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PERFORMANCE AGRICULTURAL, MINING, AND INDUSTRIAL SECTORS IN SOUTH SUMATRA PROVINCE BEFORE AND DURING THE COVID-19 PANDEMIC

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Abstract. Now, COVID-19 pandemic which began in Wuhan, China, on December 2019, has been affecting several lethal health problems that ever happened throughout global history. Without exception for Indonesia which was confirmed that COVID-19 has been occurring since 2 March 2020. COVID-19 pandemic has been affecting many sectors including agricultural, mining, and industry. This research aims to understand the impact of COVID-19 pandemic on changes in Gross Regional Domestic Product (GDRP), growth, contribution, and base sectors in agriculture, mining, and industry. This study used secondary data. This study used multiple linear regression analysis with dummy variables and Location Quotient (LQ) analysis. The results showed agricultural sector had no changes in GDRP either positive or negative; mining sector had negative changes in GDRP, while industrial sector had positive changes in GDRP. Agricultural, mining, and industrial sectors had no growth changes either positive or negative. Only the mining sector had decreased in contribution during COVID-19 pandemic. Only the industrial sector is a non-basic sector, while the agriculture and mining sectors are the basic sector, but experienced a decline in LQ values during the COVID-19 pandemic.

Keywords: COVID-19 pandemic, Agricultural Sector, Mining Sector, Industrial Sector, Base Sector.

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INTRODUCTION

The world has witnessed many outbreaks of viruses such as the Spanish Flu, SARS (Severe Acute Respiratory Syndrome), MERS (Middle East Respiratory Syndrome), and the Ebola epidemic. These days, the COVID-19 pandemic, which began in Wuhan, China, in December 2019, has been affecting a lot of lethal health problems that have happened throughout global history. Without exception for Indonesia, it was confirmed that COVID-19 has been occurring since 2 March 2020 (Indonesia.go.id. 2020). Many experts have mentioned this pandemic as a disaster that will negatively impact the global economy (Sharma et al., 2020). The current COVID-19 pandemic has caused such a drastic economic

shock as more than 170 countries, including Indonesia, will be having negative per capita GDP growth (Gopinath 2020). According to Badan Pusat Statistik (BPS) Indonesia (2022), Indonesia's GDP in 2020 had a contraction (negative growth) -2.07%.

Badan Pusat Statistik (BPS) Sumsel (2022) South Sumatra Province's economic growth in the second quarter of 2022 was 5.71% (y-on-y). The main sectors of agriculture, mining, and industries maintained positive growth in the second quarter. The agricultural sector had grown 0.61% (y-on-y), the mining sector had grown 1.68% (y-on-y), and the industrial sector also had grown 0.37% (y-on-y). These three sectors are driving economic growth in South Sumatra Province.

Badan Pusat Statistik (BPS) Sumsel (2022) noted that before the COVID-19 pandemic, the sectors that contributed significantly to South Sumatra Province's GDRP were the mining, industrial, and agricultural sectors. Before the pandemic, the growth of these three sectors strongly influenced South Sumatra province's economy. South Sumatra's economic structure in the second quarter of 2022 is dominated by the mining sector at 19.67%, followed by the industrial sector at 19.26%, and the agricultural industry at 15.46%. The role of those three sectors reached 54.40% of the total GDRP of South Sumatra Province.

This study provides valuable insights into the economic impacts of the COVID-19 pandemic, mainly focusing on regional variations within Indonesia. By analyzing the resilience of key economic sectors such as agriculture and mining in South Sumatra during the pandemic, this research contributes to a deeper understanding of how different sectors respond to global health crises. Additionally, it offers crucial policy recommendations for mitigating the economic impact of future pandemics, making a significant contribution to economics, public health, and disaster management. This research also expands the discourse on regional economic recovery strategies in the face of global disruptions.

