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Research Article

Leading Sector in Banyumas Regency During The Covid-19 Pandemic Using Location Quotient and Shift-Share

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ABSTRACT

The economic growth rate is an indicator used to measure the achievement of development. In 2020, the economic growth rate of Banyumas Regency contracted by -1.65 percent but this figure is still above the economic growth rate of Central Java Province which is -2.65 percent. The economic growth of a region is driven by the leading sectors in the region. This research aims to find out the leading sectors in Banyumas Regency that experienced progressive, growing, sluggish and backward movement during the Covid-19 outbreak compared to Central Java Province using *Location Quotient and Shift-Share* (LQ Shift- Share) analysis. The results of the analysis showed that the sectors that contributed the two largest to the Gross Regional Domestic Product (GRDP) in Banyumas Regency in 2020 at the same time including the progressive sector were trade sector (G) and construction sector(F).

Keywords*: economic growth, GRDP, location quotient, shift-share*

Background

Banyumas Regency contributed to the Gross Regional Domestic Product (GRDP) of Central Java Province in 2020 by 3.98 percent. When viewed from Table 1, the GRDP value of Banyumas Regency is ranked fourth largest compared to 33 regency/city in Central Java after Semarang City, Cilacap Regency, and Kudus Regency. This shows that Banyumas Regency has considerable economic potential to generate added value for its population. However, it needs to be examined more deeply whether the added value generated in Banyumas Regency has been felt by all of people of Banyumas Regency or not.

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Table 1. Percentage contribution to the total gross regional domestic product of the five largest regencies/cities in Central Java Province in 2020

Regency/City	2020
Semarang City	14,05
Kudus Regency	8,10
Cilacap Regency	7,80
Banyumas Regency	3,98
Semarang Regency	3,64

Source: Publication of Central Java Province in Numbers 2021, Central Bureau of Statistics

In the midst of the pandemic Covid-19 that occurred since March 2020, Banyumas Regency was able to maintain the rate of decline in economic growth so that it did not plummet too far. Banyumas Regency's economic growth rate in 2020 reached -1.65 percent or above the growth rate of Central Java Province which is -2.65 percent. Good economic defense in the wake of the pandemic Covid-19 in Banyumas Regency prompted researchers to find out more about the sectors that sustain the economy in Banyumas Regency.

The largest sectors contributing to the economy of Banyumas Regency in 2020 are the processing industry (25.37 percent), large trade and retail, car and motorcycle repairs (15.23 percent), and construction (12.82 percent). But all of the three sectors have negative growth rate in 2020. The growth rate in 2020 in the processing industry sector by -0.05 percent, large trade and retail, car and motorcycle repairs by -3.70 percent and construction by -3.71 percent. The sectors that experienced positive economic growth in 2020 were the information and communication sector by 13.81 percent, health services and social activities by 7.83 percent and water procurement, waste management, waste and recycling by 4.15 percent. The decrease in the economic growth rate of the trade sector and the preparation of drinking in line with the decrease in the value of sales turnover (Saturwa HN, Suharno, Abdul, 2021).

Table 2. Three Sectors with the largest distribution and the rate of economic growth of the sector towards GRDP Banyumas Regency Year 2020 (percentage)

Sector	Distribution	Growth Rate
Processing Industry	25,37	-0,05
Large Trade and Retail; Car and Motorcycle Repair	15,23	-3,70
Construction	12,82	-3,71

Source: Publication of GRDP Sector Banyumas Regency, Central Bureau of Statistics

It can be known from Table 2 that the high percentage distribution of sectors to GRDP in Banyumas Regency does not guarantee that the sector is able to maintain the economic growth rate of the sector to grow positively during the pandemic Covid-19. On the other hand, there are three sectors that only contribute 6.79 percent but experience positive economic growth in the pandemic period. Therefore, this study aims to find out the sector in Banyumas Regency that is experiencing progressive, growing, sluggish and backward movement compared to the Central Java Province during pandemic Covid-19 year 2020.

