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Analysis of Basic and Non-Basic Sectors on Export Commodity Opportunities with *Location Quontent, Shift Share* and Klassen Typology Approaches in Aceh Province

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Abstract:

This study aims to analyze and determine the basic sectors in the Aceh Province economy, so that commodities from which sectors are eligible for export at the national and international levels can be determined. By using secondary data, namely GDP and GRDP (gross regional domestic product) in 2017-2022. By using the Loation Quontient (LQ) analysis method. Shift Share (SS), and Klassen Typology. The results of the calculation of the three analyses in Aceh Province for 6 years, it can be identified from 17 economic sectors in Aceh Province there is 1 sector that is classified as a basic sector, namely the first sector of Agriculture, Forestry, and Fisheries. After that the researchers analyzed again with the same three analyses of the sub-sectors in the basic sector and found that of the seven sub-sectors in the basic sector, the plantation crop sub-sector was the basic sub-sector, then the researchers analyzed again the commodities in the sub-sector with the same three analyses so that it was found that of the 8 commodities, the Coffee commodity with an LQ value (3.96), Shift Share (5.7), Klassen Typology (quadrant 1), and the Cocoa commodity with an LQ value (2.24), Shift Share (13.8), Klassen Typology (quadrant 1). And from the results of the analysis that has been done, it can be concluded that commodities that have a great opportunity to be exported are Coffee commodities and Cocoa commodities.

Keywords: *Base and Non-Base Sector, Export, Loation Quontient (LQ), Shift Share (SS), Klassen Typology.*

1. Introduction

Economic growth is an indicator of successful development in an economy. The progress of an economy is determined by the growth shown through changes in national output. The change in output in the economy is a short-term economic analysis. Economic growth is an effort to increase production capacity to achieve additional output, measured using Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP) in a region (Hasibuan, 2020).

In observing fluctuations in economic growth in real terms from year to year, it will be evident through the gross regional domestic product (GRDP) or the consumer price

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index on a regular basis. Positive growth indicates an increase in the economy, whereas negative growth signifies economic decline. A good gross domestic product (GRDP) in a region demonstrates the extent to which the economic activity of the region is thriving. Analyzing regional economic growth is essential to assess development success and determine future policies (Kurniawan, 2016).

The determination of the leading sector is crucial as the basis for regional development planning in the era of regional autonomy. Regions have the opportunity and authority to make policies in line with regional potential to accelerate regional economic development and increase community prosperity. The base sector is a leading sector, ensuring that when the sector grows, other sectors as a whole will also grow, indicating multiplier growth (Masruri et al., 2021).

There are seven leading sectors in Aceh Province, namely:
1. Agriculture, forestry, and fisheries sector.
2. Construction sector.
3. Wholesale and retail trade sector, car, and motorcycle repair.
4. Transportation and warehousing sector.
5. Real estate sector.
6. Government administration, land, and compulsory social security sector.
7. Health services and social activities sector.

Base sectors export goods and services outside the region's economy boundaries, while non-base sectors provide goods and services to meet the needs of people living within the economic boundaries of the region (Amalia & Yulistiyono, 2020). Despite being rich in natural resources, Aceh Province has consistently ranked among the top 7 poorest provinces in Indonesia for the last 5 years and the poorest in Sumatra since 2017. This is unfortunate, considering Aceh's abundance of natural resources, such as limestone, a raw material for cement, as well as significant oil, gas, and coal reserves. To address this, the researcher hopes that this research can contribute to increasing economic growth in Aceh Province by utilizing commodities from the leading sectors and exporting them to other regions (Xu et al., 2019; Parvez et al., 2020).

Ginting (2017) emphasized that increasing export performance is crucial for boosting economic growth in Indonesia. Exports involve the mutual agreement to conduct buying and selling activities of goods or services between residents in different countries. Novikoka et al. (2020) suggested that increasing exports can contribute to long-term economic growth, leading to higher added value. Adnan et al. (2022) also support this idea in their research on the effect of exports and imports on economic growth in Aceh Province.

