Forecasting of local tax realization with least square method in Tanggamus Regency

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Abstract

Purpose: This study aims to identify the contribution of local taxes to regional revenues in Tanggamus Regency and predict the pattern of realization of regional tax revenues in the coming period.

Research methodology: This research is a quantitative study with a time series trend analysis according to the type of regional tax and an overview of the target and its realization. The sample used in this study was data from seven types of regional taxes obtained from the Regional Financial Management Agency of Tanggamus Regency. The data analysis process uses the least squares method, often used to forecast, and the application uses Minitab software with fitted line plots and descriptive statistics features.

Results: This study's results showed that the seven tax subjects seemed to go through changes and tended to grow in the future.

Limitations: This research is limited to the specific scope of taxes selected and does not cover all other types of taxes and levies.

Contributions: This study's ability to predict the future helps make plans for regional tax revenue, especially when it comes to planning for policies that might change in the near future.

Novelty: This research is new because it has a new update on how to use predictive methods with Minitab and an analysis of how local taxes have changed over time.

Keywords: *Local Tax, Least Square, Regional Governments, Forecasting*

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1. Introduction

The decentralization policy of local governments in Indonesia is part of the efforts to strengthen the justice and welfare of Indonesian citizens (Wibowo, 2022). The region is expected to fully manage its potential for all citizens' benefit. It includes improving regional financial capabilities by providing additional sources of regional income (Hafandi & Romandhon, 2020). Several policies have been issued, including Law Number 28 of 2009, concerning regional taxes and regional levies. In particular, district and city governments are given additional new types of local taxes, such as duty tax on the acquisition of land and building rights, land tax, and urban and rural buildings, groundwater tax, and a swallow's nest tax, under the law (Juliarini, 2018).

Based on the authority to collect taxes, they are divided into two types: central and regional. Central tax is a tax collected by the central government and used to finance State households, while local tax is a tax collected by local governments to finance regional development (Asih, 2018). The definition of local tax is based on Law No. 28 of 2009, article 1, paragraph 10, concerning regional taxes and regional levies, regional taxes. Local taxes are mandatory contributions made by individuals or entities to the regions without balanced direct compensation that can be imposed under applicable laws and regulations, which are used to finance the implementation of local government and

development (Iryanie, 2018). From now on, local taxes are mandatory contributions to the regions owned by individuals and entities that are coercive by not getting direct compensation and used for regional purposes for the greatest prosperity of the people (Ismail, 2018). Based on the definition above, conclusions can be drawn about the main characteristics or elements contained in the definition of regional taxes: (1). Taxes are collected under the law, (2). Taxes are coercive (3). It is intended to finance the administration of local government, and (4). It cannot be shown to be a counter-achievement directly. Based on Law Number 28 of 2009, article 2 describes if the Regency/City Tax includes: (a). Hotel Tax, (b). Restaurant Tax, (c). Entertainment Tax. (d). Billboard Tax. The subject of the tax is the individual or entity that organizes or orders the advertisement. (e). Street Lighting Tax is a tax on electricity use, whether self-generated or obtained from other sources (f). Class C Material Collection Excavation Tax, (g). Parking Tax, (h). Groundwater Tax, (i). Swallow's Nest Tax, (j). Land and Building Tax, (k). Land and Building Rights Acquisition Duty is a tax on the acquisition of rights to land and buildings by individuals or entities due to an event or legal action.

According to Government Regulation Number 91 of 2010, article 1; tax collection is a series of activities ranging from collecting data on objects and subjects of taxes or levies. It determines the amount of taxes or levies owed to tax collection activities or levies to taxpayers or levy payers and monitors their deposits (Anasta & Nengsih, 2019). Tax collection is collecting a certain amount of tax owed on a transaction. The collection of taxes will increase the payment for acquiring goods (Aryadi, Ahadiat, & Ribhan, 2020). The contribution of local taxes is expected to be the largest source of regional income, which will later return in the form of government policies that support the development of the economic potential of local communities (Iqbal & Sunardika, 2018).

Tanggamus Regency is one of the regions in Lampung Province that has experienced a slight slowdown in the development of the economic level in 2021, as happened in all regions of Indonesia and the world. However, economic growth continued to grow by around 2.3%, up from minus 1.77% in 2020. The open unemployment rate declined slightly to 2.93% from 2.96% a year earlier. Then the Human Development Index (HDI) increased to 66.65 from 66.42 (BPS Tanggamus, 2022). The Covid-19 pandemic has affected domestic revenue receipts so that the realization of the planned receipt of funds to local governments is not fulfilled 100%, and results in the lack of optimal development programs that have been planned (Mawandhi, 2022). The pandemic period and after the pandemic has been challenging for local governments, including Tanggamus. Projections on regional revenues at that time can be carried out to determine the form of intervention feasible for these conditions to optimize regional revenues later (Salim, Haliah, & Nirwana, 2022). Within the scope of the Tanggamus Regency, this study aims to analyze the contribution of local taxes to regional revenues in the Tanggamus Regency and identify prediction patterns for the realization of regional tax revenues in the coming period. Both of these questions will be reviewed scientifically in this article. Uncertainty and unpredictable challenges in the future make forecasting activities one of the efforts to anticipate unwanted impacts by local governments. Therefore, this forecasting approach becomes interesting for local tax management efforts.