Herawaty (2017) in her research used LQ calculations to find out the leading plantation commodities in North Sumatra Province and shift share analysis to find out the development of plantation commodities. Azwartika, et al (2013) conducted research to find out the leading commodities of agriculture in Pamekasan Regency. Gantara and Tri Achmadi (2012) conducted a regional development model for port development which uses LQ and shift-share

analysis to identify the base and non-base sectors for further modeling of dock length. Zulha, and Eko (2013) in their research entitled spatial linkage patterns of districts / cities in East Java Province based on their leading sector use static LQ analysis to find out the base level to then be combined with dynamic LQ to find out the high development potential. From the above studies it can be concluded that LQ and shift-share analysis are able to produce output in the form of leading sectors in a region.

Methods

The method used in this research are Location Quotient (LQ) and Shift-share analysis. The method are used to help the analysis so that it will get more concrete research results. Data used were data of Gross Regional Domestic Product (GRDP) Banyumas Regency and Central Java Province year 2015-2020 which were obtained from Publication of Central Bureau of Statistics of Central Java Province in Figures and Publication of GRDP Banyumas Regency.

Analysis Location Quotient (LQ)

LQ analysis is a formula used to find out the extent of specialization / concentration of regional sectors. The LQ calculation formula is as follows:

$$LQ = \frac{({}^{Q_{ir}}/_{Q_r})}{({}^{Q_{nr}}/_{Q_n})}$$

Where :

- Q_{ir} is an economic indicator of sector *i* region
- Q_r is an economic indicator of the entire region.
- Q_{in} is an economic indicator of sector *i* of the broader area of reference
- Q_{ir} is an economic indicator of the entire broader area of reference.

The indicator used in this study is added value. If the value of LQ > 1 means that the role of sector *i* in the region is more prominent than the role of sector *i* more broadly. Or in other words, sector *i* is a leading sector and has the potential to be developed as a driver of the region's economy. If the value of LQ < 1 means that the role of sector *i* in the region is smaller than the role of the sector more broadly or the role of sector *i* is less potential to be developed as economic drivers of the region.

Analysis LQ SHIFT-SHARE

LQ *shift-share* analysis is used to determine the performance of the region's economy that is refreshed in the form of regional growth, the rate of growth relative regional sectors and the competitiveness of regional sectors. LQ *shift-share* analysis is developed from the LQ model and is more dynamic because it pays attention to the development of the sector in two points in time. In addition, LQ-share and LQ-shift analysis can identify specialization / concentration and development of the regional sector because it is based on a very similar calculation concept so that the results of calculations support each other against the determination of progress or relative decline of the regional sector.

The level of specialization/concentration of the region sector can be identified in two time period points. Calculations LQ_{share} is as follows:

$$LQ_{share} = \left[\frac{{}^{1}/_{2}\,(Q_{Rkn} + Q_{Rk0})}{{}^{1}/_{2}\,(Q_{Rn} + Q_{R0})} \Big/ \frac{{}^{1}/_{2}\,(Q_{Nkn} + Q_{Nk0})}{{}^{1}/_{2}\,(Q_{Nn} + Q_{N0})}\right] = \left[\frac{(Q_{Rkn} + Q_{Rk0})}{(Q_{Rn} + Q_{R0})} \Big/ \frac{(Q_{Nkn} + Q_{Nk0})}{(Q_{Nn} + Q_{N0})}\right]$$

Where :

- Q_{Rk0} is economic indicator sector *k* early period area
- Q_{Rkn} is economic indicator sector *k* end of period area
- Q_{R0} is economic indicators of total sector of the early period
- Q_{Rn} is economic indicators of total sector region end of period
- Q_{Nk0} is economic indicator sector *k* reference region early period
- Q_{Nkn} is economic indicators sector *k* of the end of the period
- Q_{N0} is economic indicators of total sector of the initial reference region of the period
- Q_{Nn} is economic indicators of total sector of the end-period reference region
- $\frac{(Q_{Rkn}+Q_{Rk0})}{(Q_{Rn}+Q_{R0})}$ is component of *share* sector *k* area of observation

- $\frac{(Q_{Nkn}+Q_{Nk0})}{(Q_{Nn}+Q_{N0})}$ is component of *share* sector *k* reference area

Interpretation of the results of the analysis LQ_{share} is as follows:

- LQ_{share} > 1, sectors with a higher level of specialization/ concentration than the reference area
- LQ_{share}< 1, sectors with a level of specialization / concentration lower than the reference area
- LQ_{share} = 1, sector with a level of specialization / concentration equal to the reference area

The development of the competitiveness of the region in two points of the time period is seen LQ_{shift} as follows:

$$LQ_{shift} = \left[\frac{\frac{(Q_{Rkn} - Q_{Rk0})}{(Q_{Rn} - Q_{R0})}}{\frac{(Q_{Nkn} - Q_{Nk0})}{(Q_{Nn} - Q_{N0})}}\right]$$

$\frac{(Q_{Rkn}-Q_{Rk0})}{(Q_{Rn}-Q_{R0})}$ is component of *shift* sector *k* area of observation

$\frac{(Q_{Nkn}-Q_{Nk0})}{(Q_{Nn}-Q_{N0})}$ is component of *shift* sector *k* reference area

Interpretation of the results of the analysisLQ_{shift} as follows:

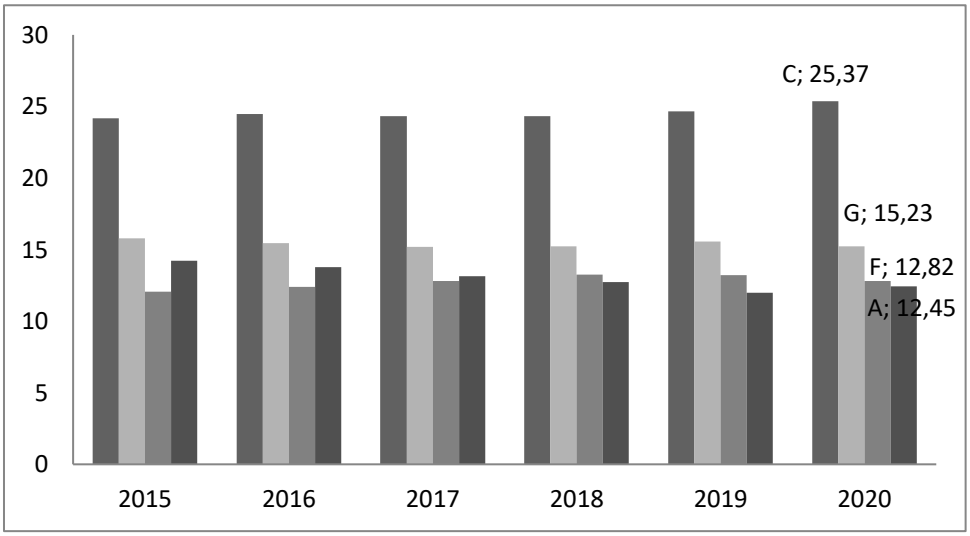
- LQ_{shift} > 1, sectors with a higher level of specialization / concentration than the reference region
- LQ_{shift} < 1, sectors with a level of specialization / concentration lower than the reference area
- LQ_{shift}= 1, sector with a level of specialization / concentration equal to the reference area

The establishment of the relative position of the sector based on the following criteria:

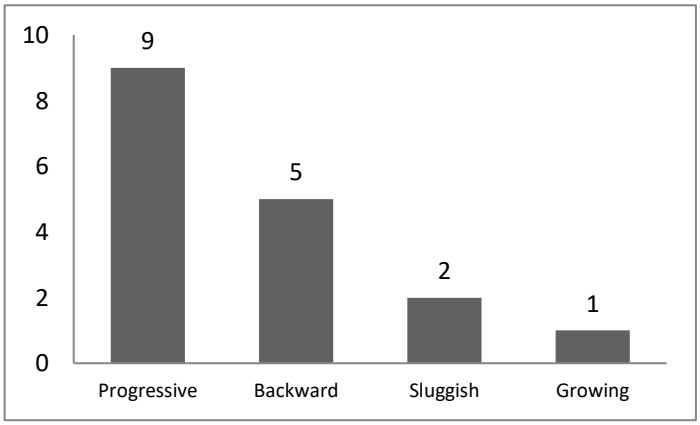
1. LQshare ≥1 and LQshift ≥1
   Progressive Sector.
   Showing that the level of specialization / concentration and the rate of change / competitiveness of the sector is high, the sector is very instrumental.
2. LQ*share* <1 dan LQ*shift* ≥1
   Growing Sector.
   Indicates that the level of specialization / concentration of the sector is still low but the pace of change is relatively high, so the sector has a good prospect to play a role.
3. LQ*share*≥1 dan LQ*shift*<1
   Sluggish Sector
   Shows that the level of specialization / concentration of the sector is high but with a low rate of change / competitiveness. The sector is being targeted by the same sector from other regions.
4. LQ*share*<1 dan LQ*shift*<1
   Backward Sector.
   Showing that the level of specialization / concentration and the rate of change / competitiveness of the sector is low, the sector has a less good prospect to play a role.

