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Effect Of Consumption and Net Exports on Economic Growth With Investment as A Moderating Variable In North Sumatera Province

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Abstract

This study aims to determine the effect of consumption and net exports on economic growth in North Sumatra, and to prove whether investment can moderate the relationship between consumption and net exports on economic growth. The secondary data used in this study comes from the Central Bureau of Statistics (BPS) of North Sumatra and Bank Indonesia during the period 1994-2023. The analysis was conducted using moderated regression analysis with the help of SPSS 25. The results showed that the consumption variable had a significant negative effect on economic growth in North Sumatra. The net export variable has a significant positive effect on economic growth in North Sumatra. However, investment does not moderate the effect of consumption on economic growth in North Sumatra, and does not moderate the effect of net exports on economic growth in North Sumatra. Nevertheless, the simultaneous test results show that consumption, net exports, together have a significant effect on economic growth in North Sumatra.

Keywords: Economic Growth; Household Consumption; Net Export; Investment

1. Introduction

Economic development is a multidimensional process that involves changes in social structures, societal attitudes, and national institutions, alongside accelerated economic growth, reduced inequality, and the eradication of absolute poverty [1]. In this context, economic growth is a key indicator reflecting the success of a country's or region's development. It is generally measured by increases in Gross Domestic Product (GDP) or Gross Regional Domestic Product (GRDP) at the local level and is the result of various economic factors interacting. Among these, consumption, exports, and imports are particularly important.

Keynesian economic theory emphasizes the role of aggregate demand, with consumption as the largest component driving economic growth. Meanwhile, David Ricardo's international trade theory suggests that exports and imports enhance resource allocation efficiency and stimulate growth through specialization and comparative advantage [2].

For developing countries like Indonesia, which operates an open economy, the roles of consumption, exports, and imports are crucial in shaping growth dynamics. Data from the Coordinating Ministry for Economic Affairs (April 2022) illustrates a significant rise in export and import performance. Exports reached IDR 397.5 trillion (US$26.50 billion), growing by 29.42% month-on-month (mtm) and 44.36% year-on-year (yoy), while imports grew to IDR 329.55 trillion (US$21.97 billion), an increase of 32.02% (mtm) and 30.85% (yoy). This resulted in a significant trade surplus of IDR 67.95 trillion (US$4.53 billion), continuing a surplus trend that started in May 2020.

Sumatra Utara Province, with its rich natural resources and strategic position in international trade routes, serves as a compelling case for analyzing regional economic growth dynamics. Strong domestic consumption and dynamic export-import activities contribute significantly to the province's economic expansion. Exports channel local goods and services to international markets, while imports supply necessary items that support consumption and industrial needs, fostering local economic growth.

The following data presents economic growth, consumption, net exports, and investment in Sumatra Utara from 2010 to 2023:

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Table 1.1 Economic Growth, Consumption, Net Export, and Investment of North Sumatra for the Period 2010 - 2023

Year	Economic Growth (%)	Consumption (USD Billion)	Net Exports (USD Billion)	Investment (Billion USD)
2010	6,38	499694,00	5571,53	662,70
2011	6,66	564565,00	6929,81	1673,00
2012	6,45	599060,00	5229,19	2550,30
2013	6,08	656133,00	4489,50	5068,90
2014	5,23	699627,00	4314,60	4223,90
2015	5,10	755189,00	3764,35	4287,40
2016	5,18	853756,00	3856,25	4864,20
2017	5,12	909817,00	4589,48	11683,60
2018	5,18	1001709,00	3134,63	8371,80
2019	5,22	1063964,00	3152,65	19749,00
2020	(-)1,07	1124253,00	4106,35	18189,50
2021	2,61	1142717,00	6650,28	18484,50
2022	4,73	1216497,00	6913,01	22789,20
2023	5,01	1305339,00	4627,51	21574,00

Based on Table 1.1, North Sumatra plays a significant role in Indonesia's national economy. From 2010 to 2023, the region's economy showed dynamic trends in economic growth, consumption, investment, and net exports. Data from the Indonesian Central Statistics Agency (BPS) reveals steady economic growth between 2010 and 2019, peaking in 2011 at 6.66%. However, between 2014 and 2019, growth slowed to a range of 5.1% to 5.23%. Consumption has been a major driver, rising from Rp499,694 in 2010 to Rp1,305,339 in 2023, indicating increasing purchasing power and demand. Despite this, economic growth slowed between 2012 and 2015, suggesting that consumption alone isn't enough without significant contributions from investment and net exports.

