**Analyze The Factors That Influence The Production Structure in Sumatera Economy For Period L 2010 - 2016**

**Zulgani1, Rahma Nurjanah2**

1 FEB, University of Jambi, Jambi, Indonesia, 🖂 (e-mail) gzulgani@gmail.com

2 FEB, University of Jambi, Jambi, Indonesia, 🖂 (e-mail) rahmanurjanah@ymail.com

**Abstract**

The research entitled the analysis of factors affecting the production structure in Sumatera economic period 2010-2016 aims to analyze the factors affecting the production structure in Sumatera economy and to examine the effect of population variables, HDI, Special Allocation Fund (SAF),Income percapita (YCapita), FDI, Domestic Investment(DI) and Exports to services sector, primary sector, secondary sector and utility sector. Quantitative tool used is panel data regression model. The results show that these variables are generally less significant in terms of the primary sectors, utilities and secondary sectors. While the service sector, the influence of these variables is significant. It is recommended that the direction of economic development of Sumatera sector be reviewed.

**Keywords**:Structural Transformation, Economic Growth

**Introduction**

The economy of 10 provinces in Sumatra has been quite encouraging. It can be seen from the growth of agriculture sector, manufacturing industry sector, mining sector and trade, hotel and restaurant sector with contribution of 22.27 percent, 20.24 percent, 15.95 percent and 14.86 percent respectively, meanwhile in the same period the average economic growth rate for the province in Sumatra of 5.82 percent is lower than the national economic growth rate which in the same period grew by 6.32 percent (National Development Planning Agency of The Republic of Indonesia, Regional Development In Figures, 2012).

Nevertheless, during the last 5 years the economy of 10 provinces in Sumatra has decreased. This is due to the decline in prices of some primary commodities such as rubber, palm oil and coal which has been the mainstay of Sumatra's economy. The decline in commodity prices is very influential on the economic growth performance of Sumatra which in turn will also affect the economic structure of Sumatra both in the short term and in the long term. Conceptionally, the fluctuation impact of macroeconomic variables will be seen from the aspect of allocation, distribution aspect, accumulation aspect, and demography aspect.According Kuznets, Chenery and Syrquin there are several variables that affect the changes of economic structure that is the number of population, income per capita, investment, foreign debt and exports.

The interaction of these variables in term is very influential on changes in economic structure. In relation to the above opinion, the researcher wants to study the influence of macro economic variables on the economic performance of the region especially viewed from the production side. According to background, the problems of this research are what is pattern of changes in the production structure of the Sumatran economy seen from the allocation, accumulation, distribution and demography process, and How big is the influence of population variables, per-capita GRDP, Human Development Index (IPM), Special Allocation Fund (SAF), Domestic Investment (DI), Foreign Investment (FDI) and export to the production structure of every province in Sumatera?

**Method**

**Data Sources**

The data used in this study consisted mostly of secondary data obtained from several relevant agencies such as Bank Indonesia, especially the Regional Economic Research (KER), the annual Economic Report of Indonesia, from the National Development Planning Agency (BAPPENAS), the Central Bureau of Statistics (BPS) on aggregate figures of GDP, GRDP, Regional Development In Figures (PDDA), BPS Strategic Data, Indonesian Statistics and Quarterly Reports on the Indonesian Economy periodically published by the Central Bureau of Statistics (BPS).The type of data required in this study is

1. Y/capita or GDRP per capita data of provinces in Sumatra.
2. PDRB data of the provinces in Sumatra according to constant prices and prices apply based on industrial origin or by sectors
3. Data of Special Allocation Funds already distributed to all provinces in Sumatra.
4. Data Index of human development of provinces in Sumatra.
5. Export data of provinces in Sumatra.
6. Domestic Investment Data (DI) and Foreign Investment (FDI) of provinces in Sumatra.
7. Number of laborers working by sector,

 The above data were collected from 2000 to 2015 as well as supporting data such as Indonesia's GDP, Indonesia's economic growth rate, total export-import of goods (including oil and gas), total realized PMDNs, employment data working according to sector and education level.