Results and Discussion

In the last six years, the sectors that contributed greatly to the GRDP of Banyumas Regency experienced a slight shift, namely the agricultural, forestry, and fisheries sectors to the construction sector. Graph 1 shows from 2018 to 2020, the contribution of agriculture, forestry and fisheries sectors was shifted by the construction sector. This shift shows a decrease in production produced by the agricultural sector while the value of projects produced by the construction sector is increasing from year to year.



Graphic 1. Percentage Distribution of the Four Largest Sectors in Banyumas Regency in 2015-2020



Graphic 2. Number of Sectors According to LQ Shift Share Analysis Category

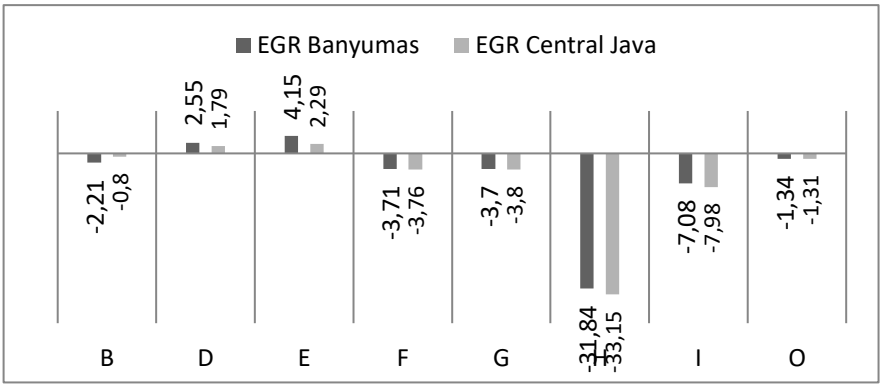
The results of the LQ shift-share analysis showed that in Banyumas Regency there are 9 sectors that are progressive, 5 sectors include backward categories, 2 sectors include sluggish categories, and 1 sector belongs to the developing category.

Progressive Sector

In the Great Dictionary of Indonesian (Kamus Besar Bahasa Indonesia), progressive means that it is heading towards progress. The nine sectors that fall into the progressive category can be seen in the following table:

Table 3. Sectors that Belong to the Progressive Category

Code	Sector
B	Mining and Quarrying
D	Electricity and Gas
E	Water Supply, Sewerage, Waste Management & Remediation Activities
F	Construction
G	Wholesale and Retail Trade; Repair of Motor Vehicles & Motorcycles
H	Transportation and Warehousing
I	Provision of Accommodation and Drinking
O	Government Administration, Defense and Mandatory Social Security



Graphic 3. Economic Growth Rate of the Nine Progressive Sectors of Banyumas Regency and Central Java Province in 2020

It can be seen from Graph 3 that sectors D (electricity and gas procurement) and E (water procurement, waste management, waste and recycling) experienced positive growth even in the midst of pandemic Covid-19. Positive economic growth in 2020 shows that economic movements are growing better than in 2019. Economic movements that grow positively are supported by many indicators, including the amount of water channeled to the community more and more, the increasing number of consumers of Drinking Water Regional Company (DWRC or PDAM) and electricity, the increasing amount of waste produced by the community, prices that increased compared to the previous year, etc. While the other seven sectors experienced negative economic growth, meaning decreased compared to the previous year. The rate of economic growth of Banyumas Regency when compared to the rate of economic growth of Central Java Province is in line, in a sense, the pattern of economic movement in Banyumas Regency is almost the same as Central Java Province for the nine progressive sectors.