Investment also showed notable growth, from Rp662.70 in 2010 to Rp21,574.00 in 2023, proving vital to maintaining economic stability. However, the economy contracted by -1.07% in 2020 due to the COVID-19 pandemic. By 2021, growth rebounded to 2.61%, continuing to 5.01% in 2023, driven by strong investments. Net exports fluctuated throughout 2010-2023, peaking at Rp6,929.81 in 2011 but dropping to Rp4,627.51 by 2023. While exports are important, their inconsistent performance suggests that further strengthening is needed to ensure long-term growth.

This study examines the impact of consumption and net exports on economic growth, with investment as a moderating variable in North Sumatra. Theoretical foundations include the Total Regional Capital Growth Theory (PMTD) and Keynesian economics, emphasizing the importance of aggregate demand and international trade in boosting regional productivity.

2. Literature Review

2.1 Economic Growth

Economic growth is defined as the development of activities in the economy that lead to an increase in the goods and services produced and the prosperity of society. According to Todaro (2006) in Khadijah (2022), economic growth is a process where the production capacity of an economy increases over time to generate higher levels of income. Regional economic growth involves local governments and communities managing resources to create new jobs and stimulate economic activity. According to the Central Statistics Agency (BPS), the Gross Regional Domestic Product (GRDP) is the total value of goods and services produced by all business units in a specific area. GRDP is also defined as the total net value of final goods and services produced by all economic units.

There are three methods for calculating GRDP based on production, income, and expenditure [3].

a. The production approach calculates the total value added from goods and services produced within a year across 17 categories of business sectors.
b. The expenditure approach sums up the final demand components, including household consumption, government consumption, investment, stock formation, and net exports.
c. The income approach calculates the total compensation received by production factors, such as wages, land rent, interest, and profits before tax.

Indonesia primarily uses the production approach in calculating GRDP because it provides a comprehensive overview of the added value generated by production units in the country. This approach, using the 2010 base year and categorizing data into 17 business sectors, helps track the contribution of each sector to the national economy, aiding in economic planning and policy-making.

2.2 Consumption

Consumption refers to the activity of using or depleting the utility of goods or services, either immediately or gradually, to meet needs [4]. It involves using goods or services to satisfy life's needs, which are influenced by income. Goods produced by manufacturers can be categorized into luxury and regular goods, or basic and non-basic goods [5]. Consumption also refers to household expenditures on goods and services for final consumption. These expenditures include the total market value of goods

and services purchased by households within a year, consisting of durable goods (e.g., cars, electronics) and non-durable goods (e.g., food, clothing). Consumption plays a key role in short-term economic analysis, as it affects aggregate demand and contributes two-thirds of GDP, making its fluctuations significant for economic cycles.

2.3 International Trade (Export and Import)

International trade refers to the exchange of goods and services between economic entities from different countries. These entities include residents, companies involved in exports and imports, industries, and state-owned enterprises[6]. Trade arises due to differences in natural resources, capital, human resources, and technological advances between nations [7]. Net exports, the difference between export and import values, serve as a crucial indicator of a region's trade position.

Adam Smith's theory of absolute advantage posits that trade occurs when countries specialize in producing goods they can produce more efficiently and trade them for goods where they are less efficient, benefiting both parties. Robbock defines international trade as an economic activity involving the movement of various business elements across countries, such as:

a. Transfer of Goods and Services: Involves exporting and importing finished goods, raw materials, and services like consultancy and tourism.
b. Transfer of Capital: Includes Foreign Direct Investment (FDI) and other forms of investment between nations.
c. Transfer of Labor: Involves the movement of workers across borders to fill labor shortages.
d. Transfer of Technology: International trade promotes the exchange of technical knowledge and patents, improving productivity.
e. Transfer of Trademarks: Multinational companies license or establish their brands in foreign markets.
f. Transfer of Data and Information: Successful trade relies on the efficient flow of information about market conditions, raw materials, and consumer demands to optimize strategies.

