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To cite this article: Abdul Kadir, Retna Astuti Kuswardani & Isnaini (2018): The determination on taxable income of land and building sectors in the implementation of autonomy and increasing income in North Sumatra, Medan, Indonesia, Journal of Transnational Management, DOI: 10.1080/15475778.2018.1512826

To link to this article: https://doi.org/10.1080/15475778.2018.1512826

Published online: 26 Dec 2018.
The determination on taxable income of land and building sectors in the implementation of autonomy and increasing income in North Sumatra, Medan, Indonesia

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ABSTRACT
Regional autonomy, as the implementation of Law no. 32 of 2004 and Law no. 33 of 2004, provides an opportunity for the Regional Government to autonomously complete its economic development based on the potential of economic resources in its territory. This article focuses on the value of tax object sales (NJOP) using primary data to analyze stakeholder perceptions and secondary data for path equation analysis. The results showed simultaneously variables of economic growth and population density significantly affect the NJOP at 95% confidence level. Partially, the variable of economic growth and population density significantly influence to NJOP at 95% confidence level.

ARTICLE HISTORY
Received 8 May 2018
Accepted 8 August 2018

KEYWORDS
Economic growth; NJOP; PAD; PBB; population density

Introduction

Background
Regional autonomy and decentralization, allowing regions to autonomously administer the economy, in the implementation of broad regional autonomy, real and accountable, the authority and ability to extract its own financial resources, supported by the financial balance between Central and Regional Government and between provinces and districts/municipalities which are prerequisites in governance.

With the financial resources, it is expected that the region can manage it well in order to maintain the sustainability of the regional economy. Local revenue as a source of financing for the regions, the locally-generated revenue can function as a pillar of the sustainability of regional autonomy and serve as the backbone of regional development.

In accordance with the provisions of the law, that type of source of regional revenue has been established both in the form of local taxes and levies, one of which receipt of Land and Building Tax (PBB) from the plantation sector.
The contribution is quite as large as one of the Profit Sharing Funds in the Provincial and Regency/City Budgets (APBD) in North Sumatra. This PBB acceptance can be increased again through the determination of the value of tax object sales (NJOP), among others, from the PBB object on the utilization of plantation land in the productive period (yield). The amount of UN revenue in North Sumatera Province each year has increased as in Table 1.

The contribution of the United Nations plantations to PBB revenue from 2001 to 2005 shows a decline. This is certainly needed a strategy in an effort to optimize the increase of PBB revenue from the plantation sector. Substantially, the determinant of NJOP of PBB is possible to increase the revenue of plantation sector through discretion to the region that is able to give the recommendation to the authorized institution in establishing NJOP PBB of plantation sector.

According to 2005 data, the potential of plantations in North Sumatera with an area of 1.75 million ha increased 134,799 ha or increased by 7.71% from 2001 (1.61 million ha) with a growth rate of 2.05% per year. Total production in 2005 was 4.34 million tons, an increase compared to production in 2001 which had production of 3.62 million tons, and the average production growth rate was 2.19% (Department of Plantation, 2005).

Therefore, it is necessary to conduct policy analysis on the establishment of NJOP of PBB in the sector of plantation in the implementation of autonomy and improvement of local revenue source in North Sumatera, in order to create and realize the improvement of regional development and community welfare in the framework of Unitary State of Republic of Indonesia (NKRI), which is one the most important part to empower the potential in supporting regional planning sourced from the NJOP-based revenue of the PBB plantation sector.

### Literature review

#### Regional approach

**Science of regional development**

The science of regional development is a relatively new subject developed in the 1950s. The emergence of scientific development in this region is due...
to the dissatisfaction of social economics experts for less attention on the economic analysis of partial dimension (Budiharsono, 2005). According to Misra (1997), Regional Development Sciences is a discipline supported by four pillars (tetraploid discipline), as described in Figure 1.

Based on the four pillars mentioned above have not covered or represented about social and environmental biogeophysical aspect, hence at least science of area development need to be supported by six pillars (Budiharsono, 2005) can be seen in Figure 2.

The science of the regional development is an integration of applied theory and science, namely geography, economics, sociology, mathematics, statistics, political science, regional planning, environmental science, and so on. This can be understood in the development of a region is a motivated phenomenon that requires a variety of human efforts from various fields of science.

The importance of the science of regional development in the context of development in Indonesia, in general, is in the region of North Sumatra in particular. The science of regional development can be applied to the provincial, district/city level even at the sub-district/village level.

Area

Hanafiah classified the upper regions:

1. Formal Area (Formal Region)
   That is an area that has some similarities in physical terms such as topography, climate, vegetation, and economy (such as the agricultural industry).

2. Functional Area (Functional Region)
   That is the area that shows functional cohesiveness and interdependence, such as cities and villages.

3. Planning Area
   Namely, a region that is a combination of formal and functional areas marked a region-wide enough, meets the criteria of investment in
economies of scale. Able to support the industry with the procurement of labor and has at least one word at the center of growth.