2. Literature review

Tax can be interpreted as compulsory contributions charged by the state to the community or people's contributions to the state treasury (transfer of wealth from the private sector to the government sector) based on applicable laws (Cui, 2019). The funds are coercive, do not get rewards, and are used for state purposes for the greatest prosperity of the community (Rostami, Ghamami, & Aslezaeim, 2021). According to (Mardiasmo, 2016), taxes are people's dues to the state treasury under the law that can be imposed by not getting lead services that can be directly demonstrated and used for general purposes. Taxes are compulsory contributions to the state that are coercive and payable by those who pay them and have been regulated by applicable laws (Hasanah & Sabar, 2021). They do not apply reciprocal services, and taxes are used to finance various general expenses related to the state's duty to administer the government (Hartanto, 2020). By Feldman's definition, taxes are achievements that are unilaterally imposed and owed by the government in the absence of counter-achievement and are used to cover general expenditures (Lyon & Catlin, 2020).

Meanwhile, the local tax stated in Indonesian Law No.34 of 2000, a regional tax, is a mandatory contribution to the region owed by individuals or entities that is coercive under the law by not getting compensation directly and is used for regional purposes for the greatest prosperity of the people. Tax revenue is all tax revenue derived from domestic and international taxes. Law No. 14/2015 on the State Budget for Fiscal Year 2016 states that local government tax revenues are mandatory contributions to the regions owed by private persons or entities. It is coercive under the law by not getting compensation directly and used for regional purposes for the greatest prosperity of the people (Herlina & Romadhona, 2021).

Several factors play an essential role in influencing and determining the optimization of income into the state treasury through tax collection to citizens, including (1). Clarity and certainty of tax laws and regulations (Surya, Desmon, & Alie, 2019). A clear, simple, easy-to-understand law will give the same interpretation to taxpayers and fiscus. Awareness and compliance with fulfilling tax obligations are formed with non-convoluted regulations. Uncomplicated procedures, easy-to-understand forms for filling out, and an easy-to-achieve location of the tax recipient's office will reduce the tax burden for the taxpayer. (2). The intellectual level of society. With a reasonably good intellectual level, it will be easier for taxpayers to understand the applicable tax laws and regulations (Fakhroni & Fitraratri, 2022). Taxpayers with sufficient education can carry out tax administration, such as calculating taxes owed or filling out a notification letter. With sufficient knowledge gained because it has a high level of education, it can also understand that by not complying with regulations, it will receive administrative and fiscal sanctions. Thus, it will be realized that people who are tax-conscious and willing to fulfill their tax obligations will be realized. (3). The quality of the tax officer (intellectual, skill, integrity, high morale). The quality of tax officers largely determines the effectiveness of tax laws and regulations. Tax officers have a good reputation as far as technical proficiency is concerned, and they are efficient and effective in speed, accuracy, and fairness (Rahman, Setyadharma, & Wiratama, 2021). Tax officers who deal with the taxpayer community must have high intellectuality, be well-trained, be well-paid, and have high morals (Owusu, Akomeah, & Duah, 2021). Tax officers should be aware that all actions taken and attitudes towards taxpayers in the course of carrying out their duties have a direct influence on public trust. The tax officer must be competent and be able to dig up tax objects that, according to the law, must be taxed, not just trust the taxpayer's information and financial statements. (4). Proper tax administration system. Tax administration should be the highest priority because the government's ability to perform its functions effectively depends on the amount of money that can be earned through tax collection (Hernimawati & Sufi, 2020). The administrative system plays an important role. Necessary units as strategic keys in the administration organization (Tax Service Office) as operating arms of the government must have the right tax administration system. An integrated tax information system using the internet makes it easier to confirm between units and strategic keys and more manageable for taxpayers who make restitution in terms of receiving confirmation answers.

