

The Strategic Role of Defense, Investment, and Economic Sectors on Economic Growth in Eastern Indonesia: A Panel Data Approach

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Abstract

Economic stability is closely linked to the condition of security, particularly in regions where investment and sectoral development are still evolving. While previous studies tend to examine defense expenditure as a single determinant, limited attention has been given to how defense interacts simultaneously with investment and key economic sectors in shaping regional economic growth. This study explores the dynamics of economic growth in Eastern Indonesia by incorporating defense, investment, and selected sectoral variables into a unified analytical framework. A quantitative approach is applied using secondary data processed through panel data regression with EViews 13. The dataset consists of balanced panel data from 10 provinces over a ten-year period, generating 100 observations. The results reveal that defense, agriculture, and industrial sectors contribute significantly to economic growth. In contrast, the fisheries sector does not demonstrate a measurable impact despite the region's strong maritime characteristics. Similarly, investment does not show a statistically significant effect, indicating the presence of structural constraints that limit its effectiveness. These findings highlight that regional growth in Eastern Indonesia is not solely driven by resource availability, but also by how strategic sectors are managed and integrated.

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INTRODUCTION

Eastern Indonesia is widely recognized as a region endowed with abundant natural resources, including fisheries, agriculture, energy, and mining. However, this potential has not yet been fully translated into strong economic performance at the national level. Data from Statistics Indonesia (BPS) show that the contribution of Eastern Indonesia to national Gross Domestic Product (GDP) remains relatively limited, generally ranging between 15–18% during the last decade. This condition reflects persistent regional disparities between the eastern and western parts of Indonesia and indicates that resource availability alone is not sufficient to drive sustainable economic growth (Ghimire, 2023; Ullah et al., 2021), leading to persistent issues such as poverty and low-income levels (Taghvaei et al., 2023; Abrahamson & Weis, 2020).

This imbalance highlights the importance of examining not only economic variables but also structural and non-economic factors that influence regional development. In recent years, security and defense have gained increasing attention as determinants of economic stability, particularly in regions characterized by geographical challenges, border vulnerabilities, and limited infrastructure. A stable security environment plays a crucial role in supporting investment flows, ensuring the continuity of economic activities, and strengthening regional integration. Without adequate security conditions, development efforts tend to face higher risks and inefficiencies (Bassanetti et al., 2019; Brzoska et al., 2022). Widiyarini & Latuconsina (2022) state that domestic investment has a significant and positive effect on the fisheries sector, which contributes to economic growth, in the Riau Islands. However, studies on the impact of investment on economic growth in Eastern Indonesia indicate the presence of a significant research gap.

In addition to defense, the role of key economic sectors such as agriculture, fisheries, and industry, along with investment, becomes increasingly relevant in explaining regional economic dynamics. These sectors not only contribute directly to output but also function as drivers of employment, income distribution, and structural transformation. Rather than analyzing these factors in isolation, it is important to understand how they interact within a broader development framework, particularly in regions that are still undergoing economic transition. Therefore, this study seeks to explore how defense, investment, and selected economic sectors collectively shape economic growth in Eastern Indonesia.

This study seeks to address the existing gap in the literature by integrating security and economic perspectives within the context of regional development. In addition, this study is expected to provide data-driven insights for both central and regional governments in formulating development policies that are contextual, locally grounded, and sustainable. By employing a quantitative approach based on provincial panel data from Eastern Indonesia during the 2014–2023 period, this research offers empirically relevant contributions to medium- and long-term development planning. Thus, this study is not only academically significant but also practically valuable as a foundation for evidence-based policymaking to achieve equitable development and inclusive economic growth across all regions of Indonesia.

THEORETICAL REVIEW

The Impact of Defense on Economic Growth

The concepts of geopolitical strategy and defense economics have emerged to emphasize that defense-related economic decisions are heavily influenced by external threats, regional power balances, and military diplomacy (Tian et al., 2023). In Eastern Indonesia, this approach highlights the importance of defense budgets in border regions and the Arafura Sea. Although Tian et al. (2024) reports focus on global and regional perspectives, their principles are highly relevant to the Stability Development Nexus in Eastern Indonesia. Rising tensions in the Indo-Pacific region have increased the urgency of strengthening defense capabilities in maritime and border areas such as the Arafura Sea and Papua. Dunne & Smith (2020) fails to verify a reliably strong correlation between defense spending and these specific economic indicators.

Defense economics examines how budget administration affects national economies via consumption and production lenses. From a consumption viewpoint, the defense sector secures national assets, ensuring stability and even augmenting national consumption (Saputro et al., 2021). Defense budget levels are frequently calibrated according to national output, various studies confirm that Gross Domestic Product (GDP) positively influences military spending (Conrad, 2023). Thus, analyzing this link is imperative for Indonesia to enhance its defensive posture. Defense outlays may exert a negative impact on economic growth by crowding out private investment, distorting resource allocation, or diverting capital from more productive activities. Alternatively, military expenditure contributes positively to economic growth when funds are channeled into research and development, technical skill acquisition, vocational training, and the development of infrastructure that serves broader national interests. The government, particularly the Ministry of Defense, needs to develop a modernization plan for defense equipment by applying three key approaches: budgeting, investment, and procurement strategies (Siregar & Achnaf, 2022). To maximize the impact of defense spending, resources should be strategically directed toward the acquisition of weaponry, advancement of research, and the growth of the defense industry (Rasyid, 2024).

The Security Development Nexus in defense economics, as proposed by Bassanetti et al. (2019b), highlights the reciprocal relationship between security stability and economic development, especially in developing or conflict-prone regions. This approach is critical for understanding how defense spending and security policies can or cannot support sustainable economic development. Without security, economic development cannot be sustained. Brzoska et al. (2022b) further note that reducing military allocations through responsible reform can create fiscal space to increase social sector expenditures without compromising national stability.

Military expenditures, when directed productively for instance, to maintain regional stability, secure economic assets, and develop strategic infrastructure is able to foster sustained economic growth, especially within developing nations contending with significant domestic and foreign security difficulties (Dunne & Smith, 2020). In developing countries like Indonesia, Hartley & Belin (2019) show that transfer of technology from foreign military procurements can foster local industrial development provided it is

supported by robust industrialization policies and research capacity. The defense industry can also play a role in developing remote regions, establishing regional strategic industrial bases, and nurturing technical human capital.

