Analysis of The Leading Sector for Regional Development: A Case Study of Batam, Bintan, and Karimun (BBK), Riau Islands Province, Indonesia

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Abstract: Spatial planning in Batam, Bintan, and Karimun (BBK) areas is prioritized because it has an important impact on the national economy. This research aims to identify the potential leading sectors in the BBK areas as a reference in regional development. This study uses time series data on Gross Regional Domestic Product (GRDP) based on constant prices in the BBK areas from 2011 to 2021. The analytical tools used in this research are Location Quotient to identify basic and non-basic sectors, Shift Share Analysis to determine changes and shifts in sectors, and Klassen Typology to determine the classification of sector in each region. The three analytical tools combined results demonstrate that economic growth in Batam is supported by the processing sector. A growing sector in Bintan is related to the tourism. Economic potential in Karimun dominated by the agricultural, forestry, and marine sectors. Tanjungpinang's economic potential is dominated by the service sector, which supports the city's role as the capital of the Riau Islands Province. However, the fisheries sector has not developed optimally. As an archipelago, regional development policies in the BBK areas should develop other sectors to optimize the maritime economic potential.

Keywords: Klassen Typology, Location Quotient, Leading Sectors, National Strategic Areas, Shift Share Analysis

INTRODUCTION

The concept of regional development in Indonesia is dominated by developing new growth centers. This approach refers to the growth pole theory of Francois Perroux (1950), which suggests that growth occurs at specific points or growth poles of varying intensities. This growth is driven by the presence of a sector that can stimulate development. Furthermore, Boudeville (1966) expanded on this concept by applying it to geographical space and referring to these points as growth centers (Muta'ali, 2015). The basic idea of this theory is that economic activity in a region tends to agglomerate or concentrate in certain areas that have local advantages.

One form of growth centre-based regional development is the establishment of special zones, including Free Trade Zones (FTZs). FTZs have been developed since the 18th century in Gibraltar (1704). This concept continued to be developed in various countries with the aim of increasing exports, attracting foreign investment, transferring technology, creating jobs and other economic benefits (UNCTAD, 2019). The establishment of FTZs has become increasingly in Asia since the 1960s. There are some cities that have successfully implemented them, such as Shenzhou, China, which is now a manufacturing and shipping hub in southern China, but there are also areas that have failed to implement them, such as North Korea (Ministry of National Development Planning, 2008).

Consistent with Zhao's (2022) research on FTZs in China, it shows that the improvement of industrial structure is influenced by innovation and foreign investment. Inspired by China's success, a study by Alkon (2018) in India, economic zones have failed to improve local socio-economic development. This is due to political conditions and difficulties in obtaining land. Research by Suvorova (2019) in Russia, using spatial autocorrelation assessment and cartography, proved that regions closest to growth centres will lose resources.

As a form of economic zone in Indonesia, the term Free Trade Zone (FTZ) is paired with Free Trade Zone and Free Port (KPBPB). There are 4 KPBPBs namely Sabang, Batam, Bintan and Karimun. The objectives of FTZ implementation in these areas are to: increase investment; absorb labour; increase foreign exchange earnings from exports; increase competitiveness; increase use of local resources, services and capital for increased exports; and promote technology transfer. However, the KPBPBs still face difficulties in overlapping regulations, attracting foreign investment, promoting industrialisation and creating new jobs (Ministry of Foreign Affairs, 2021).

