GROSTLOG 2022
Global Research on Sustainable Transport & Logistics

ISSN: 2622-5778 (online)
Advances in Transportation and Logistics Research
http://proceedings.itltrisakti.ac.id/index.php/altr

LOAD FACTOR IMPROVEMENT ANALYSIS OF RETURN CARGO ON THE TOL LAUT SHIP ROUTE

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Abstract: The purpose of this study is to determine the route of the return cargo on Tol Laut Ships, based on the potential of superior commodities. Potential chargebacks are performed based on the sector approach of the regional economic base through Location Quotient Analysis (LQ) and Shift Share Analysis (SS).- Aceh, North Maluku, and North Sulawesi, are base sectors in the agricultural, forestry and fisheries sectors, with superior commodities in each region that has a competitive advantage, compared to the national level, so it has the potential to become a return cargo route on Tol Lauts. Finding that the amount of potential Tol Laut backload varies (based on the livelihoods of the regional economic base sector) under different conditions (Regional Gross Domestic Product) can help Tol Laut Ship managers better understand the conditions in the field in determining Tol Laut routes, especially return routes. this study uses primary data, namely based on the results of supervision and evaluation of the first semester of the implementation of the Tol Laut in the period from January to June 2022, and secondary data, namely Indonesia's National Gross Domestic Product (GDP) and Provincial Gross Regional Domestic Product (GRDP) in Aceh, North Maluku, and North Sulawesi Provinces, in 2018 to 2021

Keywords - Load Factor, Location Quotient, Shift Share, Tol Laut

1. INTRODUCTION

Indonesia is the largest Archipelago State in the world, with a coastline of 81,000 km, consisting of several large and small islands, stretching between them with a total of more than 17,499 islands, with a total area of 7.81 million km2. consists of: 2.01 million km2 of land, 3.25 million km2 of ocean. For this reason, the most suitable mode of transportation is needed, as an alternative mode of transportation to send goods between islands (**Larence, S., 1972)**.

The speciality of this geographical condition makes Indonesia have the potential for abundant natural products both in terms of water and land, unfortunately these produce cannot be optimized due to the difficulty of logistical distribution from one region to another which is very far away, so that in social and economic activity the population is very dependent on the mode of transportation in accordance with the characteristics and activities of the local people. Which is the case in commodity trade among islands and continents, most use ship shipping services **(Kalem, 2015)**.

Implementation of Public Service Obligations for Transportation of Goods at Sea or better known as " Tol Laut", is present as one of the manifestations in the government's efforts to design a strategy "building Indonesia from the periphery" to support logistics movement from the sea side by providing subsidies and guaranteeing the smooth flow of goods with liner shipping services (remains and/scheduled). Basically, the main purpose of implementing the Tol Laut is to provide Sea Transportation services to 3TP areas that have not been served by commercial sea transportation, so it is expected to reduce price disparities between the western region and the eastern region and/ between the 3TP (Disadvantaged, Remote, Outermost, and Border) regions and the more developed regions **(Kusuma et al., 2021).**

ISSN: 2622-5778 (online)
Advances in Transportation and Logistics Research
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Since it was first declared in 2015 the implementation of the Tol Laut road has continued to record achievements every year, including the continued increase in the number of routes and the number of ports visited, namely in 2022 there are as many as 130 stopover ports served on 33 routes using as many as 32 ships for the service of the Tol Laut program.

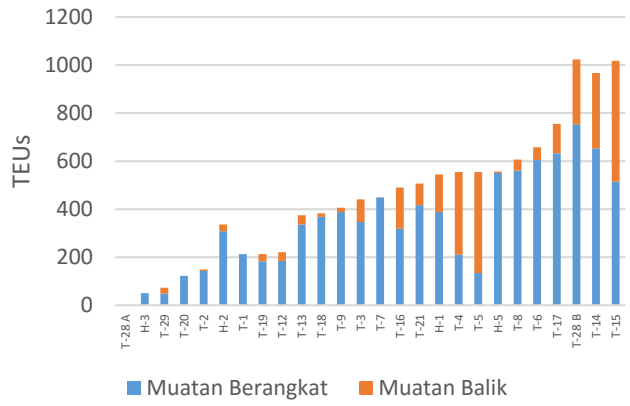
One of the problems with the implementation of the Tol Laut is related to the effectiveness and cost efficiency, which in this case is the high inequality between the departing cargo and the return load Tol Laut Ships, so that shipping costs in both directions become increased twice or more than normal shipping costs **(Komarudin et al., 2017)**. Based on the evaluation report for the first semester of the realization of voyages and cargoes of Tol Laut Ships for the Fiscal Year 2022 until June (Figure 1), the realization of the achievements of Tol Laut Shiploads (with the pattern of ship operational subsidies and container storage) the most is found on Route T-15, which is 1018 Teus, while the realization of the achievement of Tol Laut Shiploads is the least found on Route T-28A which is 0 Teus. Generally, services start from Tanjung Priok, Tanjung Perak, Makassar, Teluk Bayur, Bitung, Kupang, Sorong, Merauke, Biak and Timika, then sent to a number of remote areas. The average load factor of departing cargo and return cargo of Tol Laut Ships is 76% and 24%, respectively, where the amount of this inequality can affect the overall performance of Tol Laut services, especially in the suboptimal utilization of ship loading and costs and space.

