



Structural Change: Applying Location Quotient and Shift-Share Analysis in Determining Leading Sectors in Bangka Regency Over The 2000-2021 Period

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ABSTRACT

Economic growth is an important indicator to measure the success of a region's economic development. Changes in the driving sector mainly affect changes in economic growth. This study aims to identify leading economic sectors and analyze sectoral shifts in the economy of Bangka Regency over the period 2000-2021. The data used in this study is the Gross Regional Domestic Product of Bangka Regency and Bangka Belitung Islands Province over the period 2000-2021 in determining the leading sector and analyzing the sector using Location Quotient and Shift-Share analysis. The results showed that in 2000-2007 the leading sectors consisted of agriculture, mining and quarrying, manufacturing, utilities (electricity, gas and water), constructions, trade, hospitalities (hotels and restaurants), transportation and communications, and services sectors. Meanwhile, the results showed that the basic sectors of Bangka Regency in the period 2007-2021 shows that the leading sectors consist of Agriculture, Forestry and Fisheries, Mining and Quarrying, Manufacturing, Electricity and Gas Procurement, Water Supply, Waste Management, Waste and Recycling, Construction, Accommodation and Food Services, Information and Communication, Financial and Insurance, and Real Estate. The results of the Shift-Share analysis show that several sectors have a high level of competitiveness compared to the same sector, including the mining and quarrying sector and manufacturing industry because they lead to relatively fast growth.

Keywords: *Structural Change, Location Quotient, Shift-Share, Leading Sectors.*

1. INTRODUCTION

The economy of Bangka Regency based on the Gross Regional Domestic Product (GRDP) the basic price of Bangka Regency valid in 2021 reached IDR 16.17 trillion and the constant base price in 2010 reached IDR 10.73 trillion [1]. Throughout 2010-2021, Bangka Regency has an average economic growth above the economic growth of Bangka Belitung Province, which is 4.67%, while the economic growth of Bangka Belitung Province is 4.28%.

According to BPS data [1] there are 17 (seventeen) sectors that make up the GRDP of a region. Bangka Regency's economic growth is supported by GRDP structure that consisted of main and supporting sectors with several leading sectors among them, especially in

the last 3 (three) years having consistency from the same sector or emerging from other sectors.

Leading sectors are sectors that manage to encourage growth or development for other sectors, both the ones that support the upstream as well as downstream sectors in the production process [2]. The economic strength of a region is determined by the region's leading sector [3]. In a previous study of GRDP, the inflation rate and regional spending were used as research variables in influencing employment opportunities in North Sulawesi. According to Wahyuningsih [4], GRDP and population affect the poverty level in Nagan Raya Regency. Regional development is carried out in accordance with the leading sectors and superior commodities [5]. The

leading sector has the potential to grow faster than other sectors in an area [6]. Leading sectors can reduce regional development inequality [7].

This study uses GRDP of the business field as variable in determining the leading sector in South Sumatra Province. The methods are Location Quotient (LQ) and Shift share analysis. Location Quotient (LQ) is a comparison of the role of the sector/industry in an area to the size of the role of the sector/industry nationally. The sector/industry being compared in the regions must be the same as the sector/industry at the national level, and the comparison period must also be the same. For example, the 2021 construction sector in Bangka Regency must be compared with the 2021 Bangka Belitung Province construction sector as well. Shift share analysis is generally used in analyzing the role of a sector or the shift of a sector in the region towards the same sector in the national economy. In line with this opinion, shift share analysis is used to compare differences in the growth rate of sectors/industry in the region.

2. METHODS

This study uses secondary data regarding the GRDP of Bangka Regency compared to GRDP at constant prices according to the time-series business field 2007-2021 (BPS, 2021). Furthermore, from an understanding of the leading sectors in Bangka Regency, an analysis was carried out using the LQ and shift share methods.

2.1. Economic Base Theory

Richardson (1973) explains the theory of economic basis which states that the main determinant of economic growth in a region is directly related to the demand for goods and services from outside the region [8]. Glasson (1990) divides the basic concept of the economic base into two sectors: the basic sector and the non-basic sector [9]. The basic sectors are sectors that are able to export goods and services outside the economic boundaries of the community concerned. Meanwhile, the non-basic sectors are sectors whose goods and services are consumed within the boundaries of the local economy.