According to Budiharsono (2005), a region is defined as a geographical unit that is limited by certain criteria whose parts are internally dependent. Areas can be divided into four types, namely:

1. Homogeneous Area
   Homegene territory is an area seen from one aspect/criterion having relatively similar traits or characteristics. The properties and characteristics of the homogeneity are, for example, economic (such as areas with homogeneous production and consumption structures, low income/poor income areas, and so on).

2. Nodal Area
   The nodal region is a region that is functionally dependent between the center (core) and its hinterland. This level of dependence can be seen in the flow of population, factors of production, goods, and services, or communication and transportation.

3. Administrative Area
   Administrative territory is an area whose boundaries are determined based on the interests of government or political administration, such as provincial, district, sub-district, village, and RT/WR.

4. Planning Area
   The planning area is defined as an area that shows the coherence or unity of economic decisions. The planning area can be seen as a large area to allow for important changes in population dispersion and employment but small enough to allow its planning problems to be viewed as a unity.

**NJOP PBB and plantation**

Understanding NJOP PBB is the average price obtained from the sale and purchase transactions that occur naturally, that is not affected by a special relationship between the seller and the buyer. Understanding NJOP in Law
no. 12 Year 1994 is the average price obtained from the sale and purchase transactions that occur naturally, and when there is no sale and purchase transaction, the sale value of the tax object is determined by price comparison with other similar objects, the new acquisition value, or the selling value of the object replacement tax.

In the general provisions of Law no. 18 of 2004 concerning plantations mentioned, the definition of plantation is any activity that seeks certain crops on soil and/or other growing media in an appropriate ecosystem; managing and supplying the goods and services of the crops, with the help of science and technology, capital, and management to realize the welfare of the plantation businessmen and the community.

Further Article 3 of Law no. 18/2004 states that plantations are held with the aim of:

1. Increase public income
2. Increase state revenue
3. Increase foreign exchange earnings
4. Increasing employment
5. Increase productivity, added value, and competitiveness
6. Meet the needs of domestic consumption and raw materials industry
7. Optimize sustainable natural resource management.

Regional autonomy

The rolling of the reform era that became the implementation and the wishes of the general public affected the pattern of life and old habits. Similarly, the pattern of governance also changes, from the waiting pattern of direction from the center, replaced by bottom-up patterns, in which all community needs are voiced by community representatives (DPRD) to the local government, and local governments can forward them to the central government, governance is also aligned with the state of the region.

Implementation of autonomy to meet the needs and demands in the governmental administration has a correlation, among others, about the need for sources of funding, where the functions and duties of local governments will be able to run properly and maximally if in carrying out government affairs are accompanied and given sufficient resources and adequate.

Based on Law no. 32/2004 and Law no. 33/2004, it has provided a need to improve the efficiency and effectiveness of local governance which focuses on aspects of inter-governmental relations among local governments, regional potencies and diversity, opportunities and challenges of global competition by granting the widest possible authority to regions
with rights, and the obligation to organize regional autonomy in unity of state administration system.

**Regional revenue source**

In relation to the exercise of authority to meet the needs and demands in the implementation of autonomy has a correlation with the need for financing sources. In Law no. 32/2004 Article 157 and Law no. 33/2004 on Article 5 mentioned the source of regional income includes:

1. Regional Original Revenue hereinafter referred to as PAD, namely:
   a. The result of local tax
   b. The result of regional retribution
   c. The result of separated regional wealth management
   d. Other legitimate local revenue
2. Balancing Funds
3. Other Legal Revenue.

In line with the above laws, in Law no. 32/2004, Article 21 on Regional Rights and Obligations, it states that there is authority from local government to collect local taxes and levies.

**Increased local revenue**

According to Soekarwo (2003), the increase of Pendapatan Asli Daerah (PAD) can be implemented through several things, namely:

1. Intensification
2. Extensification
3. Improvement of services to the community.

Intensification is an activity that is carried out to improve and update all data related to regional revenue, data renewal is done periodically, and by applying random checking to some local revenue source, such activities can be done through:

1. Data collection and rejuvenation of object and subject of local taxes and levies, so that all sources of local revenue can be extracted and adjusted according to the laws and regulations
2. Studying and reviewing local taxes that are trimmed (revoked) in order to seek the possibility of being diverted into regional levies
3. Intensify the acceptance of user charges
4. Improving the infrastructure and levy facilities that have not been adequate, so that all charges are financing based on facilities and infrastructure is good and true.

Extensification is an activity undertaken through the excavation of new revenue sources with the utilization of potential areas that are able to provide economic benefits to the government and the wider community.

Excavation of local revenue sources is intended to finance regional development, not merely to raise funds as much as possible, so that it can hamper the investment climate and even damage/kill businesses that have developed before the levy is done.