**Data Analysis Method**

Analysis method used in this research is qualitative data analysis method, and method of quantitative data analysis. Technically the sectoral groupings contained in GRDP are divided into 4 main sectors including:

1. Primary sector (primary sector) consisting of agriculture sector and mining and quarrying sector.
2. Industrial sectors (secondary sectors) consisting of several sub-sectors including manufacturing industry sector (including), including, and building sector (construction).
3. Utility Sector consisting of Electricity, Gas and Water Supply, Hotel and Restaurant Trade, and Transportation and Communication.
4. The service sector (tertiary sector) consisting of sectors including the financial sector, real estate banking and corporate services.

Quantitative analysis tool used in this research is panel data. From the above understanding then in this study put forward the following model: to answer the first problem used qualitative descriptive approach, while to answer the second problem used econometric approach with the model as follows:

 (1)

 (2)

 (3)

 (4)

Where :

α0 = Intercept

β1 s/d β7 = Panel Data Regression Coefficients

Emp = Employment

SAF = Special Allocation Fund

HDI = Human Development Index

X = Export

Y / Cap = Income Percapita

DI = Domestic Investment

FDI = Foreign Direct Investment

e = Disturbance Error

Ln = Log Natural

**Results and Discussion**

The dynamic pattern of Sumatra's economy shows a significant development of changes in economic structure seen from the production side. The results of the calculation of research conducted by using the panel data regression model approach to the factors that influence the changes in the economic structure of Sumatra from the production side are as follows:

1. For the service sector, the analysis with fixed effect approach to changes ini economic structure shows the following trends :

|  |  |  |  |
| --- | --- | --- | --- |
| Dependent Variable: SERVICE SECTOR |  |  |  |
| Method: Pooled Least Squares |  |  |  |
| Date: 05/11/18 Time: 06:41 |  |  |  |
| Sample: 2010 2016 |  |  |  |  |
| Included observations: 7 |  |  |  |
| Cross-sections included: 10 |  |  |  |
| Total pool (unbalanced) observations: 69 |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|  |  |  |  |  |
| C | -6.26168 | 2.193814 | 2.854243 | 0.0062 |
| EXPORT? | -0.02074 | 0.007451 | 2.784177 | 0.0075 |
| EMPLOYMENT? | -0.02427 | 0.036662 | 0.661868 | 0.511 |
| HDI? | 3.332284 | 0.796628 | 4.182987 | 0.0001 |
| SAF? | 0.019234 | 0.001811 | 10.62164 | 0.0000 |
| YCAPITA? | -0.36615 | 0.078778 | 4.647896 | 0.0000 |
| FDI? | 0.015923 | 0.00465 | 3.423928 | 0.0012 |
| DI? | 0.003348 | 0.002546 | 1.315015 | 0.1943 |
| Fixed Effects (Cross) |  |  |  |  |
| \_NADP--C | -0.06744 |  |  |  |
| \_SUMUTP--C | 0.034738 |  |  |  |
| \_RIAUP--C | -0.26706 |  |  |  |
| \_SUMBARP--C | 0.039712 |  |  |  |
| \_JAMBIP--C | 0.082471 |  |  |  |
| \_SUMSELP--C | 0.032813 |  |  |  |
| \_BENGKULUP-C | 0.130084 |  |  |  |
| \_LAMPUNGP--C | 0.023057 |  |  |  |
| \_KEPRIP--C | -0.02208 |  |  |  |
| \_BABELP--C | 0.032295 |  |  |  |
|  | Effects Specification |  |
| Cross-section fixed (dummy variables) |  |  |
|  |  |  |  |  |
| R-squared | 0.990743 | Mean dependent var | 1.215474 |
| Adjusted R-squared | 0.987894 | S.D. dependent var | 0.209617 |
| S.E. of regression | 0.023063 | Akaike info criterion | -4.49125 |
| Sum squared resid | 0.02766 | Schwarz criterion | -3.94082 |
| Log likelihood | 171.948 | Hannan-Quinn criter. | -4.27287 |
| F-statistic | 347.8203 | Durbin-Watson stat | 1.608443 |
| Prob(F-statistic) | 0.00000 |  |  |  |