The ability of a country to export its goods depends on the demand for those goods in other countries and their inability to produce or meet domestic needs. Factors such as the quality and price competitiveness of exported goods, as well as the preferences of foreign consumers, play a crucial role in a country's exports (Daulay et al., 2019; Isabhandia & Setiartiti 2020).

Based on the classification results of the average growth of economic sectors with the advanced and rapid Klassen typology, the developing sectors in Mandailing Natal are the Agriculture, Forestry, and Fisheries sectors. The average Location Quotient calculation results indicate that the basic sectors are agriculture, forestry, and fisheries. The results of the Shift Share analysis show that the sector is competitive and has competitiveness, specifically in the Agriculture, Forestry, and Fisheries sectors (Sari et al., 2013; Maspaitella et al., 2021; Putri 2023). In their research on the analysis of base and non-base sectors and economic competitiveness in increasing economic growth in Medan City, Hutapea et al. (2020) show that the Medan city economy, overall, has high or strong regional competitiveness compared to the North Sumatra economy. This is evident in the positive Differential Shift value, indicating strong competitiveness or a high competitive advantage across almost all economic sectors in Medan city compared to the same sectors in the North Sumatra economy.

2. Theoretical Background

Base Theory

According to this theory, a region's economic structure can be categorized into two sectors: base and non-base. The base sector refers to an economic sector capable of exporting goods and services beyond the local economy's borders, while the non-base sector provides goods solely needed within the region. Ricahardo (1973) asserts that the primary determinant of economic growth in a region is directly linked to the demand for goods and services from outside the region (Khan et al., 2020).

Export

Export is the activity of dispatching domestic goods abroad in compliance with applicable provisions and regulations. Countries usually engage in export activities when they produce a surplus of goods and the domestic demand has been satisfied, prompting the export of these goods to countries unable to produce them or where demand surpasses local production capacity (Prus & Sikora, 2021).

Theories of Export Advantage

There are two prominent export theories put forth by experts, elucidating the foundations of a country's ability to engage in international trade.

1. Theory of Comparative Advantage

David Ricardo (1817) introduced the comparative advantage model, also known as The Theory of Comparative Advantage. This theory posits that international trade or exports can occur when there are disparities in comparative advantage. A country can engage in large-scale production of certain goods at a lower cost compared to other countries. Additionally, income can be generated through specialization in the production of goods or services with high productivity and efficiency, leveraging

abundant natural and human resources processed at a low cost but yielding a larger volume (Suhardi et al., 2021).

2. Competitive Advantage Theory

Michael E. Porter, in his book titled "The Competitive Advantage Of Nations," argues that export potential arises from demand conditions. This involves the nature of domestic demand for specific goods and services. Before exporting, one must assess domestic market conditions. If product demand is sufficiently met in the domestic market, then the product or service becomes exportable (Porter, 1990).

3. Methodology

The data analysis technique used in this research is Descriptive data analysis technique. where GDP (Gross Regional Domestic Product) data and GDP (Gross Domestic Product) data obtained from the Central Statistics Agency (BPS) will be processed using three approaches, namely the *location quontient (*LQ) analysis approach, *shift share* (SS) and Klassen typology, and the results of these three analyses will be presented in tabular form. And those included in descriptive statistical data analysis techniques include presenting data in the form of graphs, tables, percentages, frequencies, diagrams, means, modes, etc. (Rahmani, 2022)

4. Empirical Findings/Result

To find out the basic and non-basic sectors in Aceh Province, three analyses were carried out, namely *Location Quontient analysis, Shift Sfare*, and Klassen Typology, with the data used in the analysis being Aceh Province GRDP data and GDP data as comparison data.