Figure 1. Realization of Voyage and Ship Loading for Tol Laut Logistics Semester I

(Source: Ditlala 2022 – processed)

In this study, we consider the regional economic base sector as a potential return cargo in an effort to increase the load factor of the return load of Tol Laut Ships. For this reason, Location Quotient (LQ)) and Shift Share (SS) analysis tools are used. The calculation of the load factor is carried out to determine the boundaries of the research area, namely; The T-5 route with the highest load load factor (86%), the T-10 with the medium load load factor (50%), and the T-1 route with the lowest load load load factor (0%).

The three main questions in this study, which will be answered, are:



RQ1. What sectors of the economy are the leading commodities with the Location Quetiont (LQ) approach?

RQ2. What sectors have the potential to be developed into superior commodities with a Shift Share (SS) approach?

RQ3. What are the results of the analysis of LQ and SS calculations regarding superior commodities in these areas, in an effort to increase the Load Factor of Tol Laut Ships?

ISSN: 2622-5778 (online)
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This research is important to do considering the high inequality between departing cargo and return cargo of Tol Laut Ships, since the inception of the Tol Laut program in 2015 is the same as it is today, while the number of routes and the number of ports are constantly being increased.

In the existing theoretical research that I found and read, no one uses the Calculation methods Location Quetiont (LQ) and Shift Share (SS) are associated either directly or indirectly with calculations the potential for a return load of Tol Laut vessels.

To further complementthe ad a study, we empirically analyzed the increase in load factor of return cargo on the route of Tol Laut Ships using the Location Quetiont (LQ) and Shift Share (SS) approaches in three research areas (Aceh, North Maluku, and North Sulawesi provinces) each of which is bounded by straits, so that each character and condition of the province can be compared, in contrast to previous studies which were limited to only one research area.

2. THEORETICAL FOUNDATIONS

Definition of Tol Laut

Tol Laut is a connectivity in the form of a network of ship routes that connect ports to support the movement of goods that travel regularly and scheduled from the west to the east of Indonesia **(Bapenas 2015)**. Literally the word " Tol Laut" consists of two syllables, namely "Tol" stands for "Total Logistics" and the word "Sea" is part of the sea transportation mode **(Willem 2020)**, the purpose of the Tol Laut is to reach and distribute logistics of Essential Staple Goods (Bapokting) to frontier, outermost, remote and border areas (3TP) and to ensure the availability of goods and reduce price disparities to improve the welfare of the community **(Bapenas 2015)**.

Economic Base Theory

The essence of the theory of economic bases is that the direction and growth of a region is determined by the sector that exports its products to the region or even to other countries. Base economy theory classifies all economic activities into two sectors, namely the base sector and the non-base sector. The base sector is a sector that has high potential in determining overall development in the regions, while the non-base sector is a supporting sector in the development **(Hutapea 2020)**.Economic base theory can provide comparative information about the economic status of a region, as well as an understanding of the economic structure of society **(Rupasingha & Patrick, 2018)** *Location Quotient* (LQ).

Location Quotient (LQ)

LQ analysis is an analysis used to determine the degree of specialization of economic sectors in an area that utilizes the base sector or the *leading sector*. Systematically the calculation of LQ is stated as follows:

$$LQ = \frac{Si/S}{Ni/N} = \frac{Si/Ni}{S/N}$$

Information:

LQ	=	*Location Quotient* Value
S	=	Total GRDP value at lower regional level
Si	=	Value of GRDP Sector I at the lower regional level
N	=	GRDP value at higher regional level
Ni	=	Value of GRDP of Sector I at a higher regional level

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According to **Arsyad**, there are 3 types of LQ calculation outputs, namely:

1) If the LQ value is more than one (LQ > 1), it means that the sector is included in the base sector, namely a sector that is able to serve the needs of its own region and areas outside the region.
2) If the LQ value is less than one (LQ < 1), then the sector is included in the non-base sector, namely a sector that is only able to serve the needs of its own region or has not been able to serve the needs of its own region.
3) If the LQ value is equal to one (LQ = 1), it means that the sector in the study area and in the reference area has increased.