With the significant contribution of mining, industrial, and agricultural sectors to the economic structure of South Sumatra Province, it is crucial to know the extent to which the impact of the COVID-19 pandemic on these key sectors affects the financial structure of South Sumatra Province. The aims of this study are: *i).* To know how much the GDRP, growth, and contribution of agricultural, mining, and industrial sectors during the COVID-19 pandemic is. *ii).* To find out whether the agricultural, mining, and industrial sectors are the base sectors in South Sumatra Province both before and during the COVID-19 pandemic.

In his study entitled *What Is the Impact of COVID-19 Disease on Agriculture?* Siche (2020) Aims to understand the impact of the pandemic on the agricultural sector. The study uses data from the Food and Agriculture Organization (FAO), the World Health Organization (WHO), and other scientific documents. There is sufficient evidence to confirm that pandemics caused by COVID-19 have a significant impact on agriculture and the food supply chain, primarily affecting food demand and security. According Kakaei et al. (2022)Food demand and security are heavily affected by travel restrictions (Lockdown), the declining global population's purchasing power, and the greater impact on food security of the most vulnerable groups of the population.

As claimed by Laing (2020) and Marimuthu et al. (2022)The impact of the COVID-19 pandemic on the mining sector is caused by a contraction in demand since industry and construction production have effectively stopped in most countries for an unspecified period of time. This declining demand has led to a drastic drop in prices of various metals and minerals during March and April 2020. The most drastic decline occurred in aluminum and copper mining.

According to Hailu (2020) and Vargas-Ramella et al. (2021) the COVID-19 pandemic has impacted and will continue to impact the industry. There is a growth in retail demand for processed food, a decrease in demand for food services for processed food, a slowdown in food processing activities because of a shortage of labor and raw material input, and a reduction in export and import activities. In addition, the impact of a pandemic may depend on the type of product and the size of the processor. The overall effect of a pandemic on the activities of the food processing industry and its GDP depends on the volume and persistence of the consequences of COVID-19 on the activities of the industry as well as the initiatives and investments made by processors to manage the disruption caused by the COVID-19 pandemic.

METHOD

The data used in this study was secondary. Data resources were obtained from Central Bureau Statistics (BPS) of South Sumatra Province, Central Bureau Statistics (BPS) of the district/city in South Sumatra Province, the Regional Development Planning Agency (BAPPEDA), and related ministries. The data resources used were data from quarters I-IV in 2017 and I-II in 2019 before the COVID-19 pandemic. Data on quarter I-IV of 2020 was used, and data on quarter I-II of 2022 during the COVID-19 pandemic was used as well.

This study used regression analysis methodology with dummy variables to determine the impact of COVID-19 pandemic on changes in GDRP, growth and contribution of agricultural, mining, and industrial sectors to the economy of South Sumatra Province. Location Quotient (LQ) analysis was used to identify the base and non-base sectors both before and during the COVID-19 pandemic in South Sumatra Province.

The dummy variable is a qualitative variable in the regression equation that usually indicates the presence (presence or absence) of a "quality" or an "attribute," for example, male or female, working or not working (unemployment), academic or non-academic, married or unmarried (Gujarati 2006).

The regression equation with variable dummy, which aims to understand the changes in GDRP value, can be written as equation (1):

$$Y_1 = \beta_1 + \beta_2 D_1 + \varepsilon_1 \quad (1)$$

Where:

Y_1 : Changes in GDRP Sector (%)
D : A dummy variable as an independent variable with a value of 0 or 1.
0 : GDRP per-quarter sector values before the COVID-19 pandemic
1 : GDRP per-quarter sector value during COVID-19 pandemic
ε : The level of error (error term)

The regression equation with a variable dummy aimed at seeing the sector growth is written as equation (2):

$$Y_2 = \beta_3 + \beta_4 D_2 + \varepsilon_2 \quad (2)$$

Where:

Y_2 : Growth of Sector (%)
D_2 : A dummy variable as an independent variable with a value of 0 or 1.
0 : Growth per-quarter sector values before the COVID-19 pandemic
1 : Growth per-quarter sector value during the COVID-19 pandemic
ε_2 : The level of error (error term)

