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Does Natural Resource Revenue Contribute to Achieving Inclusive Growth?

Rezaneri Noer Fitrianasari*

Postgraduate student, BPS-Statistics Kalimantan Timur Province, Brawijaya University, Malang, East Java, Indonesia, <https://orcid.org/0009-0007-4832-4943>

Moh. Khusaini

PhD in Economics, Professor of The Department of Economics, Brawijaya University, Malang, East Java, Indonesia, <https://orcid.org/0000-0003-0472-9678>

Setyo Tri Wahyudi

PhD in Economics, Associate Professor of The Department of Economics, Brawijaya University, Malang, East Java, Indonesia, <https://orcid.org/0000-0003-4779-5747>

***Corresponding author:** rezaneri@student.ub.ac.id.

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Abstract: This study aims to analyse the attainment of inclusive growth and investigate the relationship between the impact of natural resource revenue on inclusive growth and the extent of investment in education. This study utilises data from ten locations in East Kalimantan, spanning 2015 to 2022. This study employs an approach that entails constructing an index by assigning certain weights and doing nonlinear panel data regression. Based on actual evidence, none of the regions in East Kalimantan Province achieved more remarkable inclusive growth between 2015 and 2022. Due to substantial revenue from natural resources, most regions only managed to attain moderately decent inclusive growth. This study makes a new contribution by finding a threshold of education expenditure of 21.18 per cent, which determines the relationship between natural resource revenues and inclusive growth. This finding highlights that education investment has a more significant role than previously understood, especially in regions rich in natural resources. This study contributes to the literature on inclusive economics and natural resource revenue management, as few studies have identified a specific threshold that can alter the impact of natural resource revenues on inclusive growth. The results of this

study provide practical guidance for local governments, especially in East Kalimantan Province, in formulating natural resource revenue allocation policies. This finding emphasises allocating many natural resource revenues to the education sector to achieve inclusive growth. Thus, this research becomes an essential reference for formulating policies focusing on human development and economic sustainability in natural resource-rich regions.

Keywords: Economic Development, Human Capital, Education Spending, Panel Data, Kink Threshold Model.

Introduction

The relationship between natural resource revenue and inclusive growth is a captivating research subject, generating substantial scholarly attention and igniting crucial policy discussions. Natural resource revenue, encompassing minerals, fossil fuels, forestry, and fisheries, constitutes a fundamental component of particular economies. Well-managed natural resources will be a blessing because they can increase output, as research conducted by Aslan and Altinoz (2021) concluded that total natural resource rent significantly increases the production of Asian and American countries. Sharma and Paramati (2022) also concluded that natural resources can increase per capita output in developed and developing countries. Furthermore, Chen et al. (2023) investigated and said that natural resources have been proven to increase production in Portugal. In the same year, Wang and Tian (2023) confirmed that natural resources have a positive effect on output in all quantiles of the G7 countries. Meanwhile, recent research by Xu et al. (2024) proves that natural resource rent can increase per capita production in Latin American and Caribbean countries. Countries with ample resources are expected to enjoy higher prosperity and faster growth than those without such significant natural assets. Nevertheless, this assumption applies only to a few countries with ample resources (Hordofa et al., 2022).

On the other hand, the abundance of natural resources can also cause dependency, which can hinder the growth of different economic sectors to the point of failing to increase economic growth (Wang et al., 2023). Other studies consider natural resource abundance an exclusive source of growth (Oyinlola et al., 2020). The entire natural resource supply chain, from discovery to sale, should have growth elitism characteristics. As an illustration, the government or appointed parties hold ownership rights over natural resource wealth, enriching themselves further without investing the wealth generated for comprehensive growth. Natural resource income is only enjoyed by a small number of people. Most of this income is spent on routine and administrative expenses, biased towards the poor and unemployed. So, the poor and unemployed have the potential to not benefit from the endowment fund; it also limits their ability to contribute their productivity to national output. Therefore, natural resource abundance is considered not to lead to inclusive growth (Oyinlola & Adedeji, 2019). The collection of this revenue can generate government cash for investment in development. However, they can lead to corruption, inequality, and environmental deterioration (Ahmad et al., 2023). Attaining inclusive growth requires the meticulous administration of natural resources to ensure their exploitation in a way that benefits all levels of society.

Human capital can also be a mediating variable for the impact of natural resource abundance on inclusive growth. This is because human capital development determines the direction of the effects of natural resource abundance, whether it is a curse or a blessing for these areas. Human capital can change the impact of natural resources from a curse to a blessing (Rahim et al., 2021). In addition, if natural resource income is managed correctly, allocating it to education spending can strengthen the impact on inclusive growth (Raheem et al., 2018). However, education spending has also been shown to cause a crowding out effect, so that natural resources hurt output growth (Wang et al., 2021). According to Hu and Wang (2024), in investing in human capital, the government must allocate an optimal amount of budget so that it can have an impact on the total output of the economy. So, there must be a threshold

for the amount of education spending that can affect the effects of natural resource income on inclusive growth.

The reason for selecting East Kalimantan's regions is East Kalimantan exemplifies a situation where there is economic growth but lacks overall development. While regional economic progress occurs in East Kalimantan, it is not experienced by most of the population (Kuncoro & Idris, 2015). East Kalimantan ranks as the seventh wealthiest province in Indonesia, boasting a Gross Regional Domestic Product (GRDP) of IDR 921 trillion. East Kalimantan's per capita income in 2022 was IDR 238.92 million, making it the second highest in Indonesia, following DKI Jakarta (Badan Pusat Statistik, 2020). East Kalimantan region is renowned for its immense natural resources, particularly oil, natural gas, coal, fisheries, marine resources, and forest products. Therefore, East Kalimantan receives Indonesia's most significant natural resource revenue-sharing funds. In 2022, the total natural resource revenue sharing funds received by East Kalimantan was 28.3 trillion or around 10.5 per cent of the total non-tax state revenue from natural resources obtained by the country. Regrettably, the abundant natural resources of East Kalimantan have failed to enhance the well-being of its residents, as seen by the high poverty rate, unemployment levels, and regional disparities. The poverty rate in East Kalimantan was documented as 6.31 per cent in March 2022. In August 2022, East Kalimantan had an unemployment rate of 5.71 per cent due to a lack of job opportunities. In March 2022, the Gini ratio in East Kalimantan was 0.328, indicating moderate income inequality in the region.

Research Problem

This study needs to study several gaps to understand the relationship between human capital investment, natural resource income, and inclusive growth. First, issues related to inclusive growth are usually only studied using per capita income indicators or income divided by the number of people employed. Second, most studies focus on natural resource GRDP; only a few studies look at the impact of natural resource income from the fiscal side, namely taxes and royalties. Third, existing studies use a linear regression model by adding interaction variables to examine the relationship between human capital investment, natural resources, and inclusive growth.

Research Focus

This study's objective is to assess the extent to which inclusive growth has been achieved in the regions of East Kalimantan Province. It also aims to investigate the influence of natural resource revenues on inclusive growth in the East Kalimantan region and explore whether there is a specific threshold percentage of education spending that affects the impact of natural resource revenues on inclusive growth.

Research Aim and Research Questions

The research questions in this study are:

1. How is inclusive growth achieved in regions in East Kalimantan Province?
2. How does the education spending threshold affect resource income's impact on East Kalimantan's inclusive growth?