Batam Island has the longest history of economic development (Damuri et al., 2015). Since the 1970s, Batam Island has served as a logistical and operational base for oil and gas exploration and exploitation. In 2000, the BBK areas was established, covering parts of Batam City, Bintan Regency and Karimun Regency. Subsequently, based on Presidential Regulation No. 1 of 2024 concerning Master Plan for the Development of KPBPB BBK, the BBK areas not only Batam City, Bintan Regency, Karimun Regency, but also includes Tanjungpinang City, both KPBPB and non-KPBPB regions, as illustrated in Figure 1.
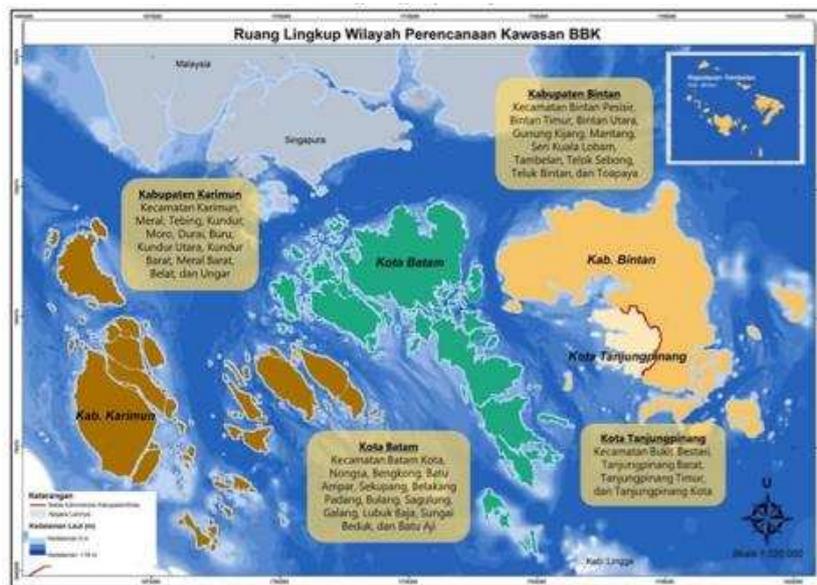
Figure 1. Location Orientation of Batam, Bintan, Karimun, and Tanjungpinang Area
Source: Presidential Regulation No. 1 of 2024 concerning Master Plan for the
Development of KPBPB BBK

The BBK areas situated within the Riau Islands Province. Geographically, the location is strategic in world trade route, stretching from the Strait of Malacca to the Natuna Sea and directly bordering Vietnam, Malaysia, Cambodia, and Singapore. The BBK areas is legally supported by several regulations, including Law Number 44 of 2007 and Government Regulations Number 46, 47, and 48 of 2007. The BBK areas is also identified as one of the National Strategic Areas (KSN) according to the Presidential Regulation No. 87 of 2011.

The designation of the BBK areas as a national strategic area is based on the recognition of its competitive potential. The potential may be found in the form of natural resources, human resources, tourism, and a variety of other factors that can support the development of each region, thereby enabling it to attract foreign investment (Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, 2016).

To promote the growth of a region, a strategy is needed to accelerate the pace of development (Rustiadi et al., 2017). In the long term, regional development needs to focus on recognising the potential of the region's natural resources and local development potential that can support economic growth, improve community welfare and alleviate poverty (Friedmann & Alonso, 2008). Regional development that prioritises regional competitive advantage is an effective strategy for promoting sustainable economic growth. Commodities with a strong market position are expected to be the main drivers of regional development (Amelia & Guswandi, 2021). Therefore, the development of leading sectors needs to be prioritised as it can have a significant impact on welfare and stimulate multiplier effects in other sectors (Muta'ali, 2015).

As a strategic area with high economic value, the BBK areas is expected to make a significant contribution to the nation. Previous studies related to this study mostly focus on one region only, namely Batam City. Previous studies related to Free Trade Zone (FTZ) mostly focus on one region only, namely Batam City. The research method used was descriptive qualitative method (Yealta, 2015; Wiryawan, 2016; Zaenuddin *et al.*, 2017; Negara *et al.*, 2018; Purba *et al.*, 2018; Alfiandri *et al.*, 2020; Aritenang, 2020; Budiyantini *et al.*, 2021; and Santyarini *et al.*, 2021).

Therefore, this case study is an empirical evidence of 10 years observation of the regional development in the BBK areas. The objective of this study is to examine the economic potential of the region with the aim of identifying the leading sectors of each region. This identification stage is an important prelude to the development of the area plan.

METHODS

The research was conducted in the BBK areas, which is comprised of the following constituent entities: Batam City, Bintan Regency, Karimun Regency, and Tanjungpinang City. The selection of this research area was conducted with the following considerations: : 1) The BBK areas is one of Indonesia's Free Trade Zones (FTZ) or Free Trade and Free Port Areas (KPBPB) (Presidential Regulation No. 1 of 2024 concerning KPBPB Development Master Plan); 2) It is also a National Strategic Area (KSN) from an economic standpoint (Presidential Regulation No. 87 of 2011 concerning Spatial Plan of National Strategic Areas); 3) The longest history of regional development in Indonesia is the development of Batam Island, since the 1970s. This region is a pioneer in the development of growth center-based areas and has various regulations governing it (Damuri et al., 2015).