The above data provide the following information: there are 5 main variables, among others: export, special fund allocation (SFA), income per capita, HDI and FDI affecting changes in economic structure seen from the service sector with interpretation: if the export variable increased by 1 percent, service sector of -0.02 percent (this variable has a negative effect), for the HDI variable, if the HDI variable grows by 1 percent then, the service sector in the sumatera economy increases by 3.33 percent (this variable has a positive effect), meanwhile for the variable SFA, the effect is positive where if SFA increases by 1 percent will change the service sector by 0,019 percent, the next for variable income per capita, the effect on service sector contribution is negative, meaning if variable per capita income increased by 1 percent then, by 0.37 percent. For the FDI variable, its influence on service sector development is positive, meaning if the FDI variable increases by 1 percent, the service sector contribution will increase by 0.02 percent. The value of R squared of 0.987894 gives the meaning that simultaneously almost all independent variables have a significant influence on service sector development (almost 99 percent). Meanwhile, for F test, it also shows that all independent variables have significant effect on dependent variable (in this case development of service sector). The Fixed Effect model is selected after Chow test (for choice between fixed effect or PLS), while for the choice between FEM and REM (Hausman test has been done, FEM decision is fixed using model.

1. The Primary Sector, the analysis used still uses the Fixed Effect Model approach, because after being tested both with Chou Test (determining which one is best of PLS and FEM and Hausman's test to determine which model is best between FEM and REM), the decision remains on the model FEM is best. The results of data processing include:

|  |  |  |
| --- | --- | --- |
| Dependent Variable: PRIMARY SECTOR |  |  |
| Method: Pooled Least Squares |  |  |  |
| Date: 05/11/18 Time: 11:20 |  |  |  |
| Sample: 2010 - 20016 |  |  |  |  |
| Included observations: 7 |  |  |  |
| Cross-sections included: 10 |  |  |  |
| Total pool (balanced) observations: 70 |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|  |  |  |  |  |
| C | 27.25758 | 6.543265 | 4.165747 | 0.0001 |
| EXPORT? | 0.007328 | 0.010589 | 0.69204 | 0.4919 |
| EMPLOYMENT? | -0.04074 | 0.140234 | -0.290545 | 0.7725 |
| HDI? | -7.42311 | 2.157794 | -3.44014 | 0.0011 |
| SAF? | -0.00479 | 0.006079 | -0.787505 | 0.4345 |
| YCAPITA? | 0.466228 | 0.214271 | 2.175886 | 0.0340 |
| FDI? | -0.00259 | 0.01477 | -0.175447 | 0.8614 |
| DI? | 0.005752 | 0.008168 | 0.704194 | 0.4844 |
| Fixed Effects (Cross) |  |  |  |  |
| \_NADP--C | 0.292569 |  |  |  |
| \_SUMUTP--C | -0.22767 |  |  |  |
| \_RIAUP--C | 0.153284 |  |  |  |
| \_SUMBARP--C | 0.031844 |  |  |  |
| \_JAMBIP--C | 0.267835 |  |  |  |
| \_SUMSELP--C | 0.016721 |  |  |  |
| \_BENGKULUP--C | 0.170422 |  |  |  |
| \_LAMPUNGP--C | 0.018548 |  |  |  |
| \_KEPRIP--C | -0.58 |  |  |  |
| \_BABELP--C | -0.14356 |  |  |  |
|  |  |  |  |  |
|  | Effects Specification |  |
|  |  |  |  |  |
| Cross-section fixed (dummy variables) |  |  |
|  |  |  |  |  |
| R-squared | 0.952623 | Mean dependent var | 3.558043 |
| Adjusted R-squared | 0.93832 | S.D. dependent var | 0.302455 |
| S.E. of regression | 0.075116 | Akaike info criterion | -2.13206 |
| Sum squared resid | 0.299046 | Schwarz criterion | -1.586 |
| Log likelihood | 91.62218 | Hannan-Quinn criter. | -1.91516 |
| F-statistic | 66.60524 | Durbin-Watson stat | 2.213368 |
| Prob(F-statistic) | 0 .00000 |  |  |  |