The importance of local taxes for local governments encourages various efforts to optimize the achievement of targets and their contribution to the regional economy (Chigora, Kapesa, & Svongoro, 2021). These efforts are not only reactive, responding to what happens implicitly. However, it is also preventive using a predictive approach; this approach is widely used in various policy evaluation efforts. For example, several countries' corruption research can be carried out predictively based on openly accessible statistical data (Lima & Delen, 2020). Other research uses it to shed light on the implications of implementing a carbon tax (Abrell, Kosch, & Rausch, 2019) or in the context of carbon tax revenues in the industrial sector (Hájek, Zimmermannová, Helman, & Rozenský, 2019). The commonly used method is machine learning with statistical databases (Agarwal, 2021). This approach can also be used in tax management to examine aspects of people's social behavior in complying with tax regulations (Ioana-Florina & Mare, 2021). Reflecting on the various efforts, a similar approach can be used to make predictive efforts toward developing regional tax achievements. It aims to produce preliminary data that can anticipate the tax collection process in the future. Therefore, researchers assume that predictively, several types of local taxes will have increased

achievements, but others will also have decreased achievements. This assumption is then statistically tested and can be explained in the discussion section.

3. Methodology

This quantitative research intends to overview the regional tax component realization in Tanggamus Regency. This research wants to analyze trends in a time series of the components of the Regional Tax post and an overview of targets and their realization. The sample used in this study was data on seven types of Regional Taxes between 2016 and 2020 obtained from the Regional Financial Management Agency of Tanggamus Regency. Based on those data, we tried to make predictions for the next three years (2021-2023). In this study, we determined the seven types of taxes analyzed, considering that the potential is significant, the realization percentage tends to be large, and the source of taxes reflects the region's development. Here are the seven types of local taxes: Hotel Tax, Restaurant Tax, Entertainment Tax, Billboard Tax, Street Lighting Tax, Land and Building, and BPHTB Tax (BPKD Tanggamus, 2021).

The data analysis process is carried out using the Least Square method, often used to forecast, where statistical and mathematical techniques are used as primary tools in forecasting preparation (Ali & Asrori, 2022). In order to facilitate the analysis process, researchers use Minitab software with fitted line plots and descriptive statistics features (Akers, 2018). Minitab can perform statistical data, especially ANOVA, experimental design, multivariate analysis, forecasting, time series analysis, statistical process control, qualitative data analysis, non-parametric analysis, and others (Lesik, 2018). Minitab can also make statistical graphs easily and display graphs more attractive and informative in telling probabilities (Allen, 2019).

In the initial stage, a regression is carried out to identify the appropriate model to obtain an R-sq value that shows validity. Then a sequential analysis of variance is carried out to determine the P value from a choice of linear or quadratic sources. The next stage is visualizing a fitted line plot to make it easier to observe the distribution of values and clarify arguments for changes in patterns (Blackburn, 2022). In the next stage, a descriptive analysis identifies each tax type's mean value.

Furthermore, calculating the projected tax value is carried out several years after the data. The equation used is **Y = mean –Xn**. "Y" is the value of the tax budget, and "Xn" is the nominal tax realization in the previous year. The analysis results are presented in several tables and visualized into relevant graphic images.

4. Results and discussions

In this section, it will be explained in advance about the contribution and projection of each local tax that is part of the original regional revenue component in Tanggamus Regency. Furthermore, it explained the predictive analysis of the development of the tax for the next three years.

4.1. Projected Local Tax Contribution

4.1.1. Hotel Tax

This hotel tax appears to have a fluctuating contribution to the original income of the region, where there are periods where the contribution is high and there are periods whose contribution is minimal. In order to analyze the development of this hotel tax contribution, a regression analysis was carried out with the following regression equation; Realization = 6716 + 1,370 targets P.Hotel - 0.000003 targets P.HOTEL^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
14917.9	85.02%	70.04%

The model shows that the R-sq value is 85%, so it is considered quite convincing to analyze. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	1254201712	2.19	0.235
Quadratic	1	1272326604	5.72	0.139

The table above shows that the P value is linearly at 0.2 and quadratically at 01, so it can be said to be valid. From the model, a curve-shaped plot graph can then be generated as illustrated below:
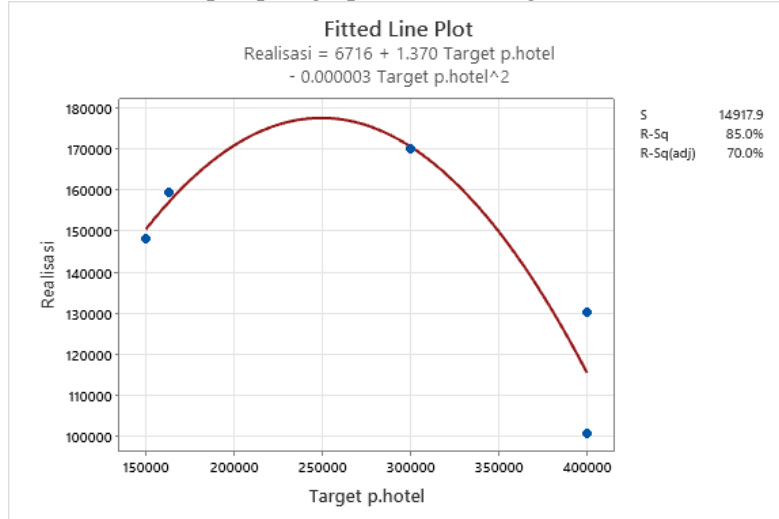