This study uses time series data on Gross Regional Domestic Product (GRDP) based on constant prices in the BBK areas from 2011 to 2021. The data were obtained from the Central Bureau of Statistics (BPS) and from studies conducted by other ministries and institutions. This data encompasses the four regions under examination: Batam City, Bintan Regency, Karimun Regency, and Tanjungpinang City.

A combination of Location Quotient (LQ), Shift Share Analysis (SSA), and Klassen Typology are used to measure the competitive and comparative advantages of a region. Based on these analytical tools, the economic potential of the region can be identified in the form of leading sectors as the engine of the economy. The following section provides a description of the analytical tools employed in this study.

Location Quotient (LQ)

LQ an analytical method used to determine the comparative advantage of the concentration of an activity in an area within the scope of a wider aggregate area. This

analytical method is an analytical technique that aims to examine the composition of regional base sectors based on Gross Regional Domestic Product (GRDP) as an indicator of regional growth. LQ is a simple indicator that shows the strength or size of the role of a sector in a region compared to the region above it (Tarigan, 2005). In this study, the economic base analysis was conducted at the city/district level within the province.

In this analysis, an applied formula is used to measure the potential economic sectors that can be favored by a region. If v_i^R and v_t^R are the total value added of sector i and all sectors in region R, respectively, while VI and VT represent the total at the provincial or national level, then the LQ of sectors in a region can be defined as follows:

$$LQ_i^R = \frac{v_i^R / v_t^R}{VI / VT} \qquad\qquad LQ_i^R = \frac{v_i^R / v_t^R}{VI / VT} \tag{1}$$

Where, v_i is income of sector i in a region; v_t is total income of a region; VI is income of sector i at the national or provincial level; and VT is total income at the national or provincial level.

The criteria used to interpret the LQ value according to Bendavid-Val in Kuncoro (2002), are as follows:

- LQ > 1, indicates that the sector is a basic or leading sector, as it can enhance and developing the region or area in question. This signifies that the sector/sub-sector's capacity to contribute to GRDP is superior to the average capacity of analogous sectors/sub-sectors in the reference area. Consequently, it can be classified as a potential sector/sub-sector.
- LQ = 1, indicates that the sector is not a basic sector and is only capable of fulfilling local demands. However, it has the potential to evolve into a basic sector. This signifies that the sector/sub-sector's contribution to GRDP is commensurate with the average contribution of similar sectors/sub-sectors in the reference region. Consequently, it is only capable of fulfilling local needs.
- LQ < 1, indicates that the sector is not a basic or leading sector. This is because it is unable to meet local needs, leading to a tendency to import from outside the region.

The rationale for this concept is based on the economic base theory, which posits that economic base activities produce goods and services for the region and for external markets. Economic transactions with external markets generate income for the region, which has an impact on increasing consumption and investment, increasing income, and opening new employment opportunities. Therefore, the region must develop an economic base that is an economic potential.

Shift Share Analysis (SSA)

Shift Share Analysis is an analytical tool to determine the performance or productivity of the regional economy by comparing it with the wider region. Thus, it is expected that the use of this method will be able to determine the potential of each district/city in regional growth (Tarigan, 2005).

The objective of this share analysis is to present a static representation of the regional structure. This analysis compares regional changes that have occurred in a region between two specific points in time, with a particular focus on whether the regional change is greater or less than the national average change (i.e., whether there is an upward or downward shift or change).

This method is considered sharper than the LQ method. The LQ method does not provide an explanation of the factors causing changes while the SSA method details the causes of changes in several variables. SSA assumes that economic growth or value added of a region (D_{ij}) is influenced by three main components that are interconnected with each other, namely sector growth (Regional share-N_{ij}), sectoral growth (Proportional shift-M_{ij}), and regional competitiveness growth (Differential Shift-C_{ij}). The general form of shift share analysis and its components is (Arsyad, 2005):

$$D_{ij} = N_{ij} + M_{ij} + C_{ij} \qquad (2)$$

Where, i is economic sectors studied; j is region studied; D_{ij} is change of sector i in region j; N_{ij} is growth of sector i in region j; M_{ij} is sector mix i in region j; C_{ij} is competitive advantage of sector i in region j.