Researchers have conducted preliminary analysis with these three analyses on all economic sectors in Aceh Province and found that of the 17 economic sectors, the agriculture, forestry and fisheries sector is the most basic sector in Aceh Province with the third highest value in the LQ analysis with an average value of 2.23. The first rank in the Shift Share analysis with a value of 4,965,238. and the first rank also in the Klassen Typology analysis with a sector growth value of 3.18% and a contribution of 28.03%. So that only the subsectors of this sector are suitable for further analysis as follows:

***Location Quontient* (LQ) Analysis**

With this Location Quontient analysis, it will be known which sub-sectors are the mainstay subsectors and which are not the mainstay subsectors in Aceh Province, and the LQ analysis itself has criteria if LQ> 1 then it is included in the base subsector which means that the subsector is able to meet production from the region and out of the region, otherwise if LQ < 1 is a non-base sector which means that the sector has not been able to meet the needs in the region, while LQ = 1 means that the sector is able to cover the fulfillment of life in the region but cannot export.

Table 1. LQ calculation results of Aceh Province Subsectors (2017-2022)

Sub Sector	2017	2018	2019	2020	2021	2022	Average LQ	
A. Agriculture, Forestry and Fisheries	2,21	2,23	2,24	2,24	2,21	2,26	2,23	base
1. Agriculture, Livestock, Hunting and Agricultural Services	2,26	2,28	2,30	2,29	2,31	2,33	2,30	base
a. Food Crops	1,90	1,88	1,86	1,76	1,64	1,55	1,77	base
b. Horticultural Crops	2,68	2,66	2,68	2,53	2,81	2,96	2,72	base
c. Plantation Crops	2,08	2,13	2,17	2,11	2,27	2,31	2,18	base
d. Livestock	2,62	2,65	2,68	2,62	2,69	2,68	2,66	base
e. Agricultural and Hunti ng Services	5,62	5,66	5,71	5,52	5,84	5,93	5,71	base
2. Forestry and Logging	2,35	2,33	2,20	2,15	1,80	1,88	2,12	base
3. Fisheries	1,96	1,97	1,99	2,06	1,92	2,05	1,99	base

Source: GRDP and GDP data (processed)

The table above shows the results of the LQ analysis on all subsectors of the basic sector in Aceh Province, namely the Agriculture, Forestry and Fisheries sector. And it can be seen from the table above that all subsectors in this sector are included in the basic sector because all the values of these subsectors reach even more than 1. However, after ranking, there are 3 subsectors that have the highest value in this analysis, namely the first Horticultural Crops subsector with an LQ value of (2.72), the second Livestock subsector with an LQ value of (2.66), and the third Plantation Crops subsector with an LQ value of (2.18).

Shift Share **Analysis**

This shift share analysis is useful to know the first national growth effect (Nij) which shows how the influence of the growth of a sector/subsector of the economy in the reference area on the sector/subsector in the area under study, the second propotional shift (Mij) which aims to show the performance of a sector/subsector in a particular area against the same sector/subsector in the reference area, and the third differential shift (Cij) which gives how much the competitiveness of the sector/subsector of the region with the reference area.

Table 2. Shift share calculation results on subsectors in Aceh Province

Sub Sector	Mij	Cij	Dij
A. Agriculture, Forestry and Fisheries	-1371947	162525	4965238,26
1. Agriculture, Livestock, Hunting and Agricultural Services	-1335553	400698	3935540,01
a. Food Crops	-1110314	-1396325	-1266486,88
b. Horticultural Crops	226638	471751	1505191,41
c. Plantation Crops	-225571	989963	2488699,27
d. Livestock	78520	45715	988066,65
e. Agricultural and Hunting Services	-71959	56727	220069,56
2. Forestry and Logging	-286330	-385669	-352003,54
3. Fisheries	179202	218230	1381701,8

Source: GRDP and GDP data (processed)

From the table above, it can be seen that the results of the national growth effect (Nij) information show that the growth of subsectors at the national level affects the growth of subsectors in Aceh Province, and the three subsectors whose growth is most influential are Estate Crops by (1724308), second is Food Crops with a value of (1240152), and the third is fisheries with a value of (984270).

