Sensitivity of Regional Income and Economic Changes to Medan City Regional Budget

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Abstract. The purpose of this study was to analyze the sensitivity of economic changes and the main instrument of regional income to the Medan City Regional Budget. The estimation results show that the research variables in the model are able to explain changes in the Medan City APBD by 92.5%. The value of the F-statistical test illustrates that all variables jointly affect the Medan City APBD significantly. The partial test shows that PAD, provincial transfers, central transfers, and economic growth have a significant positive effect on the Medan City Regional Budget. The highest level of significance is in the PAD instrument and provincial transfers, which are below 1 percent alpha. While the central transfer has a degree of error below 10 percent. The results of the study conclude that the PAD instrument has the highest sensitivity to changes in the APBD, while central transfers have the lowest sensitivity of the three main regional revenue instruments.

Keywords: Sensitivity; Regional Income; Growth

1. Introduction

Changes in the amount of the Regional Revenue and Expenditure Budget are the result of fiscal decisions that ideally become a buffer for economic development so that it can run according to the long-term planning corridor. Local governments are required to carry out government obligations properly, to encourage individuals to work together in carrying out progress. The government is also needed to increase value and equity with the aim that can strengthen all the capabilities of each region. These huge responsibilities and demands make local governments think more about options for making great execution steps [1]. [2], conducted an analysis of the performance of the Magelang Regency APBD before the pandemic and during the COVID-19 pandemic. The results of the study show that the ratio of Magelang Regency's regional financial independence in 2019-2020 is very low. While the PAD effectiveness ratio of Magelang Regency from 2019-2020 shows good financial performance and is classified as very effective, which is strengthened by a good financial efficiency ratio.

[3] shows that fiscal stress has a significant effect on the financial performance of district/city governments in East Java before and after the crisis. The results of this study are that the level of regional financing capacity before the crisis was relatively greater than after the crisis, in terms of regional mobilization capacity it was relatively better after the crisis, in terms of the level of dependency relatively it showed positive developments after the crisis. [4] shows that there was a change in the average district/municipal income and expenditure before and after the crisis. During the economic crisis, the average district/municipal revenue and expenditure decreased significantly. Unstable regional revenues during the economic crisis led

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to conditions of fiscal stress (financial pressure), resulting in a decrease in average regional revenues and expenditures.

This study aims to analyze the sensitivity of changes in the economy and the main instrument of regional income to the Medan City regional budget. In this case, economic changes are translated into the form of economic growth, and the main instruments of regional income in question include PAD, central transfer funds, and provincial transfer funds.

2 Literature Review

[5], [6], [7] and [8] state that PAD is revenue obtained by a region from sources within its own territory which is collected based on regional regulations in accordance with applicable laws and regulations. PAD is an important component as a source of regional revenue. PAD can be seen as one of the indicators or criteria for measuring regional financial performance. [9] stated that administratively the management of PAD could not be managed optimally because the executors or government officials in carrying out their duties had not been able to comply with administrative regulations, whereas according to [10] the obstacles in managing PAD were the lack of capacity and capability of the apparatus, weak collection systems and mechanisms and the need for administrative systems and procedures.

[11] stated that development spending is a logical effort by local governments to increase public trust in order to increase regional economic growth. The research found that there is a strong relationship between development spending and the level of decentralization which will encourage and accelerate economic growth in the region. [12] examined the relationship between regional economic growth, development spending and PAD in Java and Bali which showed that regional economic growth had a significant impact on increasing PAD. But unfortunately the economic growth of district and city governments is still small, as a result their PAD receipts are also small, while development spending has a positive impact on PAD and economic growth.

[13] conducted research on the impact of fiscal decentralization. This study concludes that PAD has a positive effect on economic growth, while DAU has a negative effect on economic growth. [14] also conducted research entitled "The Influence of Regional Original Income (PAD), General Allocation Funds (DAU) and Special Allocation Funds (DAK) on Economic Growth. The results of his research show that PAD has a significant positive effect on economic growth, DAU has a significant effect on economic growth, while DAK has no significant positive effect on economic growth.

[15] showed that in order to maintain large revenues from the central government, regions have a tendency to increase spending significantly. Related to this, regional preparedness is an important factor that sufficiently determines regional success in implementing this regional autonomy policy. One indicator that can be used is the regional financial capacity. Regional financial capacity in the era of regional autonomy is often measured using PAD performance. The size of the receipt of PAD is often associated with the success of the region in carrying out regional autonomy. Regional taxes and levies (which are the largest contributing components of PAD) should be able to finance regional government spending [16].

3 Research Methodology

The research method used is descriptive quantitative. The data is sourced from the Medan City BPKAD in the period from 2011 to 2020.The analytical tool used is ordinary least squared regression analysis which is used to see the sensitivity of local revenue, provincial transfers, central transfers and economic growth to the total income of Medan City. The regression equations from this study for the sensitivity model are:

$$\text{Revenue} = \beta_0 + \beta_1\, PAD + \beta_2\, Prov + \beta_3\, Central + \beta_4\, Growth + \varepsilon \quad (1)$$

Where "Revenue" is the total revenue from government budget of Medan, "PAD" is regional own-source revenue, "Prov" is the provincial transfer fund, "Central" is the central transfer fund, "Growth" is the economic growth of Medan City, $\beta 0,\ldots,\beta 4$ is the regression coefficient, and ε is the residual value. To get the sensitivity value, the total income, regional own-source revenue, provincial transfers and central transfers were transformed into data by means of a logarithm which then looked for the change values for all research variables, so that the regression equation became:

$$\Delta(logRevenue) = \beta_0 + \beta_1\Delta(logPAD) + \beta_2\Delta(logProv) + \beta_3\Delta(logCentral) + \beta_4\Delta(Growth) + \varepsilon \quad (2)$$

Regression testing can be done after the model of this study meets the requirements, namely the fulfillment of the assumptions of classical regression (Gauss-Markov). For this reason, before carrying out regression testing, it is necessary to first test the assumptions of the classical regression, which consists of tests for normality, multicollinearity, heteroscedasticity and autocorrelation [17].