2.2. Location Quotient (LQ)

Arsyad states that LQ is an approach used to measure the performance of economic base in a region. LQ can identify whether an economic sector is considered basic sector or non-basic sector, where the base sector is a sector that has a comparative advantage. LQ calculation is used to measure activity concentration [10]. LQ calculation is done by measuring the concentration of an economic sector activity in an area compared to its role in the regional economy with similar economic sector activities in the regional or

national economy [11]. The LQ is formulated as follows.

$$LQ = \frac{X_{ij}/RV_j}{X_i/RV} \quad (1)$$

With

LQ = LQ value of sector i in regency/city j

X_{ij} = GRDP sector i related regency/city j

X_i = GRDP sector i the province

RV_j = Total GRDP of regency/city j

RV = Total GRDP of the province

According to Hardiani & Lubis (2017) there are three criteria for the LQ value. If LQ > 1, it means the related sector in the region is a basic sector and has the potential to be exported. In other words, the sector has a comparative advantage. If LQ < 1, it indicates that the related sector in the region is a non-basic sector. If LQ = 1, it means the sector's output is consumed by its own region [12].

2.3. Shift Share (SS)

Shift Share (SS) analysis is used to identify changes in the economic structure of a region, using a higher regional economic structure as a comparison [13]. The components contained in the SS analysis include components of Regional Shift, Proportional Shift, and Differential Shift. Competitive advantage in sector i can be identified from the Differential Shift component. Soepono [14] explains the shiftshare calculation formula as follows.

$$C_{ij} = E_{ij}(r_{ij} - r_{in}), \quad (2)$$

$$r_{ij} = \frac{(E_{ij}^* - E_{ij})}{E_{in}}, \quad (3)$$

$$r_{in} = \frac{(E_{in}^* - E_{in})}{E_{in}}, \quad (4)$$

With

C_{ij} = The effect of the competitive advantage of sector I regency/city J

E_{ij} = GRDP Sector I regency/city J at the beginning of the research period

E_{ij}^{*} = GRDP Sector I regency/city J at the end of the research period

E_{ij} = GRDP Sector I regency/city J at the beginning of the research period

E_{in} = GRDP Sector I province J at the beginning of the research period

r_{in} = Sector I GRDP growth rate in the province

r_n = Total GRDP growth rate in the province

There are three criteria to indicate a leading sector. If, it means the growth of sector I in the district/city is faster, compared to the same sector in provincial level. In other words, it means the sector has a competitive advantage.

That means the growth of sector I in a Bangka regency is relatively slower than the growth of the same sector in provincial level.

3. RESULTS

Based on the data from GRDP of Bangka Regency and GRDP of Bangka Belitung Province, we can see the Location Quotient of each sector (see table 1).

Table 1. Location quotient value of each business sector in bangka regency 2000-2007

Sector	LQ > 1 (Basic)	LQ = 1 (Local)	LQ < 1 (Non Basic)
(1)	(2)	(3)	(4)
1. Agriculture	1.36		
2. Mining & Quarrying	1.37		
3. Manufacturing			0.36
4. Electricity, Gas, and Water	1.08		
5. Buildings	1.24		
6. Trade, Hotel & Restaurants	1.03		
7. Transportation & Communications			0.96
8. Finance, Rent & Service Company			0.84
9. Services	1.03		

From the information in Table 1 above, sectors with LQ value > 1 are agriculture, mining and quarrying, manufacturing, electricity, gas and water, construction, trade, hotels and restaurants, and services sectors, which are the leading sectors in Bangka Regency. These sectors are also called the basic sectors (basic sector) or the commodity sectors. From Table 1, the one that has the highest value is mining and quarrying sector; the lowest sector is manufacturing. This is quite a concern because mining products have not been optimally used in manufacturing sector of Bangka Regency over the 2000-2007 period. The mining sector has a role in GRDP, but has not been able to develop the upstream and downstream sectors of the mining business field [15].