***Shift Share* (SS)**

shift share analysis tool is used to determine changes and shifts in the national economy in this study, through the provincial growth component, the industrial distribution component, and the competitive advantage component per economic sector. This analysis examines the shifts in the provincial economy in relation to higher levels of economic growth. Systematically the calculation of SS is stated as follows:

$$Dij = Nij + Cij$$

Information:
Dij = Change of a regional variable in sector i in region j in a certain period of time.
Nij = Component of national growth of sector i in region j
It is the *share* or contribution of sector i components in the regions above or nationally to the growth of sector i in the regions concerned.
Mij = Distribution of sector I industry in region j
With the provision that if the Mij is positive, then the growth of sector i is faster than similar sectors at the regional level above. If the Mij is negative then the growth of sector i is slower than similar sectors at the regional level above it.
Cij = Industry advantage of sector I in region j

With the provision that if Cij is positive then sector i has higher competitiveness than similar sectors at the regional level above it. If Cij is negative, then sector i has lower competitiveness compared to similar sectors at the regional level above it.Where, rij, rin and rn represent the regional growth rate and the national growth rate which are defined as:

rij = (E*ij --Eij) / Eij

rin = (E*in --Ein) / Eir

rn = (E*n --En) / En

description:

Eij = labor in sector i in region j,

Ein = employment opportunities in the sector at the national level, and

Ern = national employment opportunities, all measured in a base year

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Indonesia's Gross Domestic Product (GDP)

According to **Sukirno (2001, p. 34)** in his book entitled Introduction to Macroeconomic Theory, GDP is defined as the value of goods and services in a country that have been produced within 1 (one) year by production factors. Both by production owned by that country and foreign countries, as long as they are in the territory of the same country.

GDP is based on current prices and constant prices, GDP at current prices (ADHB) is the added value of goods and services calculated using current prices for that year, and GDP at constant prices (ADHK) is calculated using prices for a particular year which is added value of these products and services. GDP at current prices can be used to identify changes and economic structure, while constant prices are used to determine annual economic growth **(Central Bureau of Statistics, 2022).**

Gross Regional Domestic Product (GRDP)

Gross Regional Domestic Product (GRDP) is the gross added value of all goods and services produced in the domestic area of an area arising from various economic activities within a certain period regardless of whether the production factors are owned by residents or non-residents **(Central Bureau of Statistics, 2022).**

The preparation of GRDP can be done through 3 (three) approaches, namely the approach to production, expenditure, and income which are presented on the basis of current prices and constant (real) prices.

Ship Load Factor (*Load Factor*)

Load Factor is the ratio between occupied capacity and available capacity for one voyage which is usually expressed as a percentage (%). The *load factor* calculation is systematically expressed in:

$$f = \frac{M}{S} \times 100\%$$

Information:

F = Load Factor

M = Amount of cargo transported

S = Available capacity

3. RESEARCH METHODS

This research is a descriptive research with a mixed research approach (Mix Methode) which is carried out by combining quantitative methods and qualitative methods. The data sources used are primary data and secondary data. Primary data is obtained based on the results of the evaluation of the first semester of the implementation of public service obligations for the transportation of goods at sea (Tol Laut), to be precise from January 2022 to June 2022, namely by calculating the Load Factor of the return load of Tol Laut Ships, the results of which are used as research limits as well as a comparison with the lowest, medium and highest Load factor categories.

The data analysis techniques used include using the LQ (Location Quotient) analysis tool and the SS (Shift Share) analysis tool. LQ is used to determine the type of base sector and the superior commodities

ISSN: 2622-5778 (online)
Advances in Transportation and Logistics Research
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of the location of the study area while the SS is used to spatially identify the movement or movement of goods from the market location through interconnected transport networks. The data input used in the calculation is the production value of each sector and sub-sector in the form of data on THE GRDP of ADHB and GRDP ADHK Based on 2010 According to Business Fields in the period 2018 to 2022 in each area passed by Tol Laut Ships in Aceh Province, North Maluku Province, and North Sulawesi Province.