**Property tax**

Land and building tax is one of the objects of central tax levies, which are distributed to regions (provinces and districts/municipalities). Understanding the Earth and the buildings contained in Article 1 number 1 of Law no. 12 The year 1985 called the understanding of the Earth and buildings as follows: Earth is the surface of the Earth coupled with the Earth beneath it (the surface of the Earth covering the land in the waters, inland, and sea territory of the Republic of Indonesia). The regulation of PBB acceptance allocated in Law no. 33/2004, with details as follows:

1. 10% of the central share of PBB revenue shall be distributed to all districts/municipalities based on the realization of PBB revenue in the current fiscal year, with the following balance:
   a. 65% is distributed equally to all regencies/municipalities
   b. 35% is distributed as incentives to districts/municipalities whose realization of the previous year reached/exceeded certain sector revenue plans, aimed at encouraging the intensification of PBB collections
2. 90% for the region, which is broken down as follows:
   a. 16.2% for the province
   b. 64.8% of districts/municipalities
   c. 9% for the collection fee

The PBB objects are grouped into five sectors—Rural, Urban, Plantation, Forestry, and Mining—which in practice implements the system and procedures of registering, collecting, assigning, and depositing PBB to the state treasury through designated banks that are authority of the Directorate General of Taxation (Ministry of Finance of the Republic of Indonesia) with its staff of the United Nations Directorate and Service Office of the United
Nations in the region. These banks have linked operational activities in the field with provincial and district government elements.

**Conceptual framework**

Economic development is aimed at creating the livelihood of the people of many countries concerned more prosperous and prosperous, both in economic terms. In addition, economic development is also often intended to make the economic structure of the country concerned more balanced between one economic sector and the other, especially between the agricultural sector, including plantation, and industry (Marsudi, 1994).

The Indonesian state that has so many natural resources, one of them is natural resources that produce plantation-based economy. In accordance with the Law no. 32/2004 and Law no. 33/2004 should contribute to local government revenues. Given the local government’s acceptance of plantation-based economic potentials, it can increase regional development.

Establishment of NJOP of PBB on plantation sector through the approach of land use criteria (land) with observed variables as a sketch of research conceptual framework (Figure 3). The lands controlled by plantation managers generally consist of categories such as unplanted land, planted soil, emplacement land, unproductive crops, yielding crops, which are currently subject to the same United Nations, but the five types of land it has a different NJOP because the land that is generating different economic value, so with the categorization of land in accordance with its function will be obtained a different NJOP and impact on the PBB imposed, with the PBB changes are imposed then there is the central and regional, which in the end contributing to regional development. Specifically, the conceptual hypothesis can be seen in Figure 4.

**Research Methods**

**The location of research**

The research was conducted in North Sumatera Province at Regency/City whose area was cultivated wide of state and private plantation land.

**Research design**

The design of the research is a plan, structure and research strategies are arranged in such a way, so that data can be obtained from representative and valid data processing. The approach of this research is a type of research that is observing the policy of determination of NJOP in relation with PBB of plantation sector.
In the regencies/municipalities of North Sumatra Province, which have plantations, there are 18 districts/cities consisting of Nias, Mandailing Natal, Tapanuli Selatan, Central Tapanuli, Toba Samosir, Labuhan Batu, Asahan, Simalungun, Dairi, Karo, Deliserdang, Langkat, Pak-Pak Bharat, Serdang Bedagai, Pematang Siantar, Medan, Binjai and Padang Sidempuan, the sample is determined by the institution/institution based on the determination of the selling value of the tax object and the operational administration and the amount determined based on the objectives.

**Research variable**

**Classification of variables**

Variables used in this study can be classified into three groups: (1) endogenous, (2) exogeneous, and (3) intervening (intermediaries).
1. Endogeneous variable is a variable whose existence is determined by exogenous variables, in this study including exogenous variables are:
   a. Tax Object Selling Value (NJOP)
   b. Productive plants
   c. Local Own Revenue (PAD)
   The above variable values can be obtained from the equation and out of the equation.

2. Exogenous variable is a variable that explains the dependent variable. In this study which included the independent variables are:
   a. Economic growth
   b. Population density
   c. Tax Object Selling Value (NJOP)
   d. Property tax (PBB)

3. Intervening variable
   Intervening variable (perantara) is a variable that serves as an intermediary of the independent variable in determining the effect of the dependent variable. In this study intervening variables are:
   a. Tax Object Selling Value (NJOP)
   b. Property tax (PBB)

**Secondary data collection procedures**

In relation to this study using secondary data, the data collection procedure is obtained directly from official publications such as Central Bureau of Statistics, Tax Office, Dispenda, Plantation Agency, Publication Institution in the form of the annual report, journal, thesis or dissertation, and textbook by taking notes.