Military expenditure can impact a nation's development through multiple pathways, including its effects on economic growth and political instability (Luqman & Antonakakis, 2021). The use of military power is highly effective in implementing a country's foreign policy, making military spending a critical component in enhancing national security. Military expenditures are often justified as a vital tool for securing territorial expansion and safeguarding economic interests (Chary & Singh, 2024). Military expenditure finances a range of costs, such as personnel salaries, large-scale weapons systems, and physical infrastructure, as well as continuous operations, training programs, and preparedness activities. Each of these components is anticipated to have distinct effects on economic growth (Becker & Dunne, 2023). Meanwhile, other empirical studies show contrasting results, indicating that military spending negatively impacts human development and economic growth, despite the favorable outcomes derived from rapid urbanization and food scarcity (Luqman & Antonakakis, 2021). Every increase of one percentage point in the military expenditure-to-GDP ratio is associated with a 1.10-percentage-point contraction in economic growth (Saeed, 2025). Using time-scale regression analysis, Khalid & Habimana (2021) demonstrated that military budgets hold a marked negative correlation with per-capita economic growth.

The Influence of the Fisheries Subsector on Economic Growth

The Fisheries Governance Theory proposed by Chuenpagdee & Jentoft (2018) emphasizes the importance of inclusive, equitable, and sustainable governance in the fisheries sector. This approach has been widely developed in the context of small-scale fisheries and has become a global reference in shaping humanistic and rights-based fisheries policies. The fisheries sector is not merely an economic and ecological system it is also a complex socio-political system. Therefore, governance cannot rely solely on technical management, it must also involve participatory processes, recognition of local rights (rights-based fisheries), and the balancing of social justice with ecosystem sustainability.

Fisheries governance is an approach that does not focus solely on technical and managerial aspects, but also on social, institutional, and normative dimensions. Chuenpagdee & Jentoft (2018) argue that effective fisheries governance must align three key elements: institutional quality, multi-level actor engagement, and the principle of social-ecological justice. Small-scale fisheries governance is primarily viewed as a complex and adaptive system (wicked problem), which necessitates participatory, inclusive, and rights-based approaches. This marks a shift from “management” to “governance,” where the state is no longer the sole actor, but instead shares responsibilities with local communities, civil society organizations, and economic actors in the fisheries sector.

This research includes exogenous variables in analyzing how defense influences economic growth. A panel data linear regression model is applied to assess the combined

effects of defense, the fisheries subsector, investment, the industrial sector, and the agricultural sector on economic growth. Consequently, this current research study adds to the defense literature by integrating these economic factors within the research framework. The fisheries subsector plays an important role by creating job opportunities and generating significant revenue through the export of fish and fish products. This sector holds considerable potential to drive economic growth and social development in rural areas (Gupta, 2019). Sustainable fishing practices are adopted to preserve fish stocks, support fishermen's welfare, boost employment, elevate the quality and market standing of marine commodities, ensure commercial stability, bolster sectoral operations, and foster macroeconomic expansion (Latuconsina et al., 2023). The Covid-19 pandemic negatively impacted the fisheries sector, leading to reduced demand, supply chain interruptions, trade limitations, and affecting the livelihoods of millions who rely on this sector. Nevertheless, the decline in fishing activity during the pandemic has contributed to the recovery of aquatic biodiversity and helped restore ecological balance necessary for the sector's long-term sustainability (Bhendarkar et al., 2025).

The Impact of Investment on Economic Growth

The development of theoretical studies on investment has shifted from a conventional, profit-oriented paradigm toward a more holistic approach grounded in social values, environmental sustainability, and local characteristics. This shift is particularly relevant for regions such as Eastern Indonesia, which require a contextual, sustainable, and inclusive investment model. Investment is seen as a key catalyst for structural transformation, moving from an agrarian economy toward industry and services. In the New Structural Economics Investment Theory, investment both public and private should be directed toward sectors with potential comparative advantages and supported by state intervention in providing infrastructure and institutions (Lin, 2015). Investment should follow the comparative advantage following strategy, in which the state acts as a facilitator rather than a market substitute. This concept emphasizes the development of integrated industrial and logistics clusters. In Eastern Indonesia, investment should be designed to stimulate sectors aligned with local strengths (e.g., fisheries, agriculture, tourism), accompanied by basic infrastructure support and regional fiscal and investment policies. Investment is not solely for financial return but also intended to generate measurable social and environmental impact. The primary focus is on sustainable development-oriented investment (GIIN, 2025).

The Place-Based Investment Theory also argues that economic investment should be adapted to local characteristics rather than based purely on national efficiency metrics. Investment should be grounded in unique local attributes such as archipelagic geography, marine potential, and indigenous cultural values rather than solely following national strategies (Rodríguez-Pose, 2022). This approach underscores the importance of local empowerment, availability of social capital, and strengthening of local institutional capacity. Investment should be directed toward environmentally friendly and low-carbon economic projects, including clean energy, waste management, and nature conservation (OECD, 2021). In this way, Eastern Indonesia has the potential to become a hub for green

investment, such as eco-tourism, sustainable fisheries, and renewable energy. Investment is regarded as one of the key tools for promoting economic growth, not merely by increasing financial assets, but also through improving reach to cutting-edge technological innovations, as well as participation in international exhibitions and festivals (Agyeman et al., 2022). Indonesia continues to depend on foreign direct investment (FDI) to support its sustainable development goals. This reliance is particularly evident in Eastern Indonesia, where sustainable infrastructure development is unlikely without foreign investment. Investment in physical capital, especially through the construction of road infrastructure, serves as a crucial driver of long-term economic growth. The external benefits of road infrastructure, as part of physical capital, play a significant role in shaping economic growth (Zhang & Cheng, 2023). Both foreign direct investment and trade openness positively affect long-term economic growth. There is a two-way causal relationship between foreign direct investment and economic growth, as well as between trade openness and foreign direct investment. Additionally, trade openness has a one-way causal effect on foreign direct investment (Banday et al., 2021).

The sectoral composition of foreign direct investment also influences its growth impact in developing countries. Investments directed toward manufacturing have a positive and statistically significant influence on economic growth. In contrast, investments in the tertiary sector have a statistically significant negative impact, while investments in the primary sector show a negative but minimal effect on economic growth. Greater foreign direct investment in manufacturing tends to drive stronger economic growth (Emako et al., 2022). In some cases, foreign direct investment in the primary sector has shown a positive and significant impact on economic growth, whereas investments in the secondary and tertiary sectors have had little to no influence (Taylor, 2020). Investments in manufacturing and the oil industry positively contribute to the economy, unlike investments in the financial sector, retail trade, telecommunications, and technology, which tend to have a significant negative effect on economic performance (Ingham et al., 2020).