Literature Review

This section aims to present a concise summary of inclusive growth and the influence of natural resources and investment in human capital on inclusive growth, as established by past research, serving as the foundation for this study. This section provides a compilation of past research findings that share thematic characteristics and are pertinent to the issues addressed in this study. The purpose of this study is to provide clarity regarding its path.

Inclusive growth is a new approach in growth theory (Huang & Quibria, 2013). The theory of inclusive growth first emerged because increasing economic growth in many Asian countries is always followed by decreased poverty and increased income inequality (Klasen, 2010). The increase in income

inequality results in a decrease in community welfare, contrary to the initial goal of economic development. There is no agreed indicator to determine the progress of inclusive growth. Several international organisations define inclusive growth in ways that contradict each other.

McKinley (2010) measures inclusive growth using the composite index method. This method consists of four dimensions, each composed of several subdimensions and several indicators, each of which is given a score from 1 to 10 and then averaged to produce a subdimension score. Each subdimension that forms it is multiplied by a total weight of one hundred per cent. The Inclusive Growth Composite Index (IGCI) consists of four dimensions, namely: 1) economic growth, productive employment, and economic infrastructure; 2) poverty and equality; 3) human capacity; and 4) social protection. The index has a value range from 1 to 10. The higher the index value of a region, the more advanced it is in inclusiveness. Generally, an index value of 1 to 3 will be categorised as unsatisfactory inclusive growth progress, a score of 4 to 7 will be considered satisfactory progress, and a score of 8 to 10 will be regarded as superior progress. Based on McKinley's (2010) research results, Indonesia has slightly satisfactory inclusive growth progress, with an index of 4.4.

Whether natural resources are a blessing or a curse has long been an exciting topic among economic researchers. Many recent studies have proven this by using econometric analysis to see the impact of natural resources on various financial indicators (Chen et al., 2023; Lashitew & Werker, 2020; Ross, 2015; Sharma & Paramati, 2022; Wang & Tian, 2023; Zhou et al., 2023). The discovery of natural resources always brings dreams of wealth and prosperity to developing countries. However, research results show that natural resources can have positive or negative effects depending on circumstances (Takatsuka et al., 2015).

Several researchers found that natural resources can increase income, create jobs, and contribute to infrastructure development, ultimately stimulating economic growth (Ahmed et al., 2016; Chen et al., 2023; Song et al., 2018). Olayungbo (2019) stated that revenue from oil and gas exports was positive and contributed significantly to Nigeria's economic growth. Then, Mohamed (2020) investigated and reported that the positive impact of natural resources on economic growth also occurred in Sudan. In another study, Umar et al. (2020) highlighted the significant stimulating implications of natural resources on carbon emissions due to the growth effect. The following year, Ben-Salha et al. (2021) found that natural resources drive economic growth in eight resource-abundant countries. Then, Islam et al. (2023) investigated and confirmed that natural resources significantly accelerate growth in Bangladesh. Recent research by Xu et al. (2023) shows that natural gas and mineral rents encourage economic growth in middle-income countries.

The study was conducted by Afriliana and Wahyudi (2022) in 34 provinces in Indonesia from 2014 to 2020. The purpose of this study was to see inclusive growth and the components that support it. The Poverty Equivalent Growth Rate (PEGR) method was used to analyse inclusive growth. Then, the generalised method of Moment Arellano Bond (GMM-AB) was used as a dynamic panel data estimation model to see which components can increase inclusive growth. The study results show Indonesia's economic growth is still not wholly inclusive. Increasing inclusion in Indonesia is influenced by per capita income, education budget, health, and foreign investment. At the same time, DDI does not support inclusive development in Indonesia.

In a recent study by Inuwa et al. (2023), the authors utilised the innovative GMM to examine how reliance on natural resources promoted economic growth in OPEC member countries from 2008 to 2018. The study's findings indicate that reliance on natural resources hinders economic progress. Nevertheless, the analysis demonstrated that economic growth impacts the financial sector development coefficient. The impact of natural resource rents on economic growth was examined in the top ten African countries with plentiful resources. The findings revealed an unfavourable and robust relationship between natural resources financial development and economic growth. Nevertheless, the results indicated that human capital and institutional quality favourably impacted economic growth.

Dai et al. (2024) discuss the role of natural capital in socio-economic sustainable development goals (SDGs 1, 3, 5, and 8) in 131 countries from 2000 to 2018. In the long run, increasing reliance on natural capital can contribute to decent work and economic growth. Still, it negatively impacts poverty reduction and improves good health, well-being, and gender equality. The relationship between natural capital and each socio-economic goal changes with different socio-economic levels. Furthermore, the regression results across countries at various stages of development show heterogeneity. Reliance on natural capital reduces poverty in high-income countries and improves gender equality in middle-income countries, in contrast to low-income countries. Governments should create incentives to protect and enhance natural wealth to prevent depletion of natural capital or unsustainable conversion into other forms of capital.

Erdoğan et al. (2020) examined the correlation between the influence of exporting natural resources on economic growth and the extent of financial development. They analysed data from specific Next-11 nations from 1996 through 2016. This study posits that enhancing the financial system is necessary to ensure that natural resource exports can effectively contribute to economic growth. If the level of financial system development remains below a specific threshold, the impact of natural resource exports on economic growth is insufficient. Hence, it is imperative to establish a definitive threshold for the extent of financial development that positively influences the expansion of natural resource exports. This study employs a threshold-based nonlinear panel data approach. According to empirical findings, in the initial phase, where the extent of financial expansion is less than 45%, the rise in oil exports does not have a statistically meaningful impact on economic growth. In the second regime, characterised by a financial deepening level exceeding 45%, a one-unit increase in oil exports led to a 7% gain in economic growth.

In their study, Wang et al. (2021) examined the impact of natural resources on China's development by analysing province panel data spanning from 2007 to 2019. The use of the GMM approach revealed a consistent and significant positive association between natural resources and economic development, independent of other variables. This finding substantiates the notion that resource development can catalyse economic expansion. When taking other factors into account, there is a clear negative relationship between natural resources and economic growth in China, suggesting the presence of a resource curse impact. When evaluating the extent of technological advancement, the presence of natural resources has a negative influence that obstructs economic progress. Specifically, the resource curse, characterised by technology displacement, demonstrates this. When examining the components of human resources, it becomes apparent that the influence of human resources worsens the impact of natural resources on economic development. Specifically, the resource curse is demonstrated through the displacement of human resources, resulting in a decrease in their overall quantity. It leads to resource buildup and intensifies the resource curse's negative impact. When the input variable of material capital is included, it is found that the variable remains unchanged. Asset investment has a dual effect of promoting economic development and mitigating the negative impact of the resource curse. When the energy innovation variable is included, the negative influence of natural resources on economic growth is diminished, as seen by the significant reduction in its elasticity coefficient. This highlights the crucial role of China's energy innovation.

Pham et al. (2024) developed a framework to evaluate the impact of financial development (FD), natural resource rent, and inclusive growth of ten Asian provinces with the highest GDP. Using the CS-ARDL method, the results show that financial development, natural resource rent, inflation, and industrialisation positively affect inclusive growth. This study helps policymakers to make policies to achieve broad, inclusive growth by building an excellent financial structure and proper allocation of natural resources in the country.