4 Finding and Discussion

The normality test uses the Jarque-Bera test approach by comparing or looking at the resulting probability values, where if the probability value is greater than 0.05 then the research data has been normally distributed. From the table of results, it is obtained that the Jarque-Bera probability value is 0.7413 which is greater than 0.05 so that the research data for the sensitivity model is declared to be normally distributed.

Table 1. Normality Test

Indicator	Value
Skewness	-0.1868
Kurtosis	2.5314
Jarque-Bera	0.5986
Probability	0.7413

Multicollinearity testing is done by looking for the Variance Inflation Factor value which is then compared with a standard value of 10, where if the VIF value is less than 10 then it can be said that there are no symptoms of multicollinearity between the observed variables. From the table below it is found that the VIF value of the research variable is smaller when compared to the standard value of 10, so it can be said that there are no symptoms of multicollinearity between the observed variables in the sensitivity model

Table 2. Multicolinearrity Test

Variable	Value of VIF
PAD	2,6118
Prov	1,8960
Central	1,4242
Growth	2,9038

Autocorrelation test uses the Breusch-Godfrey Serial Correlation method so that the probability value of the test is obtained which will be compared with a value of 0.05, where if the probability value is greater than 0.05 then it is stated that there are no autocorrelation symptoms in the research model. From the results of the autocorrelation test, it was obtained that the chi squared probability value for the Breusch-Godfrey method was 0.0607 which was greater than 0.05 so that it could be said that there were no autocorrelation symptoms in the research data.

Table 3. Autocorrelation Test.

Indicator	Value
Obs R Squared	5.6028
Prob. Chi Square	0.0607

Heteroscedasticity testing uses the Breusch-Pagan-Godfrey test approach by comparing or looking at the resulting probability values, where if the probability value is greater than 0.05 then the research data is free from symptoms of heteroscedasticity. From the table of results, a probability value of 0.4485 is obtained which is greater than 0.05 so that the research data for the sensitivity model is declared free from heteroscedasticity symptoms.

Table 4. Heterocedasticity Test

Indicator	Value
Obs R Squared	3.6978
Prob. Chi Square	0.4485

The Gauss-Markov assumption test shows that the estimate is free from errors in inference, so the model is feasible to use as a prediction. The estimation results show that the research variables in the model, namely PAD, provincial transfers, central transfers and economic growth are able to explain changes in the Medan City APBD by 92.5%. The value of the F-statistical test illustrates that all variables jointly affect the Medan City APBD significantly.

From the table below, a positive relationship is obtained from all research variables, namely, regional own-source revenue, provincial transfers, central transfers and economic growth to Medan City APBD revenues. With a coefficient value of 1.13, it shows that regional own-source revenue (PAD) has the highest sensitivity value compared to provincial transfers and central transfers. With a coefficient value of 0.85, it shows that transfer funds from the province of North Sumatra have a fairly high sensitivity value compared to central transfers. With a coefficient value of 0.32, it shows that transfer funds from the central government have the smallest sensitivity value compared to local revenue and central transfers.

Table 5. Coefficient Regression Result

Component	Coefficient	Probability
PAD	1.1303	0.0001
Prov (Provincial Transfer Fund)	0.8463	0.0000
Central (Central Transfer Fund)	0.3155	0.0886
Growth (Economic Growth)	0.0047	0.0290
R-squared	0.9250	
Adjusted R-squared	0.9165	
F-statistic	107.96	
Probability	0.0000	

Regional own-source revenue is the main component that provides the highest sensitivity value to the Medan City budget. This condition shows that the regional own-source revenue that has been collected by the Medan City Government is very important for the Medan City Regional Budget itself, because with an increase in regional own-source revenue it will be able to contribute directly and significantly in the preparation of the APBD and the implementation of the APBD itself.

The provincial transfer fund obtained by the Medan City Government from the North Sumatra Provincial Government comes from the tax revenue sharing fund sourced from the land and building tax receipts as well as the restaurant tax. Looking at the geography of Medan City, which does not have natural resources and is an urban area as well as a business center, the provincial transfer fund received by the Medan City Government has a fairly high influence and contribution to the regional revenue which will be used as the regional expenditure budget for the Medan City Government.

The very small central transfer sensitivity value indicates that Medan City's regional revenue through the central fund transfer mechanism, although the value is very large, because it does not come from the economic activities of economic actors in the Medan City area, it does not have a significant impact on increasing Medan City budget revenues

5 Conclusion

The sensitivity of the Medan City Regional Budget is strongly influenced by the ability to increase regional own-source revenue, followed by the City Government's ability to coordinate and communicate with the provincial government to obtain provincial transfer funds and the low sensitivity of central transfers to the Medan City APBD increase.

The Medan City Government can implement electronic taxes and levies to increase the effectiveness and efficiency of regional own-source revenue receipts, so that Medan City's financial capacity will be better and more independent. In addition, through the application of electronic taxes and levies, it can also close the gap for various kinds of budget leaks, so that the perceived impact of increasing local revenue through increased tax and levy revenues will have a high sensitivity to the Medan City budget.

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