4. RESULTS AND DISCUSSION

A. *Load Factor* Analysis

From the results of the *Load Factor calculation* as shown in Table 1, it was found that the route with the lowest *load factor* for reverse loading was on route T-1 (0%) serving Aceh Province with the Tanjung Priok service route -397- Tanjung Perak -397- Tanjung Priok - 895 - Belawan - 144 - Lhoksumawe - 114 - Malahayati - 1111- Tanjung Priok, then the reverse load with a moderate *load factor* is on the T-10 (50%) route that serves North Maluku Province with the Tanjung Perak service route – 1216 – Tidore Soasio – 156 – Morotai – 72 – Galela – 144 – Maba/Buli – 139 – Weda – 1213 – Tanjung Perak, and the return load with the highest *load factor* is on route T-5 (86%) serving North Sulawesi Province with service route Bitung - 89–ulu Siau/Tagulandang – 64- Tahuna – 84 - Marore – 84 - Miangas – 57 - Marampit – 55 - Lirung / Melangoane– 83 – Mangaran – 171 – Bitung.

Table 1. Table of Calculation of LF for Marine Toll Vessels in the Period January to June 2022

Route	Boat	Operator	Payload Capacity 2022*	2022 payload			Load Factor (%)	
				Voy	Leave	Come back	Leave	Come back
T-1	KM. Kendhaga Nusantara 12	PT. Adinusantara's New Image	97	18	30.4	0	31%	0%
T-10	KM. Nusantara Logistics 06	PT Pelni	187	60	216.7	92.7	116%	50%
T-5	KM. Kendhaga Nusantara 05	PT. Pelni	35	20	9.6	30.1	19%	86%

Notes:
*Based on the RAB of cargo departing the Tol Laut FY2022.

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B. Analysis of Indonesia's GDP and GRDP of North Sulawesi, North Maluku and Aceh

Indonesia's Gross Domestic Product (GDP)

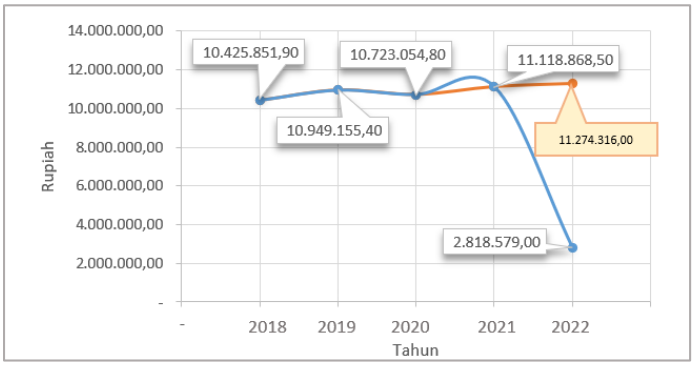

Figure 2. Graph of Gross Domestic Product at Constant Prices (ADHK) by Business Field in Indonesia for the Period 2018 - 2022

Figure 2 above shows Indonesia's GDP growth which has fluctuated over the last 5 years, while in 2022 as of March or in Quarter I, Indonesia's national GDP growth has only reached Rp. 2,818,579.00 (billion) which if it is assumed that the calculation of Indonesia's GDP in quarter II - IV is the same as the result of the calculation of GDP in the first quarter, then the total GDP of Indonesia in 2022 will reach Rp. 11,274,316.00, where this figure is the highest achievement of Indonesia's GDP in the period 2018 to 2022.

North Sulawesi's Gross Regional Domestic Product (GRDP)

The distribution profile of North Sulawesi's GRDP in the 2021 period by business field group is dominated by the Agriculture, Forestry, and Fisheries sectors which contributed 19.66% per quarter IV (Table 2). Despite being the highest contributor to the GRDP of the Province of North Sulawesi, this sector will experience a contraction in 2021 with a decrease in the performance of the Agricultural LU caused by the entry of the planting period and the influence of La Nina which hampers production in this agricultural sector. Nevertheless, the Farmer's Exchange Rate (NTP) indicator in quarter I-2022 still recorded an increase to 127.1 from the previous quarter of 125, this increase in FTT reflects the price received is higher when compared to the costs incurred when producing the plantation. The agricultural economic sector in North Sumatra is dominated by the plantation crops sub-sector and the food crops and horticulture sub-sector. Oil palm, rubber, and coffee commodities are included in the plantation sub-sector and have a large share in North Sumatra.