The regression equation with variable dummy aimed to find out the sector contribution is written as equation (3):

$$Y_3 = \beta_5 + \beta_6 D_3 + \varepsilon_3 \quad (3)$$

Where:

Y_3 : Contribution of the Sector (%)
D_3 : A dummy variable as an independent variable with a value of 0 or 1.
0 : Contribution per-quarter sector values before the COVID-19 pandemic
1 : Contribution per-quarter sector value during the COVID-19 pandemic
ε_3 : The level of error (error term)

The Location Quotient (LQ) method was used to study economic conditions to identify how much contribution of a sector to local economic activities (Carroll, Reid, and Smith 2008; Chiang 2009; Jing and Cai 2010). Therefore, Location Quotient (LQ) is often used to define a base sector that can drive other sector growth or development and affect economic growth in a region in equation (4):

$$LQ = \frac{k_s/k_t}{K_s/K_t} \quad (4)$$

Description:

k_s : GDRP of agricultural, mining, and industrial sectors in South Sumatra Province
k_t : Total GDRP in South Sumatra Province
K_s : GDP of the agricultural sector, mining sector, and national industrial sectors in Indonesia
K_t : Total GDP in Indonesia

RESULT AND DISCUSSION

1. Changes in GDRP, Growth, and Contribution of Agricultural, Mining, and Industrial Sectors to the Economy of South Sumatra Province

It is important to know the extent to which the impact of the COVID-19 pandemic on changes in GDRP, growth, and contribution of agricultural, mining, and industrial sectors to the economy of South Sumatra Province during the COVID-19 pandemic, whether the main sectors still dominate the economic structure of South Sumatra Province or are declining, can be seen in Table 1. The results of linear regression analysis using dummy variables in agricultural, mining, and industrial sectors in South Sumatra Province before and during the COVID-19 pandemic can be seen in Table 1.

Table. 1. The results of multiple linear regression analysis of changes in GDP, growth, and contributions of Agricultural, Mining, and Industrial Sectors using dummy variables before and during the COVID-19 pandemic in South Sumatra Province

Sector	Description	Coefficient	Dummy	R^2	t Stat.	F Stat.	Prob.
Agriculture	Changes in GDRP	12972.300	417.531	0.047	0.707	0.500	0.495
	Growth	-0.401	3.169	0.019	0.444	0.197	0.666
	Contribution	16.611	0.285	0.019	0.443	0.196	0.666
Mining	Changes in GDRP	17615.880*	-651.863	0.255	-1.852	3.432	0.093
	Growth	1.921	-2.922	0.111	-1.119	1.253	0.289
	Contribution	22.568***	-1.156	0.704	-4.881	23.826	0.000
Industry	Changes in GDRP	14571.430*	264.126	0.271	1.931	3.732	0.082
	Growth	0.933	-0.984	0.166	-1.414	2.000	0.187
	Contribution	18.679	0.051	0.004	0.222	0.049	0.828

Source: Data Processed, 2022

Sig:
*** : 0.01
** : 0.05
* : 0.10

Table 1 indicates that the agricultural sector had not changed in GDRP, growth, and contribution (either positive or negative) because of insignificantly prob values. This showed that the agricultural sector was stable against various crisis conditions, including the COVID-19 pandemic. The stability of agricultural sector performance was driven by rubber production, which has increased along with the recovery of rubber tapping activity, which was also driven by the increasing of rubber prices at the farmers' level as well as at the international level. Besides rubber production, crude palm oil production also increased, which was also driven by price rising at the global level (Bank Indonesia 2022b).

According to Bank Indonesia (2022b) the increase in economic and social activity during Ramadan and the Great Religious and National Day (HBKN) of Idul Fitri increased the demand for food and beverages, which also affected the increasing demand for food materials from the subsectors of food crops, horticulture, livestock, and fisheries. Vegetable and fruit production in South Sumatra Province in quarter II of 2022 increased by 24.04% (YoY). At the same time, the government of South Sumatra Province has also developed an export-oriented land fishing industry.