**Data analysis**

Primary data and secondary data that have been collected done unification and correction tabulation, presentation in the form of tables or pictures in accordance with the issues studied. Based on the path analysis diagram above to prove the first hypothesis through the following structural equations:

\[
Y_1 = PY_{11}X_1 + PY_{12}X_2 + e_1
\]  

Information:
- \(Y_1\) is the Sales Value of Plantation Sector Tax Object
- \(PY_{11}, PY_{12}\) is coefficient
- \(X_1\) is Economic Growth (%)
- \(X_2\) is Population Density (Org/km)
- \(e_1\) is an Error
To test the second hypothesis is done by analysis of the estimation path of the following structure equation II:

\[ Y_2 = P Y_{11} X_1 + P Y_{22} X_2 + P Y_{21} Y_1 + e_2 \] (II)

Information:
- \( Y_2 \) is Land and Building Tax (PBB)
- \( P Y_{11} \), \( P Y_{22} \), \( P Y_{21} \) is coefficient
- \( X_1 \) is Economic Growth
- \( X_2 \) is Population Density
- \( Y_1 \) is NJOP
- \( e_2 \) is Error

To prove the third hypothesis is done by path analysis through equation structure III as follows:

\[ Y_3 = P Y_{31} X_1 + P Y_{32} X_2 + P Y_{32} Y_2 + e_3 \] (III)

Information:
- \( Y_3 \) is the Original Revenue (PAD) (Rp)
- \( P Y_{31} \), \( P Y_{32} \), \( P Y_{32} \) is coefficient
- \( X_1 \) is Population Density (Org/km)
- \( X_2 \) is Economic Growth (%)
- \( Y_1 \) is the Value of Sale of Tax Objects (NJOP) (Rp)
- \( e_3 \) is Error

To give the fourth hypothesis is done by path analysis through the equation structure IV as follows:

\[ Y_3 = P Y_{31} X_1 + P Y_{32} + P Y_{31} Y_1 + P Y_{32} Y_2 + e_4 \] (IV)

Information:
- \( Y_3 \) is the Original Revenue (PAD) (Rp)
- \( P Y_{31} \), \( P Y_{32} \), \( P Y_{31} \), \( P Y_{32} \) is coefficient
- \( X_1 \) is Population Density (Org/km)
- \( X_2 \) is Economic Growth (%)
- \( Y_1 \) is the Value of Sale of Tax Objects (NJOP) (Rp)
- \( Y_2 \) is Land and Building Tax (PBB) (Rp)
- \( e_4 \) is Error

**Results and discussion**

**Equation structure analysis I**

Based on the model of equation structure I, the calculation of magnitude coefficient of each explanatory variable using SPSS 15 program is shown in Table 2.
Based on the data provided in Table 2, the equation structure I can be determined as follows:

\[ Y_1 = 0.249 X_1 + 0.590 X_2 \]

The result of equation analysis of structure I can give information to NJOP as follows:

1. **Influence partially**
   Economic growth variable significantly influences to NJOP at 95% confidence level. This real effect is considered by \( t \)-test through a decision of a significant value of less than tolerance (Sig = 0.005 < tolerance = 0.05). The population density variables significantly affect the NJOP at the 95% confidence level. This real effect is considered by the “\( t \)” test, through the decision of the significant value of level less than tolerance (Sig = <0.05)

2. **Influence simultaneously**
   Economic growth and population density variables significantly affect the NJOP at 95% confidence level. This real effect is considered by the “\( F \)” test through a decision of a significant level less than tolerance (Sig = 0.000 < 0.05)

3. The coefficient of determination (\( R^2 \)) shows the value of 0.387, giving information that the variable of economic growth and population density together can give NJOP variation equal to 38.70%. While the rest of 61.30% explained by other variables that are not accompanied by the equation model of structure I.

4. **Classical Assumption Deviation Test**
   Based on the results of print out data, it can be done to diagnose whether the estimation model is symptomatic Multicolinearity, Heterokendestisitas, and Autokorelasi as follows:
   a. Diagnosis of multicolinearity
      Based on the consideration of tolerance and VIF, symptom of multicolinearity can be determined with base tolerance if the value of the variable coefficient is less than 0.5 and base VIF if the coefficient value of the variable is greater than 5. Table 3 shows the coefficient

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient standards</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>0.249</td>
<td>0.005</td>
</tr>
<tr>
<td>Population density</td>
<td>0.590</td>
<td>0.000</td>
</tr>
<tr>
<td>( F ) Sig</td>
<td>0.600</td>
<td></td>
</tr>
<tr>
<td>( F )</td>
<td>26.161</td>
<td></td>
</tr>
<tr>
<td>( R )</td>
<td>0.622</td>
<td></td>
</tr>
<tr>
<td>( R^2 )</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>NJOP</td>
<td>= dependent variable</td>
<td></td>
</tr>
</tbody>
</table>
tolerance value of variable greater than 0.5 and variable economic growth and population density less than 5 imply that no symptom of collinearity is observed. We can also see the multicollinearity symptom in the estimation model of the correlation coefficient between economic growth variable and population density. Based on the table of tolerance, the coefficient shows the correlation of 0.08 (8%). Mean estimation model is asymptomatic collinerity.

b. Diagnosis of Heteroscedasticity
To diagnose heteroscedasticity, the estimation model is done by “Rank Spearman” test, with the decision of Heteroscedasticity if the value of significant level is less than tolerance (5%). Based on Non Parametric correlation, “Rank Spearman” shows Sig value of economic growth variable and population density variable none less than tolerance (0.05). Mean estimation model is not symptomatic heteroscedasticity (Table 4).