2.4 Investment (Domestic Fixed Capital Formation)

Domestic Fixed Capital Formation refers to investments measured by their use in national accounts or the structure of GDP [8]. This type of investment is crucial for supporting long-term economic activities, such as infrastructure development, equipment acquisition, and other fixed assets. By promoting sustained and stable growth, it enhances a country's productive capacity. The success of this formation is often reflected in rising per capita income or stable, high GDP growth rates. Investment is an action taken with the expectation of future returns. It refers to delaying current consumption to facilitate efficient production over a certain period and involves committing funds with the hope of gaining future benefits [9].

Based on Indonesian laws, investments are categorized as either Foreign Direct Investment (FDI), which comes from overseas, or Domestic Investment, which is funded by local entities such as individuals or state-owned enterprises. Investments can also be classified as direct or indirect. Direct investments involve acquiring assets in financial markets, including money markets, capital markets, and derivatives. Indirect investments occur through securities purchased via investment companies.

2.5 Interaction Theory

Interaction Theory, which is often used in moderation regression analysis, explains how the effect of an independent variable on the dependent variable can vary depending on the level of the moderator variable [10]. In the context of this study, this theory can explain how investment can strengthen or weaken the relationship between consumption or net exports and economic growth in North Sumatra.

3. Research Method

This study employs a quantitative method with an explanatory research approach. It uses secondary data sourced from official publications by the Central Bureau of Statistics (BPS) of North Sumatra and Bank Indonesia. The data collected include economic growth figures for North Sumatra from 2010-2023, and data on household consumption, exports, imports, and investments from 1994-2023.

The research analyzes several interrelated variables, categorized into exogenous variables (consumption, X1; net exports, X2), a moderating variable (investment, Z), and an endogenous variable (economic growth, Y). To test hypotheses regarding the effects of consumption and net exports on economic growth, multiple linear regression analysis is applied.

The study also uses moderated regression analysis to examine whether investment moderates the relationship between consumption and net exports with economic growth. The analysis is conducted using SPSS version 25, following the interaction method for moderated regression analysis [11].

4. Results and Discussion

The following presents the results of the data analysis on the variables of consumption and net exports in relation to economic growth in North Sumatra, using multiple linear regression.

Table 4.1 The Result of Multiple Linear Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2749778,106	1133693,116		2,426	,022
	Consumption	-6,271	1,494	-,780	-4,197	,000
	Net Export	923,343	347,048	,495	2,661	,013

a. Dependent Variable: Economic Growth

Source: Processed By Researcher, 2024

The estimated model equation I from the results of the multiple linear regression test is as follows:

$Y = 2{,}749{,}778.106 - 6.271X_1 + 923.343X_2$

This equation can be explained as follows:

1. The constant 2,749,778.106 represents the value of Y (Economic Growth) when the values of Consumption (X_1) and Net Export (X_2) are zero. In this case, when consumption and net exports do not contribute anything (equal to zero), economic growth is valued at 2,749,778.106.
2. The coefficient for X_1 (-6.271) indicates a negative relationship between consumption and economic growth. This means that for every one-unit increase in consumption, economic growth will decrease by 6.271 units, assuming the other variable (Net Export) remains constant. This negative relationship may indicate that an increase in consumption in this context could lead to a reduction in economic growth, for example, if consumption is driven by debt or unproductive spending.
3. The coefficient for X_2 (923.343) shows a strong positive relationship between Net Export and Economic Growth. This means that for every one-unit increase in net export, economic growth will increase by 923.343 units, assuming consumption remains constant. This suggests that an increase in net exports (more exports than imports) has a positive impact on economic growth, possibly because international trade stimulates productivity and job creation.

Based on the partial hypothesis testing table, the results can be explained as follows:

1. The Consumption variable (X1) has a significance value of 0.000 (< 0.05). Therefore, H1 is accepted, meaning that consumption has a significant effect on economic growth in North Sumatra.
2. The Net Export variable (X2) has a significance value of 0.13 (< 0.05). Therefore, H2 is accepted, meaning that net exports have a significant effect on economic growth in North Sumatra.

