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The Influence of Agriculture, Processing Industry and Service Sectors on Labor Absorption in The Bukit Barisan Plateau Area of North Sumatra Province

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Abstract

This study aims to determine how the agricultural sector, processing industry and services influence labor absorption in the Bukit Barisan Highlands area of North Sumatra Province. This study uses descriptive research with a quantitative approach. The data source for this study is secondary data obtained from the Central Statistics Agency (BPS) with research objects of 9 districts/cities in the period 2013-2022. This study uses a panel data analysis method and hypothesis testing using the coefficient of determination test (R2), partial significance test (t test) and simultaneous significance test (F test). The results of this study indicate that simultaneously the agricultural sector, processing industry and services have a positive and significant effect on labor absorption. Partially, it is known that the variables of the agricultural sector, processing industry and services have a positive and significant effect on labor absorption.

Keywords: GRDP of agricultural sector; GRDP of manufacturing industry sector; GRDP of services sector and Labor Absorption (PTK)

1. Introduction

Indonesia is one of the countries with the largest population in the world, the 4th largest. According to the World Population Review, in 2024 there will be 279,072,446 people in Indonesia. With such a large population, Indonesia is a developing country that is still in the development stage

The Bukit Barisan plateau area is a specific regional economic development based on agriculture and aimed at advancing the rural and supported by the growth of the surrounding urban economy. Currently, this area consists of 9 regencies/cities, namely Karo Regency, Dairi Regency, Simalungun Regency, Pakpak Bharat Regency, Humbang Hasundutan Regency, Toba Regency, North Tapanuli Regency, Samosir Regency, and Pematangsiantar City. (Perda of North Sumatra Province Number 2 of 2017). Due to its geographical location in the highlands, this region is rich in natural resources in the form of agricultural products.

So that there needs to be special attention by the provincial government in developing this area so that its potential can be maximized to increase regional and national income. However, with all the advantages of the region, it has not been fully utilized properly to absorb more labor. This can be seen in the Labor Force Participation Rate (TPAK) of the Bukit Barisan Plateau Region of North Sumatra below.

Table 1. TPAK Bukit Barisan Plateau of North Sumatra Province in 2018-2022 (%)

Year	Karo	Dairi	Simalungun	Pakpak Barat	Humbang Haundutan	Toba	Tapanuli Utara	Samosir	Pematangsiantar
2016	2,23	1,26	5,75	2,28	1,22	3,47	2,56	1,28	9,47
2017	1,34	1,42	5,62	0,49	0,31	2,18	1,89	1,28	8,80
2018	1,50	1,69	5,10	0,43	0,34	2,15	1,42	1,35	12,14
2019	1,09	1,58	4,39	0,19	0,33	1,26	1,33	1,25	11,09
2020	1,83	1,75	4,58	1,93	0,84	2,50	2,94	1,20	11,50

Source : Badan Pusat Statistik

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Table 1 shows that over the past 5 years, the average TPAK in Karo, Dairi, Pakpak Bharat, Humbang Hasundutan, Toba, North Tapanuli, and Samosir districts is still above 80%. However, in Simalungun district and Pematang Siantar City it is still below 80%, indicating a lower labor supply. The agricultural sector is very important in every aspect of economic life, whether it concerns the availability of basic human economic needs or the availability of employment opportunities for the community. The development of a strong agricultural sector will provide a foundation for the development of highly competitive industries with adequate resource support. Opportunities for advancing the processing industry in Indonesia are vast given its large population. The services sector also plays a key role in the modern economy, contributing significantly to economic growth. Over time, with the advancement of digital technology, the services sector will be increasingly needed.

2. Literature Review

2.1. Labor Force

According to the Central Bureau of Statistics, the Labor Force Participation Rate (TPAK) is the percentage of the total labor force to the total working-age population. Labor Force Participation Rate (TPAK) is the percentage of the total labor force to the total working-age population. Labor Absorption. Labor absorption is the quantity of labor used by a sector or business unit.

2.2. Agriculture sector

The agricultural sector includes various subsectors such as food crops, horticulture, plantations, livestock, fisheries, and forestry. The GRDP of the agricultural sector is the total value of the output of goods and services produced by the agricultural sector in a certain area within a certain period of time.