5. Diagnosis of Autocorrelation
To diagnose autocorrelation, the estimation model is done by Durbin–Watson test (DW test), considering the decision of autocorrelation symptoms if DWhitung < dl or DWhitung > 4 – dl. DW table shows the value at = 1.62 du = 1.72, 4 – dl = 2.38 and 4 – du = 2.28, and DWhitung shows the value of 0.882 is less than dl (DWx = 0.882 < dl = 1.62), means the estimation model symptomatic autocorrelation.

**Equation structure analysis II**

Based on the model of equation structure II, the calculation of the coefficients of each explanatory variable using SPSS 15 program is shown in Table 5.

Based on the data provided in Table 5, the equation structure II can be determined as follows:

\[ Y_2 = 0.179 X_1 + 0.580 X_2 + 0.905 Y_1 \]

The result of structural equation II can give information to UN variable as follows:

1. Influence partially
   Economic growth variable significantly influenced PBB variable at 95% confidence level. The negative influence of this variable is considered by the “t” test, through the decision of the value of the significant level less than tolerance (Sig value 0.009 < tolerance = 0.05).
The population density variables significantly affect the PBB variable at 95% confidence level. The negative influence of this variable is considered by the “t” test, through the decision of the value of the significant level less than tolerance (Sig value $0.009 < \text{tolerance} = 0.05$).

NJOP variables significantly affect the PBB variable at 95% confidence level. This real effect is considered by the “t” test, through the decision of the value of a significant level less than tolerance (Sig value $0.009 < \text{tolerance} = 0.05$).

2. Influence together

Economic growth variables, population density, and NJOP significantly affect the PBB at a 95% confidence level. This real effect is considered by the “F” test, through a decision of a significant value of less than 5% tolerance (significant value $= 0.000 < \text{tolerance} = 0.05$).

3. The determination coefficient ($R^2$) shows the value of 0.672, giving information that the variable of economic growth, population density, and NJOP together can provide a variation of UN variable equal to 67.20%. While the remaining 32.80% is explained by other variables that are not included in the model of equation estimate of structure II.

4. Classical Assumption Deviation Test

Based on the results of print out data, it can be done to diagnose whether the estimation model of the equation structure II is symptomatic Multicolinearity, Heterokendastisitas, and Autokorelasi as follows:

a. Diagnosis of Multicolinearity

Based on the consideration of tolerance and VIF, symptom of multicolinearity can be determined with base tolerance if the coefficient value is less than 0.5 and base VIF if the coefficient value is greater than 5. In Table 6, coefficient from the print out data shows

\begin{table}
\centering
\caption{Rank Spearman correlation.}
\begin{tabular}{lcc}
\hline
Information & Economic growth & Population density \\
\hline
\text{Residual} & 0.067 & 0.157 \\
\text{Correlation coefficient} & 0.542 & 0.148 \\
\text{Sig (2-Talked)} & 86 & 86 \\
\hline
\end{tabular}
\end{table}

\begin{table}
\centering
\caption{Regression result of economic growth variables and population density to NJOP.}
\begin{tabular}{lccc}
\hline
Variable & Coefficient standards & Sig \\
\hline
\text{Economic growth} & 0.179 & 0.009 \\
\text{Population density} & -0.580 & 0.000 \\
\text{NJOP} & 0.905 & 0.000 \\
\text{F Sig} & = 0.000 \\
\text{F hitung} & = 55.878 \\
\text{R}^2 & = 0.819 \\
\text{R} & = 0.672 \\
\text{PBB} & = \text{dependent variable} \\
\hline
\end{tabular}
\end{table}
Table 6. The coefficient of colinearity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>0.903</td>
<td>1.108</td>
</tr>
<tr>
<td>Population density</td>
<td>0.635</td>
<td>1.574</td>
</tr>
<tr>
<td>NJOP</td>
<td>0.613</td>
<td>1.630</td>
</tr>
</tbody>
</table>

c. Diagnosis of Heterocampasity

To diagnose Heterocampasity, the estimation model of the equation structure II is done by “Rank Spearman” test with the decision of Heterocampasity if the value of significant level is less than 5% tolerance. Based on correlation table, Rank Spearman shows Sig value of economic growth variable (0.052), population density (0.107) and NJOP (0.932) is greater than tolerance 0.05, meaning that variable of economic growth, population density, and NJOP is not symptomatic of heterokelasticity.

c. Diagnosis Autocorrelation

To diagnose the autocorrelation, the estimation model of equation structure II is done by Durbin–Watson Test (DW-Test) with consideration of decision of autocorrelation symptoms if DW count (dl or DW count > 4 – dl) DW table show dl = 1.62, du = 1.72, 4 – dl = 2.38 and 4 – du = 2.28 DW count shows 1.136 less than in (DW count = 1.136 < dl = 1.62), meaning that the estimation model of the equation structure II is symptomatic of autocorrelation.

Equation structure analysis III

Based on the model of equation structure III, the calculation of the coefficients of each explanatory variable using the SPSS 15 program is shown in Table 7.

