

Inequality Analysis of District/City Economic Development in North Sumatra

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ABSTRACT

This research was conducted in the administrative areas of the North Sumatra Provincial Government such as North Tapanuli, Toba Samosir, Simalungun, Dairi, Karo, Humbang Hasundutan and Samosir. The research was carried out from 2016 to 2021. The type of data used in this study was quantitative data and the data source used was secondary data. The source of the data used in this study comes from the Central Statistics Agency of North Sumatra Province in several publications. To find out the existence of inequality in economic development in the North Sumatra region, it is necessary to look for development disparities in each Regency/City in North Sumatra using the Williamson Index method. From the results of the study, it was found that inequality in the city of Medan was in the "moderate" criteria while inequality for other districts/cities was "very low" using data from 2016 to 2021. By using GRDP development data on the basis of constant prices 2010 for North Sumatra province from 2016 to 2021, the estimated GRDP of North Sumatra Province for 2021 using QM software is 556,836 (Billion RP). By using North Sumatra GRDP data from 2016 to 2021 and disparity data in North Sumatra from 2016 to 2021, it can be calculated that the closeness between GRDP to inequality that occurs in North Sumatra from 2016 to 2021 is 0.973% which states that if the income in an area is increasing, the possibility of deviation is getting smaller.

Keywords: GRDP and Development Inequality

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INTRODUCTION

Economic growth is often seen as a very important part of the country's economic policy making and any country's economic system, because this economic growth is an indicator to see whether there is an increase in the welfare of a society (Acemoglu, 2012; Durusu, 2017; Mutaqin, 2018). Therefore, economic growth is often used as a benchmark for the success of economic development which is interpreted as a series of efforts in developing activities, so that the more infrastructure available, the more companies will grow and the higher the level of education (Widiansyah, 2017).

The process of regional development is often directed at the process of increasing economic growth and optimal equity with indicators that can be used to see the success of a region is increasing economic growth (Amriadi, 2020). However, development planning in North Sumatra is directed at realizing a more prosperous, prosperous and just society in accordance with Nawacita point 3 to develop Indonesia from the periphery by strengthening regions and villages within the framework of the Unitary State, with development policies carried out to achieve high economic growth by how to take advantage of existing potential and resources (Sianipar L., 2020).

In addition, the policy of granting regional autonomy includes the following strategic steps: First, regional autonomy and decentralization are the answer to local problems in the form of threats to national disintegration, poverty, development inequality, low quality of life of the people, and problems in human resource development. Second, regional autonomy and decentralization are regional strategic steps to welcome the era of economic globalization by strengthening the regional economic base (Sianipar L., 2020). This is very important for the Regional Government in determining the efforts that can be made to encourage economic growth in the region (Syafrizal, 2008; 76) One way to assess the achievement of economic growth is through the calculation of the Gross Domestic Product (GDP), according to the prices prevailing in base year. The value obtained is called GDP according to fixed prices, namely prices that apply in the base year (Han et.al., 2020). Meanwhile, the way to assess the achievement of economic growth at the regional level is called the Gross Regional Domestic Product (GRDP) (Putri, 2020; Noviar, 2021). This is enough to prove that the regional autonomy implemented by North Sumatra has produced positive results because it can increase North Sumatra's economic growth from year to year and of course this will have an impact on other sectors and it is hoped that conditions like this will continue in the coming years. long-term. long term and was followed by other developments that would further improve the economic and political situation.

North Sumatra Province since the implementation of regional autonomy in 2001 has experienced an increase in various economic sectors. This is enough to prove that the regional autonomy implemented by North Sumatra has given positive results because it can increase North Sumatra's economic growth from year to year and of course this will impact other sectors and it is hoped that conditions like this will continue in the long term. long term and followed by other developments that will further improve the economic and political situation.