The continuous growth of exports of agricultural commodities such as rubber, crude palm oil, and pulp and paper also highlights the stability of agricultural sector performance in South Sumatra Province. As stated by Bank Indonesia (2022a) South Sumatra Province's exports in quarter II of 2022 grew 56.34% (YoY) to USD 1 .157,50 million, higher than in the previous quarter, which was 8.59% (YoY). The highest exports were rubber commodities, reaching USD 424,64 million (36.68%), followed by coal commodities, reaching USD 307.38 (26.55%), pulp and paper

commodities, reaching USD 286.77 million (24.77%), and palm crude palm oil (CPO), reaching USD 36.88 million (3.19%).

According to Bank Indonesia (2022a), growth in rubber export in quarter II of 2022 had a significant increase of 90.80% (YoY) higher than the export in the previous quarter, which was 24.90% (YoY). The increasing rubber export in South Sumatra Province was induced by the increasing domestic rubber production conforming to the recovery of manufacturing activities, including the automotive industry and transportation activities that drive demand for rubber commodities as raw materials. Besides, the increasing demand for rubber derivatives such as latex gloves and masks during the COVID-19 pandemic drove the growing demand in rubber commodities.

As claimed by Bank Indonesia (2022a), export growth in pulp and paper in quarter II of 2022 grew 7.96% (YoY), although lower than the previous quarter of 40.91% (YoY). The positive growth of pulp and paper exports in South Sumatra Province was because of the increasing demand for packaging delivery goods (drugs and food) and tissue in the middle lifestyle changes during the COVID-19 pandemic. Additionally, there should be a campaign to reduce plastic packaging use. The high demand at the domestic level, especially for paper derivatives and the downstream of dissolving pulp for the textile industry, also drove the growth of pulp and paper exports.

As stated by (Bank Indonesia 2022a) The export value growth for crude palm oil in quarter II of 2022 had increased by 36.02% (YoY), although relatively lower than the previous quarter, which was 152.29% (YoY). The recovery of crude palm oil demand from India, China, and the Middle East induced the continuous positive growth of crude palm oil exports in South Sumatra Province. Demand for crude palm oil (CPO) derivatives such as food processing and derivatives for medical needs (soap, hand sanitizer, body care) also increased. On the other hand, production and productivity of fresh fruit bunch (TBS) and CPO in South Sumatra Province also increased along with the wet-dry season, which can expand production and develop the size of mature plants after replanting.

GDRP and mining sector contribution changes had significant prob values of 0.10% and 0.01%. This showed that the COVID-19 pandemic significantly impacted GDRP value and the mining sector's contribution to the declining South Sumatra province’s economy. According Perks and Schneck (2021)The COVID-19 pandemic has impacted mining activity, in particular the effects of policies implemented by the government of South Sumatra Province during the COVID-19 pandemic, namely large-scale Social Restriction or Pembatasan Sosial Berskala Besar (PSBB). This PSBB policy caused some mining company activities to stop producing, so the company's performance descent was sufficiently significant (Halimatussadiah et al. 2020).

Generally, the existence of the PSBB policy had affected production and consumption and concurrently affected international trade, especially exports and imports of mining materials (Aisyah et al. 2024). PSBB policy led to differences and disruption in the price of mining commodities at once. Although the Indonesian government has not implemented a policy of total closure of activities in the mining sector until now, mining sector performance has been disturbed, causing negative changes in GDP value and decreased contributions to the national economy. The COVID-19 pandemic significantly impacted the decline in production, commodity prices, and mining stocks. Metals that dropped fairly significantly are nickel, iron, iron ore, aluminum, zinc, and copper (Garinas 2020).