Table 4. Economic Growth Rate of the Nine Progressive Sectors Banyumas Regency in 2015-2020

Sector	2015	2016	2017	2018	2019	2020
B	2.12	4.06	4.55	4.27	3.34	-2.21
D	2.07	7.16	4.36	6.76	5.16	2.55
E	1.61	2.08	10.54	5.43	4.17	4.15
F	6.02	11.26	9.84	8.63	4.30	-3.71
G	3.35	4.66	4.59	7.22	8.11	-3.70
H	6.84	5.97	6.24	6.47	7.97	-31.84
I	8.76	9.38	8.64	5.57	7.76	-7.08
O	8.14	1.34	2.39	3.36	3.64	-1.34
R,S,T,U	3.35	7.47	9.32	9.08	9.05	-5.44

The development of the rate of economic growth of the nine progressive sectors over the past six years shows that the transportation sector is the worst sector compared to the other eight progressive sectors. This is due to the restriction of community activities so that the mobility of the population decreases drastically. On the other hand, the electricity and gas procurement sector as well as water procurement, waste management, waste and recycling showed positive economic growth figures during the pandemic Covid-19 in 2020. This is because the basic needs of the community are increasing along with the increasing of population in 2020.

Table 5. The Number of Population 15 Years and Above in Banyumas Regency who worked for a week ago according to sector in 2019 and 2020

Sector	2019	2020	Difference
B	2.354	5.586	3.232
F	83.316	66.562	-16.754
G	193.728	184.200	-9.528
H	28.565	28.737	172
I	44.618	45.229	611
O	14.445	16.429	1.984
R,S,T,U	36.320	43.404	7.084
D,E,J,L	6.904	12.853	5.949

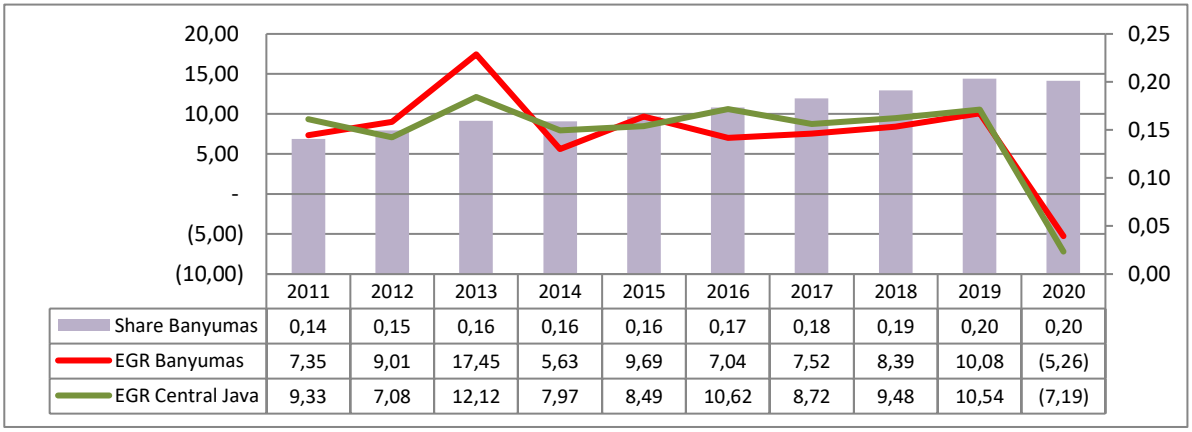
Source: National Labor Force Survey 2019 and 2020

Table 5 shows that the population working in the construction (F) and trade (G) sectors in 2020 decreased compared to 2019. The decline in the number of people working is in line with declining economic growth in the sector. Sectors D and E show an increase in the number of working people also showing movements in line with the positive rate of economic growth. On the other hand, the mining sector, transportation, accommodation provision and drinking and other service activities (R, S, T, U) showed that the increase in the number of working people in 2020 was inversely proportional to the negative economic growth rate.