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Table 2. Table of GRDP of North Sulawesi Province on the basis of Constant (Real) Prices in 2010 by Business Field (Billion Rupiah) for the Period of 2018 to 2022 (Quarter I)

Business Field (Category)	[Series 2010] Gross Regional Domestic Product of North Sulawesi Province by Business Field (Billion Rupiah)				
	On 2010 Constant Price Basis				
	2018	2019	2020	2021	2022
Agriculture, Forestry and Fisheries	16367.26	17320,48	17705.45	17994.18	-
Construction	11346.94	12039.44	11518.35	12321.29	-
Wholesale and Retail Trade; Car and Motorcycle Repair	10701.92	11634.92	11445.86	11839,70	-
North Sulawesi's GDP	84029.21	88738,50	87839.53	91518,40	-

The GRDP of North Sulawesi Province shows a fluctuating increase and decrease in a positive direction. In Table 2 above, it was recorded that in 2018 the value of the GRDP of the Province of North Sulawesi was 84,029,210 (Million Rupiah) and experienced a significant increase in 2019, which was 88,738,503 (Million Rupiah), followed by a slight decrease in 2020. it is still better when compared to 2018 which is 87,839,528 (Million Rupiah), and then in 2021 the value of North Sulawesi's GRDP has increased to reach a value of 91,518,395 (Million Rupiah).

North Maluku's Gross Regional Domestic Product (GRDP)

The distribution profile of North Maluku's GRDP in the 2021 period according to business field groups is dominated by the Manufacturing Industry sector and the agriculture, forestry and fishery sectors. This was driven by the acceleration of foreign export growth in line with the continued increase in production of downstream nickel commodities, as well as the growth of all consumption components in line with the implementation of the XXVI STQ national event in North Maluku.

In Table 3 it is illustrated that the GRDP of North Maluku Province from year to year continues to show positive growth. In the table above, it was recorded that in 2018 the GRDP value of North Maluku Province was 25,034.10 (Billion Rupiah) and continued to increase in the following years until the highest value was recorded at the end of 2022 which reached 32,625.10 (Billion Rupiah).

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Table 3. Table of GRDP of North Sulawesi Province on the Basis of Constant (Real) Prices in 2010 by Business Field (Billion Rupiah) Period 2018 to 2022 (Quarter I)

Business Field (Category)	[Series 2010] Gross Regional Domestic Product of North Sulawesi Province by Business Field (Billion Rupiah)				
	On 2010 Constant Price Basis				
	2018	2019	2020	2021	2022
A. Agriculture, Forestry, and Fisheries	5,305,90	5,518.10	5,593.20	5700,10	-
C. Processing Industry	1,971.90	1,996.00	3,206.60	5,755,30	-
G. Wholesale and Retail Trade, Repair of Cars and Motorcycles	4,541.90	4,876,90	4,595,00	4,693.20	-
GRDP OF MALUT	25,034,10	26,597.60	28,020,70	32,615,10	-

Aceh's Gross Regional Domestic Product (GRDP)

The distribution profile of Aceh's GRDP in the 2021 period according to business field groups is dominated by the Agriculture, Forestry and Fisheries sectors. The performance of the agricultural business field was recorded to have decreased when compared to the previous year from 28.80% to 27.93%. The decline in performance was due to shifting planting seasons, and production constraints such as seeds, pests, fertilizers, and agricultural production tools and facilities.

Table 4. Table of GRDP of Aceh Province on the basis of Constant (Real) Prices in 2010 by Business Field (Billion Rupiah) Period 2018 to 2022 (Quarter I)

Business Field (Category)	[Series 2010] Gross Regional Domestic Product of North Sulawesi Province by Business Field (Billion Rupiah)				
	On 2010 Constant Price Basis				
	2018	2019	2020	2021	2022
Agriculture, Forestry and Fisheries	35430.00	36680.00	37900.00	37770.00	-
Construction	11950.00	12570.00	139000.00	13840.00	-
Wholesale and Retail Trade; Car and Motorcycle Repair	19730.00	20320.00	19240.00	20050.00	-
ACEH GRDP	126820.00	132090.00	131590.00	135250.00	-

The GRDP of Aceh Province shows a positive growth trend every year, as shown in table 4, it was recorded that in 2018 the value of the GRDP of Aceh Province was 126.82 (Trillion Rupiah) then experienced a significant growth In 2019, which was 132.09 (Trillion Rupiah). Despite a correction in 2020 to 131.59