The COVID-19 pandemic had a significant impact on the mining sector. In the short term, it will affect prices, production, and margins in that field (as well as stockholders, society, and government). However, its long-term effect will be much more significant. Understanding this impact is crucial to ensure that the mining sector can fulfill its role in providing livelihoods and boosting the economic cycle through national tax revenues. (Laing 2020). As claimed by Jain (2021) During the early lockdown period in India, the COVID-19 pandemic hurt mineral mining. Mining operations that supplied raw materials to steel plants are included in “essential services,” which were excluded from the lockdown policy, just as the Indonesian government did. Nevertheless, companies and mining operators faced difficulties in continuing mining activities. Marimuthu et al. (2022) this was because business disruption and operational difficulties (lack of availability of the required workforce, restriction of human movement, high risk of pandemic spread, and disruption of port operations) were worsened by decreasing demand from downstream industries and producers.

Changes in the GDRP of the industrial sector had a significant prob value at 0.10%. This showed that the industrial sector can still change in PDRB positively, even during the COVID-19 pandemic. The industrial sector in South Sumatra Province has not totally stopped, so it can continue operating. Activities in the industrial sector are limited because of policies from the South Sumatra Province government, which impacted a decrease in industrial sector production and productivity during the COVID-19 pandemic compared to before the COVID-19 pandemic (Tambunan, 2021). However, in quarter II of 2022, the employment rate in South Sumatra Province increased. The employment rate in South Sumatra Province has improved since early 2022, although it has not recovered as before the COVID-19 pandemic. This was demonstrated in the Business Activity Survey (SKDU) to entrepreneurs in South Sumatra Province, which showed improvement in employment conditions after having a contraction in quarter I of 2022. The industrial sector grew 1.92 (YoY) in quarter II, after having a contraction in the previous quarter, which was -0.02% (YoY). The increasing growth of the industrial sector was driven by the performance of the food and beverage industry during Ramadan and Idul Fitri (Bank Indonesia 2022b).

Unlike the industrial sector in South Sumatra Province, South Tangerang City is one of the industrial cities with the majority of its population working in the manufacturing industry sector and Small and Medium Enterprises (UKM) affected by the COVID-19 pandemic. Several industries have been forced to reduce their production capacity because of a lack of raw materials and a lack of workforce due to the impact of the PSBB policy implemented by the local government of Southern Tangerang City. This policy persuaded people to stay at home as one of the efforts to break COVID-19 spreading (Sunarsi, Suryani, & Jati 2020). Thousands of workers in Tangerang City were exposed to termination of employment (PHK) during the COVID-19 pandemic. Fifty-three companies in total affected had reported to the Regional Office of Manpower Department (Disnaker) Tangerang City (Muslim 2020). As stated by Caraka et al. (2020) many industrial sectors on a national scale initially tended to have high growth but declined. These are textile, furniture, and other manufacturing industries. The decline in the industrial sector is caused by the lack of optimum economic activity due to the Indonesian government's implementation of the PSBB policy. Consequently, population mobility was very restricted.

2. Base Sector Analysis on Agriculture, Mining and Industry Before and During COVID-19 Pandemic

Development of agricultural, mining, and industrial sectors will be faster if more specific analysis is carried out which analysis to identify base or non-base sectors. The results of classification sectors as base or non-base sectors can be used as a reference by the government in implementing regional development priority programs, mainly during the COVID-19 pandemic. This classification can help the government prioritize development in the base sector to increase economic growth in South Sumatra Province during the COVID-19 pandemic. The result of the Location Quotient (LQ) analysis on agricultural, mining, and industrial sectors in South Sumatra Province before and during the COVID-19 pandemic can be seen in Table 2.

Table. 2 The Result of Location Quotient (LQ) Analysis on Agricultural, Mining, and Industrial Sectors before and during COVID-19 pandemic in South Sumatra Province

Sectors	Location Quotient Analysis		
	Before COVID-19 Pandemic	During COVID-19 Pandemic	Changes (%)
Agriculture	1.36	1.34	-1.55
Mining	3.04	2.98	-2.17
Industry	0.90	0.90	0.70

Source: Data Processed, 2022

Table 2 shows that the agricultural sector during the COVID-19 pandemic had a declining LQ value -of 1.55%. Farmers' reduced planting activities caused the declining LQ value in the farm sector during the COVID-19 pandemic. The implementation of the PSBB policy of the South

Sumatra Province government induced it. This policy sufficiently interrupted planting activities carried out by farmers, starting from planting, treatment, harvesting, and marketing. Additionally, the need for agricultural inputs such as seeds, fertilizers, and pesticides is difficult to obtain because of the population mobility ban, which has caused a decline in agricultural commodity productivity. Like China, because of disturbance in international trade, farmers faced a shortage of agrarian input supplies such as seeds, fertilizers, and pesticides (Adnan and Nordin 2021; Pujiyanto, Darwanto, and Mulyo 2022).