Table 1. Component of Shift Share Analysis

Component	Definition	Formula
Regional Share-RS (N_{ij})	It represents the aggregate growth of the region over two specified time points. A positive Regional Share (RS) value indicates that the district/city is exhibiting accelerated growth relative to the provincial level.	$N_{ij} = E_{ij}.r_n$
Proportional Shift-PS (M_{ij})	It referred to as the structural component or industrial mix. The Proportional Shift (PS) value represents the relative growth of a sector in comparison to the overall growth of the entire region. A positive M_{ij} component indicates that a sector in the district is experiencing rapid growth.	$M_{ij} = E_{ij} (r_{in} - r_n)$

Differential Shift-DS (C_{ij})	It demonstrates the competitiveness of a specific activity in comparison to the overall growth of that sector/activity within the region. If the Differential Shift (DS) value is positive, it indicates that the sector is more competitive than other sectors within the district/city.	$C_{ij} = E_{ij} (r_{ij} - r_{in})$
growth rate of sector i in region j (r_{ij})	It measure the percentage change of a sector in each region	$r_{ij} = (e^*_{ij} - e_{ij}) / e_{ij}$
growth rate of sector i of the national economy (r_{in})	It show the percent change of a sector in national level over a given period of time	$r_{in} = (e^*_{in} - e_{in}) / e_{in}$
national growth rate (r_n)	It represent the percentage change in a nation during a period of time	$r_n = (e^*_n - e_n) / e_n$

Source: Arsyad, 2005; Muta'ali, 2015.

Where, E_{ij} is GRDP of sector i in region j; e^*_{in} is GRDP of sector i at the national level in the last year of analysis; e_{in} is GRDP of sector i at the national level in a particular base year; e^*_{ij} is GRDP of sector i in region j in the last year of analysis; e_{ij} is GRDP of sector i in region j in a particular base year; e^*_n is national GRDP in the last year of analysis; e_n is national GRDP in a particular base year.

The Shift Share method offers several advantages. It allows for the identification of the sector with the greatest potential for regional growth and development, thereby informing the formulation of targeted policies to foster that growth. It also enables the identification of sectors requiring immediate attention for development. Furthermore, it facilitates the creation of development policies tailored to specific sectors. Finally, it provides a means of comparing regional economic growth with national growth, offering insights into the relative performance of different regions. One limitation of this analysis is that it does not allow for the measurement of the specific changes that drive economic sector growth in a each region (Yogi et al., 2019).

Klassen Typology Analysis

Klassen typology is a model for identifying the level of economic development of a region. It employs a database of per capita income and economic growth, with a division based on averages (Muta'ali, 2015). The outcome of a Klassen typology analysis is a regional classification. The benefits of Klassen typology analysis include the following: determination of the potential for regional economic development; analysis of regional economic performance; determination of regional development priorities; compilation of a

classification of regional economic levels; and the basis for formulation of regional development policies and programs.

According to Klassen's typology for the classification of economic sector productivity, the regional economic sectors are divided into four (4) classifications, namely:

- Developed and fast-growing sectors: are sectors that have higher sectoral economic growth rates and sectoral contributions than the average district/city in the province.

- Developed, but depressed sectors: These are sectors that have a higher sectoral contribution but a lower sectoral economic growth rate than the average district/city in the province.

- Relatively lagging sectors: these are sectors that have low sectoral economic growth rates and lower sector contributions than the average district/city in the province.

- Potential, fast-growing sectors: these are sectors that have high sectoral economic growth rates, but lower sectoral contributions than the average district/city in the province.

Table 2. Sector Classification based on Klassen Typology

		Sector growth per year (g)	
		Below the aggregate regional average	Above aggregate region average
Sector contribution to GRDP (s)	Above aggregate region average	QUADRAN II (developed, but depressed sectors) $g_i<g$; $s_i>s$	QUADRAN I (developed and fast-growing sectors) $g_i>g$; $s_i>s$
	Below the aggregate regional	QUADRAN III (relatively lagging sectors) $g_i<g$; $s_i<s$	QUADRAN IV (potential sector, can grow fast) $g_i>g$; $s_i<s$

Source: Sjafrizal, 2018

Where, g is sector growth in the aggregate region; g_i is growth rate of the observed region; s is sector contribution to the aggregate region's GRDP; s_i is sector contribution to the GRDP of the observed region.

