HDI, which includes economic and social sectors. In this condition, the more democratic a region is, the more equitable development will be, and all people will have better access to health, education, and the economy, which will ultimately increase the human development index in the area. The insignificant effect indicates that the strength of the influence of democracy has begun to weaken because democracy has experienced a threshold effect that usually occurs in countries that are already quite well established economically (Liotti et al., 2018).

6. CONCLUSION AND RECCOMMENDATION

Research has shown that the Indonesian Government Expenditure Efficiency Level indicates that there are 20 provinces that are above the average level of provincial budget efficiency in Indonesia, including the Riau Archipelago, Bangka Belitung, Bengkulu, West Java, Central Java, DI Yogyakarta, East Java, Bali, East Nusa Tenggara, Central Kalimantan, East Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, Southeast Sulawesi, West Sulawesi, Gorontalo, Maluku, North Maluku, and West Papua. Furthermore, the Productivity Level of Indonesian Government Expenditure shows that there are nine provinces that are above the average level of budget productivity in Indonesia, including the Provinces of Bangka Belitung, Riau Archipelago, Bali, East Kalimantan, North Kalimantan, Gorontalo, West Java, North Maluku, and West Papua. Based on the results of this study, budget efficiency and labor productivity in Indonesia can be determinants of HDI, whereas trade openness, degree of fiscal autonomy, and democracy cannot be used as determinants of HDI because they have an insignificant effect on HDI.

The study's findings contribute to some implication. In theoretical point of view, this study supports fiscal federalism theory that decentralization can improve efficiency to support better growth as local government can allocate resources to support local needs and maximizing public services. In practical view the results suggest to promote government policy regarding the importance of budget efficiency within regional governance. As the role of government to support education, health and welfare for their citizen become more efficient, for example, allocated budget based on historical data and needs, the result will improve human development in the area which ultimately contribute to economic growth. The result also suggest that government need to prioritize optimizing budget management to provide a better social benefit to society. In addition, the government needs to strive to increase productivity in managing inputs into outputs that benefit the community. Other factors, such as economic openness, fiscal autonomy, and democracy, still do not play a major role to improve human development index within province.

This study has several limitation to consider. Firstly, we rely on historical data recorded at the end of year which may not capture the fiscal policy change and economic fluctuation during the year. This study also does not examine governance capacity that may impact the government budget efficiency. We also provide limited time frame due to the implementation of the law of regional government and the presence of COVID-19 outbreak. Lastly, this study is specific to Indonesia's decentralization. While its findings provide valuable insight on regional human development, the result should not be directly generalizable to other countries. Future research should be conducted especially with qualitative assessment of government capacity to gain new insight of fiscal policy on human development.

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REFERENCES

Agrawal, D. R., Brueckner, J. K., & Brülhart, M. (2025). Fiscal Federalism in the Twenty-First Century. On: Wed, 24, 50. https://doi.org/10.1146/annurev-economics-081623-020713

Akinyele, O. D. (2024). Assessing the determinants of human development in OECD economies: evidence from labor productivity and investment decisions. *Journal of Economic Studies*, 51(8), 1664–1676. https://doi.org/10.1108/JES-10-2023-0596

Amate-Fortes, I., Guarnido-Rueda, A., & Molina-Morales, A. (2017). Economic and Social Determinants of Human Development: A New Perspective. *Social Indicators Research*, 133(2), 561–577. https://doi.org/10.1007/s11205-016-1389-z

Arcelus, F. J., Sharma, B., & Srinivasan, G. (2006). The Human Development Index Adjusted for Efficient Resource Utilization. *Inequality, Poverty and Well-Being*, 177–193. https://doi.org/10.1057/9780230625594_9

Arzaghi, M., & Henderson, J. V. (2005). Why countries are fiscally decentralizing. *Journal of Public Economics*, 89(7), 1157–1189. https://doi.org/10.1016/j.jpubeco.2003.10.009

Badan Pusat Statistik. (2021). *Human Development Index* (*Indeks Pembangunan Manusia) 2020*. https://www.bps.go.id/id/publication/2021/04/30/8e777ce2d7570ced44197a37/indeks-pembangunan-manusia-2020.html

Bareke, M. L., Agezew, B. H., Dedho, N. H., Lebeta, M. F., Demissie, M. M., Yimer, B. M., & Herut, A. H. (2021). Determinants of Human Capital Development in Ethiopia: Implications to Education Policy. *Education Research International*, *2021*. https://doi.org/10.1155/2021/6619674

Barro, R. J. (1999). Determinants of democracy. *Journal of Political Economy*, 107(6 PART 2). https://doi.org/10.1086/250107