Based on the data provided in Table 7, the equation structure III can be determined as follows:

\[
Y_3 = 0.179 X_1 + 0.580 X_2 + 0.905 Y_1
\]

\[
Y_3 = -0.230 X_1 - 0.558 X_2 + 0.964 Y_1
\]
The result of structural equation III can give information to PAD variable as follows:

1. Influence partially
Economic growth variables significantly affect the PAD variable at 95% confidence level. The negative effect of this variable is considered by the \( t \) test, through the decision of the value of the significant level is less than tolerance (Sig value \( 0.003 < \) tolerance =0.05).

The population density variables significantly affect the PAD variable at 95% confidence level. The negative effect of this variable is considered by the \( t \) test, through the decision of the value of the significant level less than tolerance (Sig \( 0.000 < \) tolerance =0.05).

NJOP variable has a significant effect on PAD variable at 95% confidence level. This apparent effect is considered by the \( t \) test, through the decision of the value of the significant level less than tolerance (Sig value \( 0.000 < \) tolerance =0.05).

2. Influence together
Economic growth variable, population density, and NJOP have significant effect to PAD at a 95% confidence level. This real effect is considered by the \( F \) test, through a decision of a significant value of less than 5% tolerance (significant value =0.000 < tolerance =0.05).

3. The determination coefficient \((R^2)\) shows the value of 0.570 giving information that the variable of economic growth, population density, and NJOP together can provide a variation of PAD variable equal to 57%. While the remaining 43% is explained by other variables that are not included in the model estimation of structure equation III.

4. Classical Assumption Deviation Test
Based on the results of print out data, it can be done to diagnose whether the estimation model of equation structure III is symptomatic Multicolinearity, Heterokendastisitas, and Autokorelasi as follows:

a. Diagnosis of Multicolinearity
Based on the consideration of tolerance and VIF, symptom of multicolinearity can be determined with base tolerance if the coefficient value is

\[
\begin{array}{l|c|c}
\text{Variable} & \text{Coefficient standards} & \text{Sig} \\
\hline
\text{Economic growth} & -0.230 & 0.003 \\
\text{Population density} & -0.558 & 0.000 \\
\text{NJOP} & 0.964 & 0.000 \\
\text{F} & \text{Sig} = 0.000 \\
\text{Fhitung} & = 36.299 \\
\text{R}_2 & = 0.755 \\
\text{R} & = 0.570 \\
\text{PAD} & = \text{dependent variable} \\
\end{array}
\]
less than 0.5 and base VIF if the coefficient value is greater than 5. In Table 8, coefficient shows the value of coefficient tolerance variable of economic growth (0.903), variable of population density (0.635), and NJOP variable (0.613), indicates greater than 0.5, meaning that economic growth variables, population density, and NJOP are asymptomatic multicollinearity. The VIF coefficients of economic growth variables (1.108), population density (1.574), and NJOP (1.630) show less than 5, meaning that the variable of economic growth, population density, and NJOP are asymptomatic multicollinearity.

b. Diagnosis of Heterocampasity

To diagnose Heterocentasticity, the estimation model of the equation structure III is done by "Rank Spearman" test with the decision of Heterocentasticity if the value of significant level is less than 5% tolerance. Based on correlation table, Rank Spearman shows Sig value of economic growth variable (0.744), population density (0.000), and NJOP (0.815) show greater than tolerance 0.05, meaning that variable of economic growth and NJOP is not symptomatic of heterokelasticity, and density variable is the symptomatic population of heterokelasticity.

c. Diagnosis Autocorrelation

To diagnose the autocorrelation, the estimation model of structure equation III is done with Durbin–Watson Test (DW–Test) by considering the decision of autocorrelation symptoms if DW count (dl or DW count >4 – DW) DW table show dl =1.62, du =1.72, 4 – dl =2.38 and 4 – du =2.28 DW count, showing 0.837 less than dl (DW count =0.837 < dl =1.62), meaning that the estimated model of the equation of III is symptomatic structure of autocorrelation.

**Equation structure analysis IV**

Based on the model of equation structure IV, the calculation of the coefficients of each explanatory variable using the SPSS 15 program is shown in Table 9.

Based on the data provide in Table 9, the equation structure IV can be determined as follows:

\[
Y_3 = -0.332 X_1 - 0.228 X_2 + 0.448 X_3 + 0.570 X_4
\]
The result of the equation structure IV can give information to PAD as follows:

1. **Influence partially**

   Economic growth variables significantly affect the PAD at 95% confidence level. This apparent effect is considered by the “\(t\)” test, through a decision of a significant level is less than a 50% tolerance (Sig =0.000 < 0.05)

   The population density variables significantly negatively affect the UN at a 95% confidence level. This real effect is considered by the “\(t\)” test, through the decision of the significant value of less than 5% tolerance (Sig =0.028 < tolerance =0.05)

   The NJOP variable had a significant positive effect on PAD at 95% confidence level. This real effect is considered by the “\(t\)” test, through the decision of the significant value of less than 5% tolerance (Sig =0.01 < tolerance =0.05)

   The UN variable has a significant positive effect on PAD at 95% confidence level. The real effect is considered by the “\(t\)” test, through the decision of the significance level less than the 5% tolerance (Sig =0.000 < tolerance =0.05).