Figure 1. Plot Line Realization of Hotel Tax Revenue

From the picture above, we can see a pattern in the form of an inverted curve. It indicates the progress of hotel tax realization, which tends to decrease the budget quantity and the ratio between target and realization. There needs to be intervention in the revenue aspect in the eyes of this hotel tax budget, for example, through investment support for the construction of new hotels. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 1. Distribution of Descriptive Statistical Values

Variable	N	N*	Mean	SE Mean	StDev	Minimum
Hotel Tax Target	5	0	282615	54652	122206	150000
Realization	5	0	141805	12189	27256	100815

4.1.2. Restaurant Tax

This restaurant tax also appears to have a fluctuating contribution to local revenues, where there are periods where contributions are high and where contributions are minimal. In order to analyze the development of this restaurant tax contribution, a regression analysis was carried out with the following regression equation: Realisasi_1 = 3944882 - 4,755 Target p. restaurant + 0.000002 Target p. resto^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
276382	87.17%	74.34%

The model shows that the R-sq value is 87%, so it is considered quite convincing to analyze. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	5.08002E+11	2.23	0.232
Quadratic	1	5.29758E+11	6.94	0.119

The table above shows that the P value is linearly at 0.2 and quadratically at 01, so it can be said to be valid. From the model, a curve-shaped plot graph can then be generated as illustrated below:
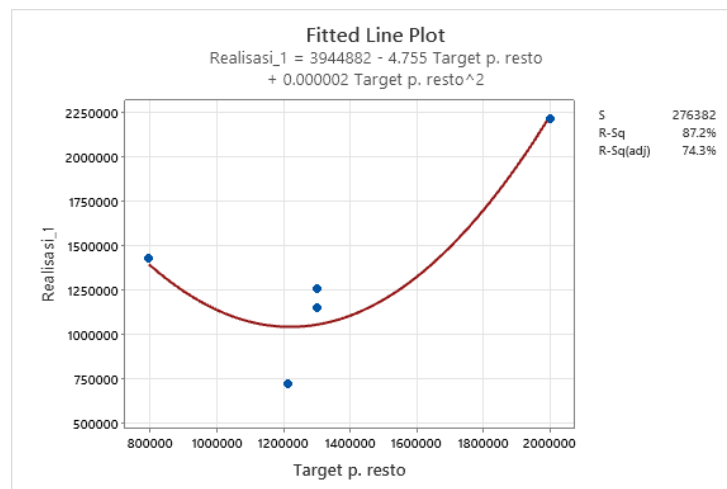

Figure 2. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a curve-shaped pattern. It indicates that the progress of restaurant tax realization tends to fluctuate and begins to increase, although there is still a loose gap in the ratio between target and realization. There needs to be a push to increase revenue in the eyes of this restaurant tax budget, for example, through the intensification of tax collection to restaurants that are not yet taxpayers. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 2. Distribution of Descriptive Statistical Values

Variable	N*	Mean	SE Mean	StDev	Variance	Minimum
Restaurant Tax Target	0	1322197	193493	432664	1.87198E+11	795985
Realisation	0	1354792	243981	545558	2.97634E+11	723623

4.1.3. Entertainment Tax

This entertainment tax appears to have a fluctuating contribution to the original income of the region, where there are periods with high contributions and periods with minimal contributions. In order to analyze the development of this entertainment tax contribution, a regression analysis was carried out with the following regression equation; Realization = 6716 + 1,370 targets P.Hotel - 0.000003 targets P.HOTEL^2. After that, a model will be obtained as in the equation below:

$$\textbf{S} \qquad \textbf{R-sq} \quad \textbf{R-sq(adj)}$$
$$2779.50 \quad 54.72\% \qquad 9.44\%$$

The model shows that the R-sq value is 54%, so it is considered convincing enough to be analyzed even though it seems insignificant. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	6696905	0.73	0.455
Quadratic	1	11974762	1.55	0.339