Raheem et al. (2018) undertook a study to examine the impact of the natural resource curse on inclusive growth in 18 countries in Sub-Saharan Africa (SSA) that were endowed with abundant natural resources. The analysis was conducted by constructing a fixed effect model incorporating moderation.

The findings demonstrated that the presence of natural resource rents has been shown to contribute to more inclusive growth. Expenditure on education and healthcare also played a significant role in explaining the growth in Sub-Saharan Africa (SSA). Incorporating health expenditure into the calculation of natural resource rents enhances the inclusivity of the growth process. The simulation results indicate that augmenting government expenditure on healthcare will result in a GDP per capita growth rate above 3.1 per cent.

Rahim et al. (2021) examined the impact of natural resources, human resources, financial development, industrialisation, technical progress, and international trade on the economic growth of Next Eleven countries from 1990 to 2019. The findings confirm the resource curse hypothesis, which states that increased natural resource revenues have been shown to impede the economic development of Next Eleven countries. Conversely, economic expansion necessitates the development of human capital, financial systems, industrialisation, technical innovation, and international trade. Furthermore, this study reveals that the combination of human resources and natural resources has a beneficial effect on economic growth. Thus, human resource development has a role in reducing the adverse effects of the resource curse on Next Eleven countries. It is essential to prioritise human resource development to convert the natural resource curse into a beneficial outcome for these nations.

Maddah et al. (2022) used a dynamic panel threshold kink approach to measure the threshold level of political competition that maximised economic growth in Iranian provinces during 2000–2019 and analysed the moderating role of political competition in the functioning of the resource curse hypothesis. The results showed that various indicators of political competition have threshold effects on economic growth, and the nonlinear relationship between political competition and economic growth is confirmed to be U-shaped, based on political competition above the threshold level leading to more economic growth. The authors also found that political competition affects the functioning of the resource curse hypothesis in Iranian provinces by moderating the effect of oil revenue on economic growth. Considering the spatial impact on the dynamic panel threshold kink regression model, which was modelled for the first time in Iranian provinces, the findings of this study have been strengthened. The conclusions of this study support the positive and significant effect of political competition on economic growth in countries with natural resources.

To sum up, previous work has examined the influence of natural resource revenue and other control variables on economic growth in many places worldwide. Prior research indicates that the impact of natural resources and investment in education on inclusive growth can vary across different regions. Multiple studies assert that investing in human resources has the potential to transform the adverse effects of natural resources into positive outcomes. However, there is also data indicating that the expansion of human resources is leading to the depletion of natural resources, transforming what was formerly considered a benefit into a detriment. This study specifically examines the economic situation in East Kalimantan as distinctive circumstances and difficulties characterise it. Furthermore, we employ a nonlinear regression methodology to quantify the impact of human capital on the correlation between natural resources and inclusive growth.

Methods

This research was conducted on ten regions in East Kalimantan with abundant natural resource potential and significant realisations of natural resource revenue-sharing funds for regional income. This study utilises secondary data obtained indirectly from the source. The data used is in the form of annual data for 2015-2022 with the following details. The data used in the study are secondary data sourced from the Central Statistics Agency, the Ministry of Health, and the Ministry of Finance. Technically, all of the data covers 10 regions in East Kalimantan Province, which are calculated using the composite index of inclusive growth and regression analysis.

The analysis in this study begins with preparing an inclusive growth index to obtain independent variables in this study. The analysis was carried out by adopting the method carried out by (McKinley,

2010). The index consists of 4 dimensions and 21 indicators. The composite index, which utilises an assessment mechanism and weighting scheme, inherently incorporates subjective assessments. The composite index is formulated by calculating a weighted average score of 0 to 10. This score is determined by evaluating the performance of a region on each of its four components. Each of the four components is a weighted average of its respective subcomponents. Generally, a score of 1-3 will be considered unsatisfactory progress in inclusive growth. A score ranging from 4 to 7 is regarded as satisfactory progress, while a score ranging from 8 to 10 is considered extraordinary progress. The indicators forming the composite index of inclusive growth are presented in Table 1.

Table 1

List of Indicators and Weights forming the Inclusive Growth Index

Dimension	Sub Dimension	Indicator	Weight
Economic growth, productive jobs and economic infrastructure	Economic growth	Per capita GDP growth (%); Percents of the agricultural sector (%); Percents of the industrial sector (%); Percents of the services sector (%)	25 %
	Productive jobs	Workers of the industry (%); Workers with self-employed status and unpaid family workers (%)	15 %
	Economic infrastructure	Households with electricity (%); Population having/having cellular phones (%)	10 %
Poverty and inequality	Poverty	Poverty rate (%)	10 %
	Income inequality	Gini ratio (index)	10 %
	Gender inequality	Ratio participation rate female and male labour force (%); Maternity assisted health personnel in health care facilities (%)	5 %
Human capabilities	Health and nutrition	Life expectancy (year)	5 %
	Education	Primary school participation rate (%); Secondary school participation rate (%)	5 %
	Decent drinking water and sanitation	Population with safe drinking water (%); Population with proper access to sanitation (%)	5 %
Social Protection	Social Protection	The ratio of total revenue to regional gross domestic income (%); Social protection spending (%); Social protection per capita (rupiah)	10 %

Source: Authors' development.

Furthermore, to analyse how the education spending threshold affects the impact of resource income on inclusive growth in East Kalimantan, an inferential analysis was conducted. By using the dynamic panel method with a threshold, the research model can be written as follows (Seo et al., 2019):

$$ig_{i,t} = \beta_1 ig_{i,t-1} + \beta_2 nr_{i,t} + XB + (\delta_1 ig_{i,t-1} + \delta_2 dbh_{i,t} + X\Delta)I(\Psi edu_{i,t} \geq \gamma) + \mu_i + e_{i,t}$$

Where t and I represent time series (year) and cross-section (region), respectively, μ_i is the unobserved effect between cross sections and $e_{i,t}$ is the error term. $\Psi edu_{i,t}$ is the threshold variable of human capital investment. The unknown model parameters are $\theta = (\beta, \delta, \gamma,)$ which will be obtained using the GMM estimator. $I(\cdot)$ is an indicator function, indicating the regime determined by the threshold variable $\Psi edu_{i,t}$. γ is a threshold parameter that divides the equation into two coefficients, β (slope) and δ (regime). X is a matrix of exogenous control variables, including physical investment and labour. Details of the variables used in the regression analysis are presented in Table 2.