2.3. Processing Industry sector

According to the Central Bureau of Statistics (2017) the processing industry is a unit or unit of production located in a certain place that carries out activities to convert raw materials with chemical machines or by hand into new products, or change goods of less value into goods of value with the intention of bringing these products closer to the final consumer. The GRDP of the manufacturing sector is the total gross value added generated by all production activities in the manufacturing sector in a region within a certain period of time.

2.4. Service Sector

According to the Central Bureau of Statistics, the services sector consists of wholesale and retail trade, repair and maintenance of cars and motorcycles; transportation and warehousing; provision of accommodation and eating and drinking; information and communication; financial services; real estate; corporate services; government administration, defense and mandatory social security; education services; health services and social activities and other services.

Service sector GRDP is the total gross value added generated by all economic activities in the service sector in a region within a certain period of time.

2.5. Gross Regional Domestic Product (GRDP)

Gross Regional Domestic Product (GRDP) is the gross added value of all goods and services created or produced in the domestic area of a country arising from various economic activities in a certain period. The preparation of GRDP can be done through 3 (three) approaches, namely the production, expenditure, and income approaches presented at current prices and constant prices.

3. Research Method

The type of research used in this research is descriptive research with quantitative research methods. This research was conducted in 9 districts located in the Bukit Barisan Plateau of North Sumatra Province To obtain the necessary data, the authors used several data collection techniques in this study, including Secondary Data, Literature Research.

In this study, researchers used panel data regression model testing using eviews 12 which is a combination of cross- sectional and time-series data using.

The general equation model of panel data regression in this study is stated as follows:

$$Yit = \alpha + \beta 1X1it + \beta 2X2it + \beta 3X3it + \beta 4X4it + \varepsilon it$$

And continued with hypothesis testing to prove the truth or validity of a hypothesis based on available sample data.

4. Results and Discussion

4.1. Descriptive Analysis Results

Table 2. Descriptive Analysis Results

Description	PTK	Agriculture GDRP	GDRP of Manufacturing Industry	Services GDRP
Mean	97.12533	2.50856	17.77567	39.71578
Median	98.31000	47.00500	15.40000	37.59500
Maximum	99.81000	58.19000	33.78000	67.08000
Minimum	8786000	1.54000	10.26000	23.70000
Std Dev	2.924407	16.04292	7.083915	10.28200
Observations	90	90	90	90

Source: Data processed by researchers (2024)

Based on the descriptive analysis results in table 2 above, it shows that the number of observations in this study was 90 and this study used panel data analysis. The number of cross sections is 9 districts / cities in North Sumatra province and time series per year for 10 years, namely 2013-2022.

4.2. Panel Data Estimation Model Selection

1. Chow Test

Table 3. Chow Test

Effect Test	Statistic	d.f	Prob.
Cross Section F	6.501480	(8,78)	0.0000
Cross Section Chi Square	45.982503	8	0.0000

Source: Eviews 12, processed (2024)

The results of the chow test show that the probability value of F is 0.0000 < 0.05, so H0 is rejected, meaning that the better model in this study is the Fixed Effect Model.

2. Hausman Test

Teble 4. Hausman Test

Effect Test	Chi-Sq. Statistic	Vhi-Sq. d.f	Prob.
Cross Section Random	19.129460	3	0.003

Source: Eviews 12, processed (2024)

The results of the Hausman test show that the probability value of F is 0.0003 <0.05, so H0 is rejected, meaning that the better model in this study is the Fixed Effect Model.

4.3. Fixed Effect Model (FEM) Estimation Results

Table 5. Fixed Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	0.374050	0.066504	5.624498	0.0000
Agricultural GDRP	0.137922	0.024337	5.667183	0.0000
GDRP of Manufacturing Industry	0.054108	0.025087	2.156804	0.0341
Services GDRP	0.159295	0.045137	3.529120	0.0007

Source: Eviews 12, processed (2024)

Based on table 5 above, the panel data regression equation can be made as follows :

PTK = 0.37 + 0.14AGRICULTURALGDRP + 0.05GDRPOFMANUFACTURINGINDUSTRY + 0.16SERVICESGDRP

The above equation can be interpreted as follows:

The constant value of 0.37 means that if the value of the independent variables, namely agricultural GRDP, processing industry GRDP, and service GRDP, is zero or fixed, the value of the dependent variable, namely labor absorption, will increase by 0.37%.