Next is the result of propotional shift (Mij) information, where in this information there are only three subsectors that have positive values, namely Horticultural Crops with a value of (226638), Animal Husbandry (78520), and Fisheries (179202). Next is information from the differential shift (Cij) and in this information there are two subsectors that have negative values, namely subsector 1, Food crops. 2, Forestry and logging. And other than that subsector gets a positive value or has the potential to compete with the same subsector at the national level. The three subsectors with the highest Cij values include the first Plantation Crops with a Cij value of (989963), the second Horticultural Crops (471751), and the third Fisheries (218230).

***Klassen Typology* Analysis**

Klassen Typology Analysis is a regional economic analysis tool used to determine the classification of economic sectors in Aceh Province by comparing it to the economic sector at the national level. This analysis has four sector classifications including:

- Quadrant 1. Developed and fast-growing sectors (developed sector)
- Quadrant 2. Developed but stagnant sector
- Quadrant 3. Potential or developing sectors.
- Quadrant 4. Relatively underdeveloped sector

The following is the formula for the Klassen Typology analysis:

Table 3. the results of the calculation of Klassen Typology Aceh Province

Sub Sector	Average LQ	Dij
A. Agriculture, Forestry and Fisheries	2,23	4965238,3
1. Agriculture, Livestock, Hunting and Agricultural Services	2,30	3935540
a. Food Crops	1,77	-1266486,9
b. Horticultural Crops	2,72	1505191,4
c. Plantation Crops	2,18	2488699,3
d. Livestock	2,66	988066,65
e. Agricultural and Hunting Services	5,71	220069,56
2. Forestry and Logging	2,12	-352003,54
3. Fisheries	1,99	1381701,8

Source: GRDP and GDP data (processed)

Table 4. Klassen Typology classification results

Quadrant 1	Quadrant 3
Horticultural Crops	-
Plantation Crops	-
Livestock	-
Quadrant 2	Quadrant 4
Forestry and Logging	-
Food Crops	-

Source: GRDP and GDP data (processed)

The table above explains the classification of each subsector in the Agriculture, Forestry and Fisheries sector that has been analyzed using the Klassen Typology approach. Where the results of the Klassen Typology calculation show that the subsectors included in the category of developed and fast-growing sectors (quadrant 1) are Horticultural Crops, Plantation Crops, and Animal Husbandry. And those included in the developed but depressed sector (Quadrant 2) are Forestry and logging, and Food Crops. Those in the potential or growth sector category (Quadrant 3) do not exist. And in the category of underdeveloped subsectors (Quadrant 4) there are none.

From the results of the three analyses above conducted on all subsectors in the agriculture, forestry and fisheries sectors, it can be concluded that the plantation crop subsector gets the highest average ranking of the three analyses that have been carried out, where in the LQ analysis it gets the third rank with a value of (2.18), then the first rank in the Shift Share (SS) analysis with a value of (2488699.27), and the first rank is also in the Klassen Typology analysis with a value (LQ 2.18 and Dij 2488699.27) and get a position in quadrant 1. So it can be concluded that Plantation Crops is the most basic subsector of the basic sector in Aceh Province so that this subsector is worth analyzing with the three analyses to find which commodities are most feasible to export to other regions.

Location Quontient Analysis on Commodities

Table 5. LQ analysis results on Plantation Crop commodities in Aceh Province

LQ Value	2017	2018	2019	2020	2021	LQ
Palm Oil	0,998467	0,988547	0,986951	0,979994	0,972568	0,99
Coconut	0,885016	0,913621	0,921883	0,943533	0,974742	0,93
rubber	1,073266	1,054694	1,058944	1,081723	1,171848	1,09
coffee	3,847759	3,826951	3,964477	4,06146	4,156288	3,97
cocoa	1,862756	2,092725	2,295566	2,414998	2,51183	2,24
cane	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
tea	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
tobacco	0,444716	0,35534	0,3194	0,351089	0,384621	0,37

Source: GRDP and GDP data (processed)

The table above shows the LQ value of commodities in the Estate Crops subsector in Aceh Province, and of the eight commodities in the Estate Crops subsector there are

three commodities included in the base commodity, namely the first Coffee commodity with an LQ value of (3.97) and the second ranking Cocoa commodity with an LQ value of (2.24), and the last Rubber commodity with an LQ value of (1.09).