2. **Influence together**

   Economic growth variable of population density, NJOP, and PBB have a significant effect on PAD at 95% confidence level. This real effect is considered by the “\(F\)” test, through a decision of a significant value of less than 5% tolerance (Sig =0.000 < tolerance =0.05).

   The coefficient of determination (\(R^2\)) shows the value of 0.677 gives information that the variable of Economic growth, population density, NJOP, and PBB together can provide a variation of PAD variable equal to 67.70%. While the rest of 32.30% explained by other variables that are not included in the estimation model of equation structure IV.

### Table 9. Regression result of economic growth variables, population density, NJOP, and PBB on PAD.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient standards</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>-0.332</td>
<td>0.000</td>
</tr>
<tr>
<td>Population density</td>
<td>-0.228</td>
<td>0.028</td>
</tr>
<tr>
<td>NJOP</td>
<td>0.448</td>
<td>0.001</td>
</tr>
<tr>
<td>UN</td>
<td>0.570</td>
<td>0.000</td>
</tr>
<tr>
<td>F Sig</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Fitung</td>
<td>42.482</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0.823</td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.677</td>
<td></td>
</tr>
<tr>
<td>PAD</td>
<td>variable dependent</td>
<td></td>
</tr>
</tbody>
</table>
3. Classical Assumption Deviation Test

Based on the results of print out data, it can be done to diagnose whether the estimation model is symptomatic Multicollinearity, Heterokasticity, and Autocorrelation as follows:

a. Diagnosis of Multicollinearity

Based on growth tolerance and VIF, a symptom of multicollinearity can be determined with base tolerance if the coefficient value is less than 0.5 and base VIF consideration if the coefficient of the variable is greater than 5. In Table 10, the coefficient shows the value of coefficient tolerance variable of economic growth (0.830) greater from 0.50, meaning that the variable of economic growth is not symptomatic of multicollinearity. The population density variables (0.385), NJOP (0.242), and PBB (0.328) show less than 0.5, meaning that the variable of population density, NJOP, and PBB is symptomatic of multicollinearity in estimation model of structure equation IV. Considering the VIF, coefficient shows the economic growth variables (1.208), population density (2.598), NJOP (4.124), and PBB (3.044) are less than 5, meaning that economic growth variables, population density, NJOP, and UN are asymptomatic of multicollinearity.

b. Diagnosis of Heterokasticity

To diagnose Heterokasticity, the estimation model of the equation structure IV is done by “Rank Spearman” test with the decision of Heterokasticity if the value of significant level is less than 5% tolerance. Based on Table 11, the Sig Value of the economic growth variables (0.521), NJOP (0.444), and PBB (0.450) indicates a value of greater than 0.05, meaning that economic growth variables, NJOP, and UN are asymptomatic, but density variables symptomatic population of heterokasticity because the Sig value is less than 0.05 (Sig Value) = 0.02 < α tolerance =0.05).

c. Diagnosis Autocorrelation

To diagnose Autocorrelation, the estimation model of structure equation IV is done with the test “Durbin–Watson Test (DW Test) with the consideration of autocorrelation symptoms if DW value count less than dl or DW count greater than 4 – dl. DW table

Table 10. Coefficient of colinerity.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Tolerance</th>
<th>VIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>0.830</td>
<td>1.208</td>
</tr>
<tr>
<td>Population density</td>
<td>0.385</td>
<td>2.598</td>
</tr>
<tr>
<td>NJOP</td>
<td>0.242</td>
<td>4.124</td>
</tr>
<tr>
<td>PBB</td>
<td>0.328</td>
<td>3.044</td>
</tr>
</tbody>
</table>
show $dl = 1.62$, $du = 1.72$, $at = 2.38$ and $4 - du = 2.28$. DW arithmetic (based on 0.883 shows less than $dl$ (DW count $= 0.883 < dl = 1.62$)), meaning that the estimation model of the equation of IV structure is symptomatic of autocorrelation.

**Direct, indirect, and total effect analysis**

To determine the magnitude of the direct, indirect, and total effects of each observed variable, it can be done by integrating the equation results of structures I, II, III, and IV as in Figure 5.

Based on Figure 5, it can be determined:

1. Direct effect
   a. The effect of economic growth variable on NJOP
      
      $X_1 \rightarrow Y_1 = PY_{11}$
      
      $= 0.249$

   b. Effect of NJOP variable on PAD
      
      $X_1 \rightarrow Y_2 = PY_{2y1}$
      
      $= 0.179$

   c. Effect of economic growth variable on PAD
      
      $X_1 \rightarrow Y_3 = PY_{31}$
      
      $= -0.230$

   d. Effect of population density variable on NJOP
      
      $X_2 \rightarrow Y_1 = PY_{12}$
      
      $= 0.590$

   e. Influence variable of economic growth to PBB
      
      $X_2 \rightarrow Y_2 = PY_{22}$
      
      $= -0.2580$

   f. Influence variable of economic growth to PBB
      
      $X_2 \rightarrow Y_3 = PY_{32}$
      
      $= -0.558$

   g. The effect of population density variables on PBB
      
      $Y_1 \rightarrow Y_2 = PY_{2y1}$
      
      $= -0.448$

   h. Effect of NJOP variable on PAD
      
      $Y_1 \rightarrow Y_3 = PY_{3y1}$
      
      $= 0.964$
i. The effect of the UN variable on PAD

\[ Y_2 \rightarrow Y_3 = PY_3Y_2 \]
\[ = 0.570 \]