RESULTS AND DISCUSSION
Leading Sector in the BBK Areas

The measure of a region's development success is the achievement of high economic growth. The process of development and economic growth will not be optimal if it does not match the potential of the region (Putra et al., 2019). In order to ascertain the economic potential of the BBK areas, this study employs secondary data on Gross Regional Domestic Product (GRDP) by business field, based on constant prices, from 2011 to 2021. The growth rate is calculated by subtracting the value of GRDP in year n from the value in year n-1 (the previous year), then dividing the result by the value in year n-1, and finally multiplying the quotient by 100 percent. The growth rate demonstrates the evolution of aggregate income from a specific point in time to the preceding point in time (Gusrizal, 2022).

A review of secondary data from the Central Statistics Agency (BPS) reveals that the BBK areas experienced fluctuations in its economic growth rate over the 10-year period between 2011 and 2021. A comparison of the BBK areas with the Riau Islands Province reveals a downward trend in growth from 2011 to 2017, followed by a decline during the 2019-2020 pandemic. A comparison of the four regions reveals that, except for 2017, the growth rate of Batam City is relatively higher than that of Bintan Regency, Karimun Regency, and Tanjungpinang city. This is illustrated in Table 3 and Figure 2 below.

Table 3. Economic Growth Rate in Riau Islands 2011-2021 (in percent)

Region	Year											Average
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Kepulauan Riau	6.96	7.63	7.21	6.60	6.02	4.98	1.98	4.47	4.83	-3.80	3.43	5.03
Tanjungpinang	7.03	7.11	7.78	5.28	5.70	5.01	2.63	3.21	3.27	-3.45	0.59	4.42
Batam	7.83	7.40	7.18	7.16	6.87	5.43	2.61	4.96	5.92	-2.55	4.75	5.76
Bintan	6.86	6.58	6.08	6.35	5.16	5.05	4.94	4.85	4.51	-4.20	0.23	4.64
Karimun	7.04	7.24	7.09	6.87	6.54	6.17	5.29	5.05	4.89	-3.59	2.37	5.50
Natuna	2.58	7.83	4.60	4.42	3.90	3.00	0.87	2.53	1.75	-4.29	0.02	2.72
Lingga	6.65	6.58	6.88	5.16	2.38	4.09	6.08	4.00	5.18	-0.68	1.95	4.83
Kepulauan Anambas	1.82	3.89	3.18	3.70	3.03	2.90	-0.10	-8.21	-0.13	-7.83	0.04	0.23

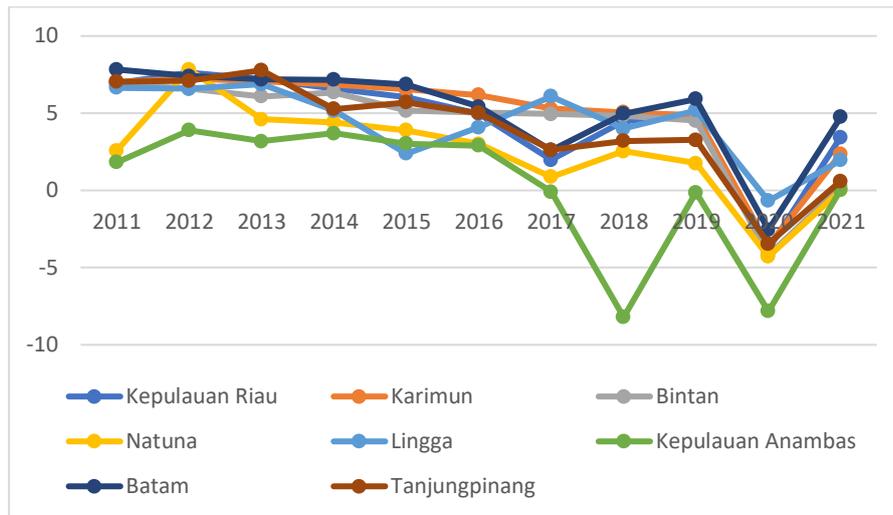Source: Processed based on BPS Kepulauan Riau, 2012-2022.

Figure 2. Economic Growth Rate in Riau Islands Province 2011-2021
Source: Processed based on BPS Riau Islands, 2012-2022.

Based on 10-year growth rate in Riau Islands Province, Batam's average economic growth (5.76%) is higher than that of Bintan (4.64%), Karimun (5.50%) and Tanjungpinang (4.42%), and even higher than that of Riau (5.03%). As a designated growth center, the BBK areas has been the recipient of regulatory and other incentive measures from the central government. Therefore, it is reasonable to conclude that the area will experience a high economic growth rate in accordance with the stated target.