Bunyaminu, A., Mohammed, I., Yakubu, I. N., Shani, B., & Abukari, A.-L. (2022). The effect of health expenditure on average life expectancy: does government effectiveness play a moderating role? *International Journal of Health Governance*, 27(4), 365–377. https://doi.org/10.1108/IJHG-03-2022-0027

Despotis, D. K. (2005). A reassessment of the human development index via data envelopment analysis. *Journal of the Operational Research Society*, 56(8), 969–980. https://doi.org/10.1057/palgrave.jors.2601927

Enikolopov, R., & Zhuravskaya, E. (2007). Decentralization and political institutions. *Journal of Public Economics*, 91(11–12), 2261–2290. https://doi.org/10.1016/j.jpubeco.2007.02.006

Fauzi, A. (2019). Regional autonomy framework for better regional government (Otonomi Daerah Dalam Kerangka Mewujudkan Penyelenggaraan Pemerintahan Daerah Yang Baik). *Spektrum Hukum*, 16(1), 119. https://doi.org/10.35973/sh.v16i1.1130

Ferraz, D., Mariano, E. B., Rebelatto, D., & Hartmann, D. (2020). Linking Human Development and the Financial Responsibility of Regions: Combined Index Proposals Using Methods from Data Envelopment Analysis. In *Social Indicators Research* 150(2). Springer Netherlands. https://doi.org/10.1007/s11205-020-02338-3

Fujii, E. (2019). What Does Trade Openness Measure? *Oxford Bulletin of Economics and Statistics*, 81(4), 868–888. https://doi.org/10.1111/obes.12275

Gerring, J., Thacker, S. C., & Alfaro, R. (2012). Democracy and human development. *Journal of Politics*, 74(1), 1–17. https://doi.org/10.1017/S0022381611001113

Golub, S. S. (2009). Openness to foreign direct investment in services: An international comparative analysis. *World Economy*, 32(8), 1245–1268. https://doi.org/10.1111/j.1467-9701.2009.01201.x

Gousario, F., & Dharmastuti, C. F. (2015). Regional Financial Performance and Human Development Index Based on Study In 20 Counties/Cities of Level I Region. *The Winners*, 16(2), 152. https://doi.org/10.21512/tw.v16i2.1568

Hardianto, A. M., Tjahjadi, B., & Narsa, I. M. (2017). Human Development Index (HDI) As a Planning Plan for Dealing Globalization of Asean Economic Society (MEA) in Indonesia. *Proceedings of the ICECRS*, 1(2), 108–115. https://doi.org/10.21070/picecrs.v1i2.1444

Hendarmin, H., & Kartika, M. (2019). The Relationship Between Human Capital and the Regional Economy Productivity. *Jejak*, 12(1), 138–152. https://doi.org/10.15294/jejak.v12i1.18396

Hidayat, P., & Sari, R. L. (2022). Linkage between financial inclusion and Indonesian welfare: a recent evidence. *Cogent Business and Management*, 9(1), 0–12. https://doi.org/10.1080/23311975.2022.2108299

Hossain, R. (2022). The effects of foreign direct investment and trade openness on economic growth amid crises in Asian economies. *Economic Journal of Emerging Markets*, 14(2), 217–229. https://doi.org/10.20885/ejem.vol14.iss2.art7

Hye, Q. M. A. (2012). Exports, imports and economic growth in China: An ARDL analysis. *Journal of Chinese Economics and Trade Studies*, 5(1), 42–55. https://doi.org/10.1108/17544401211197959

Irtyshcheva, I., Boiko, Y., Kramarenko, I., Voit, D., & Popadynets, N. (2022). Efficiency of Decentralization as an Important Instrument of Ukraine's Socio-Economic Development. *International Journal of Industrial Engineering and Production Research*, 33(1). https://doi.org/10.22068/ijiepr.33.1.5

Jaba, E., Balan, C. B., & Robu, I.-B. (2014). The Relationship between Life Expectancy at Birth and Health Expenditures Estimated by a Cross-country and Time-series Analysis. *Procedia Economics and Finance*, 15, 108–114. https://doi.org/https://doi.org/10.1016/S2212-5671(14)00454-7

Jaunky, V. C. (2013). Democracy and economic growth in Sub-Saharan Africa: A panel data approach. *Empirical Economics*, 45(2), 987–1008. https://doi.org/10.1007/s00181-012-0633-x

Katti, S., Pratiwi, D., & Setiahadi, R. (2019). Klassen Typology Approach for Analysis of the Role of Competitiveness Agricultural Sector. *IOP Conference Series: Earth and Environmental Science*, 347(1), 0–11. https://doi.org/10.1088/1755-1315/347/1/012106