The table above shows that the P value is linearly at 0.4 and quadratically at 0.3, so it can be said to be quite valid. From the model, a curve-shaped plot graph can then be generated as depicted below:
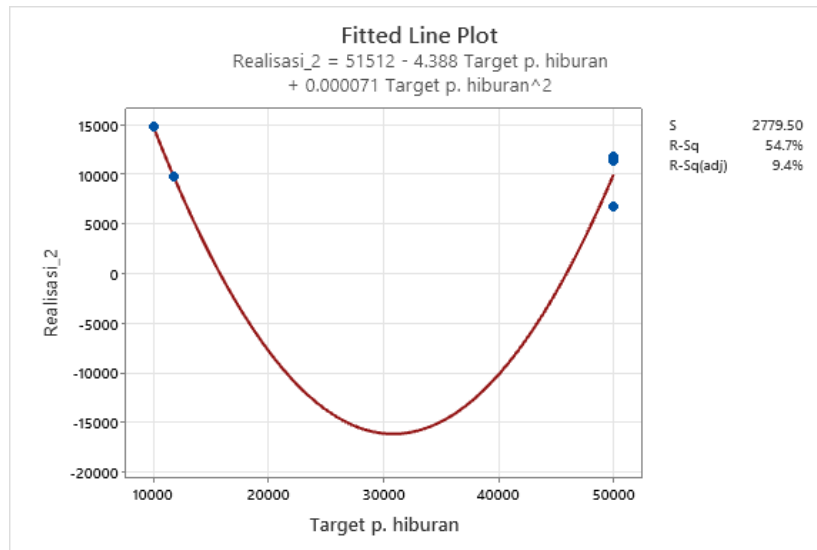
Figure 3. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a curve-shaped pattern. It indicates that the progress of entertainment tax realization tends to fluctuate and is immensely increasing, although there is still a loose gap in the ratio between target and realization. There needs to be a push to increase revenue in the eyes of this tax budget, for example, through promotion and support for businesses in the entertainment sector. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 3. Distribution of Descriptive Statistical Values

Variable	N*	Mean	SE Mean	StDev	Variance	Minimum
Entertainment Target	0	34352	9586	21436	459499520	10000
Realization	0	10887	1306	2921	8530737	6780

4.1.4. Advertising Tax

This billboard tax seems to have a fluctuating contribution to local income, where there are periods with high and minimal contributions. In order to analyze the development of this advertising tax contribution, a regression analysis was carried out with the following regression equation; Realization = 166981 - 0.3279 Billboard Tax Target + 0.000000 Billboard Tax Target^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
28843.8	46.37%	0.00%

The model shows that the R-sq value is 46%, so it is considered not convincing enough to be analyzed. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	167209308	0.17	0.707
Quadratic	1	1271468331	1.53	0.342

From the table above, it can be seen that the P value is linearly at 0.7 and quadratically at 0.3, so it can be said that it is not linear valid enough, but quadratically it can still be said to be valid. From the model, a curve-shaped plot graph can then be generated as depicted below:
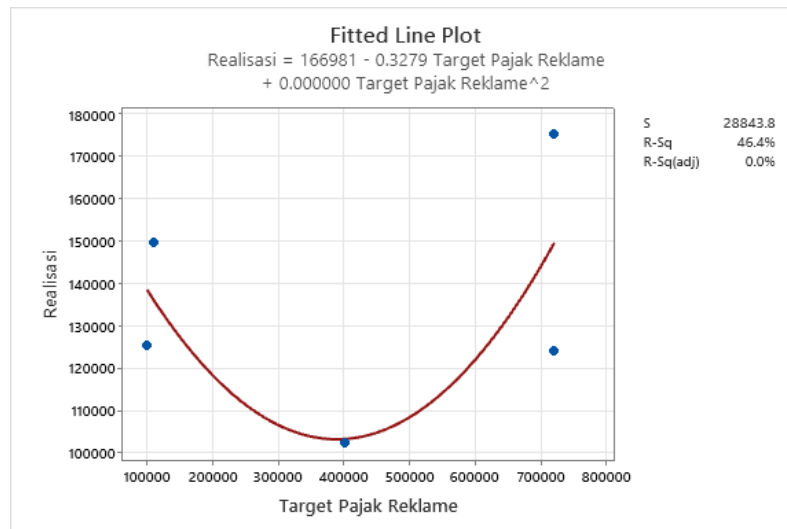

Figure 4. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a curve-shaped pattern. It indicates the progress of the realization of advertising taxes which tends to be volatile and have increased quite a bit. However, there seems to be a very tenuous distance in the ratio between the target and realization. There needs to be a push to increase revenue in the eyes of this tax budget, for example, through intensification or strengthening of tax collection efforts and expansion of the location and form of tax objects to be collected. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 4. Distribution of Descriptive Statistical Values

Variable	N	N*	Mean	SE Mean	StDev	Minimum
Billboard Tax Target	5	0	410000	137550	307571	100000
Realization	5	0	135346	12455	27851	102429