The inversely proportional relationship between the increase in the number of people working in the mining sector, transportation, accommodation and drinking and other service activities with the rate of economic growth indicates low productivity in the sector. In addition, it also shows that residents in Banyumas Regency are still trying to work and find work due to layoffs but the wages received are low.

Growing Sector

Sectors that belong to the growing category are the corporate service sector. When viewed from the economic growth rate of the corporate services sector in Banyumas Regency over the past 10 years, this sector has always grown positively from 2011 to 2019 then in 2020 decreased by 5.26 percent compared to 2019. Although the economic growth rate of the company's services sector in 2020 decreased, the share of GRDP Banyumas Regency increased from year to year. In 2020 the share of the company's services sector to the Banyumas Regency GRDP of 0.2 percent means that the company's service sector is still able to produce goods and services in proportion even though the value is lower than the previous year.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Share Banyumas	0,14	0,15	0,16	0,16	0,16	0,17	0,18	0,19	0,20	0,20
EGR Banyumas	7,35	9,01	17,45	5,63	9,69	7,04	7,52	8,39	10,08	(5,26)
EGR Central Java	9,33	7,08	12,12	7,97	8,49	10,62	8,72	9,48	10,54	(7,19)

Graphic 4. Economic Growth Rate of Developing Sector of Banyumas Regency and Central Java Province in 2020

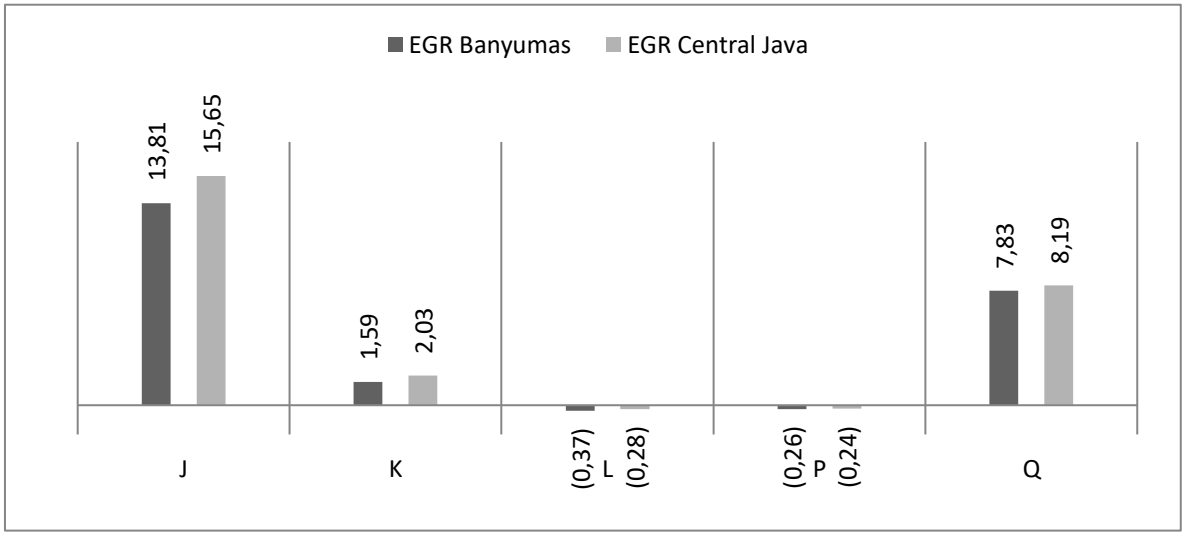
When viewed Table 6, the number of workers working in the corporate services sector in 2020 decreased by 3,865 workers compared to 2019. This decrease is due to companies unable to pay labors during the pandemic Covid-19 due to the decline even the absence of corporate income so that many workers are laid off. As for the types of companies that fall into this category such as legal and accounting activities, architecture, technical analyst ship and testing, science research and development, advertising, photography, translators, rentals, travel agencies, etc.