Although the LQ value of the agricultural sector declined during the COVID-19 pandemic, it did not change the status of the agricultural sector as a base sector in South Sumatra Province. As stated by Oktavia, Darwanto, and Hartono (2015) That the agriculture sector is a base sector and contributes 21.79% to the total GDRP of South Sumatra Province, not only was the contribution of the agricultural sector to the total GDRP of South Sumatra Province higher than the contribution of the agricultural sector to the total GDP, but the agricultural sector can also meet the needs of South Sumatra Province while being able to meet the needs of other areas (Export).

During the COVID-19 pandemic, the mining sector dropped LQ values by -2.17%. The declining value LQ values of the mining sector during the COVID-19 pandemic were caused by the declining production in the mining sector. According to Gałaś et al. (2021) the main negative impact caused by the COVID-19 pandemic on the level of mining production is due to several significant reasons. The first reason was the declining demand for raw materials because of the weakening economy on a global scale. The second was related to restrictions arising from the COVID-19 pandemic: labor, transportation, and market (product supply disruption). Production restrictions could also be caused by disruptions in material supply that are necessary for mining operations. As Santiago Cuesta-Lopez et al. (2020) claimed, the short-term impact of the COVID-19 pandemic, mainly due to the policy of lockdown or exploitation/production restriction, is a problem of limited labor. Otherwise, for projects in other European countries, the cessation of mining activities due to the spread of COVID-19 was noticeable.

Although the LQ values of the mining sector declined during the COVID-19 pandemic, it did not change the status of the mining sector as a base sector in South Sumatra Province. As mentioned by Badan Pembangunan Nasional (2015) That the mining sector is a base sector and contributes 21.86% to the total GDRP of South Sumatra Province, this shows that not only was the contribution of the mining sector to the total GDRP of South Sumatra province higher than the contribution of the mining sector to the total GDP, but also that the mining sector can meet the needs in South Sumatra province while being able to meet the needs in other regions (Export).

During the COVID-19 pandemic, the industrial sector's LQ value increased by 0.70%. This increase was due to the increasing performance of the rubber processing industry and the rising global automotive industry activity (Bank Indonesia, 2022a). Although the LQ value of the industrial sector increased during the COVID-19 pandemic, it did not change the status of the industrial sector, a non-base sector in South Sumatra Province. Similarly, according to Badan Pembangunan Nasional (2015) The industrial sector is a non-base sector but has the third largest contribution, after mining and the agricultural industry, at 18.36%, to the total GDP of South Sumatra Province. This shows not only that the industrial sector's contribution to the total GDRP of South Sumatra Province was lower than that of the industrial sector to the total GDP but also that the industrial sector was unable to meet the demand in South Sumatra Province. The government had to import goods from other regions to meet the demand in South Sumatra Province.

CONCLUSION

The agricultural and industrial sectors play a key role in the GDRP of South Sumatra Province, with more stable growth and contribution than the mining sector. Despite no negative impact on GDP and development during the COVID-19 pandemic, the agricultural sector saw a decrease in its Location Quotient (LQ) value. To ensure stability, the government should continue to provide agrarian incentives and promote the use of technology to support productivity. The mining sector, which has the most

significant contribution to the province's economy, was significantly affected by the pandemic, with adverse changes in GDRP and a decrease in its contribution due to disruption in labor, transportation, and market conditions. However, it remained a base sector with a decline in LQ value. The industrial sector also showed positive changes in GDRP and stable growth, making it another key contributor alongside agriculture despite the challenges posed by the pandemic.

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