The Influence of the Agricultural Sector on Economic Growth

The agricultural sector in Eastern Indonesia has characteristics that differ from those in the western region, in terms of natural resources, socio-economic conditions, and institutional aspects. In general, agriculture in this region is still dominated by traditional and smallholder farming systems, with relatively low productivity and limited access to technology and markets. From the perspective of agricultural development theory, this condition can be explained through the concept of adaptive modernization. This approach critiques the classical modernization model, which is linear and uniform, and emphasizes that agricultural transformation should be gradual, contextual, and based on local conditions. This aligns with findings that agricultural modernization is influenced not only by technology but also by structural and cultural factors embedded within farming communities (S. Ali & Amrullah, 2023).

The phenomenon of low agricultural productivity in Eastern Indonesia cannot be separated from the limited capacity of farmers and their minimal access to innovation.

Recent studies indicate that low farmer capacity directly affects the low productivity of farming activities, highlighting the need for region-based empowerment approaches and gradual capacity building (Wang et al., 2023). This reinforces the view that modernization cannot be achieved instantly, but rather through a continuous process of improving the quality of agricultural human resources. In addition, the adoption of modern agricultural technology in this region tends to be slow. Modernization programs such as mechanization and digitalization are capable of improving efficiency and productivity; however, their implementation remains limited to certain areas and has not been evenly distributed (Rachmawati, 2021). These limitations are caused by various factors, including low levels of farmer education, limited capital, and insufficient support through agricultural extension services (Junaidi, 2024). Therefore, the moderate modernization approach emphasizes the importance of appropriate technology that aligns with local conditions.

Another prominent phenomenon is the strong influence of institutional and social factors in the agricultural system of Eastern Indonesia. Farmer institutions, such as farmer groups, play an important role in supporting the adoption of innovation and the management of agricultural resources. However, weak institutional capacity often becomes a constraint in the agricultural modernization process (Kamaruddin et al., 2025; Nur'aini et al., 2025). Agricultural institutional theory emphasizes that the success of agricultural development is largely determined by the effectiveness of local organizations and community social networks. On the other hand, the experience of agricultural modernization in Indonesia during the Green Revolution shows that modernization approaches that are too rapid and not context-specific can create dependency and even worsen the conditions of smallholder farmers (Gultom & Harianto, 2021). Therefore, a moderate modernization approach becomes more relevant, as it integrates technology with local wisdom while also considering environmental sustainability aspects. This moderate agricultural modernization framework is the most appropriate, as it explains that delays in agricultural transformation are not a failure, but rather a process of adaptation to existing limitations and local conditions.

The development of theoretical studies on the agricultural sector reflects a paradigm shift in modern agriculture from merely increasing crop yields to becoming an instrument for sustainable development, food security, and local economic transformation. The classical concept of agricultural transformation, as developed by Christiaensen & Martin (2018), explains the structural change in agriculture from subsistence-based systems to commercial and technology-intensive systems. In the modern technological era, agriculture is no longer seen solely as a source of food production, but also as a foundation for poverty reduction and a driver of rural economic growth. The role of natural resources in achieving economic growth targets cannot be overlooked in any country (J. Han et al., 2022), especially the agricultural sector, which is one of the most important sectors for economic development (Magrini, 2021), capable of increasing employment opportunities and alleviating poverty levels (Jie & Lan, 2024).

The Influence of the Industrial Sector on Economic Growth

The development of approaches in the industrial sector reflects a global shift toward digital, green, and inclusive industrial transformation and its impact on economic development in developing countries such as Indonesia. The Industry 4.0 and Smart Manufacturing Theory proposed by Schwab & Davis (2018) defines industrial transformation based on automation, the Internet of Things (IoT), Artificial Intelligence (AI), and data analytics. Factories are becoming smarter and more efficient through systemic connectivity and real-time decision-making based on big data. Indonesia has adopted this concept through the “Making Indonesia 4.0” roadmap, which aims to position five industrial sectors (food, textiles, automotive, chemicals, and electronics) as drivers of a new economy.

Altenburg & Assmann (2017) introduced the Green Industrialization Theory, which shifts the industrial growth paradigm from resource-intensive and polluting practices toward environmentally friendly, energy-efficient, and circular industries. This approach is highly suitable for developing green industrial zones in Eastern Indonesia, a region rich in biodiversity and renewable energy potential. Industrial development should not solely pursue economic growth but must also be socially inclusive and environmentally sustainable. This approach is particularly important to implement in Eastern Indonesia, where high poverty rates, infrastructure limitations, and the need for local value creation through industrial downstreaming are key issues. The Regional Industrialization and Economic Catch-up Theory, as proposed by Storper & Scott (2009), explains how lagging regions can catch up industrially through regional policies such as fiscal incentives, connectivity infrastructure, and resource-based industrial agglomeration. Eastern Indonesia experiences industrial lag due to infrastructure disparities and low investment in the secondary sector. This approach can be used to promote regional industrialization based on comparative advantages.

The Digital Industrial Ecosystem Theory, proposed by Liao et al. (2017), highlights the importance of developing a collaborative digital industrial ecosystem involving government, private sector, state-owned enterprises, startups, and research and development institutions. It emphasizes the integration of traditional industries with technology startups. The evolution of industrial sector approaches has shifted from a focus on production efficiency to one of structural transformation that is digital, inclusive, and sustainable. Applying these approaches is highly relevant for promoting downstream industrialization, reducing regional disparities, and strengthening the local economic competitiveness of Eastern Indonesia. Industrial development plays a vital role in boosting per capita income and driving national growth. This transition is fueled by the movement of labor from farming to manufacturing, alongside the reduced bargaining power of unions, which allows firms greater flexibility in allocating capital between urban and rural settings (Rota & Spinesi, 2024).

METHODS

Research Method

This study employs a quantitative approach to examine the relationship between defense, key economic sectors, and economic growth in Eastern Indonesia. Using balanced panel data from ten provinces over the 2014–2023 period (100 observations), the analysis applies panel data regression estimated with EViews 13. Although panel regression is well-established in social science research, its application to the defense–regional growth nexus remains comparatively limited.