Shift Share Analysis of Plantation Crop Commodities in Aceh Province

Table 6. Shift Share analysis results on Plantation Crop commodities in Aceh Province

LQ Value	Nij	Mij	Cij	Dij
Oil Palm	214,305	65,766	-111,270	168,800
Coconut	15,518	-15,540	1,322	1,300
rubber	24,265	-39,182	1,018	-13,900
coffee	16,926	-11,330	0,104	5,700
cocoa	6,696	-1,079	8,183	13,800
cane	#VALUE!	#VALUE!	#VALUE!	#VALUE!
tea	#VALUE!	#VALUE!	#VALUE!	#VALUE!
tobacco	0,494	0,125	-0,519	0,100

Source: GRDP and GDP data (processed)

The table above shows the results of the Shift Share analysis calculation on each commodity of the Plantation Crop Subsector in Aceh Province, and the results of this analysis show that the value of the national growth effect (Nij) on all commodities in the Plantation Crop Subsector in Aceh Province has a positive value which means that commodity growth in the Plantation Crop Subsector at the national level has a positive influence on the same commodity in Aceh Province.

Next is the value of the Propotional Shift (Mij) information, where in this information all commodities have a negative value except for the Palm Oil commodity whose value is (65.766). And next is the Differential Shift (Cij) information, in this information only the Palm Oil commodity has a negative value which means that this commodity has low competitiveness when compared to the same commodity at the national level, but there are three other commodities that get a positive value or are worthy of competing at the national level, namely the first Coffee commodity with a value of Cij (8.183), the second Coconut commodity with a value of (1.322), and the third Rubber commodity with a value of (1.018).

Klassen Typology Analysis of Plantation Crop Commodities in Aceh Province

Table 7. Calculation of Klassen Typology data

TK Value	LQ	Dij
Oil Palm	0,99	168,800
Coconut	0,93	1,300
rubber	1,09	-13,900
coffee	3,97	5,700
cocoa	2,24	13,800
cane	#VALUE!	#VALUE!

tea	#VALUE!	#VALUE!
tobacco	0,37	0,100

Source: GRDP and GDP data (processed)

To determine the classification of Plantation Crop commodities in Aceh Province, it must use the LQ and Shift Share values as a comparison value as researchers do in the analysis of Klassen Typology in Sectors and Subsectors, where the classification results on Plantation Crop Commodities in Aceh Province are as follows:

Table 8. Classification results of Klassen Typology analysis

Quadrant 1	Quadrant 3
Coffee	Palm Oil
Cocoa	Coconut
Quadrant 2	Kuardan 4
Rubber	Sugarcane
	The
	Tobacco

- Quadrant 1 is an advanced and fast-growing sector. From the results of the analysis there are two commodities of Plantation Crops that are classified as advanced and growing rapidly in Aceh Province, namely: Coffee Commodity, and Cocoa Commodity.
- Quadrant 2 Advanced but depressed sector. From the results of the analysis there is one developed but depressed commodity in Aceh Province. ie: Rubber Commodity.
- Quadrant 3 Potential sectors or can still grow. From the results of the analysis there are two potential commodities or still able to develop in Aceh Province, namely: Palm Oil Commodity and Coconut Commodity.

Quadrant 4 Relatively lagging sectors. From the results of the analysis, there are three relatively lagging commodities, namely: Sugarcane commodity, Tea Commodity, and Tobacco Commodity

5. Discussions

The research aimed to identify basic and non-basic sectors in Aceh Province, focusing on the agriculture, forestry, and fisheries sector. Three analyses—Location Quotient (LQ), Shift Share, and Klassen Typology—were conducted using GRDP and GDP data for Aceh Province. The primary focus was on the plantation crop subsector, with further analysis on individual commodities within this subsector.