2. Indirect effect

a. The effect of economic growth variable on PBB through NJOP variable

\[ X_1 \rightarrow Y_1 \rightarrow Y_2 = PY_{11} \times PY_{2 Y_1} \]
\[ = 0.249 \times 0.448 \]
\[ = 0.1116 \]

b. Effect of economic growth variable on PAD through NJOP variable

\[ X_1 \rightarrow Y_1 \rightarrow Y_3 = PY_{11} \times PY_{3 Y_1} \]
\[ = 0.249 \times 0.964 \]
\[ = 0.2400 \]

c. Effect of population density variable on PAD through NJOP variable

\[ X_2 \rightarrow Y_1 \rightarrow Y_2 = PY_{12} \times PY_{3 Y_1} \]
\[ = 0.590 \times 0.448 \]
\[ = 0.2643 \]

d. Effect of population density variable on PAD through NJOP variable

\[ X_2 \rightarrow Y_1 \rightarrow Y_3 = PY_{12} \times PY_{3 Y_3} \]
\[ = 0.590 \times 0.964 \]
\[ = 0.5688 \]

e. Effect of NJOP variable on PAD through UN variable

\[ Y_1 \rightarrow Y_2 \rightarrow Y_3 = PY_{2 Y} \times PY_{3 Y_2} \]
\[ = 0.448 \times 0.570 \]
\[ = 0.2554 \]
3. Total effect
   a. The effect of economic growth variable on PBB through NJOP variable
   \[ X_1 \rightarrow Y_1 \rightarrow Y_2 = PY_{11} + (PY_{11} \times PY_{2y1}) \]
   \[ = 0.249 + (0.249 \times 0.448) \]
   \[ = 0.3606 \]
   
   b. Effect of population density variable on PAD through NJOP variable
   \[ X_1 \rightarrow Y_1 \rightarrow Y_3 = PY_{11} + (PY_{11} \times PY_{3y1}) \]
   \[ = 0.249 + (0.249 \times 0.964) \]
   \[ = 0.4890 \]
   
   c. Influence of population density variable to PBB through NJOP variable
   \[ X_2 \rightarrow Y_1 \rightarrow Y_2 = PY_{12} + (PY_{12} \times PY_{2y1}) \]
   \[ = 0.590 + (0.590 \times 0.448 \times 0.570) \]
   \[ = 0.7034 \]
   
   d. Influence of variable of Population Density to PAD through NJOP variable
   \[ X_2 \rightarrow Y_1 \rightarrow Y_3 = PY_{12} + (PY_{12} \times PY_{3y1}) \]
   \[ = 0.290 + (0.590 \times 0.964) \]
   \[ = 0.3606 \]
   
   e. Effect of NJOP variable on PAD through PBB variable
   \[ Y_1 \rightarrow Y_2 \rightarrow Y_3 = PY_{2Y1} + (PY_{2Y1} \times PY_{3y2}) \]
   \[ = 0.448 + (0.448 \times 0.570) \]
   \[ = 0.7034 \]

**Conclusion**

Based on the results of the research, it can be concluded several things, among others:

1. Partially and simultaneously variable of economic growth and population density have a real effect to NJOP. The ability of variable of economic growth and population density together can give an explanation of NJOP variation equal to 38.70%
2. Partially and together with the variables of economic growth, population density, and NJOP significantly affect the UN. Together with the variable of economic growth, population density, and NJOP able to give an explanation of variable variation of PBB equal to 57%
3. Partially and simultaneously economic growth, population density, NJOP, and PBB has a significant effect on PAD. Together variables of economic growth, population density, NJOP, and PBB able to give an explanation of variation of PAD equal to 67.70%
4. Partially and simultaneously economic growth, population density of NJOP and PBB has a significant effect on PAD. Together variables of economic growth, population density, NJOP, PBB able to give an explanation of variation of PAD equally.

5. Taking into account, the juridical aspect that is based on Law no. 33/2004 through the establishment of plantation characteristics belonging to the components of renewable natural resources

6. The magnitude of the effect of economic growth variable is 0.116, and the magnitude of the effect of population density is 0.2643 to PBB through NJOP

7. The magnitude of the effect of economic growth variable is 0.24, and the magnitude of the effect of population density is 0.5688 to PAD through NJOP

8. The amount of influence of NJOP is 0.2554 to PAD through PBB variable

9. There is a chance of determining NJOP based on the juridical aspect

10. There is no difference of opinion of government stakeholders, government, and entrepreneurs toward the determination of NJOP PBB based on the value of productive crops

11. There is no difference of opinion of government stakeholders, government, and entrepreneurs on the determination of NJOP PBB based on macroeconomic variables.

References


Legislation