Data Collection Techniques

This study adopts a causal associative design within a quantitative research framework. The data source used is secondary data, obtained from Statistics Indonesia (BPS) published through the website www.bps.go.id, the Ministry of Marine Affairs and Fisheries (KKP) published through <https://portaldata.kkp.go.id/>, and the Ministry of Defense of the Republic of Indonesia. The following are the definitions of the variables used in this study:

Table 1. Variable Operational Definition

Variable	Indicator	Source	Scale
Defense	Budget realization for tasks used for defense of the Eastern Indonesian Archipelagic Sea Lane (Rp.)	Ministry of Defense of the Republic of Indonesia	Ratio
Fisheries Sub-sector	Fisheries sub-sector in marine capture fisheries production (Tonnes)	Ministry of Marine Affairs and Fisheries of the Republic of Indonesia	Ratio
Investment	Gross Fixed Capital Formation (IDR Billion)	BPS	Ratio
Agricultural Sector	Agricultural Sector (Rp. Billion)	BPS	Ratio
Industrial Sector	Industrial Sector (Rp. Billion)	BPS	Ratio
Economic Growth	Gross Regional Domestic Product Growth Rate at Constant Prices (%)	BPS	Ratio

Source: Collected from various sources by researchers, 2026

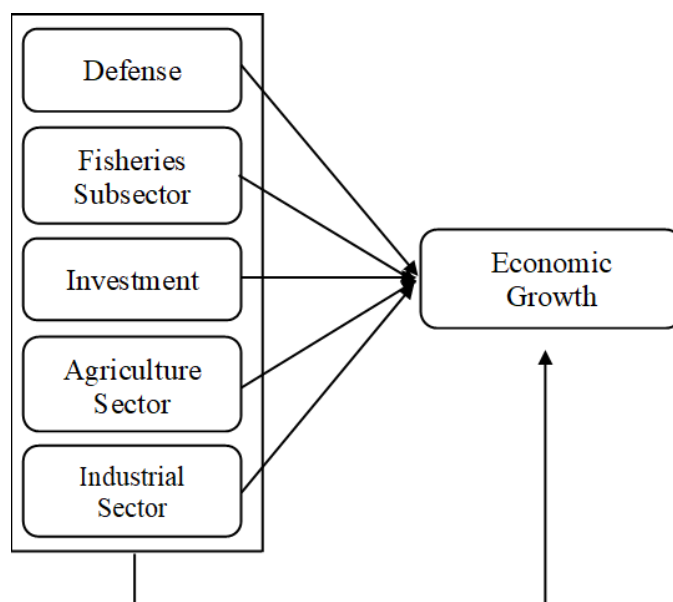
Data Analysis

Statistical analysis is conducted using EViews 13, including descriptive statistics, stationarity testing, correlation analysis, and multiple regression estimation. The steps in this research are as follows:

Step I

Determine the path diagram based on the variable relationship paradigm below.

Figure 1. Research Paradigm



Source: Processed by Researcher, 2026

This figure explains that economic growth is influenced by five main sectors: defense, the fisheries subsector, investment, the agricultural sector, and the industrial sector. Each independent variable is assumed to contribute, either partially or simultaneously, to increasing economic growth. This conceptual framework illustrates the causal relationship between several strategic sectors and economic growth as the dependent variable. This model emphasizes that economic development is not influenced by a single factor, but rather the result of the interaction of various key sectors within the economy.

Step II

Determine the structural equation as follows:

$$\ln y = \beta_0 + \beta_{x1y1} \ln x_1 + \beta_{x2y1} \ln x_2 + \beta_{x3y1} \ln x_3 + \beta_{x4y1} \ln x_4 + \beta_{x5y1} \ln x_5 + \varepsilon$$

Description:

x_1 = Defense

x_2 = Fisheries Subsector

x_3 = Investment

x_4 = Agriculture Sector

x_5 = Industrial Sector

y = Economic Growth

Step III

Analyze using 5 steps, namely analysis for substructural 1, substructural 2, substructural 3, substructural 4 and substructural 5.

RESULT AND DISCUSSION

Descriptive Statistics Analysis

Descriptive statistical analysis is used to determine the data picture of the variables used in a study by looking at the average value (*mean*), maximum value (*maximum*), minimum value (*minimum*), and the number of observations (*observations*). The following data picture is obtained:

Table 2. Descriptive Statistics

	Economic Growth	Defense	Fisheries Subsector	Investment	Agriculture Sector	Industrial Sector
Mean	5.786200	55.78472	262310.6	35525.38	18947.44	11377.98
Median	5.615000	35.01762	240729.0	30386.21	15327.15	4636.760
Maximum	22.94000	277.0391	618004.0	145390.8	72226.30	71086.17
Minimum	-15.72000	10.23555	101861.0	5251.230	3293.150	647.0400
Observations	100	100	100	100	100	100

Source: Data processed by researchers, 2026

Table 2 presents descriptive statistics for 100 balanced panel observations across ten Eastern Indonesian provinces over the 2014–2023 period. Economic growth averaged 5.78%, ranging from –15.72% — recorded during the COVID-19 pandemic — to a peak of 22.94%. Defense expenditure averaged 55.78 billion (min: IDR 10.23 billion; max: 277.03 billion), while marine capture fisheries production averaged 262,310.6 tonnes (min: 101,861; max: 618,004). Investment averaged 35,525.38 billion (min: 5,251.23 billion; max: 145,390.80 billion). The agricultural and industrial sectors recorded mean values of 18,947.44 billion (min: 3,293.15 billion; max: 72,226.30 billion) and 11,377.98 billion (min: 647.04 billion; max: 71,086.17 billion), respectively. The wide range observed across all variables reflects substantial cross-provincial heterogeneity in economic and sectoral performance throughout the study period.

Data Analysis Results

This section explains the results of the statistical data analysis regarding the strategic role of defense, investment, and the performance of economic sectors on economic growth in Eastern Indonesia. The results of the inferential analysis obtained during the 2014–2023 observation period are as follows:

Table 3. Multiple Regression Analysis

Variabel	All Observation with Economic Growth as Dependent			
	Level	First Difference	Second Difference	Fixed Effect Model
Defense	1,512*** (1,395)	-0,145*** (1,202)	-0,710*** (0,790)	0,662*** (0,689)
Fisheries Subsector	0,139*** (1,692)	0,674*** (1,531)	-0,074*** (0,990)	0,976*** (1,606)
Investment	0,371* (2,569)	1,280* (3,309)	-1,175*** (2,898)	0,856* (3,169)
Agriculture Sector	-5,365	1,196**	2,438***	0,624**

	(1,794)	(3,337)	(2,595)	(3,206)
Industrial Sector	3,347	2,995**	0,238***	3,989**
	(1,235)	(1,857)	(1,211)	(0,991)
Constant	-13,478	5,397	5,631	-28,786
Adjusted R-squared	0,350	0,192	0,151	0,326

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Data processed by researchers, 2026

The Multiple regression analysis table 3 above presents the results of a multiple linear regression analysis using the Fixed Effect Model, which can be used to examine the strategic role of defense, investment, and economic sectors on economic growth in Eastern Indonesia, as described below:

$$Y = -28,786 + 0,662 x_1 + 0,976 x_2 + 0,856 x_3 + 0,624 x_4 + 3,989 x_5 + \varepsilon$$

The estimated coefficients indicate that defense ($\beta_1 = 0.662$), fisheries ($\beta_2 = 0.976$), investment ($\beta_3 = 0.856$), and agriculture ($\beta_4 = 0.624$) exhibit inelastic relationships with economic growth ($E < 1$), implying that a one-unit increase in each variable produces a less-than-proportional change in output. In contrast, the industrial sector ($\beta_5 = 3.989$) demonstrates an elastic relationship ($E > 1$), suggesting that industrial expansion exerts a disproportionately large effect on regional economic growth.