ISSN: 2622-5778 (online)
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(Trillion Rupiah), Aceh Province's GRDP growth recorded the highest growth in the research period in 2021 with a value of 135.25 (Trillion Rupiah). Aceh's economic growth is supported by the agricultural, trade and mining sectors. In the agricultural sector, production has decreased due to shifts in the growing season, and production constraints such as seeds, pests, fertilizers, and agricultural production tools and facilities. The potential of Aceh's upstream sector can be utilized to encourage manufacturing as a sector that can be opened safely, utilized, absorbs labor, and has a strong *multiplier effect* . Mapping of industrial plants for each item as well as technical research on the potential of each industrial plant is very necessary, so that trade in agriculture, fisheries and forestry does not turn into wholesale, retail without added value. can be provided by the commercial processing industry. This is important so that the province of Aceh does not lose the added value generated by the processing industry.

C. *Location Quotient* (LQ) and *Shift Share* (SS) analysis

North Sulawesi Province (Highest Return Load Factor)

Table 5. Table of LQ Calculations in North Sulawesi Province

Business Field (Category)	LQ calculation				
	2018	2019	2020	2021	Average
A. Agriculture, Forestry, and Fisheries	1.55	1.58	1.52	1.46	1.53
C. Processing Industry	0.47	0.46	0.47	0.48	0.47

Based on the results of the processed data in table 5, it was found that the average LQ in the agriculture, forestry and fishery sectors as well as the processing industry of North Sulawesi province and the base sector is the Agriculture, Forestry, and Fisheries sector because the results of the average LQ calculation in the period 2018 to 2021 shows a value of more than 1. Overall, the calculation of LQ in the Agriculture, Forestry and Fisheries sector experienced a contraction, this decline occurred due to the influence of La Nina which hampered plantation and fishery production during the end of 2021.

Table 6. SS Calculation Table in North Sulawesi Province

	PROVINCE GRDP		NATIONAL GRDP		SS CALCULATIONS						
	2020	2021	2020	2021	rij	rin	rn	Nij	Mij	Cij	Dij
Agriculture, Forestry, and Fisheries	17,705.449.00	17,994,184.00	1,378,331,40	1,403,710.00	0.02	0.02	0.03	578,702.45	10,655.39	-37,267.52	552,090.32
Processing industry	8,764,756.00	9,546,947.00	2,209,920,30	2,284,821.70	0.09	0.03	0.03	286,475.98	9,709,60	485,124.86	781310.44
GDP	87,839,528.00	91,518,395.00	10,331,662.40	10,669,352.70							

The results of the acquisition value shown in Table 6 above, the Dij component shows a positive value in the base sector in North Sulawesi, namely in Agriculture, forestry and fisheries, this shows that the economic shift in North Sulawesi is positive. The calculation of the Cij component also shows a negative value, which

ISSN: 2622-5778 (online)
Advances in Transportation and Logistics Research
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means that the economic base sector of the North Sulawesi Province based on the Agriculture, forestry and fisheries sectors does not yet have a competitive advantage. The acquisition of the Nij and Mij components shows a positive value, this shows that the growth in the economic sector in North Sulawesi Province is relatively fast both at the provincial and national levels. The same result with the acquisition of a higher value occurs in the calculation of SS in the manufacturing sector. The value of the Dij component shows a positive value, this shows that the economic shift in this sector is positive. The calculation on the Cij component also shows a positive value, which means this sector already has a competitive advantage. The acquisition of the Nij and Mij components shows a positive value, this shows that the growth in the economic sector in North Sulawesi Province is relatively fast both at the provincial and national levels.

North Maluku Province (Medium Load Factor)

Table 7. Table of LQ Calculations in North Maluku Province

Business Field (Category)	LQ calculation				
	2018	2019	2020	2021	Average
A. Agriculture, Forestry, and Fisheries	1.69	1.68	1.55	1.38	1.58
C. Processing Industry	0.37	0.36	0.56	0.86	0.54

Based on the results of the processed data in table 7 above, the Agriculture, Forestry, and Fisheries Sector in North Maluku Province is the base sector because the results of the average LQ calculation in the period 2018 to 2021 show a value of more than 1. Overall, the Agriculture, Forestry, and Fisheries Sector and Fisheries experience a decrease in the value of LQ from year to year. The decrease in the LQ value was caused by the provincial economic growth rate which was smaller than the national economic growth rate. Cooperation between business actors and other relevant stakeholders is needed to increase production in the agriculture, forestry, and fishery sectors. In addition, the decline in production in this sector is also affected by the decline in the performance of the agricultural sector. The commodities that will support the performance of agriculture, forestry and fisheries in 2021 are copra and fish. In 2021 the BPS of North Maluku Province estimates that the area of coconut plantations in North Maluku will reach 200,692 hectares, all of which are owned by the people, with a total production of 232,207 tons so that the production level is still being developed again.