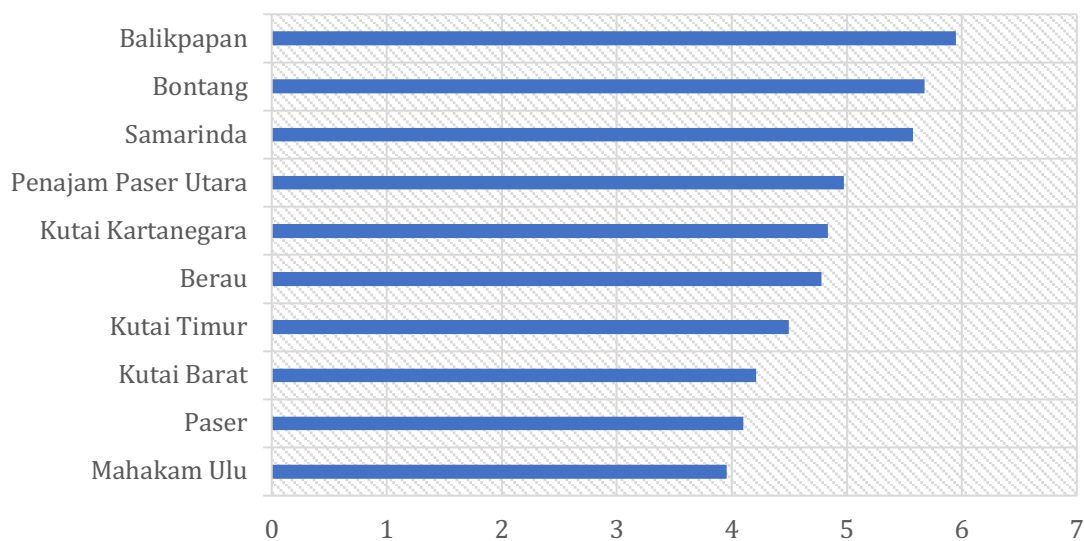
Table 2*Description of Variable*

Variable	Symbol	Description	Units	Source
inclusive growth	Ig	Inclusive Growth Composite Index	Index	Author's development
natural resource	Nr	Realisation of natural resource revenue sharing funds divided by total regional income	Per cent	Ministry of Finance
education spending	Edu	Percentage of education expenditure to total expenditure	Per cent	Ministry of Finance
human capital	Hc	Percentage of workers with high education	Per cent	BPS-Statistics Indonesia
physical capital	Pc	Percentage of investment to Gross Regional Domestic Product	Per cent	BPS-Statistics Indonesia
Labour	Lab	Number of the working population divided by the workforce	Per cent	BPS-Statistics Indonesia

Source: Authors' development.

Results

This section explains the results of the study analysis. The first objective of this study is to analyse the achievement of inclusive growth in regions in East Kalimantan Province. Inclusive growth encompasses achieving sustainable and fair economic growth that ensures advantages are distributed across all segments of society while simultaneously diminishing inequality. Inclusive growth entails providing equitable opportunities to all individuals, not only in the economic domain but also in the social sphere, encompassing areas such as education, health, and various other sectors. Hence, this study addresses the first purpose by conducting a comparative analysis of the composite index of inclusive growth across regions in East Kalimantan from 2015 to 2022.

Figure 1*Inclusive Growth Index*

Source: Author's development.

The condition of inclusive growth in East Kalimantan from 2015 to 2022 based on the composite index can be seen in Figure 1. The regions in East Kalimantan Province have an average inclusive growth index value between 3.95-5.95. The difference in inclusive growth value between regions indicates that

the conditions of the indicators that make up the index are very different between regions with the smallest and largest IG, such as education, health, and poverty. The region with the lowest inclusive growth index is Mahakam Ulu Regency, while Balikpapan City owns the highest composite index. The difference in the highest and lowest index values is significant, reaching 2 points. According to the categorisation in McKinley (2010), no regions in East Kalimantan Province from 2015 to 2022 have achieved the superior category in inclusive growth. Most regions only achieved progress in inclusive growth in the slightly satisfactory category. Even Mahakam Ulu Regency still has an unsatisfactory inclusive growth category.

The three areas in East Kalimantan Province that hold city status and exhibit the most significant average inclusive growth index are Balikpapan (5.95), Bontang (5.67), and Samarinda (5.58). These three cities possess sufficient economic infrastructure and exhibit higher levels of health and education than other regions within East Kalimantan Province. Balikpapan, Bontang, and Samarinda benefit from enhanced economic infrastructure due to substantial investments in energy distribution networks. These investments are primarily driven by the presence of major enterprises and the strategic significance of this region in the national economy. Key industries in Balikpapan include oil and gas, while Bontang is known for its petrochemical industry. Samarinda is a hub for government and administration. Regarding health services, significant cities like Balikpapan, Bontang, and Samarinda offer superior access to high-quality health facilities, advanced medical infrastructure, and more comprehensive health services. Consequently, individuals residing in these urban areas benefit from expedited and more convenient availability of essential healthcare services, promoting their overall well-being and extending their lifespan. These three significant cities also possess sufficient educational infrastructure and more trained teachers than other regions, in addition to addressing health concerns. The three regions with the highest inclusive growth achievements have more stable per capita GRDP growth because the industrial and service sectors support the economy. In addition, the poverty rate and percentage of vulnerable workers from these three regions are also the lowest compared to the other seven regions.

On the other hand, Mahakam Ulu Regency's development in inclusive growth has been inadequate due to its poor economic infrastructure, health, and education levels. These districts face significant topographical and demographic obstacles in establishing economic, health, and education infrastructure. Remote and rural locations like Mahakam Ulu face challenges in economic infrastructure due to little investment and smaller populations, resulting in less cost-effective infrastructure development for service providers. Conversely, Mahakam Ulu Regency has the most significant proportions of impoverished individuals and vulnerable workers among the nine other regions in East Kalimantan Province. Specifically, the poverty rate stands at 11.28 per cent, while the percentage of vulnerable workers is 37.56 per cent (BPS, 2022). Furthermore, it should be noted that Mahakam Ulu Regency exhibits the most minimal proportion of individuals employed in the industrial sector, explicitly amounting to 6.59 per cent, compared to all provinces inside Indonesia (BPS, 2023).

Table 3

Natural Resource Revenue Percentage and Inclusive Growth Index Regions in East Kalimantan Province

No.	Regions	Natural Resource Revenue Percentage (%)	Inclusive Growth Index
1.	Kutai Timur	52.81	4.50
2.	Penajam Paser Utara	48.74	4.97
3.	Mahakam Ulu	47.20	3.95
4.	Kutai Kartanegara	46.24	4.84
5.	Kutai Barat	46.24	4.21
6.	Paser	43.26	4.10
7.	Bontang	42.52	5.67