The Strategic Role of Defense in Economic Growth

The findings indicate that the relationship between defense and economic growth tends to be inelastic. Changes in defense strategy will lead to an increase or decrease in economic growth in Eastern Indonesia by 66.20 percent. Defense plays a crucial role in advancing development and improving societal welfare. It is not only focused on military aspects but also contributes to achieving socio-economic prosperity in the region. The findings of this study are consistent with those of (Rasyid, 2024), which state that strengthening the defense system is not only related to maintaining physical security in a region but also to ensuring regional stability.

Various studies have linked defense to economics and politics. Latuconsina et al. (2023) investigated the intersection of defense and economic sectors, both viewed as critical determinants of economic growth. Their findings indicate that defense exerts a positive and significant impact on economic growth within Eastern Indonesia. The political economy of defense serves as a framework to evaluate governmental policies, processes, and challenges, spanning from national security imperatives to the broader pursuit of global stability (Matthews, 2019). A nation's economic, political, and military capacity can be leveraged to command maritime domains for domestic advantage (use of the sea) while simultaneously preventing adversaries from exploiting these waters to the nation's detriment (sea denial) (Soedarto & Sumakul, 2015). Defense mechanisms safeguard national resources against diverse threats, thereby stabilizing or potentially

enhancing national consumption (Saputro et al., 2021). While the interplay between public debt and military expenditure may impede economic growth, official development assistance and government scale have proven to bolster it (Kengdo, 2023). Conversely, military spending the foundation of national defense is often considered less productive than allocations toward agriculture, banking, or industry (Nugroho & Purwanti, 2021). Indonesia's maritime defense strategy is essential due to the presence of significant external threats. Illegal activities in domestic waters, including piracy, terrorism, human trafficking, and illicit fishing, necessitate more advanced naval assets to effectively bypass detection and maintain maritime sovereignty (Siregar & Achraf, 2022).

The Influence of the Fisheries Subsector on Economic Growth

The fisheries sector positively contributes to economic growth, though its impact varies regionally. Eastern Indonesia holds 60–70% of national fish resources and serves as a key production hub, particularly in WPP 715 and 718. The sector contributes over 10% to regional GDP in provinces such as Maluku and North Maluku, while also supporting coastal employment. However, its contribution remains subject to structural constraints and national policy dynamics (BPS, 2024), around 20–30% of the labor force in coastal areas of Eastern Indonesia rely on fisheries activities, both capture and aquaculture.

The large potential of the fisheries subsector does not mean it is free from constraints and challenges. These include the lack of fisheries infrastructure, such as fishing ports, cold storage facilities, and seafood processing industries. Furthermore, illegal, unreported, and unregulated (IUU) fishing especially by foreign vessels in the Arafura Sea has caused significant economic losses and hindered the sustainability of fish resources. Another challenge is the policy banning transshipment and foreign vessels issued by the Ministry of Marine Affairs and Fisheries between 2015–2019, which led to a decline in capture fishery production volume in several areas, even though it aimed for long-term conservation. A similarly critical constraint is limited market access and supply chain connectivity, mainly due to high logistics costs and the lack of integration between upstream and downstream industries.

However, the development of the fisheries sector has not been very significant, contributing only 2.65% to Indonesia's GDP (Arrazy & Primadini, 2021). Rigorous national lockdowns exerted adverse effects on the distribution, production, and marketing operations within the inland and marine capture fisheries sectors, along with seed procurement and the exportation of seafood (Purkait et al., 2020). This situation also negatively affected the livelihoods of millions who rely on this sector (Bhendarkar et al., 2025).

Additionally, there were limitations on transportation to markets, export restrictions for fish and fish products, and a decline in fish prices (Alam et al., 2022). Fisheries contribute significantly to national economic indicators, food security, and labor market participation. Considering the importance of public capital in fostering the expansion of this field, increased state-directed investment is necessary (Alsaleh, 2023). This sector could function as a primary driver of rural economic growth and social progress (H. Han & Chen, 2024). Thus, developing a sustainable maritime economy stands

as one of the preeminent challenges and prospects of the modern era (Agustino et al., 2023), a challenge that is international in nature (Latuconsina et al., 2023; Witbooi et al., 2020).

The Impact of Investment on Economic Growth

The analysis indicates that investment is positively associated with economic growth, although its contribution appears relatively limited. The relationship between investment and economic growth is inelastic. Investment plays a critical role in increasing production capacity, creating employment opportunities, strengthening economic infrastructure, and generating multiplier effects in other sectors. According to data from BKPM (BKPM, 2024), during the research period, investment realization in Eastern Indonesia showed an upward trend, but its contribution remained low, accounting for only about 15–17% of total national investment. Investment has had a positive impact on economic growth in Eastern Indonesia, particularly in provinces that have successfully attracted large-scale investment and possess adequate infrastructure and regulatory readiness. Nevertheless, the investment potential in this region has not been fully realized due to structural, geographical, and institutional constraints. To optimize the contribution of investment to economic growth in the future, affirmative policies are needed, along with the acceleration of basic infrastructure development, improving the quality of local human resources, alongside developing a productive business atmosphere at every provincial, district, and city jurisdiction within the regional area.

Investment has a direct impact on economic growth by increasing capital stock (capital accumulation), it drives the development of infrastructure and production facilities that expand economic output capacity. The investment multiplier effect creates jobs, raises household incomes, and stimulates consumption and supporting sectors such as trade and services. Technology transfer and human resource development from foreign direct investment (FDI) can introduce new technologies, modern management systems, and training for local labor. Although investment shows an upward trend, its influence on economic growth in Eastern Indonesia has not yet reached optimal levels. Several barriers and constraints to investment include high logistics and energy costs due to uneven infrastructure. Security levels and legal certainty remain a concern for investors, especially in Papua and border regions. Furthermore, the availability of skilled labor is limited, leading large industries to often recruit workers from outside the region. Other issues include limited support from the business ecosystem, such as access to banking, local supply chains, and ease of licensing at the regional level.

Foreign direct investment and human capital function as essential pillars for sustainable economic growth by facilitating capital reserves, generating foreign exchange revenue, supporting technology integration, and improving overall productivity (Dankyi et al., 2022). Foreign direct investment has stimulated economic growth in many regions, whereas trade openness proved less effective, given that most developing economies must still invest in industrialization and prioritize export-driven economic growth (Zaman et al., 2021).