In the next step, the regression is performed between variable X and the hypothesized moderating variable (Z) against variable Y, using the equation previously explained. The results of the analysis can be seen in the following table:

Table 4.2 Results of the MRA Moderation Analysis Test.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2296833,506	1314038,102		1,748	,093
	Consumption	-9,847	3,792	-1,225	-2,596	,016
	Net Export	1486,741	453,597	,797	3,278	,003
	Investment	-50,186	644,802	-,122	-,078	,939
	Interaction of Consumption and Investment	,001	,000	1,517	1,043	,307
	Interaction of Net Export and Investment	-,086	,047	-1,145	-1,836	,079

a. Dependent Variable: Economic Growth

Source: Processed By Researcher, 2024

The equation for the second model estimation from the MRA moderation regression test results is as follows:

$Y = 2296833.506 – 9.874X1 – 50.186Z + 0.001X1Z$

This equation can be elaborated as follows:

1. Based on the output from the first regression equation, the regression coefficient value for Consumption is -9.847, with a significance value of 0.016 (<0.05), meaning the Consumption variable has a significant effect on Economic Growth.
2. Based on the output from the second regression equation, the regression coefficient value for Investment is -50.186, with a significance value of 0.939 (>0.05), meaning the Investment variable does not have a significant effect on Economic Growth.
3. Based on the output from the third regression equation, the regression coefficient value for the Interaction variable (the multiplication between consumption and investment) is 0.001, with a significance value of 0.307 (>0.05), meaning the Interaction variable (the multiplication between consumption and investment) does not have a significant effect on Economic Growth.

The estimated equation of the third model from the results of the moderation regression analysis (MRA) is as follows:

Y = 2,296,833.506 + 1,486.741X2 – 50.186Z – 0.086X2Z

This equation can be elaborated as follows:

1. Based on the output of the first regression equation, the regression coefficient for Net Exports is obtained as 1,486.741, with a significance value of 0.003 (<0.05), indicating that the Net Exports variable has a significant effect on Economic Growth.
2. Based on the output of the second regression equation, the regression coefficient for Investment is obtained as -50.186, with a significance value of 0.939 (>0.05), indicating that the Investment variable does not have a significant effect on Economic Growth.
3. Based on the output of the third regression equation, the regression coefficient for the Interaction variable (the multiplication of net exports and Investment) is obtained as 0.086, with a significance value of 0.079 (>0.05), indicating that the Interaction variable (the multiplication of net exports and Investment) does not have a significant effect on Economic Growth

Based on the moderation regression analysis (MRA), the interaction variables X1Z and X2Z affecting Economic Growth (Y) have significance values of 0.307 and 0.079, respectively, both of which are greater than 0.05, indicating they are not significant. Additionally, the Investment variable (Z) does not act as a moderator, with a significance value of 0.574. Therefore, Investment (Z) only serves as an independent variable, and this study emphasizes the importance of focusing on variables that significantly influence Economic Growth (Y).

Table 4.3 Results of Simultaneous Hypothesis Testing.

F	Sig.
8.829	,001[b]

Source: Processed By Researcher, 2024

Based on the simultaneous hypothesis test results, a significance value of 0.001 was obtained, which is less than 0.05. This indicates a significant relationship between the tested variables. Therefore, the alternative hypothesis (H3) is accepted, indicating that consumption (X1) and net exports (X2) simultaneously affect economic growth (Y) in North Sumatra. This underscores the importance of both factors in supporting regional economic development.

5. Conclusions

Based on the results of the hypothesis tests, both partially and simultaneously, the following conclusions can be drawn: First, the Consumption variable (X1) has a significant negative effect partially on Economic Growth (Y) in North Sumatra. Second, the Net Export variable (X2) has a significant positive effect partially on Economic Growth (Y) in North Sumatra. Third, the Consumption variable (X1) and the Net Export variable (X2) have a simultaneous effect on Economic Growth (Y) in North Sumatra. Fourth, the interaction variable between Consumption and Investment (X1Z) does not moderate Consumption in relation to Economic Growth (Y) in North Sumatra. Fifth, the interaction variable between Net Export and Investment (X2Z) does not moderate Net Export in relation to Economic Growth (Y) in North Sumatra. Sixth, the R Square value for the Consumption (X1) and Net Export (X2) variables in this study is 0.480 (48%), meaning that these two variables can explain 48% of the variability in Economic Growth (Y), while the remaining 52% is influenced by factors outside the variables studied.

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