8.	Berau	41.01	4.78
9.	Samarinda	23.72	5.58
10.	Balikpapan	24.14	5.95

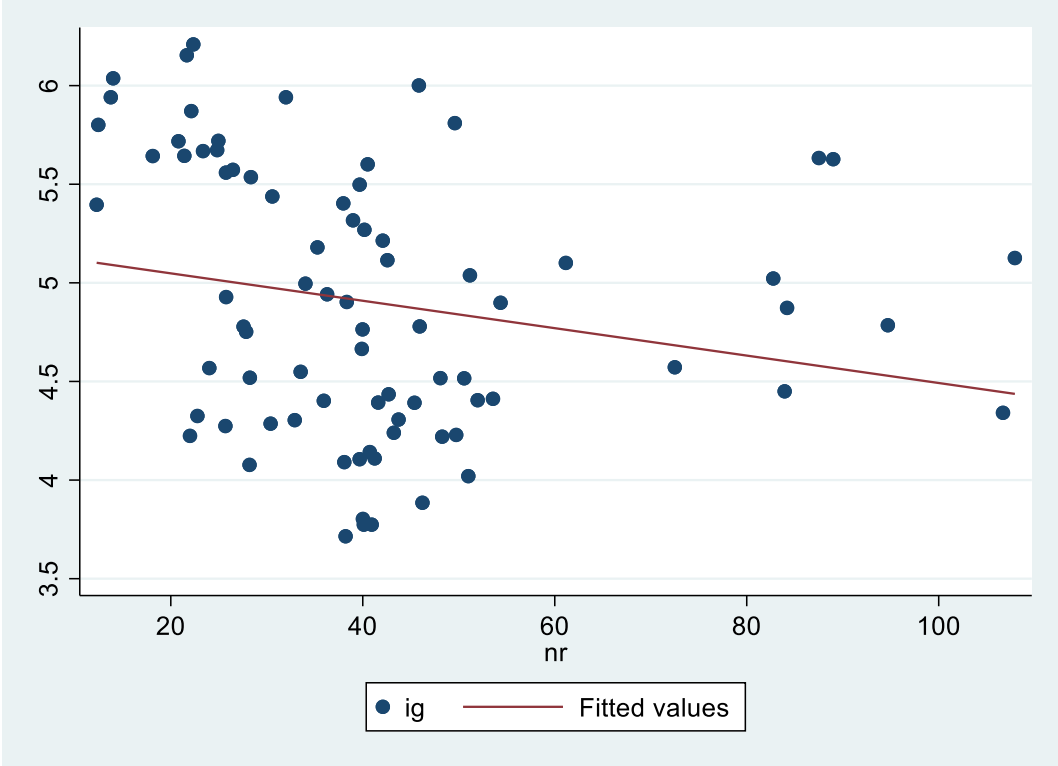
Source: Author's development.

Comparing the results of the inclusive growth accomplishment calculation with the percentage of natural resource revenue received by regions in East Kalimantan yields intriguing insights. Areas that rely less on income from natural resources tend to have better inclusive growth outcomes compared to areas that rely on finance from natural resource revenue. Regions such as Balikpapan and Samarinda demonstrate higher levels of inclusive growth despite having less revenue derived from natural resources. On the other hand, East Kutai and West Kutai are regions that have a more significant proportion of income from natural resources but have achieved lower levels of inclusive growth. For a more comprehensive explanation, please refer to Table 3 provided above.

Before analysing the possibility of a certain threshold of education spending that affects the impact of natural resource revenues on inclusive growth, the following is a scatter plot showing the relationship between inclusive growth and natural resource revenues and the relationship between growth and education spending. The scatter plot in Figure 2 illustrates the correlation between inclusive growth (ig) and revenue derived from natural resources (nr). The x-axis shows the variable nr, which signifies revenue from natural resources, while the y-axis represents the variable ig, which means the value of inclusive growth. The scatter plot indicates that the regression line, representing the fitted value (red line), has a negative slope. This suggests an inverse correlation exists between the revenue generated from natural resources and the promotion of inclusive economic growth. When there is a rise in income generated from natural resources, it typically leads to a fall in inclusive growth. The data points exhibit a significant dispersion around the fitted line, suggesting substantial variability in the data. Several data points deviate significantly from the fitted line, indicating the presence of outliers or the impact of other variables not considered in the model. The inverse correlation suggests that a higher reliance on revenue generated from natural resources could potentially hinder equitable economic growth. This aligns with study findings that indicate places with reduced reliance on income derived from natural resources demonstrate superior accomplishments in achieving inclusive growth.

Figure 2

Scatter Plot Illustrating the Correlation between Inclusive Growth and Natural Resource Revenue

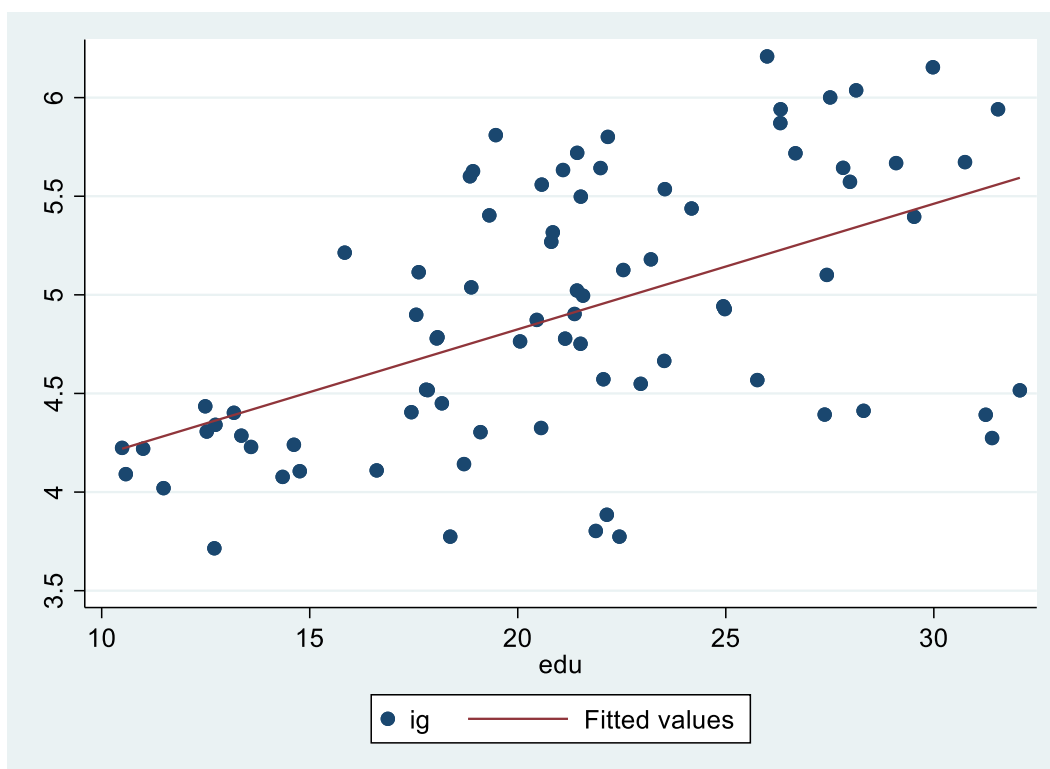


Source: Author's development.

Figure 3 depicts a scatter plot showcasing the correlation between inclusive growth (ig) and the proportion of education spending (edu). The x-axis represents the variable "edu," corresponding to the education spending percentage. The y-axis represents the variable "ig," which corresponds to the value of inclusive growth. The red regression line exhibits a positive slope, signifying a direct correlation between the percentage of education investment and inclusive growth. Consequently, an increase in the proportion of funds allocated to education leads to a corresponding rise in inclusive economic growth. The data points are dispersed around the regression line, suggesting that despite fluctuations in the data, a consistent pattern indicates that higher education expenditure is positively associated with inclusive growth. This scatter plot provides evidence that investment in education is a significant driver of inclusive economic growth. As the allocation of money towards education increases, the probability of experiencing a rise in inclusive growth also increases.

Figure 3

Scatter Plot Illustrating the Correlation between Inclusive Growth and Education Spending



Source: Author’s development.