1. The coefficient value of the agricultural GRDP variable is 0.14%, this means that if agricultural GRDP increases by one percent, the value of the dependent variable, namely labor absorption, will increase by 0.14%. The coefficient value of agricultural GRDP which is positive indicates that agricultural GRDP has a positive relationship with labor absorption.
2. The coefficient value of the processing industry GRDP variable is 0.05, this means that if the processing industry GRDP increases by one percent, the value of the dependent variable, namely labor absorption, will increase by 0.05%. The coefficient value of processing industry GRDP is.
3. The coefficient value of the service GRDP variable is 0.16, this means that if the service GRDP increases by one percent, the value of the dependent variable, namely labor absorption, will increase by 0.16%. The positive value of service GRDP indicates that service GRDP has a positive relationship with labor absorption.

4.4. Hypothesis Test

1. Coefficient of Determination Test (R2)

Table 6. Test Results of the Coefficient of Determination (R2)

R-Squared	0.942773
Adjusted R-squared	0.934657

Source: Eviews 12, processed (2024)

Based on the results of the coefficient of determination test in table 6, it can be seen that the value of R- squared is 0.942 or equivalent to 94.2%. This shows that the ability of the independent variables, namely agricultural GRDP, processing industry and services in explaining their influence on the dependent variable, namely Labor Absorption (PTK) is 94.2%. While the remaining 5.8% can be explained by other variables outside the independent variables in this research model.

2. Simultaneous Significance Test (F-statistic)

Table 7. Hasil Uji Signifikansi Simultan

F-statistic	116.7309
Prob	0.000000

Source: Eviews 12, processed (2024)

Based on the results of the simultaneous significance test in table 7, it can be explained that the value of the F-statistic obtained is 116.73> F-table 2.71 and the probability value is 0.000 <0.05. This proves that the independent variables in this study, namely agricultural GRDP, processing industry GRDP and service GRDP, have a significant effect on the dependent variable, namely labor absorption together or simultaneously.

3. Partial Significance Test (t-statistic)

Table 8. Partial Significance Test Results

Variable	t-Statistic	Prob
Agricultural GDRP	5.667183	0.0000
GDRP of Manufacturing Industry	2.156803	0.0341
Services GDRP	3.529120	0.0007

Source: Eviews 12, processed (2024)

Based on the partial significance test results in table 8, it can be described through the following explanation.

a. The agricultural GRDP variable has a t-statistic value of 5.67> t-table 1.99 with a probability value of 0.0000 <0.05, this proves that the agricultural GRDP variable has a positive and significant effect on labor absorption.
b. The processing industry GRDP variable has a t-statistic value of 2.16> t-table 1.99 with a probability value of 0.0341
c. <0.05, this proves that the processing industry GRDP variable has a positive and significant effect on labor absorption.
d. The service GRDP variable has a t-statistic value of 3.53> t-table 1.99 with a probability value of 0.0007 <0.05, this proves that the service GRDP variable has a positive and significant effect on Labor Absorption.

4.5. Incremental Labor Output Ratio (ILOR) Analysis Result

Overall, ILOR values vary across districts and sectors. Some districts show large fluctuations in ILOR from year to year. This means that there is uncertainty or instability in how economic growth measured by ADHK GRDP (at constant prices) relates to employment. These fluctuations can be caused by various factors such as changes in policy, global economic conditions, natural disasters, or technological developments that reduce the need for labor. In 2020, there were many districts with very significant negative ILOR. This may be due to the impact of the COVID-19 pandemic that disrupted the economy globally, resulting in a decline in economic activity and a reduction in the workforce in many sectors.

5. Conclusions

Based on the results of the analysis and discussion that has been carried out related to the influence of GRDP in the Agricultural Sector, Processing Industry and Services on Labor Absorption in the Bukit Barisan Plateau Region of North Sumatra Province, the following conclusions can be drawn.

1. The agricultural sector GRDP variable has a positive and significant effect on labor absorption in the Bukit Barisan Plateau Region of North Sumatra Province.
2. The GDP variable in the processing industry sector has a positive and significant effect on labor absorption in the Bukit Barisan Plateau Region of North Sumatra Province.
3. The service sector GRDP variable has a positive and significant effect on labor absorption in the Bukit Barisan Plateau Region of North Sumatra Province.

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