From the results of the above data obtained the explanation as follows: there are only two independent variables, namely HDI and income per capita that significantly influence the development of the primary sector, the remaining econometric 5 other independent variables have no significant effect on the development of the primary sector. The interpretation for the HDI variable is if it increases by 1 percent, the primary sector will decrease by -7.42 percent (this variable has a negative effect), whereas for the income variable per capita, if per capita income increases by 1 percent then the primary sector will increase by 0, 47 percent. The Fixed Effect model is chosen after Chow test (for choice between fixed effect or PLS), while for FEM and REM (Hausman test is done, FEM decision is fixed using REM model 0.952623 indicates the ability of independent variable to explain its influence on the development of the dependent variable (primary sector) of 95 percent, the rest is determined by other factors outside the model For F test, the result shows that almost all free variables affect the dependent variable (2 significant and 5 not significant).

1. Utility Sector, the results of data processing with panel regression model approach to see the effect of independent variables on the dependent variable on the utility sector in the structure of the economy of Sumatra is as follows :

|  |  |  |
| --- | --- | --- |
| Dependent Variable: UTILITY SECTOR |  |  |
| Method: Pooled Least Squares |  |  |  |
| Date: 05/11/18 Time: 13:53 |  |  |  |
| Sample: 2010 2016 |  |  |  |  |
| Included observations: 7 |  |  |  |
| Cross-sections included: 10 |  |  |  |
| Total pool (unbalanced) observations: 69 |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob |
|  |  |  |  |  |
| C | -26.1535 | 12.98444 | -2.014219 | 0.0492 |
| EXPORT? | 0.049982 | 0.036714 | 1.361373 | 0.1793 |
| EMPLOYMENT? | -0.15408 | 0.247607 | -0.622281 | 0.5365 |
| HDI? | 8.563723 | 4.944584 | 1.73194 | 0.0892 |
| SAF? | -0.08471 | 0.010567 | -8.016419 | 0.0000 |
| YCAPITA? | -0.23323 | 0.460264 | -0.50673 | 0.6145 |
| FDI? | -0.01982 | 0.027557 | -0.719282 | 0.4752 |
| DI? | -0.01372 | 0.01503 | -0.912778 | 0.3656 |
| Fixed Effects (Cross) |  |  |  |  |
| \_NADP--C | 0.291238 |  |  |  |
| \_SUMUTP--C | 0.412919 |  |  |  |
| \_RIAUP--C | -0.57787 |  |  |  |
| \_SUMBARP--C | 0.384126 |  |  |  |
| \_JAMBIP--C | -0.18169 |  |  |  |
| \_SUMSELP--C | 0.064171 |  |  |  |
| \_BENGKULUP--C | 0.169809 |  |  |  |
| \_LAMPUNGP--C | 0.357846 |  |  |  |
| \_KEPRIP--C | -0.82488 |  |  |  |
| \_BABELP--C | -0.07142 |  |  |  |
|  |  |  |  |  |
|  | Effects Specification |  |
|  |  |  |  |  |
| Cross-section fixed (dummy variables) |  |  |
|  |  |  |  |  |
| R-squared | 0.912535 |  Mean dependent var | 2.838155 |
| Adjusted R-squared | 0.885623 |  S.D. dependent var | 0.406958 |
| S.E. of regression | 0.137632 | Akaike info criterion | -0.91858 |
| Sum squared resid | 0.985013 |  Schwarz criterion | -0.36814 |
| Log likelihood | 48.69088 | Hannan-Quinn criter. | -0.7002 |
| F-statistic | 33.9077 |  Durbin-Watson stat | 1.049549 |
| Prob(F-statistic) | 0 |  |  |  |

From the results of the above data processing, can be interpreted as follows: there are only two independent variables that significantly influence the development of utilities sector in the economy of Sumatra, HDI and SAF variables, the remaining 5 independent variables did not affect the development of utility sector. The HDI variable has a positive and significant effect on the utility sector, meaning that if HDI increases by 1 percent then the utility sector will increase by 8.56 percent, while for SAF, the effect is negative and significant on the utility sector, if SAF increases by 1 percent then the utility sector will decrease by -0.08 percent. Meanwhile, for R squared value of 0.885623 means the ability of independent variables to explain the effect on the dependent variable of 89 percent, the rest is explained by other variables not listed in this model, then for F test, the results show almost all independent variables affect the variable bound. The Fixed Effect model was chosen after Chow test (for which option is the best between fixed effect or PLS), whereas for the choice between FEM and REM (Hausman test has been done, the decision is still using FEM model.