The results of two scatter plots examining the correlation between inclusive growth and natural resource revenues and education investment reveal divergent patterns in the elements that impact inclusive growth. Consequently, panel data regression analysis with a threshold is employed to do empirical testing. This study used a panel data model with a threshold to examine the relationship between education investment and the influence of natural resource income on inclusive growth. The estimation procedure starts with the unit root test that identifies the order of integration of the variables. Table 4 illustrates the outcomes of stationarity properties of each variable. This study used the Levin, Lin, and Chu test statistics, which assume a standard unit root process. Stationarity testing with a common unit root process is believed to be more potent than the individual unit root process (Levin et al., 2002). The null hypothesis is that the data is not stationary, while the alternative hypothesis is that the data is stationary. The results of the stationarity test on the data using the Levin, Lin and Chu test show that all variables, namely ig, nr, edu, pk, and lab, have been significantly stationary at a level with a significance level of 1 per cent. This can be seen from the p-value on all variables, which is less than the test level of 0.01.

Table 4

Result of Unit Root Test

Variable	Stat. Levin, Lin, and Chu	P-value	Decision
ig	-3,8440	0,0001	Stasioner
nr	-9,1924	0,0000	Stasioner
edu	-5,6150	0,0000	Stasioner
pk	-4,0542	0,0000	Stasioner
lab	-9,8326	0,0000	Stasioner

Source: Author’s development.

The study's results with static panel, kink threshold regression, stated the threshold coefficient of 21.81 with a p-value of 0.000. This means that with a significance level of 1 per cent, it is proven that there is a threshold of education spending that significantly affects the impact of natural resource revenue on inclusive growth, which is 21.81 per cent. The kink coefficient is 0.19, with a p-value of 0.003. A positive kink coefficient indicates an increasing change when education spending exceeds the threshold. The natural resource revenue coefficient is 0.002 with a p-value of 0.247. This means that when education spending is below the threshold, natural resource revenues will not impact inclusive growth because they are not statistically significant. However, if education spending exceeds the threshold, natural resource revenues will positively impact inclusive growth. This occurs after the coefficient of the kink threshold is positive and statistically significant.

Table 5

Result of Static Panel Kink Threshold Regression

Variable	Coefficient	P-value
threshold	21,8097	0,000***
Nr	0,0022	0,247
Pk	-0,0488	0,088*
Lab	0,0619	0,168
Edu	-0,1362	0,027**
Kink	0,1908	0,003**

Note. *** p<0,01; ** p<0,05; * p<0,1

Source: Author's development.

Discussion

From the research results, it was found that although regions in East Kalimantan received significant income from natural resources, the inclusive growth index calculation results stated that no East Kalimantan region could achieve superior inclusive growth. Most East Kalimantan areas could only achieve slightly satisfactory inclusive growth. Even one area has unsatisfactory inclusive growth, namely Mahakam Ulu Regency.

Furthermore, the regression study reveals a specific threshold for education spending that significantly impacts the relationship between natural resource revenue and inclusive growth in East Kalimantan regions. This threshold is determined to be 21.81 per cent. At this threshold, there is a notable shift in the impact of natural resource revenue on inclusive growth.

During the first regime, if the proportion of education spending is less than 21.81 per cent, natural resource revenues have no impact on inclusive growth. This is because the funding allocated to the education sector is insufficient, which hinders substantial improvements in the quality and accessibility of education. Inadequate education leads to a shortage of skilled individuals, thus hindering the positive impact of natural resource revenues on broader inclusive economic development.

When education spending exceeds 21.81 per cent in the second regime, the influence of natural resource revenue on inclusive growth is further amplified. A prominent and meaningful deviation characterises this. Augmenting the allocation of natural resource revenue granted to local governments can enhance equitable growth. This demonstrates that by raising investment in education to a certain level or beyond, the advantages of natural resource revenue in promoting fairer economic growth can be maximised.

The beneficial impact of natural resource revenue aligns with the neoclassical economic growth hypothesis MRW. Mankiw et al. (1992) argue that the pace of human capital expansion benefits economic growth. Human capital plays a crucial role in facilitating the exploration of novel items or

concepts. Countries with more robust beginning human capital endowments typically experience faster economic growth. Human capital is critical to driving economic development in this growth paradigm.

Human capital, as defined in human capital theory, refers to the quantity of knowledge and skills an individual possesses for production. Investing in education is a method to enhance human capital (Diebolt & Hippe, 2019). The rationale behind this hypothesis posits that persons who have attained higher levels of education, as quantified by the duration of time spent in school, are more likely to secure higher-paying employment opportunities in comparison to those with lower levels of education. The relationship between wages and productivity is such that an increase in the number of individuals with higher education leads to a corresponding increase in productivity and economic growth at the national level. As a person's degree of education increases, so does the anticipated accumulation of human capital. Given the positive correlation between human capital and economic growth, education is also favourably connected with productivity and economic growth. Education spending is a crucial component of fiscal policy in pursuing inclusive growth development in the field of study on inclusive growth. Strategic distribution of funds for education can assist in reducing the disparity in educational opportunities between impoverished individuals and those who are not. Providing education to impoverished individuals is crucial for enhancing the quality of human capital, which is vital for economic output. Augmenting investment in education can foster elevated economic growth rates, facilitate the impoverished in breaking free from the cycle of poverty, and diminish the disparity with the affluent, promoting inclusive growth.

In the study of inclusive growth, fiscal policy through education spending plays a significant role in achieving inclusive growth progress. Allocation of education spending can help narrow the access gap between the poor and non-poor. Access to education for people with low incomes plays a vital role in improving the quality of human resources, which is essential for economic productivity. Increasing education spending can contribute to higher levels of economic growth, help the poor escape the cycle of poverty, and narrow the gap with the non-poor, thus promoting inclusive growth.

Natural resource revenue allocated to education spending above the threshold produces a combination of adequate infrastructure facilities, good school quality, and sufficient quality of educators that will make growth more inclusive. Conversely, suppose education spending is below the threshold. In that case, it will impact the limited access of low-income people to school infrastructure, good school quality, and adequate quantity and quality of teachers. This ultimately makes low-income people remain poor because they cannot improve their abilities through education. So, even though it has a large portion of natural resource revenue, it will make growth more exclusive because it is only enjoyed by a handful of people.

Regions in East Kalimantan Province are among the areas with the lowest allocation of education spending in Indonesia, only slightly higher than North Maluku, West Papua, and Papua Provinces. The lack of budget for governments in East Kalimantan in the education sector also contributes to teacher quality. There are still many uncertified teachers in the regions of East Kalimantan. The teacher certification process involves training and assessment that requires time and resources. If there are still many uncertified teachers, the government and educational institutions must allocate more resources for certification programs, requiring sufficient education budgets.

Teacher certification describes the competencies and skills teachers need to provide effective and high-quality education. The large number of uncertified teachers can hurt student learning and their academic achievement. The large number of uncertified teachers in East Kalimantan regions can exacerbate the inequality in the quality of education. The low quality of education due to the large number of uncertified teachers will hurt human resource development. This can hinder inclusive growth due to the lack of skilled and educated workers essential for equitable economic development.

So, the government in the East Kalimantan region needs to adjust the education budget to meet the threshold. This budget is prioritised for improving the quality of teachers with certification, adding

teachers according to the subjects they master, and adding supporting educational facilities and infrastructure such as laboratories and libraries that impact the quality of education. Improving the quality of educators will later produce higher-quality human capital.