The Influence of the Agricultural Sector on Economic Growth

The findings highlight that the agricultural sector plays an important role in supporting economic growth in Eastern Indonesia. The agricultural sector is the main backbone of the economy in most provinces of Eastern Indonesia. It serves a crucial function in job creation, livelihoods, and raw materials for the processing industry. In regions such as East Nusa Tenggara (NTT), Maluku, Papua, Southeast Sulawesi, and Central Sulawesi, the agricultural sector absorbs more than 30% of the labor force and is a dominant contributor to Regional Gross Domestic Product. As stated by Statistics Indonesia (BPS, 2024), the contribution of agriculture to PDRB in Eastern Indonesian provinces averages between 20% and 35%, depending on regional characteristics.

The agricultural sector contributes positively to economic growth in Eastern Indonesia. It plays a key role as an economic stabilizer, supporting regional economies when other sectors such as industry or mining are underperforming. During the Covid-19 pandemic, agriculture continued to grow positively and served as a buffer for local economies. The sector absorbs a large proportion of the informal workforce and women, contributing to poverty reduction in rural and underdeveloped regions. Additionally, it serves as the foundation for local industries such as horticultural processing, rice milling, and local food/fruit canning, thus supporting domestic food security, especially in border areas like Papua and NTT which face high logistical dependency.

Agriculture in Eastern Indonesia still faces a range of structural challenges, including low productivity due to limited mechanization, technology, and irrigation infrastructure. Weather conditions are an unavoidable issue, with farming highly dependent on seasonal planting patterns and vulnerable to climate change and drought. Another problem is limited market access, particularly in remote areas and small islands. The sector also suffers from low value addition due to underdeveloped post-harvest processing industries and limited capital and agricultural financing, especially for smallholder farmers. Policies relevant to Eastern Indonesia's current conditions include the development of area-based agriculture and downstream processing as priorities.

The agricultural sector has a significantly positive influence on economic growth in Eastern Indonesia, particularly in areas that have not yet undergone industrialization. Nonetheless, its role remains limited to providing employment and basic income. To position agriculture as a sustainable driver of regional economic growth, structural transformation is needed through improved technology, infrastructure, market access, and strengthening of farmer institutions. Strengthening the agricultural subsector is critical for catalyzing the economy and guaranteeing steady food access (Q. Ali et al., 2020). While subsidies help farmers maintain sustainability, they may inadvertently drive economic inefficiency. Spatially, farm subsidies exert a positive and significant influence on both economic growth and the surrounding environment (Bernini & Galli, 2024).

The Influence of the Industrial Sector on Economic Growth

The results demonstrate that the industrial sector contributes positively to regional economic growth. Changes in the industrial sector, whether increasing or decreasing, tend to show an inelastic relationship with economic growth. The industrial sector serves as a

key driver (engine of growth) in the structural transformation process from a primary-based economy (agriculture and fisheries) to a secondary economy (manufacturing). Industry enhances the value of local resources, expands employment opportunities, and creates inter-sectoral linkages that support sustainable regional economic growth. The manufacturing sector plays an increasingly significant role in several provinces in Eastern Indonesia, although its contribution to regional GDP remains relatively low compared to the primary sector. On average, the industrial sector's contribution to GDP in Eastern Indonesia is still below 10%, far behind Western Indonesia.

Despite its considerable potential, the fisheries subsector faces several significant challenges. These include inadequate infrastructure, such as fishing ports, cold storage, and processing facilities. In addition, illegal, unreported, and unregulated (IUU) fishing—particularly by foreign vessels in the Arafura Sea—has resulted in substantial economic losses and threatened resource sustainability. Policy measures implemented between 2015 and 2019, including bans on transshipment and foreign vessels, also led to declines in capture fishery production in some areas, despite their long-term conservation objectives. Furthermore, limited market access and weak supply chain connectivity, driven by high logistics costs and poor integration between upstream and downstream sectors, remain critical constraints.

Scholars have established that the industrial sector possesses the capacity to boost per capita wealth and propel economic growth. The movement of the workforce from agriculture toward manufacturing within rural zones, combined with diminished union power regarding firm decisions on capital distribution across urban and rural sites, acts as a primary factor in elevating income levels (Rota & Spinesi, 2024; Kwakwa, 2023; Sun et al., 2022).

CONCLUSION, RECOMMENDATIONS, AND LIMITATIONS

This study empirically examines the relationship between defense, investment, key economic sectors, and economic growth in Eastern Indonesia. The results indicate that defense, agriculture, and industry significantly contribute to regional economic performance through their effects on stability, production capacity, and structural transformation. Conversely, the fisheries sector and investment yield no statistically significant impact, reflecting persistent structural constraints including infrastructure deficits, weak supply chain integration, and uneven regional development.

These findings underscore that regional economic growth is shaped not only by resource endowments but also by the quality of sectoral governance and the security environment. Defense, in particular, functions as a developmental enabler beyond its conventional military role. Accordingly, future policies should prioritize the integration of security strategies with economic development planning, supported by stronger central–regional coordination to translate stability into inclusive and sustainable growth.

This study acknowledges limitations inherent to secondary data and quantitative methods, which may inadequately capture institutional dynamics and local socioeconomic contexts. Future research employing mixed methods or expanded datasets would offer a more nuanced understanding of regional development trajectories.