Based on the calculation of the three methods, the leading sectors are obtained that meet the following criteria: has a comparative advantage (LQ>1), has a competitive advantage (DS +), and is a fast-growing sector (Klassen quadrant 1), as shown in Table 4.

Table 4. Recapitulation Result of Leading sectors in BBK areas based on Location Quotient, Shift Share, and Klassen Typology analysis in 2011-2021

Code	Sector	Batam			Bintan			Karimun			Tanjungpinang		
		LQ	DS	Klassen	LQ	DS	Klassen	LQ	DS	Klassen	LQ	DS	Klassen
A	Agriculture, Forestry, and Fisheries	0,31	0,19	4	1,78	0,47	1	4,83	0,26	1	0,24	0,06	4
B	Mining and Quarrying	0	-0,13	3	0,73	-0,81	3	0,74	0,18	4	0,06	-1,21	3
C	Processing Industry	1,44	0,01	1	1	-0,11	3	0,36	-0,15	3	0,18	-0,35	3
D	Electricity and Gas Procurement	1,55	-0,02	2	0,16	0,05	4	0,33	0	4	0,29	-0,49	3

Code	Sector	Batam			Bintan			Karimun			Tanjungpinang		
		LQ	DS	Klassen	LQ	DS	Klassen	LQ	DS	Klassen	LQ	DS	Klassen
E	Water Supply; Waste Management, Waste, and Recycling	1,55	0,13	1	0,48	0,2	4	0,35	0,27	4	0,55	0,41	4
F	Construction	1,09	0,02	1	0,99	0,56	4	0,92	0,56	4	1,9	-0,37	2
G	Wholesale and Retail Trade; Repair of Cars and Motorcycles	0,82	-0,11	4	1,2	0,09	1	2,25	-0,05	2	2,96	0,25	1
H	Transport and Warehousing	1,08	-0,18	2	0,95	0,86	4	1,42	0,46	1	2,42	0,26	1
I	Provision of Accommodation and Drinking Food	1,11	-0,09	2	2,51	0,19	1	1,05	0,39	1	0,66	0,24	4
J	Information and Communication	1,2	0,3	1	0,64	-0,75	3	1,46	-0,55	2	1,54	-0,53	3
K	Financial Services and Insurance	1,35	0	1	0,64	0,24	4	0,63	0,1	4	1,24	-0,01	2
L	Real Estate	0,99	-0,01	4	0,81	0,5	4	2,16	0,36	1	2,31	0,34	1
M,N	Company Services	0,97	-20,89	3	0,21	-20,49	4	3,52	-19,76	1	3,3	-20,29	1
O	Public Administration, Defence, and Compulsory Social Security	0,49	0,21	4	1,06	0,16	1	1,68	-0,01	1	4,23	0,09	1
P	Education Services	0,72	-0,09	3	1,42	0,13	1	2,51	0,06	1	3,02	0,21	1
Q	Health and Social Services	0,83	-0,12	2	1,05	0,11	1	1,85	0,31	1	2,78	-0,13	2
R,S,T,U	Other Services	0,92	-0,03	3	0,53	0,7	4	3,95	0,68	1	3,33	0,64	1

Source: analysis results, 2024

Explanation:
LQ: average value Location Quotient from 2011 to 2021
DS: Differential Shift value in 2021 compared to 2011
Kl: Klassen Quadrant typology based on average value during 2011-2021

Based on the combination of Location Quotient, Shift Share Analysis, and Klassen typology results, the following is an explanation of the economic potential of each region in the BBK area:

- Batam City: There are 5 leading sectors that can be the driving force of the regional economy, namely: Processing industry; Water supply, waste management, waste, and recycling; Construction; Information and communication; Financial services and insurance.

- Bintan Regency: There are 6 leading sectors that grow fast and contribute positively to regional growth, namely: Agriculture, forestry, and fisheries; Wholesale and retail trade, repair of cars and motorcycles; Provision of accommodation and eating and drinking; Government administration, defense, and mandatory social security; Education services; Health services and social activities.

- Karimun Regency: There are 7 leading sectors that have a significant contribution to regional growth, namely: Agriculture, forestry, and fisheries; Transportation and warehousing; Provision of accommodation and eating and drinking; Real estate; Educational services; Health services and social activities; Other services.

- Tanjungpinang City: There are 6 leading sectors that have a significant contribution to regional growth, namely: Wholesale and retail trade, repair of cars and motorcycles; Transportation and warehousing; Real estate; Government administration, defense, and mandatory social security; Educational services; and other services.