4.1.5. Street Lighting Tax

This street lighting tax appears to have a fluctuating contribution to the original income of the region, where there are periods with high contributions and periods where the contribution is minimal. In order to analyze the development of this entertainment tax contribution, a regression analysis was carried out with the following regression equation; Realisasi_1 = - 235424 + 1.505 Street Lighting Tax Target - 0.000000 Street Lighting Tax Target ^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
1279866	79.97%	59.94%

The model shows that the R-sq value is 79.97%, so it is considered not convincing enough to be analyzed. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	1.21236E+13	8.60	0.061
Quadratic	1	9.54458E+11	0.58	0.525

From the table above, it can be seen that the P value is linearly at 0.6 and quadratically at 0.5, so it can be said that it is not entirely valid linearly, but quadratically it can still be said to be valid. From the model, a curve-shaped plot graph can then be generated as illustrated below:
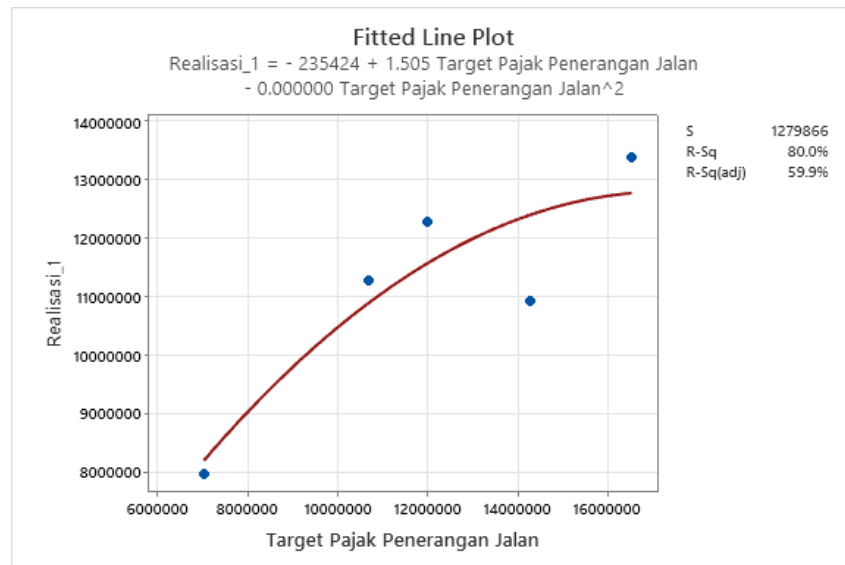

Figure 5. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a pattern in the form of an inverted curve. It indicates that the progress of road lighting tax realization tends to be volatile and has increased considerably. However, there seems to be a very tenuous distance regarding the ratio between the target and realization. There needs to be a push to increase revenue in the eyes of this tax budget, for example, through intensification or strengthening efforts to collect taxes and supervision of tax objects to be collected. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 5. Distribution of Descriptive Statistical Values

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Median	Maximum
Road Light Target	5	0	12107868	1613838	3608651	7030997	12000000	16529034
Realization_1	5	0	11157776	904271	2022012	7975614	11256658	13370607

4.1.6. Land and Building Tax

This Land and Building Tax seems to have a fluctuating contribution to the original regional income, where there are periods with high contributions and periods where the contribution is minimal. In order to analyze the development of the land and building tax contribution, a regression analysis was carried out with the following regression equation; Realisasi_4 = - 6291514 + 7,876 Land and Building Tax Targets - 0.000002 Land and Building Tax Targets^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
64110.5	88.97%	77.93%

The model shows that the R-sq value is 88.97%, so it is considered not convincing enough to be analyzed. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	5.56943E+10	8.88	0.059

Quadratic	1	5.66408E+09	0.86	0.451

From the table above, it can be seen that the P value is linearly at 0.05 and quadratically at 0.45, so it can be said to be linearly valid, but quadratically it can still be said to be quite valid. From the model, a curve-shaped plot graph can then be generated as illustrated below:

Figure 6. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a pattern in the form of an inverted curve. It indicates the realization progress of land and building taxes, which fluctuate and are immensely increasing. However, there seems to be a very tenuous distance regarding the ratio between the target and the realization. There needs to be a push to increase revenue in the eyes of this tax budget, for example, through intensification or strengthening efforts to collect taxes and supervision of tax objects to be collected. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 6. Distribution of Descriptive Statistical Values

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Median	Maximum
PBB Target	5	0	1823777	83468	186641	1632326	1794919	2135414
Realization_4	5	0	1695727	61035	136478	1510437	1743825	1855528

4.1.7. BPHTB Tax

This BPHTB tax seems to have a fluctuating contribution to local revenues, where there are periods with high contributions and periods where the contribution is minimal. In order to analyze the development of contribution, a regression analysis was carried out with the following regression equation; Realisasi_5 = 253592 + 0.1390 Rights Acquisition Duty Tax Target + 0.000000 Rights Acquisition Duty Tax Target^2. After that, a model will be obtained as in the equation below:

S	R-sq	R-sq(adj)
338056	98.35%	96.70%

The model shows that the R-sq value is 98.35%, so it is considered not convincing enough to be analyzed. The next stage is carried out a sequential analysis of variance so that the data are obtained as follows:

Source	DF	SS	F	P
Linear	1	1.28984E+13	40.92	0.008

Quadratic   1 7.17097E+11   6.27 0.129

From the table above, it can be seen that the value of P is linearly at 0.008 and quadratically at 0.12, so it can be said that it is not valid linearly enough, but quadratically it can still be said to be valid. From the model, a curve-shaped plot graph can then be generated as illustrated below:
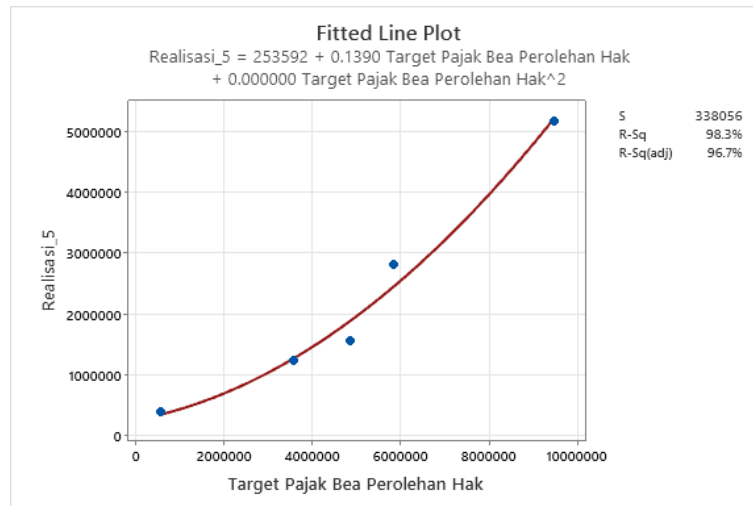

Figure 7. Fitted Line Plot Tax Revenue Projections

From the picture above, we can see a curve-shaped pattern. It indicates the progress of BPHTB tax realization, which tends to fluctuate and increase. However, there is still a very tenuous distance in terms of the ratio between the target and realization. There needs to be a push to increase revenue in the eyes of this tax budget, for example, through intensification or strengthening efforts to collect taxes and supervision of tax objects to be collected. At the next stage, it is necessary to know the mean value of this model in order to develop a narrative related to the projected realization of tax revenues in the next year. The results of the analysis of mean values can be observed in the following table:

Table 7. Distribution of Descriptive Statistical Values

Variable	N	N*	Mean	SE Mean	StDev	Minimum
BPHTB Tax Target	5	0	4857603	1458616	3261565	549727
Realisasi_5	5	0	2234303	831988	1860381	380711

4.1.8. Local Tax Forecasting Analysis
In this section, the nominal identification of the budget that has the potential to be achieved after the analyzed fiscal year is carried out. The analysis of the projected realization of the budget is carried out with the following formula: $Y = mean - X_n$. The period reached is for three fiscal years; the results of this identification can be compiled in the following table:

Table 8. Local Tax Forecasting in 2021-2023

Years	Hotel Tax	Restaurant Tax	Entertainment Tax	Billboard Tax	Road Light Tax	PBB Tax	BPHTB
2021	107259	10640	1581657	185062	14088601	2040818	2939291
2022	118611	9502	1656093	170851	13989719	2129798	2234303
2023	129102	9972	1455413	203768	12867934	2081700	2939291

From the table, it can be observed that the development of the seven tax subjects has fluctuated and tends to experience growth. There seems to be a linear growth in the hotel tax from 2021 to 2023. Meanwhile, the entertainment tax decreased in 2022 and 2023. The restaurant tax appears to have

fluctuations or conditions increase in 2022 and decrease again in 2023. Meanwhile, the billboard tax has unique fluctuations. In 2022 there will be a decline, but it will surge again in 2023. The street lighting tax also appears to have decreased the budget from 2022 to 2023. Likewise, in the land and building tax budget, there are fluctuations in 2022 but a decrease in 2023.