REFERENCES

- Abrahamson, W. G., & Weis, A. E. (2020). Evolutionary ecology across three trophic levels: goldenrods, gallmakers, and natural enemies. In *Evolutionary Ecology across Three Trophic Levels*. Princeton University Press.
- Agustino, R., Susilastuti, D., & Sugiyanto, S. (2023). Influence Of Fishery Resources, Good Governance, and Human Resources to Economic Sustainability Through Fishery Performance Using Pathway Analysis. *JIM: Scientific Journal of History Education Students*, 8(4), 4228–4237.
- Agyeman, G., Sakyi, D., & Oteng-Abayie, E. F. (2022). External debt and economic growth in selected sub-Saharan African countries: The role of capital flight. *Research in Globalization*, 5, 100091.
- Alam, G. M. M., Sarker, M. N. I., Gatto, M., Bhandari, H., & Naziri, D. (2022). Impacts of COVID-19 on the fisheries and aquaculture sector in developing countries and ways forward. *Sustainability*, 14(3), 1071.
- Ali, Q., Raza, A., Narjis, S., Saeed, S., & Khan, M. T. I. (2020). Potential of renewable energy, agriculture, and financial sector for the economic growth: Evidence from politically free, partly free and not free countries. *Renewable Energy*, 162, 934–947.
- Ali, S., & Amrullah, A. (2023). Modernitas Petani: Tingkat Modernitas Serta Hambatan Struktural Dan Budaya dalam Agribisnis Padi. *Journal of Agricultural Socioeconomics*, 20(1), 51–64. <https://doi.org/10.20956/jsep.v20i1.22620>
- Alsaleh, M. (2023). The role of the fishery industry in the shift towards sustainable food security: a critical study of blue food. *Environmental Science and Pollution Research*, 30(48), 105575–105594.
- Altenburg, T., & Assmann, C. (2017). Green industrial policy. *Concept, Policies, Country Expe-Riences*. Geneva, Bonn: UN Environment.
- Amin, C., Hasyim, A. W., Sun'an, M., Hilman, R. M., & Fahmiasari, H. (2024). Impact of increasing local economic capacity on reducing maritime logistics costs in island Province of eastern Indonesia: A dynamic system approach. *Transportation Research Interdisciplinary Perspectives*, 27, 101195.
- Arrazy, M., & Primadini, R. (2021). Potential of the fisheries subsector in provinces in Indonesia. *Bina Bangsa Ekonomika Journal*, 14(1), 1–13.
- Banday, U. J., Murugan, S., & Maryam, J. (2021). Foreign direct investment, trade openness and economic growth in BRICS countries: evidences from panel data. *Transnational Corporations Review*, 13(2), 211–221.
- Bassanetti, A., Cottarelli, C., & Presbitero, A. F. (2019). Lost and found: market access and public debt dynamics. *Oxford Economic Papers*, 71(2), 445–471.
- Becker, J., & Dunne, J. P. (2023). Military spending composition and economic growth. *Defence and Peace Economics*, 34(3), 259–271.
- Bernini, C., & Galli, F. (2024). Economic and environmental efficiency, subsidies and spatio-temporal effects in agriculture. *Ecological Economics*, 218, 108120.

- Bhendarkar, M., Canals, O., Jurado, C., Mendibil, I., Uriarte, A., Borja, A., & Rodríguez-Ezpeleta, N. (2025). Advancing ecological assessment: towards the integration of eDNA metabarcoding into an estuarine fish index. *Ecological Indicators*, 181, 114464.
- BKPM. (2024, October 15). *Rosan : Investment Realization Continues to Grow, Indonesia Consistently Implements Downstream Processing*. <https://www.bkpm.go.id/index.php/id/info/siaran-pers/rosan-realisasi-investasi-terus-bertumbuh-indonesia-konsisten-jalankan-hilirisasi> < accessed on April 1, 2026>
- BPS. (2024). *Indonesian Statistics 2024*. Central Statistics Agency.
- Brzoska, M., Omitoogun, W., & Sköns, E. (2022). *The human security case for rebalancing military expenditure*. Sipri.
- Chary, S., & Singh, N. (2024). On the role of military spending: an economic thought perspective. *Cogent Social Sciences*, 10(1), 2350837.
- Christiaensen, L., & Martin, W. (2018). Agriculture, structural transformation and poverty reduction: Eight new insights. In *World Development* (Vol. 109, pp. 413–416). Elsevier.
- Chuenpagdee, R., & Jentoft, S. (2018). Transforming the governance of small-scale fisheries. *Maritime Studies*, 17(1), 101–115.
- Conrad, J. (2023). Natural Resource Exploitation and Military Spending. *International Studies Quarterly*, 67(3), sqad061.
- Dankyi, A. B., Abban, O. J., Yusheng, K., & Coulibaly, T. P. (2022). Human capital, foreign direct investment, and economic growth: Evidence from ECOWAS in a decomposed income level panel. *Environmental Challenges*, 9, 100602.
- Dunne, J. P., & Smith, R. P. (2020). Military Expenditure, Investment and Growth. *Defence and Peace Economics*, 31(6), 601–614. <https://doi.org/10.1080/10242694.2019.1636182>
- Emako, E., Nuru, S., & Menza, M. (2022). The effect of foreign direct investment on economic growth in developing countries. *Transnational Corporations Review*, 14(4), 382–401.
- Ghimire, B. J. (2023). Three pillars of sustainable development: Challenges versus achievements. *Journey for Sustainable Development and Peace Journal*, 1(02), 132–146.
- Gultom, F., & Harianto, S. (2021). The Green Revolution Transforms the Socio-Economic Conditions of Farming Communities. *TEMALI: Journal of Social Development*, 4(2), 145–154. <https://doi.org/10.15575/jt.v4i2.12579>
- Gupta, K. (2019). A Descriptive Analysis of Fisheries Sector in Haryana. *Garg, Ishu and Gupta, Karnika (2019), "A Descriptive Analysis of Fisheries Sector in Haryana", Apeejay Journal of Management & Technology (Apeejay Institute of Management & Engineering Technical Campus, Jalandhar, Punjab, India), 14(1), 37–45.*
- Han, H., & Chen, Z. (2024). The impact of socio-economic factors on the decline of fishery resources. *International Journal of Marine Science*, 14.

- Han, J., Raghutla, C., Chittedi, K. R., Tan, Z., & Koondhar, M. A. (2022). How natural resources affect financial development? Fresh evidence from top-10 natural resource abundant countries. *Resources Policy*, 76, 102647.
- Hartley, K., & Belin, J. (2019). *The economics of the global defence industry*. Routledge.
- Ingham, H., Read, R., & Elkomy, S. (2020). Aggregate and heterogeneous sectoral growth effects of foreign direct investment in Egypt. *Review of Development Economics*, 24(4), 1511–1528.
- Jie, Y., & Lan, J. (2024). Dynamic linkages between human capital, natural resources, and economic growth–Impact on achieving sustainable development goals. *Heliyon*, 10(14).
- Junaidi, J. (2024). The Importance Of Agricultural Instructors In Sharing Millennial Farmers' Interest With The Intervening Variable Of Agriculture Technology Modernization In The Sawit Seberang Prosperous Farmer Group. *Journal of Economics*, 13(02), 647–658. <https://ejournal.seaninstitute.or.id/index.php/Ekonomi/article/view/4457>
- Kamaruddin, S. W., Zulkifli, Z., & Akbar, A. (2025). Strengthening Farmer Institutions in Rice Farming: An Interpretive Structural Modeling Approach. *Indonesian Journal of Agricultural Sciences*, 30(4), 703–711. <https://doi.org/10.18343/jipi.30.4.703>
- Kengdo, A. A. N. (2023). Military spending, public debt, and economic growth in Cameroon. *Sustainable Futures*, 6, 100131. <https://doi.org/10.1016/j.sftr.2023.100131>
- Khalid, U., & Habimana, O. (2021). Military spending and economic growth in Turkey: A wavelet approach. *Defence and Peace Economics*, 32(3), 362–376.
- Kwakwa, P. A. (2023). Sectoral growth and carbon dioxide emission in Africa: can renewable energy mitigate the effect? *Research in Globalization*, 6, 100130.
- Latuconsina, S., Susilastuti, D., Meirinaldi, M., & Widiyarini, W. (2023). The Contribution of Fisheries Subsector Performance in Increasing Economic Growth in The Eastern Indonesia Region. *Return: Study of Management, Economic and Bussines*, 2(12), 1255–1262.
- Liao, Y., Deschamps, F., Rocha Loures, E., & Ramos, L. (2017). Past, present and future of Industry 4.0 - a systematic literature review and research agenda proposal. *International Journal of Production Research*, 55. <https://doi.org/10.1080/00207543.2017.1308576>
- Lin, J. Y. (2015). *The quest for prosperity: How developing economies can take off*. Princeton University Press.
- Luqman, M., & Antonakakis, N. (2021). Guns better than butter in Pakistan? The dilemma of military expenditure, human development, and economic growth. *Technological Forecasting and Social Change*, 173, 121143.
- Magrini, A. (2021). A stochastic frontier model to assess agricultural eco-efficiency of European countries in 1990-2019. *International Journal of Statistics and Probability*, 10, 138–156.
- Matthews, R. (2019). *The Political Economy of Defence*. Cambridge University Press.