1. Location Quotient (LQ) Analysis

The LQ analysis revealed that the agriculture, forestry, and fisheries sector, particularly the subsectors of agriculture, livestock, hunting, and agricultural services, were considered basic sectors. All subsectors within this category had LQ values greater than 1, indicating their ability to meet production demands both within and

outside the region. The three highest-ranking subsectors were Horticultural Crops, Livestock, and Plantation Crops.

2. Shift Share Analysis
The Shift Share analysis provided insights into the national growth effect (Nij), proportional shift (Mij), and differential shift (Cij) of the plantation crop subsector in Aceh Province. Positive Nij values suggested that national-level growth influenced the subsector in Aceh. Proportional shift (Mij) indicated positive performance in Horticultural Crops, Livestock, and Fisheries. The differential shift (Cij) highlighted competitiveness, with Plantation Crops, Horticultural Crops, and Fisheries showing potential for competing nationally.

3. Klassen Typology Analysis
The Klassen Typology analysis classified subsectors into four quadrants. Notably, Plantation Crops emerged as a developed and fast-growing sector (Quadrant 1). Horticultural Crops, Livestock, Forestry, and Fisheries were considered potential or developing sectors (Quadrant 3). Forestry and Logging, as well as Food Crops, were identified as developed but stagnant sectors (Quadrant 2).

Theoretical and practical implications emanate from the comprehensive analyses of Aceh Province's economic sectors. The identification of advanced and fast-growing commodities such as Coffee and Cocoa suggests theoretical insights into the comparative advantages of specific crops, contributing to the literature on regional economic development. The emphasis on the export potential of Rubber, despite its depressed sector status, implies practical strategies for revitalization and global market exploration. The strategic focus on Horticultural Crops aligns with theoretical frameworks emphasizing diversified and specialized agriculture, while the encouragement of Livestock development underscores the practical significance of value-added products within the basic sector. The call for diversification and innovation contributes theoretically by highlighting the adaptive capacity of regional economies and practically underscores the need for resilient farming practices. Policy implications emphasize the translation of theoretical insights into actionable strategies for policymakers, guiding economic development, export facilitation, and regional planning. Additionally, the recommendation for further research acknowledges the dynamic nature of economic landscapes, promoting continuous theoretical refinement and offering practical solutions to emerging challenges. In sum, this research provides a robust foundation for both theoretical exploration and practical interventions, offering valuable insights for policymakers, researchers, and practitioners seeking to foster economic growth and prosperity in Aceh Province.

6. Conclusions

In conclusion, the analyses conducted highlight the prominence of two key commodities, namely Coffee and Cocoa, as dominant forces among the diverse agricultural products in Aceh Province. The Location Quotient Analysis positions Coffee at the forefront with an impressive value of 3.79, closely followed by Cocoa

with a value of 2.24. Subsequently, the Shift Share Analysis emphasizes Cocoa's significance, securing the second rank with a substantial value of 13,800, while Coffee holds the third position at 5,700. The Klassen Typology analysis categorizes both Coffee and Cocoa commodities in Quadrant 1, signifying their developed and fast-growing nature. These findings underscore the export potential and viability of Coffee and Cocoa as key contributors to Aceh Province's economic growth.

However, it is crucial to acknowledge the limitations of this study. The research primarily focuses on quantitative analyses, and a more comprehensive understanding could be achieved by integrating qualitative perspectives, considering factors such as socio-economic impacts, environmental sustainability, and local community involvement. Additionally, the study relies on historical data, and the dynamic nature of agricultural markets necessitates ongoing monitoring and adjustments in strategy.

For future research, a more in-depth investigation into the socio-economic implications of promoting Coffee and Cocoa as export commodities would provide valuable insights. Exploring the environmental sustainability practices within these commodity value chains and assessing the potential impact on local communities would enhance the comprehensiveness of future studies. Furthermore, a longitudinal analysis tracking the growth trajectories of Coffee and Cocoa, coupled with an examination of emerging trends and global market demands, would contribute to a more robust understanding of the long-term sustainability and competitiveness of these commodities in the export market.

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