Generally, few changes and shifts in the lead sector of the BBK areas for 10 years. Batam City still with the processing sector as its base sector, Bintan and Karimun Regencies which still rely on the agricultural sector, and Tanjungpinang City, with its status as the provincial capital, are very potential in the development of service and trade industries.

Regional Development Based on Growth Centers

The concept of growth centre-based regional development strategies is not a novel one. This approach assumed that areas designated as centres will develop rapidly and significantly. The Batam, Bintan and Karimun (BBK) areas has applied this strategy since the 1970s. During that time, the government has implemented several interventions with various program, expanding delineations, and completing the regulations, but the results

have been deemed to be suboptimal. The dynamics of the economic growth rate in the region are even considered to be stagnant.

An evaluation conducted by the Riau Islands Provincial Chamber of Commerce revealed that one of the factors contributing to this outcome was the failure of the area manager to prioritize the economic potential of the area. The lengthy bureaucratic processes are an inefficient use of time (Harefa, 2013). In a previous study (Yealta, 2015; Wiryawan, 2016; Yuliani et al., 2019; and Aritenang, 2020), the lack of industrial upgrading in BBK areas was attributed in part to institutional problems. Batam went through a period of economic recession in the early 2000s after seeing a boom in investment in the early 1990s. Decentralization has changed the institutional structure, which has had negative effects on Batam and further lowered the atmosphere for investment in the area. The existence of several bureaucratic barriers has negatively impacted Batam City's economic development, especially since 2015. Batam City's economic growth has not been significantly impacted by its designation as a national strategic region. The absence of thorough and current planning documents has made the investment process difficult in addition to regulatory concerns. Overlapping power and regulatory uncertainty are the primary causes of investors' continued hesitancy to make investments. Concurrently, to enhance competitiveness in regional development, it is imperative to encourage investment and innovation. Foreign Direct Investment (FDI) exerts a beneficial influence on the added value of domestic companies. In this case study, it is vital to capitalize on the locational advantage to attract investment, while fostering collaboration with domestic enterprises in the downstream sector and facilitating technology transfer within the domestic industry.

This research aims to identify the leading sectors that can be the driving force for the development of the BBK areas. Three methods (Location Quotient, Shift Share, and Klassen Typology) used to identify the economic potential of the Batam, Bintan, Karimun, and Tanjungpinang for the period 2011 to 2021. The study's findings begin with an overview of the economic growth conditions in each region, showing that Batam has the highest growth among the Riau provinces. This is in line with its initial potential as a manufacturing base. In general, the construction sector has seen consistent growth in all three regions, except Tanjungpinang, indicating ongoing development. Despite these advancements, the maritime industry nevertheless necessitates stimulation to enhance its contribution to the region's economic growth.

The BBK areas are situated within the boundaries of the Riau Islands province. The province is comprised of 96% marine territory. In general, the maritime industry represents a significant potential for development, particularly in the areas of shipping, fisheries, and marine tourism. Nevertheless, the actualization of the potential of small islands is a challenging endeavor (Harefa, 2011). The constraints can be broadly categorized as follows (Husni, 1998): (1) Their relatively small size and tendency to be isolated result in the

provision of facilities and infrastructure being a costly endeavour, as well as a scarcity of human resources to develop them; (2) Achieving optimal and profitable economies of scale is a challenging undertaking. (3) The scarcity of natural resources and environmental services that could support the development of small island ecosystems, human life, and the development activities conducted therein; and (4) The lack of accommodation, or even conflict between local island cultures in development activities.

Implementation of Regional Development Planning

The implementation of the regional development concept must be customized to correspond with the potential, problems, and current condition of the region. Regional development is achieved through the mobilization of economic activities and the accumulation of diverse investment activities that can serve as a catalyst for sustainable regional development, as outlined in the Regional Spatial Plan (Soedarso, 2001, Nugroho & Dahuri, 2004). As a legal reference for spatial planning in Batam, Bintan and Karimun (BBK), the leading sectors identified in this study have been adequately addressed in the regional spatial plan.