1. **S**econdary Sector, the results of data processing with panel regression model approach to see the effect of independent variables on the dependent variable on the secondary sector in the structure of the economy of Sumatra is as follows:

|  |  |  |
| --- | --- | --- |
| Dependent Variable: SECONDARY SECTOR |  |  |
| Method: Pooled Least Squares |  |  |
| Date: 05/11/18 Time: 13:28 |  |  |  |
| Sample: 2010 2016 |  |  |  |
| Included observations: 7 |  |  |  |
| Cross-sections included: 10 |  |  |  |
| Total pool (unbalanced) observations: 69 |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|  |  |  |  |  |
| C | -14.33868 | 7.119133 | -2.01411 | 0.0492 |
| EXPORT? | 0.016773 | 0.015083 | 1.112064 | 0.2712 |
| EMPLOYMENT? | -0.049404 | 0.124099 | -0.3981 | 0.6922 |
| HDI? | 5.160244 | 2.475904 | 2.084186 | 0.0421 |
| SAF? | 0.008305 | 0.0082 | 1.012798 | 0.3158 |
| YCAPITA? | -0.239956 | 0.21929 | -1.09424 | 0.2789 |
| FDI? | 0.006058 | 0.017883 | 0.338774 | 0.7361 |
| DI? | -0.0038 | 0.011749 | -0.32346 | 0.7476 |
| Fixed Effects (Cross) |  |  |  |
| \_NADP--C | -0.386552 |  |  |  |
| \_SUMUTP--C | 0.295924 |  |  |  |
| \_RIAUP--C | 0.228403 |  |  |  |
| \_SUMBARP--C | -0.328428 |  |  |  |
| \_JAMBIP--C | -0.308188 |  |  |  |
| \_SUMSELP--C | 0.325404 |  |  |  |
| \_BENGKULUP--C | -0.91091 |  |  |  |
| \_LAMPUNGP--C | 0.101633 |  |  |  |
| \_KEPRIP--C | 0.646201 |  |  |  |
| \_BABELP--C | 0.206383 |  |  |  |
|  |  |  |  |  |
|  | Effects Specification |  |  |
|  |  |  |  |  |
| Cross-section fixed (dummy variables) |  |  |
|  |  |  |  |  |
| R-squared | 0.953541 |  Mean dependent var | 3.222486 |
| Adjusted R-squared | 0.939246 |  S.D. dependent var | 0.429505 |
| S.E. of regression | 0.105866 | Akaike info criterion | -1.4434 |
| Sum squared resid | 0.582793 |  Schwarz criterion | -0.89297 |
| Log likelihood | 66.79729 | Hannan-Quinn criter. | -1.22503 |
| F-statistic | 66.70422 |  Durbin-Watson stat | 1.386594 |
| Prob(F-statistic) | 0 |  |  |  |

From the above processed results can be explained that there is only 1 independent variable that significantly affect the secondary sector in the economy of Sumatra. The variable is HDI, with the following interpretation: if the HDI variable increases by 1 percent then the secondary sector in the Sumatran economy will increase by 5.16 percent (positively and significantly). While the other 6 independent variables have no effect on the dependent variable. For R squared of 0.953541 means that 95 percent of variations in secondary sector variables are due to independent variables, the remaining about 5 percent is determined by other variables outside the model. For Test F, indicates that simultaneously the variables affect the dependent variable.

**Conclusions**

From the above discussion it can be concluded that changes in the economic structure seen from the side of production has not been so in line with the theory of changes in economic structure as developed by Chenery and Syrquin. The contribution of free variables such as exports, HDI, SAF, per capita income, FDI and DI, to the development of primary, secondary and utilities sectors is less significant. This condition will allow the process of changing the economic structure of Sumatera will not run significantly and slowly. It is therefore necessary to reorient the overall direction of economic development of Sumatera in order to create a strong foundation for the creation of a strong economic structure change.

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