Table 6. The number of Population 15 years and above in Banyumas Regency who worked for a week ago in the Corporate Services Sector (M, N) in 2019 and 2020

Sector	2019	2020	Difference
M,N (business activities)	16.256	12.391	- 3.865

Sluggish Sector

From the results of LQ and shift share analysis, the slow-moving sectors in Banyumas Regency are the information and communication sector (J), financial services and insurance (K), real estate (L), education services (P), health services and social activities (Q). When viewed from the economic growth rate in 2020, the information and communication sector although slow but able to produce economic growth is quite high at 13.81 percent, the health services sector and social activities by 7.83 percent and financial services and insurance by 1.59 percent. The real estate and education services sector showed negative economic growth figures.



Graphic 5. Economic Growth Rate of Five Sluggish Sectors of Banyumas Regency and Central Java Province in 2020

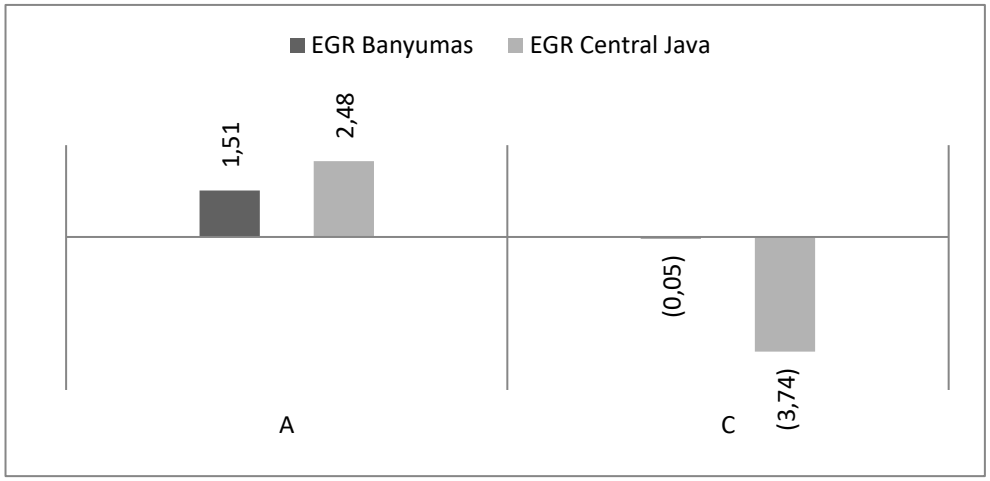
During the pandemic Covid-19, the number of people working in sectors that belonged to the sluggish category in Banyumas Regency decreased. This is because the burden of production costs is greater than income so that the company is forced to lay off some of its employees.

Table 7. The Population 15 years and above in Banyumas Regency who worked for a week ago according to sector in 2019 and 2020

Sector	2019	2020	Difference
D,E,J,L (electricity & gas, watter supply, sewerage, waste management &remediation activities, information & communication, real estate activities)	6.904	12.853	5.949
K (financial & insurance activities)	13.882	9.083	-4.799
P *(education)*	39.801	35.949	-3.852
Q *(human health and social work activities)*	12.895	14.101	1.206

Backward Sector

The agricultural, forestry and fisheries (A) and processing industries (C) are backward sector categories in Banyumas Regency. Although included in the category of backward sectors, the agricultural, forestry and fisheries sectors are able to produce a positive economic growth rate in 2020. This shows that the agriculture, forestry and fisheries sectors produced higher production and prices in 2020 than in 2019.