Krmpotic, D., Ileš, M., & Bicvid, D. (2020). The impact of fiscal autonomy on regional development in the republic of croatia. *60th International Scientific Conference on Economic and Social Development – XX International Social Congress (ISC 2020)*, *October*, 2020. https://www.proquest.com/conference-papers-proceedings/impact-fiscal-autonomy-on-regional-development/docview/2462680750/se-2

Kurniawan, I., & Murtala, M. (2020). Efisiensi Belanja Pemerintah Terhadap Indeks Pembangunan Manusia Secara Regional di Indonesia. *Jurnal Ekonomi Regional Unimal*, 3(3), 15–22. https://doi.org/10.29103/jeru.v4i2.6051

Kurteš, S., Amidžić, S., & Kurušić, D. (2023). Impact of Trade Openness, Human Capital Through Innovations on Economic Growth: Case of The Balkan Countries. *ECONOMICS - Innovative and Economics Research Journal*, 11(2), 199–208. https://doi.org/10.2478/eoik-2023-0047

Liotti, G., Musella, M., & D'Isanto, F. (2018). Does democracy improve human development? Evidence from former socialist countries. *Eastern Journal of European Studies*, 9(2), 69–88. https://ejes.uaic.ro/EJES2018_vol9_issue2.htm

Liu, M., Gong, F., & Song, W. (2022). Like the new and hate the old: The impact of fiscal decentralization on regional development strategy. *PLoS ONE*, 17(9 September), 1–23. https://doi.org/10.1371/journal.pone.0273875

Martin, N. & Edalatpanah, S. A. (2023). Application of Extended Fuzzy ISOCOV Methodology in Nanomaterial Selection Based on Performance Measures. *Journal of Operational and Strategic Analytics,* 1(2), 55-61. https://doi.org/10.56578/josa010202

Mehmood, R., Sadiq, S., & Khalid, M. (2010). Impact of Fiscal Decentralisation on Human Development: A Case Study of Pakistan. *The Pakistan Development Review*, 49(4), 513–530. https://pide.org.pk/research/impact-of-fiscal-decentralisation-on-human-development-a-case-study-of-pakistan/

Mihaiu, D. M., Opreana, A., & Cristescu, M. P. (2010). Efficiency, effectiveness and performance of the public sector. *Romanian Journal of Economic Forecasting*, 13(4), 132–147. https://ipe.ro/rjef/rjef4_10/rjef4_10_10.htm

Monyela, M. N., & Saba, C. S. (2024). Trade openness, economic growth and economic development nexus in South Africa: a pre- and post-BRICS analysis. *Humanities and Social Sciences Communications*, 11(1), 1108. https://doi.org/10.1057/s41599-024-03604-2

Mukti, H. K., & Auwalin, I. (2020). Analisis Efisiensi Pengeluaran Pemerintah Daerah Di Provinsi Jawa Timur Terhadap Islamic Human Development Index (I-Hdi): Pendekatan Bootstrap Data Envelopment Analysis (Dea) Dan Malmquist Index. *Jurnal Ekonomi Syariah Teori Dan Terapan*, 7(1), 132. https://doi.org/10.20473/vol7iss20201pp132-140

Noorlaelasari, Y., Juarti, E. R., Rahman, A., & Juraida, A. (2023). Assessing Compliance to Minimum Service Standards of Indonesian Toll Roads: An Examination of the Padaleunyi Toll Road. *Journal of Urban Development and Management,* 2(2), 84-94. https://doi.org/10.56578/judm020203

Nguyen, P. D., Vo, D. H., Ho, C. M., & Vo, A. T. (2019). Fiscal Decentralisation and Economic Growth across Provinces: New Evidence from Vietnam Using a Novel Measurement and Approach. *Journal of Risk and Financial Management*, 12(3), 143. https://doi.org/10.3390/jrfm12030143

Pasichnyi, M., Kaneva, T., Ruban, M., & Nepytaliuk, A. (2019). The impact of fiscal decentralization on economic development. *Investment Management and Financial Innovations*, 16(3), 29–39. https://doi.org/10.21511/imfi.16(3).2019.04

Pourmohammadi, M. R., Valibeigi, M., & Sadrmousavi, M. S. (2014). The relationship between hdi and its indicators with regional growth in Iranian provinces. *Regional Science Inquiry*, 6(2), 73–86. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=3c1f51510b7466c0dddcd5fbf05ca40d84875474#page=72

Qayyum, M., Younas, N., & Bashir, M. A. (2018). The Impact of Trade Liberalization on Economic Growth: A case study of Pakistan. *Journal of Economics and Sustainable Development*, 9(9), 65–71. https://doi.org/10.6007/ijarbss/v4-i5/879

Protsenko, I. (2023). Legal Status and Peculiarities of Taxation of E-Residents in Ukraine. *Collection of papers new economy,* 1, 244-255. https://doi.org/10.61432/CPNE0101244p