Table 8. SS Calculation Table in North Maluku Province

	PROVINCE GRDP		NATIONAL GRDP		SS CALCULATIONS						
	2020	2021	2020	2021	rij	rin	rn	Nij	Mij	Cij	Dij
Agriculture, Forestry, and Fisheries	5,593.20	5700,10	1,378,331,40	1,403,710.00	182.81	3.37	3.91	190.09	5,593.20	5700,10	1,378,331,40
Processing industry	3,206.60	5,755,30	2,209,920,30	2,284,821.70	104.81	3.55	2,440.02	2,548.38	3,206.60	5,755,30	2,209,920,30
GDP	28,020,70	32,615,20	10,331,662.40	10,669,352.70					28,020,70	32,615,20	10,331,662.40

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The results of the acquisition of the Dij value show a positive value in the agriculture, forestry and fishery sectors which are the basic sectors in North Maluku, as shown in table 8. This means that the economic shift in the agricultural, forestry and fishery sectors in North Maluku province is positive. The calculation of the Cij component also has a positive value, which means that the agriculture, forestry and fisheries sectors in North Maluku Province have a competitive advantage that strengthens its position as the economic base of North Maluku Province. Similar to the acquisition of the Nij and Mij components which also show a positive value, this shows that the growth in the economic sector in North Maluku Province is relatively fast, both at the provincial and national levels.

Aceh Province (Lowest Load Factor)

Table 9. Table of LQ Calculations in Aceh Province

Business Field (Category)	LQ calculation				
	2018	2019	2020	2021	Average
A. Agriculture, Forestry, and Fisheries	2.23	2.14	2.18	2.07	2.15
C. Processing Industry	0.24	0.22	0.22	0.21	0.22

Based on the processed data in Table 9 above, the basic sectors in Aceh Province are the agriculture, forestry and fisheries sectors because the results of the average LQ calculation in the period 2018 to 2021 show a value of more than 1, which is 2.15. Overall, the agriculture, forestry and fisheries sectors of Aceh Province experienced a fluctuating decline and increase in the LQ value from year to year. The decrease and increase in the LQ value is caused by the provincial economic growth rate which is larger and/or smaller than the national economic growth rate. In addition, this increase in production is influenced by an increase in fish production along with better sea temperatures for fish availability. Based on the data, fish production increased by 3.27 tons more than the previous period. On the other hand, rice harvested area in Aceh grew by 9.97% (yoy), improving compared to the previous period which contracted by 3.76% (yoy). Although the rice harvested area increased due to the base effect factor, there was a slowdown and higher barriers to growth in the agricultural business field due to seasonal harvest factors.

Table 10. SS Calculation Table in Aceh Province

	PROVINCE GRDP		NATIONAL GRDP		SS CALCULATIONS						
	2020	2021	2020	2021	rij	rin	rn	Nij	Mij	Cij	Dij
Agriculture, Forestry, and Fisheries	37,90	37.77	1,378,331,40	1,403,710.00	0.00	0.02	0.03	1.24	37,90	37.77	1,378,331,40
Processing industry	6.06	6.21	2,209,920,30	2,284,821.70	0.02	0.03	0.03	0.20	6.06	6.21	2,209,920,30
GDP	131.59	135.25	10,331,662.40	10,669,352.70					131.59	135.25	10,331,662.40

ISSN: 2622-5778 (online)
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The results of the acquisition values presented in Table 10 show that the Dij component has a positive value in the basic sector in Aceh, namely in the agricultural, forestry and fisheries sectors, this indicates that the economic shift in the province of South Sulawesi is positive. The calculation of the Cij component also has a positive value, which means that the economic base sector of Southeast Sulawesi Province based on business fields in the agricultural, forestry and fisheries sectors has a competitive advantage. The acquisition of the Nij and Mij components shows a positive value, this shows that the growth in the economic sector in Aceh Province is relatively fast both at the provincial and national levels.