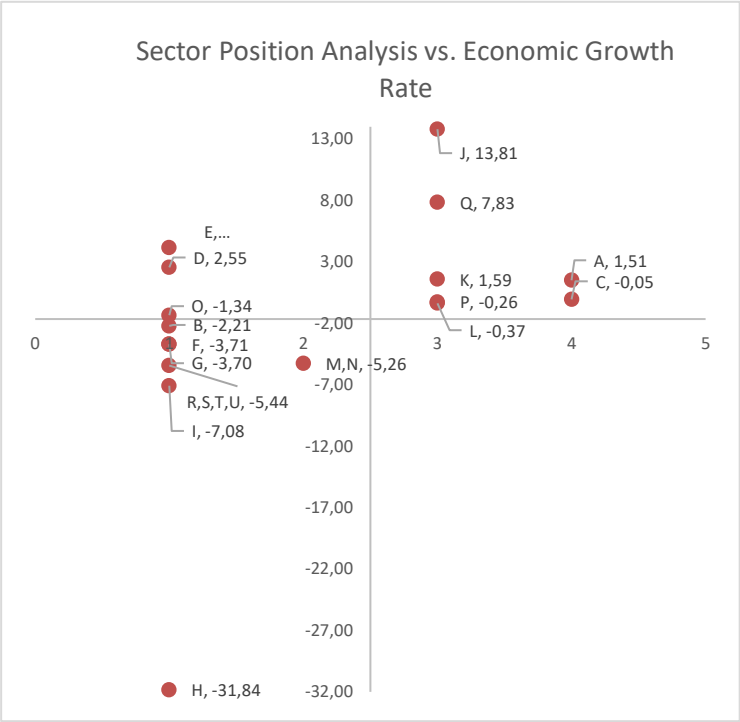


Graphic 6. Economic Growth Rate of Backward Sector of Banyumas Regency and Central Java Province in 2020

The agricultural, forestry and fisheries sectors and processing industries although included in the sector retreated but during the 2020 pandemic the number of workers increased. This indicates a shift in labor to the agricultural, forestry and fisheries sectors as well as the processing industry. The increasing number of workers in the agricultural, forestry and fisheries sectors is able to produce economic growth in 2020 higher than in 2019 while the increasing workforce of the processing industry sector has not been able to increase the economic growth of the processing industry sector in 2020.

Table 8. The number of Population 15 years and above in Banyumas Regency who worked for a week ago according to sector in 2019 and 2020

Sector	2019	2020	Difference
A (agriculture, forestry & fishing)	147.082	176.394	29.312
C (manufacturing)	166.866	173.948	7.082



Graphic 7. Analysis of Sector Position and Economic Growth Rate of Banyumas Regency in 2020

Graphic 7 shows an analysis of the sector's position and the economic growth rate of Banyumas Regency. Code 1 is a progressive sector, code 2 is a developing sector, code 3 is a sluggish sector, while code 4 is a backward sector. The horizontal line value limit used is the value of Banyumas Regency economic growth rate in 2020 of -1.65 percent. Graphic 7 shows that all sectors that fall into the category of sluggish and backward actually have a value of the growth rate of the sector above the total growth rate of Banyumas Regency. Sectors that fall into the sluggish category include real estate (L), education services (P), financial services and insurance (K), health services and social activities (Q), and information and communication (J) while sectors that include sectors backward namely the processing industry (C) and agriculture, forestry and fisheries (A). On the other hand, of the 9 sectors that include the progressive sector, only 3 sectors have a sector economic growth rate above the total economic growth rate of Banyumas Regency, the rest have a sector economic growth rate below the total economic growth rate of Banyumas Regency. While the sector that belongs to the category of developing only the corporate services sector (M, N) which has a sector economic growth rate below the total economic growth rate of Banyumas Regency

Conclusion

Based on the results of analysis, it can be concluded that:

1. The trade sector (G) and construction (F) are sectors that contribute the two largest in Banyumas Regency and they are progressive sectors which mean that the sector plays a role in the economy in Banyumas Regency.
2. The industrials sector i processing (C) is the sector that contributed the first largest to the Banyumas GRDP but included the sector that retreated meaning that the sector has low competitiveness. Therefore, the Banyumas Regency Government must devise a policy strategy to increase the production capacity and marketing of industrial processing. The subsector of the processing industry that contributes the most is the food and beverage industry.
3. The mining sector (B), transportation (H), provision of accommodation and drinking

(I) and other services (R,S,T,U) are progressive sectors that have high competitiveness. On the other hand, the increase in the number of people working in the sector is unable to maintain the economic growth rate of the sector to remain or even increase. This shows that these sectors generate low incomes during the Pandemic Covid-19.

4. The information and communication sector (J) and Health Services and Social Activities (Q) are sectors that have the highest rate of economic growth of the sector and grew positively in the pandemic period, but unfortunately these two sectors are sluggish sector. In this case, the local government can pay special attention to help increase business income in the information and communication sector and health services and social activities.

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