- Based on the Regional Regulation of Batam City No. 3 of 2021 concerning the Spatial Plan of Batam City for 2021-2041, the objective of the Batam City's spatial planning is to realize the Batam towards a civilized world city based on tourism, trade and services, maritime, logistics and industry sectors with international standards.
- Based on the Regional Regulation of Bintan Regency No. 1 of 2020 concerning the Spatial Plan of Bintan Regency for 2020-2040, the purpose of the Bintan's spatial planning is to realize a civilized and prosperous Bintan through the development of an international standard tourism sector and a safe, comfortable and sustainable industrial sector as an archipelago with strategic value.
- Based on the Regional Regulation of Karimun Regency No. 3 of 2021 concerning the Spatial Plan of Karimun Regency for 2021-2041, which states that the purpose of spatial planning in Karimun is to realize an advanced Karimun through an environmentally and sustainable industrial, agricultural and fisheries sector as an archipelago region.
- Based on Regional Regulation of Tanjungpinang City No. 10 of 2014 concerning the Spatial Plan of Tanjungpinang City for 2014-2034, which states that the purpose of spatial planning in Tanjungpinang City is to realize Tanjungpinang as a center for trade and services, industry, tourism and Malay cultural centers through optimizing space utilization that takes into account the carrying capacity of the environment.

Generally, in the planning documents in each region in the BBK areas, spatial planning objectives are prioritized on the development of the tourism sector. The determination of

tourism as a leading sector needs to be accompanied by appropriate policies and will be different for each region. The study by Yudhoyono et al. (2021) shows that high income from the tourism sector can be obtained from businesses that have been operating for a long time. However, there are inefficiencies in its financial management because business actors cannot manage assets optimally. Related to the potential of the agricultural sector, a study conducted by Priyarsono et al. (2005) shows that small-scale agro-industry is very prospective to increase economic growth. The agricultural sector has a high multiplier effect, as the sector's production inputs are available domestically. However, this agroindustry improvement policy needs to be supported by the government by prioritizing development in rural areas, pro-poor policy and pro-small-scale industries. Therefore, other sectors should be developed to support the leading sector (Wijaya, 2020; and Harjanti, 2021). In the future, a shift in the economic structure is possible through the development of the leading sector. Policies to improve people's welfare and the transfer of economic activities from the primary sector to the secondary and tertiary sectors are part of the goals of economic growth.

After 40 years since the beginning of the development of the BBK areas, the issue faced is a decrease in competitiveness compared to similar FTZs in neighboring countries (Situmorang, 2008; Kumar et al., 2013; and Negara et al., 2018). Batam Island has high competitiveness due to its strategic location. The advantage of its proximity to Singapore has allowed Batam to develop as Indonesia's economic growth center. However, the development policy of Batam Island emphasizes only the individual Batam Island and does not include the surrounding areas. The Free Trade Zone (FTZ) status is not associated with higher levels of output, exports, or productivity. Instead, factors supporting better performance are foreign ownership, export orientation, use of imported inputs, wage levels, and firm age. In other study (Rustiadi et al., 2003; Arsyad, 2005; Nashwari et al., 2017; Chulaphan & Barahona, 2018; and Fuadina et al., 2021), it is necessary to determine regional development priorities in accordance with their potential. To facilitate the evaluation of the programme in question, it is of the utmost importance that the planning area is clearly delineated. The existence of limited development resources, such as funds, human resources, and others, requires priority in allocating resources. A complete understanding of the numerous economic growth factor is essential, as each one has a different influence on different locations. Consistent with previous research, this study finds that the growth center approach does not ensure sustainability. Success in promoting regional economic growth is closely related to the quality of regional planning to use and manage its resources. Future studies could examine regional disparities and the interactions between the center and the periphery of the growth center.

CONCLUSIONS

According to the findings of Location Quotient, Shift Share, and Klassen Typology, several leading sectors have identified in the regions of Batam City, Bintan Regency, Karimun Regency, and Tanjungpinang City during the period from 2011 to 2021. Batam City's economic growth is still supported by industrial sectors that can be the driving force of the regional economy. Bintan Regency's growth is related to tourism sectors that contribute positively. Karimun Regency's potential lies in the agricultural sectors that have a significant contribution to regional growth. Last, services sectors have a significant contribution to regional growth of Tanjungpinang City, which supports the city's role as the capital of the Riau Islands Province.

The study also emphasizes the need to harness the maritime economic potential of the regions, particularly in the areas of industry, tourism, trade, and transportation. Future research could explore spatial analysis methods, such as the Geographically Weighted Regression (GWR) model, to better understand the spatial diversity of factors influencing regional development.

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