The results of this study do not correspond with Wang et al. (2021), who stated that human resources can provide a crowding-out effect. The findings of this study align with the research conducted by Pham et al. (2024) on 10 Asian countries with the highest natural resource GDP, including Indonesia. The research concluded that the proper allocation of natural resources positively impacts inclusive growth, as evidenced by the positive effect of natural resource rent in these ten countries. Furthermore, a study by Raheem et al. (2018) focused on 18 Sub-Saharan African (SSA) countries with ample natural resources. Raheem et al. (2018) asserted that natural resource rent directly, substantially, and positively affects inclusive growth, as measured by per capita GRDP, in 18 Sub-Saharan African (SSA) countries. This is because the revenue generated from natural resources is allocated towards investments in education and healthcare, which enhance human capabilities and ultimately contribute to inclusive growth.

The findings of this investigation can also supplement the research carried out by Rahma et al. (2021), which asserted that East Kalimantan exhibits the most pronounced manifestation of the natural resource curse among all provinces in Indonesia. This is because East Kalimantan is deemed insufficient in generating development performance and welfare for its population, which is not commensurate with the value of the mining natural resources extracted from the region. This indicates that the natural resource revenue component can enhance inclusive growth in areas within East Kalimantan Province but with a minimal impact.

Conclusions and Implications

Based on the discussion in the previous sections, the regions in East Kalimantan Province have achieved only a moderately decent level of inclusive growth, which is still distant from the superior category. This condition can be a foundation for the Regional Government in devising development policies. The attainment of inclusive growth in regions in East Kalimantan remains limited, necessitating the enhancement of all facets of inclusive growth in the districts/cities of East Kalimantan Province. An effective strategy for improvement involves directing substantial regional natural resource revenues into investments in education. The influence of natural resource earnings on inclusive economic growth is determined by the education spending criterion, set at 21.81 per cent. If the investment in education falls below this threshold, the rise in natural resource earnings will not affect inclusive growth. On the other hand, if the amount of money allocated to education surpasses this limit, the increase in natural resource earnings will have a more significant effect on enhancing the equality of economic growth. Therefore, the East Kalimantan Regional Government can utilise the benefits of natural resources to increase the allocation of education funds. This is done primarily to finance the improvement of the quality of educators and to produce more qualified human capital in East Kalimantan.

Limitations

The primary goal of this study is to examine the relationship between natural resource revenues and inclusive growth in resource-rich regions by considering the impact of education spending thresholds. Although this study provides valuable insights, it must acknowledge certain limitations. First, the data used covers the years 2015–2022. First, this study only covers ten locations in East Kalimantan Province. Therefore, the results may not fully represent conditions in other regions, especially those with different economic and natural resource characteristics. Second, the data used covers the years 2015 to 2022. Changes in policies or economic conditions after this period may affect the relevance of the findings in a longer-term context or different economic situations. These limitations may affect the extent to which the findings of this study can be generalised to other contexts. The results of this study may be more relevant to regions with similar economic structures to East Kalimantan. They may be less applicable to areas that rely on different economic sectors. Furthermore, future changes in

policies or economic conditions may affect the relationship between natural resource revenues, education investment, and inclusive growth. Therefore, interpretation of the results of this study must be done with these limitations in mind, and further studies are needed to test the validity of these findings in different contexts and periods.

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Conflict of Interest

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References

- Afriliana, S., & Wahyudi, S. (2022). Inclusive economic growth analysis: A comparative study across provinces in Indonesia. *Journal Of Development Economic And Social Studies*, 1(1), 44–57. <https://doi.org/10.21776/jdess.2022.01.1.5>
- Ahmad, M., Peng, T., Awan, A., & Ahmed, Z. (2023). Policy framework considering resource curse, renewable energy transition, and institutional issues: Fostering sustainable development and sustainable natural resource consumption practices. *Resources Policy*, 86, Article 104173. <https://doi.org/10.1016/j.resourpol.2023.104173>
- Ahmed, K., Mahalik, M. K., & Shahbaz, M. (2016). Dynamics between economic growth, labor, capital and natural resource abundance in Iran: An application of the combined cointegration approach. *Resources Policy*, 49, 213–221. <https://doi.org/10.1016/j.resourpol.2016.06.005>
- Aslan, A., & Altinoz, B. (2021). The impact of natural resources and gross capital formation on economic growth in the context of globalization: Evidence from developing countries on the continent of Europe, Asia, Africa, and America. *Environmental Science and Pollution Research*, 28(26), 33794–33805. <https://doi.org/10.1007/s11356-021-12979-7>
- Badan Pusat Statistik. (2020, April 29). *Statistics Indonesia 2020*. <https://www.bps.go.id/id/publication/2020/04/29/e9011b3155d45d70823c141f/statistik-indonesia-2020.html>
- Ben-Salha, O., Dachraoui, H., & Sebri, M. (2021). Natural resource rents and economic growth in the top resource-abundant countries: A PMG estimation. *Resources Policy*, 74, Article 101229. <https://doi.org/10.1016/j.resourpol.2018.07.005>
- Chen, S., Hassan, M. S., Latif, A., Rafay, A., Mahmood, H., & Xu, X. (2023). Investigating resource curse/blessing hypothesis: An empirical insights from Luxembourg, the Netherlands, and Portugal economies. *Resources Policy*, 83, Article 103647. <https://doi.org/10.1016/j.resourpol.2023.103647>
- Dai, Y., Ding, Y., Fu, S., Zhang, L., Cheng, J., & Zhu, D. (2024). Analyzing the impact of natural capital on socio-economic objectives under the framework of sustainable development goals. *Environmental Impact Assessment Review*, 104, Article 107322. <https://doi.org/10.1016/j.eiar.2023.107322>
- Diebolt, C., & Hippe, R. (2019). The long-run impact of human capital on innovation and economic development in the regions of Europe. *Applied Economics*, 51(5), 542–563. <https://doi.org/10.1080/00036846.2018.1495820>