- Nugroho, D. A., & Purwanti, E. Y. (2021). Impact of military expenditure on economic growth encouraging or constraining? *JEJAK: Journal of Economics and Policy*, 14(1), 9–20.
- Nur'aini, L. G., Endaryanto, T., & Affandi, M. I. (2025). Transformation of the Agricultural Sector in Sulawesi Island: A Panel Data Approach. *Indonesian Journal of Agricultural Sciences*, 30(4), 773–779. <https://doi.org/10.18343/jipi.30.4.773>
- OECD. (2021). *Green Finance and Investment*. https://www.oecd.org/en/publications/green-finance-and-investment_24090344.html< accessed on July 5, 2025>.
- Purkait, S., Karmakar, S., Chowdhury, S., Mali, P., & Sau, S. K. (2020). Impacts of novel coronavirus (COVID-19) pandemic on fisheries sector in India: A minireview. *Indian J. Pure Appl. Biosci*, 8(3), 487–492.
- Rachmawati, R. R. (2021). Smart Farming 4.0 To Realize Advanced, Independent, and Modern Indonesian Agriculture. *Agro-Economic Research Forum*, 38(2). <https://epublikasi.pertanian.go.id/berkala/fae/article/view/1096>
- Rasyid, M. G. (2024). The Nexus Between GDP and Military Expenditure in Indonesia: Evidence From Time Series Analysis. *Defense Journal: Information Media About Defense Studies and Strategies That Prioritize Identity, Nasionalism Dan Integrity*, 10(1), 1–15.
- Rodríguez-Pose, A. (2022). The rise of populism and the revenge of the places that don't matter. *Origins and Alternative Policy Responses*, 79.
- Rota, M., & Spinesi, L. (2024). Economic growth before the Industrial Revolution: Rural production and guilds in the European Little Divergence. *Economic Modelling*, 130, 106590.
- Saeed, L. (2025). The impact of military expenditures on economic growth: A new instrumental variables approach. *Defence and Peace Economics*, 36(1), 86–101.
- Saputro, G. E., Tarigan, H., & Rajab, D. D. A. (2021). The role of defense economic in economic growth. *Defense Journal: Information Media About Defense Studies and Strategies That Prioritize Identity, Nasionalism Dan Integrity*, 7(2), 330–341.
- Schwab, K., & Davis, N. (2018). *Shaping the future of the fourth industrial revolution*. Crown Currency.
- Siregar, H., & Achnaf, M. (2022). Strategi pertahanan laut Indonesia melalui modernisasi alutsista TNI AL. *Journal of Industrial Engineering & Management Research*, 3(5), 134–142.
- Soedarto, G., & Sumakul, W. (2015). *Strategi Maritim Bangsa Bahari Nusantara*. CreateSpace Independent Publishing Platform. <https://books.google.co.id/books?id=20M3jgEACAAJ>
- Storper, M., & Scott, A. J. (2009). Rethinking human capital, creativity and urban growth. *Journal of Economic Geography*, 9(2), 147–167.
- Sun, D., Liu, Y.-Y., Yang, X.-W., Lyu, L.-Q., & Yuan, J.-H. (2022). Economic and employment effects of China's power transition based on input–output and scenario simulation. *Advances in Climate Change Research*, 13(5), 721–728.

- Taghvaei, V. M., Arani, A. A., Soretz, S., & Agheli, L. (2023). Sustainable development spillover in MENA and Europe: regional interactions of social, environment and economy. *Iranian Economic Review*, 27(2), 471–503.
- Taylor, R. S. (2020). Foreign direct investment and economic growth. Analysis of sectoral foreign direct investment in Tanzania. *African Development Review*, 32(4), 699–717.
- Tian, N., Lopes da Silva, D., Liang, X., & Scarazzato, L. (2024). *Trends in World Military Expenditure, 2023*. <https://doi.org/10.55163/BQGA2180>
- Tian, N., Lopes da Silva, D., Liang, X., Scarazzato, L., Béraud-Sudreau, L., & Assis, A. (2023). *Trends in World Military Expenditure, 2022*. <https://doi.org/10.55163/PNVP2622>
- Ullah, A., Pinglu, C., Ullah, S., & Hashmi, S. H. (2021). Nexus of regional integration, socioeconomic determinants and sustainable development in belt and road initiative countries. *PloS One*, 16(7), e0254298.
- Wang, J., Jiang, H., & He, Y. (2023). Determinants of smallholder farmers' income-generating activities in rubber monoculture dominated region based on sustainable livelihood framework. *Land*, 12(2), 281.
- Widiyarini, W., & Latuconsina, S. (2022). Determinants of Fisheries Sub-Sector Performance to Support Economic Resilience in the Riau Islands Province. *Journal of National Resilience*, 28(2), 222. <https://doi.org/10.22146/jkn.74691>
- Witbooi, E., Ali, K.-D., Santosa, M. A., Hurley, G., Husein, Y., Maharaj, S., Okafor-Yarwood, I., Quiroz, I. A., & Salas, O. (2020). Organized crime in the fisheries sector threatens a sustainable ocean economy. *Nature*, 588(7836), 48–56.
- Zaman, M., Pinglu, C., Hussain, S. I., Ullah, A., & Qian, N. (2021). Does regional integration matter for sustainable economic growth? Fostering the role of FDI, trade openness, IT exports, and capital formation in BRI countries. *Heliyon*, 7(12).
- Zhang, Y., & Cheng, L. (2023). The role of transport infrastructure in economic growth: Empirical evidence in the UK. *Transport Policy*, 133, 223–233.