Meanwhile, in the BPHTB tax, fluctuations occurred in the form of a decrease in 2022 and an increase again in 2023. In order to present a complete visualization of the movement of regional tax realization, these projections are combined with existing data on local tax realization over the past five years. The following combined data is presented in the table below:

Table 9. Existing Conditions and Projections of Regional Tax Realization in Tanggamus Regency

Years	Hotel Tax	Restaurant Tax	Entertainment Tax	Billboard Tax	Road Light Tax	PBB Tax	BPHTB
2016	148249	723623	14748	125523	7975614	1510437	380711
2017	159601	1429228	9750	149557	11256658	1606747	1236275
2018	170092	1154112	11358	102429	12279561	1743825	1570415
2019	130270	1254172	11800	123980	13370607	1762096	2810519
2020	100815	2212826	6780	175239	10906439	1855528	5173594
2021	107259	1581657	10640	185062	14088601	2040818	7027186
2022	118611	1656093	9502	170851	13989719	2129798	8025214
2023	129102	1455413	9972	203768	12867934	2081700	8689102

From the figure below, it can be seen that the BPHTB tax indicates the potential to increase from 2021 to 2023, while the street lighting tax seems to be fluctuating with the potential for an increase in 2021 and then a decrease in 2022 and 2023. Meanwhile, in some other tax currencies, there seems to be no increase or decrease in realization, which is very drastic and even tends to stagnate. In this stagnant condition, intervention is needed to strengthen intensification efforts, identify new tax objects, and supervise the tax collection process.
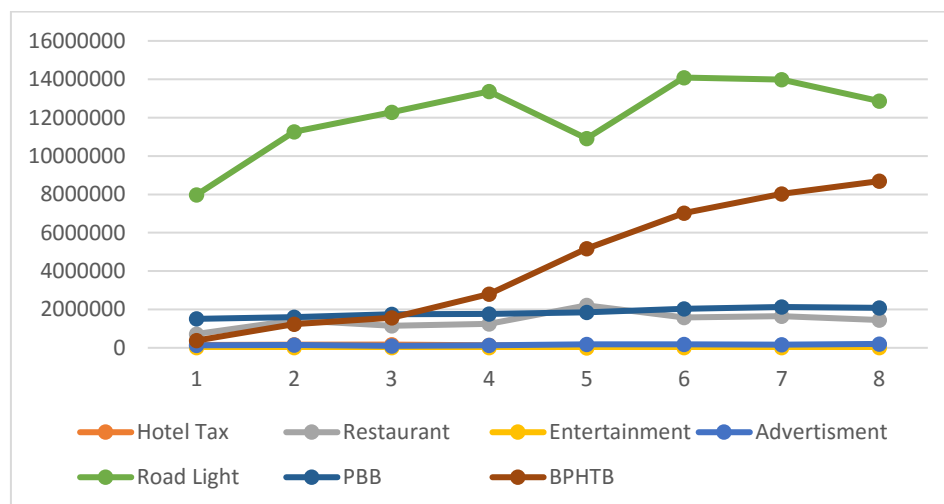

Figure 8. Forecasting Projections for Regional Tax Revenues 2016-2023

Understandably, BPHTB is one of the potential sources of tax revenue, given the population growth along with the development of new settlements (Dube, 2022). Likewise, the street lighting tax has grown with the development of new settlements and crowded centers that require the carrying capacity of the street lighting tax. However, there seems to be a performance problem in those few years (Mongdong, Masinambow, & Tumangkeng, 2018). It seems relevant to the pandemic conditions that have resulted in limited tax collection performance (Akbar, 2020). However, what is essential to explore in more depth are some sources of taxes that do not experience fluctuations. It indicates

performance problems in the tax collection process, such as monitoring and control (Eton, Mwosi, & Ogwel, 2022). Therefore, it will be essential to have research that reveals this in the future. Thus, it can be understood that using this predictive approach can determine the possibility of fluctuations that occur in the year in which the pandemic occurred, in addition to the potential for fluctuations driven by various environmental factors from the tax collection process.

5. Conclusion

5.1. Conclusion

The development of the seven tax subjects that are part of the analysis in this study seems to have fluctuated and tends to experience growth. It is known that the BPHTB tax indicates the potential to increase from 2021 to 2023, while the street lighting tax seems to be fluctuating with the potential for an increase in 2021 and then a slight decrease in 2022 and 2023. Meanwhile, in some other tax currencies, there seems to be no increase or decrease in realization, which is very drastic and even tends to stagnate. In this stagnant condition, intervention is needed to strengthen intensification efforts, identify new tax objects, and supervise the tax collection process.

This conclusion implies the need for preventive efforts to prevent several types of regional taxes that have decreased achievements. In contrast, for some types of taxes that may experience an increase in tax achievement, coordinated efforts are needed to keep this potential optimal, as predicted by this research.

5.2. Limitation

The results of this study have limitations in reaching all other sources of regional income because it will require more adequate analytical resources.

5.3. Suggestion

The results of this study will later be used as a source of scientific comparison to optimize regional revenues from regional tax sources. The predictive approach anticipates unwanted events related to performance and the global socioeconomic situation.

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