- Erdoğan, S., Yıldırım, D. Ç., & Gedikli, A. (2020). Natural resource abundance, financial development and economic growth: An investigation on Next-11 countries. *Resources Policy*, 65, Article 101559. <https://doi.org/10.1016/j.resourpol.2019.101559>
- Hordofa, T. T., Liying, S., Mughal, N., Arif, A., Minh Vu, H., & Kaur, P. (2022). Natural resources rents and economic performance: Post-COVID-19 era for G7 countries. *Resources Policy*, 75, Article 102441. <https://doi.org/10.1016/j.resourpol.2021.102441>
- Hu, Q., & Wang, L. (2024). Economic growth effects of public health expenditure in OECD countries: An empirical study using the dynamic panel threshold model. *Heliyon*, 10(4), Article e25684. <https://doi.org/10.1016/j.heliyon.2024.e25684>
- Huang, Y., & Quibria, M. G. (2013). *The global partnership for inclusive growth* [Working paper No. 2013/059]. Helsinki: UNU-WIDER. <https://www.econstor.eu/handle/10419/81052>
- Inuwa, N., Adamu, S., Hamza, Y., & Sani, M. B. (2023). Does dichotomy between resource dependence and resource abundance matters for resource curse hypothesis? New evidence from quantiles via moments. *Resources Policy*, 81, Article 103295. <https://doi.org/10.1016/j.resourpol.2023.103295>
- Islam, M. S., Parvin, R., Milon, M., & Das, M. K. (2023). The impact of gross domestic product on the Bangladesh Stock Market: An empirical analysis. *International Journal of Finance and Accounting*, 12(1), 1–12. <http://article.sapub.org/10.5923.j.ijfa.20231201.01.html>
- Klasen, S. (2010). Measuring and monitoring inclusive growth: Multiple definitions, open questions, and some constructive proposals [Working paper No. WPS102016]. Asian Development Bank. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6e1728c20ad68dd81e2b471592ac3f621386a0ea>
- Kuncoro, M., & Idris, A. N. (2015). Why growth without development occurs in East Kalimantan province?. *Journal of Development Economics: Study of Economic Problems and Development*, 11(2), 172–190. <https://doi.org/10.23917/jep.v11i2.323>
- Lashitew, A. A., & Werker, E. (2020). Do natural resources help or hinder development? Resource abundance, dependence, and the role of institutions. *Resource and Energy Economics*, 61, Article 101183. <https://doi.org/10.1016/j.reseneeco.2020.101183>
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1–24. [https://doi.org/10.1016/S0304-4076\(01\)00098-7](https://doi.org/10.1016/S0304-4076(01)00098-7)
- Maddah, M., Ghaffari Nejad, A. H., & Sargolzaee, M. (2022). Natural resources, political competition, and economic growth: An empirical evidence from dynamic panel threshold kink analysis in Iranian provinces. *Resources Policy*, 78, Article 102928. <https://doi.org/10.1016/j.resourpol.2022.102928>
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407–437. <https://doi.org/10.2307/2118477>
- McKinley, T. (2010). *Inclusive growth criteria and indicators: An inclusive growth index for diagnosis of country progress* [Working paper No. WPS102049]. Asian Development Bank. <https://www.adb.org/sites/default/files/publication/28493/adb-wp14-inclusive-growth-criteria.pdf>
- Mohamed, E. S. E. (2020). Resource rents, human development and economic growth in Sudan. *Economies*, 8(4), Article 99. <https://doi.org/10.3390/ECONOMIES8040099>

- Olayungbo, D. O. (2019). Effects of oil export revenue on economic growth in Nigeria: A time varying analysis of resource curse. *Resources Policy*, 64, Article 101469. <https://doi.org/10.1016/j.resourpol.2019.101469>
- Oyinlola, M. A., & Adedeji, A. (2019). Human capital, financial sector development and inclusive growth in sub-Saharan Africa. *Economic Change and Restructuring*, 52(1), 43–66. <https://doi.org/10.1007/s10644-017-9217-2>
- Oyinlola, M. A., Adedeji, A. A., Bolarinwa, M. O., & Olabisi, N. (2020). Governance, domestic resource mobilization, and inclusive growth in sub-Saharan Africa. *Economic Analysis and Policy*, 65, 68–88. <https://doi.org/10.1016/j.eap.2019.11.006>
- Pham, T. H. A., Lin, C. Y., Moslehpour, M., Vo, T. T. Van, Nguyen, H. T., & Nguyen, T. T. H. (2024). What role financial development and resource-curse situation play in inclusive growth of Asian countries. *Resources Policy*, 88, Article 104498. <https://doi.org/10.1016/j.resourpol.2023.104498>
- Raheem, I. D., Isah, K. O., & Adedeji, A. A. (2018). Inclusive growth, human capital development and natural resource rent in SSA. *Economic Change and Restructuring*, 51(1), 29–48. <https://doi.org/10.1007/s10644-016-9193-y>
- Rahim, S., Murshed, M., Umarbeyli, S., Kirikkaleli, D., Ahmad, M., Tufail, M., & Wahab, S. (2021). Do natural resources abundance and human capital development promote economic growth? A study on the resource curse hypothesis in Next Eleven countries. *Resources, Environment and Sustainability*, 4, Article 100018. <https://doi.org/10.1016/j.resenv.2021.100018>
- Rahma, H., Fauzi, A., Juanda, B., & Widjojanto, B. (2021). Natural resource curse phenomenon in regional development in Indonesia. *Indonesian Journal of Economics and Development*, 21(2), 148–163. <https://doi.org/10.21002/jepi.2021.10>
- Ross, M. L. (2015). What have we learned about the resource curse?. *Annual Review of Political Science*, 18(1), 239–259. <https://doi.org/10.1146/annurev-polisci-052213-040359>
- Seo, M. H., Kim, S., & Kim, Y. J. (2019). Estimation of dynamic panel threshold model using Stata. *Stata Journal*, 19(3), 685–697. <https://doi.org/10.1177/1536867X19874243>
- Sharma, C., & Paramati, S. R. (2022). Resource curse versus resource blessing: New evidence from resource capital data. *Energy Economics*, 115, Article 106350. <https://doi.org/10.1016/j.eneco.2022.106350>
- Song, M., Wang, J., & Zhao, J. (2018). Coal endowment, resource curse, and high coal-consuming industries location: Analysis based on large-scale data. *Resources, Conservation and Recycling*, 129, 333–344. <https://doi.org/10.1016/j.resconrec.2016.08.005>
- Takatsuka, H., Zeng, D. Z., & Zhao, L. (2015). Resource-based cities and the Dutch disease. *Resource and Energy Economics*, 40, 57–84. <https://doi.org/10.1016/j.reseneeco.2015.01.003>
- Umar, M., Ji, X., Kirikkaleli, D., Shahbaz, M., & Zhou, X. (2020). Environmental cost of natural resources utilization and economic growth: Can China shift some burden through globalization for sustainable development?. *Sustainable Development*, 28(6), 1678–1688. <https://doi.org/10.1002/sd.2116>
- Wang, R., Tan, J., & Yao, S. (2021). Are natural resources a blessing or a curse for economic development? The importance of energy innovations. *Resources Policy*, 72, Article 102042. <https://doi.org/10.1016/j.resourpol.2021.102042>
- Wang, J., & Tian, G. (2023). Driver or a barrier to the economy: Natural resources a blessing or a curse for developed economies?. *Resources Policy*, 87, Article 104331. <https://doi.org/10.1016/j.resourpol.2023.104331>

- Wang, J., Yang, J., & Yang, L. (2023). Do natural resources play a role in economic development? Role of institutional quality, trade openness, and FDI. *Resources Policy, 81*, Article 103294. <https://doi.org/10.1016/j.resourpol.2023.103294>
- Xu, Y., Xu, T., Huang, X., & Chu, C. C. (2024). Natural resources a curse or blessing: The story of Latin American and Caribbean economies employing bootstrap quantile method. *Resources Policy, 90*, Article 104758. <https://doi.org/10.1016/j.resourpol.2024.104758>
- Xu, X., Yu, W., Zhao, X., & Xu, W. (2023). Reassessing the linkage between natural resources and economic growth in China: Delving into the impacts of national resource taxes, renewable energy, financial advancements, and provincial fiscal expenditures. *Resources Policy, 86*, Article 104293. <https://doi.org/10.1016/j.resourpol.2023.104293>
- Zhou, Y., Lu, B., Jia, W., Huang, C., & Ma, Y. (2023). The conflict between natural resource use and welfare supply—Natural resources is a bless or a curse?. *Resources Policy, 82*, Article 103583. <https://doi.org/10.1016/j.resourpol.2023.103583>