Table 2. Location quotient value of each business sector in bangka regency 2007-2021

Industry	LQ > 1 (Basic)	LQ = 1 (Local)	LQ < 1 (Non Basic)
(1)	(2)	(3)	(4)
A Agriculture, Forestry and Fishery	1.07		
B Mining and Quarrying	1.07		
C Manufacturing	1.07		
D Electricity and Gas	2.13		
E Water Supply, Sewerage, mediation Activities	1.09		
F Construction	1.01		
G Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles			0.87
H Transportation and Storage			0.57
I Accommodation and Food Services	1.00		
J Information and Communication	1.15		
K Financial and Insurance Activities	1.52		
L Real Estate Activities	1.05		
M, N Business Activities			0.86
O Public Administration and Defense, Compulsory Social and Security			0.88
P Education			0.77
Q Human Health and Social Work Activities			0.81
R, S Other Service Activities			0.92

From the information in Table 2 above, sectors with LQ value > 1 are Agriculture, Forestry and Fisheries, Mining and Quarrying, Manufacturing, Electricity and Gas Procurement, Water Supply, Waste Management, Waste and Recycling, Construction, Accommodation and Food Services, Information and Communication, Financial and Insurance, and Real Estate sectors, which are the leading sectors in Bangka Regency. These sectors are also called the basic sectors (basic sector) or the commodity sectors.

From Table 2, the one that has the highest value is the Electricity and Gas sector; the lowest is the Transportation and Storage sector. This is quite a concern because Electricity and Gas products have not been optimally used in Transportation and Storage in Bangka Regency over the 2007-2021 period.

Table 3. Shift share value of each business sector in Bangka regency 2000-2007

Sector	Growth (R)				Component		
	Rn	Rin	Rij	Nij = (Eij x Rn)	Mij	Cij	Dij
1. Agriculture		5.13	4.52	2.806.099	2.438.687	-287.623	4.957.164
2. Mining & quarrying		9.57	5.86	1.908.625	3.094.311	-1.197.670	3.805.266
3. Manufacturing		4.54	12.99	758.153	583.579	1.085.906	2.427.638
4. Electricity, gas, and water		4.46	7.47	55.987	42.304	28.568	126.859
5. Buildings		7.25	6.57	553.341	679.722	-63.277	1.169.787
6. Trade, hotel & restaurants		4.71	6.01	1.743.561	1.390.859	383.756	3.518.176
7. Transportation & communications		6.65	5.41	275.937	310.925	-57.798	529.065
8. Finance, rent & service company		3.43	3.71	265.792	154.664	12.350	432.807
9. Services		9.37	7.00	500.469	794.900	-201.287	1.094.083
Total	5.90	5.67	5.90	8.867.964	8.515.590	356.208	17.739.762

Next, the Shift Share analysis resulted in the table above and it is known that the economic growth of Bangka Regency during 2000-2007 has grown or experienced an increase. The economic performance amounts to more than 17 trillion IDR (Dij value). Meanwhile, the industrial mix in Mij has a positive influence which indicates that the overall growth of above sectors in Bangka Regency is faster than the growth of the same sectors in the provincial level. Looking at the Cij Value, positive economic sectors are those that managed to thrive.

Several sectors that have a high level of competitiveness compared to the same sectors at the Bangka Regency level include Manufacturing, Electricity, Gas and Clean Water, Trade, Hotel and Restaurant, and Finance, rent, and services company because they lead to relatively fast growth. The Nij value shows how the economic growth in the Bangka Belitung Islands Province influence the economy of Bangka Regency. It shows a positive value in each economic sector with a total output value of 8 trillion rupiahs.