5. CONCLUSIONS AND SUGGESTIONS

Based on the results of research and discussion, the following conclusions can be drawn:

1) Based on the results of the analysis in North Sulawesi Province, the Development of the Province's Gross Regional Domestic Product (GRDP) for 4 years shows fluctuating growth in each sector every year. During the analysis period, from 2018 to 2021, the Mining and Quarrying sector and the construction sector dominate the distribution of GRDP in North Sulawesi Province. In line with the results of the LQ calculation on the economy of North Sulawesi Province, where the Mining and Quarrying base sector has a high value when compared to the other two sectors that match the criteria for goods that can be transported by the Marine Toll Road, thus making this economic activity a very basic activity. good to develop. Supported by the results of the SS calculation where each component of the calculation results for Nij, Mij, Cij and Dij is positive, which means that the sector has a fairly fast growth in a positive direction and has a competitive advantage when compared to the national economy. The main commodities of oil palm, rubber, and coffee are included in the plantation sub-sector and have a large share in North Sumatra.

2) Based on the results of the analysis in North MaIuku Province, the Development of the Province's Gross Regional Domestic Product (GRDP) for 4 years has shown a steady increase every year. During the analysis period, from 2018 to 2021, the Agriculture, Forestry, and Fisheries sectors as well as the processing industry sector dominated the distribution of GRDP in North MaIuku Province, which were 17.65% and 17.48%, respectively. In line with the results of the LQ calculation on the economy of North MaIuku Province, where these two basic sectors are very good base activities to develop. Besides that, these two sectors have rapid growth in a positive direction and have competitive advantages when compared to the national economy, while the main commodities in this basic sector are copra and fish and nikeI downstream commodities.

3) Based on the results of the analysis in Aceh Province, the Development of the Province's Gross Regional Domestic Product (GRDP) for 4 years shows fluctuating growth in each sector every year. During the analysis period, from 2018 to 2021, the Agriculture, Forestry and Fisheries sector as well as the Mining and Quarrying sector dominate the distribution of GRDP in Aceh Province as a whole. Based on the results of the calculation of LQ on the economy of Aceh Province, although it contributes greatly to GRDP, Aceh Province has negative growth and does not have a competitive advantage nationally, and is only able to meet the needs of its region. On the other hand, the Agriculture, Forestry and Fisheries sectors are categorized as basic sectors, in line with positive growth. This sector has a competitive advantage when compared to the provincial level, so development in this sector is considered very good. The leading commodities offered in this sector are fish and rice production, sometimes this production is also influenced by weather factors.

Based on the author's understanding of the potential of each region in the study, overall the three provinces served by Tol Laut ships, namely; North Maluku Province served by Tol Laut ships on Route T-10; Aceh Province served by Tol Laut ships on Route T-3; and North Sulawesi Province, which is served by Tol Laut ships on Route T-5, each have their respective base sectors and superior commodities that have competitive advantages when compared to the national level. So in connection with this the author suggests;

1) to local governments to be able to formulate the most profitable regional development strategies to be implemented in the future, namely by prioritizing production activities of superior commodities in the form of forestry, agriculture and fisheries sectors, which are dominated by fish, shrimp, copra and rice, where the production can be become a potential counterload for marine toll vessels. So that the use of the ship's cargo space will be more optimal between departing and returning cargo. In this development, it should also not ignore the non-base sector, because by improving the performance of the non-base sector, it is hoped that later it can develop into a basic sector that can add value to the Provincial GRDP and improve the regional economy.

ISSN: 2622-5778 (online)
Advances in Transportation and Logistics Research
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2) Because the Tol Laut Program is basically a *port to port goods distribution infrastructure with a Lift On Lift Off* subsidy pattern mechanism , for the smooth distribution of logistics it is necessary to optimize the performance of Tol Laut vessels at the port and control goods from the loading/unloading port to the *hinterland* , which requires cooperation between Ministries/Institutions as mandated by Presidential Regulation Number 27 of 2021 concerning Implementation of Public Service Obligations for the Transportation of Goods from and to Disadvantaged, Remote, Outermost and Border Areas. Thus, multimodal connectivity in accommodating new trade patterns from leading commodity-producing areas in areas traversed by Tol Laut ships to loading/unloading port areas can be mutually sustainable.

3) The two points above can be a separate point of concern for further research, which is related to the advanced mode needed by the region to distribute goods/logistics produced to the loading port to be transported via Tol Laut ships. In addition, in terms of formulating policies that can be used by local governments in an effort to increase the productivity of superior commodities that are highly competitive as potential counterloads of Tol Laut ships.

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ISSN: 2622-5778 (online)
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