Raith, A., Rouse, P., & Seiford, L. M. (2019). Benchmarking Using Data Envelopment Analysis: Application to Stores of a Post and Banking Business. In *International Series in Operations Research and Management Science*, 274. https://doi.org/10.1007/978-3-319-99304-1_1

Sabermahani, A., Barouni, M., Seyedin, H., & Aryankhesal, A. (2013). Provincial human development index, a guide for efficiency level analysis: The case of Iran. *Iranian Journal of Public Health*, 42(2), 149–157. https://pmc.ncbi.nlm.nih.gov/articles/PMC3595646/

Saha, S., & Zhang, Z. (2017). Democracy-Growth Nexus and its Interaction Effect on Human Development: A Cross-National Analysis. *Economic Modeling*, 63(June), 304–310. https://doi.org/10.1016/j.econmod.2017.02.021

Saragih, J., Wardati, J., & Pratama, I. (2020). Trade openness, government development expenditures, gross capital formation and economic growth: An ASEAN case. *International Journal of Innovation, Creativity and Change*, 12(10), 366–383. https://www.ijicc.net/index.php/volume-12-2020/176-vol-12-iss-10

Satyanarayana Murthy, D., Kumar Patra, S., & Samantaraya, A. (2014). Trade Openness, Financial Development Index and Economic Growth: Evidence from India (1971-2012). *Journal of Financial Economic Policy*, 6(4), 362–375. https://doi.org/10.1108/JFEP-10-2013-0056

Sow, M., & Razafimahefa, I. (2015). Fiscal Decentralization and the Efficiency of Public Service Delivery. *IMF Working Papers*, 15(59), 1. https://doi.org/10.5089/9781484351116.001

Spaiser, V., Ranganathan, S., Mann, R. P., & Sumpter, D. J. T. (2014). The dynamics of democracy, development and cultural values. *PLoS ONE*, 9(6), 24–26. https://doi.org/10.1371/journal.pone.0097856

Tashkinova, O. (2023). The Traumatic Experience of the Mariupol Civilians' Forced Migration and Adaptation Abroad in 2022. *Collection of papers new economy,* 1, 89-109. https://doi.org/10.61432/CPNE0101089t

Tekin, B. (2020). The Nexus between Financial Development and Human Development: The Case of Developing Countries. *Journal of Emerging Economies and Islamic Research*, 8(2), 73. https://doi.org/10.24191/jeeir.v8i2.8735

Tumay, M. (2021). The Effect of Fiscal Decentralization on The Human Development Index and Its Components: A Panel Data Study. *Uluslararası Ekonomi ve Yenilik Dergisi*, 7(2), 357–373. https://doi.org/10.20979/ueyd.954645

Udoh, E., Afangideh, U., & Udeaja, E. A. (2015). Fiscal decentralization, economic growth and human resource development in Nigeria: Autoregressive Distributed Lag (ARDL) approach. *CBN Journal of Applied Statistics*, 06(1), 69–93. https://dc.cbn.gov.ng/jas/vol6/iss1/4/

Varona, L., & Gonzales, J. R. (2021). Dynamics of the impact of COVID-19 on the economic activity of Peru. *PLoS ONE*, 16(1 January), 1–30. https://doi.org/10.1371/journal.pone.0244920

Vierstraete, V. (2012). Efficiency in human Development: a Data Envelopment Analysis. *The European Journal of Comparative Economics*, 9(3), 425–443. https://ejce.liuc.it/Default.asp?tipo=articles&identifier=ejce:18242979/2012/03/05

Wang, F., Jin, M., Li, J., Zhang, Y., & Chen, J. (2022). Profound Impact of Economic Openness and Digital Economy towards a Sustainable Development: A New Look at RCEP Economies. *Sustainability*, 14(21), 13922. https://doi.org/10.3390/su142113922

Wang, G. N., Yang, Y. H., & Xu Y. J. (2024). Impact of Green Finance Reform and Innovation Pilot Zones on Regional Economic Growth. J. Green Econ. *Journal of Green Economy and Low-Carbon Development,* 3(3), 161-172. https://doi.org/10.56578/jgelcd030302

Wichowska, A. (2021). The degree of fiscal decentralization in European Union countries in different stages of the economic cycle. *Entrepreneurship and Sustainability Issues*, 9(2), 198–208. https://doi.org/10.9770/jesi.2021.9.2(13)

Xu, L., Xue, H., & Wu, Q. (2022). The Impact of Development Zones on Economic Growth in Less Developed Regions: Evidence from Guangxi, China. *Land*, 11(10). https://doi.org/10.3390/land11101658

Zhang, T., & Zou, H. fu. (1998). Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics*, 67(2), 221–240. https://doi.org/10.1016/S0047-2727(97)00057-1