Table 4. Shift share value of each business sector in Bangka regency 2007-2021

Industry		Growth (R)			Component			
		Rn	Rin	Rij	Nij = (Eij x Rn)	Mij	Cij	Dij
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A	Agriculture, Forestry and Fishery		5.52	5.95	7,589,915.98	1,700,155.98	729,709.38	10,019,781.34
B	Mining and Quarrying		0.62	1.55	6,026,756.40	-5,200,516.23	1,247,066.23	2,073,306.39
C	Manufacturing		2.49	3.97	9,599,315.95	-4,297,012.34	3,147,793.48	8,450,097.09
D	Electricity and Gas		8.49	7.73	73,885.56	65,202.71	-12,531.11	126,557.16
E	Water Supply, Sewerage, Waste Management, and Remediation Activities		5.37	5.17	7,571.11	1,451.92	-345.01	8,678.02
F	Construction		6.80	6.57	3,180,231.11	1,615,619.91	-160,432.43	4,635,418.59
G	Wholesale and Retail Trade, Motor Vehicles and Motorcycles Repair		4.78	4.84	4,583,063.85	275,244.53	57,192.13	4,915,500.51
H	Transportation and Storage		4.96	5.64	793,322.30	79,892.83	118,454.00	991,669.13
I	Accommodation and Food Service Activities		6.56	6.28	878,772.82	398,533.44	-54,591.03	1,222,715.23
J	Information and Communication		9.68	9.60	919,288.27	1,053,373.81	-15,089.37	1,957,572.70

Industry		Growth (R)			Component			
		Rn	Rin	Rij	$N_{ij} = (E_{ij} \times R_n)$	Mij	Cij	Dij
K	Financial and Insurance Activities		6.14	4.66	1,001,841.93	361,536.74	-327,802.88	1,035,575.80
L	Real Estate Activities		6.62	6.25	1,320,066.24	617,803.80	-108,517.80	1,829,352.25
M,N	Business Activities		4.21	4.24	81,403.13	-5,332.02	381.94	76,453.05
O	Public Administration and Defense, Compulsory Social and Security		6.70	6.50	1,796,373.80	870,550.76	-77,522.12	2,589,402.43
P	Education		7.03	6.07	687,813.24	384,877.40	-147,014.14	925,676.51
Q	Human Health and Social Work Activities		7.83	7.16	373,320.55	274,758.12	-55,203.68	592,874.99
R,S,T,U	Other Service Activities		6.51	6.78	240,048.93	106,301.59	14,344.60	360,695.12
Total		4.51	4.28	4.67	39,152,991.16	39,152,991.16	-2,029,233.85	3,456,509.73

Here, the Shift Share analysis resulted in the table above and it shows that the economic growth of Bangka Regency during 2007-2021 has grown or experienced an increase, with economic performance amounting to more than 40 trillion IDR (Dij value). Meanwhile, the industrial mix in Mij has a positive influence which indicates that the overall economic growth of those sectors in Bangka Regency is faster than the growth of the same sectors in the provincial level. As seen in Cij Value, positive economic sectors are sectors that managed to thrive.

Several sectors that have a high level of competitiveness compared to the same sectors in Bangka Regency level include Agriculture, Mining and Quarrying, Manufacturing, Wholesale and Retail Trade, Motor Vehicles and Motorcycles Repairation, Transportation and Storage, Business Activities, and Other Service Activities because they lead to relatively fast growth. The N_{ij} value shows how the economic growth in the Bangka Belitung Islands Province influence the economy of Bangka Regency. It shows a positive value in each economic sector with a total output value of 39 trillion rupiah.

4. CONCLUSION

The results showed that in 2000-2007 the leading sectors are agriculture, mining and quarrying, manufacturing, electricity, gas and water, construction, trade, hotels and restaurants, transportation and communications, and services sectors.

In the period 2007-2021, the results showed that leading sectors in basic sectors of Bangka Regency are Agriculture, Forestry and Fisheries, Mining and Quarrying, Manufacturing, Electricity and Gas Procurement, Water Supply, Waste Management, Waste and Recycling, Construction, Accommodation and Food Service, Information and Communication, Financial and Insurance, and Real Estate sectors.

The results of the Shift-Share analysis shows that several sectors in Bangka Regency have a high level of competitiveness compared to the same sectors in Bangka Belitung Province, including the mining and quarrying sector as well as manufacturing industry because they lead to relatively fast growth.

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