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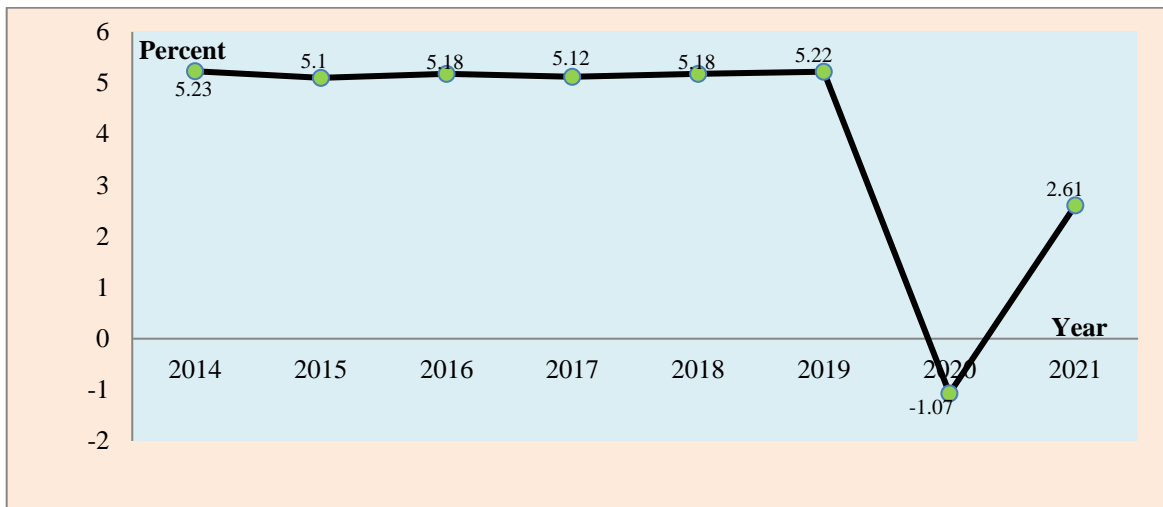


Figure 1. North Sumatra's Economic Growth Based on 2000 Constant Prices in 2002–2014

Source: BPS, North Sumatra in Figures for 2018

Figure 1 above explains North Sumatra's economic growth from 2014 to 2019, despite fluctuating, but showing a positive direction. However, overall economic growth at constant 2010 prices in North Sumatra Regencies/Cities (Percent) from 2019 to 2020 has experienced a very drastic decline, from 5.22 to a value of -1.07, although in 2021 it has increased to at a value of 2.61. This condition shows that economic growth in North Sumatra at constant 2010 prices is still heading in a negative direction, or in other words, if a straight line is drawn, economic growth in North Sumatra tends to decline (Hidayat, 2019).

Inequality in economic development between regions is due to the concentration of economic activity in a region, investment allocation, low level of mobility of factors of production between regions, differences in natural resources between regions, differences in demographic conditions between regions, and less smooth trade between regions. The problem of inequality between regions is a priority for handling in achieving sustainable economic growth (Reza, 2019). The problem of inequality between regions is an obstacle in the process of creating sustainable economic development.

To see inequality in the development of a region, a valid and reliable method or formula is needed, which means that it has been frequently used by various countries (Yoda, 2019). One method or method that is valid and reliable for measuring development inequality based on per capita income in an area or region is the Williamson Index (Ciseta, 2019; Hidayat, 2020). Usually, if the calculation results show a high Williamson Index value, it means that the level of inequality in financial independence is getting higher, and vice versa.

METHOD

This research was conducted in the administrative areas of the North Sumatra Provincial Government such as North Tapanuli, Toba Samosir, Simalungun, Dairi, Karo, Humbang Hasundutan and Samosir. The research was carried out from 2015 to 2021. The type of data used in this research is quantitative data and the data source used is secondary data. The data source used in this study comes from the Central Bureau of Statistics of North Sumatra Province in several publications.

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In this study, panel data analysis was used to determine the effect of the variables GRDP (PDRB), Population (POP), Development Expenditure (GE), and labor force (AK) variables on economic development inequality between Regencies/Cities (VW). in North Sumatra Province. The author's approach in conducting this research is using the Williamson Index approach on the grounds that this index is quite capable of explaining the extent of inequality that occurs between regions, it is quite easy to interpret the inequality figures obtained, practical and quite commonly used in measuring development inequality between regions. The Williamson Index formula is as follows.

$$IW = \frac{\sqrt{\sum (Y_j - \bar{Y})^2 f_j / n}}{\bar{Y}}$$

Where:

IW = Williamson Index

f_j = Total population of regency/city (people)

n = Number of Population

Y_j = GRDP per capita district/city (Rupiah)

 \bar{Y} = Provincial average GRDP per capita (Rupiah)

 The amount of *IW* is in the interval 0 to 1, provided that:

IW = 0, then development in all districts/cities is evenly distributed (no inequality)

 0 < *IW* < 0.3, then the development inequality is very low.

 0.3 ≤ *IW* < 0.4, then the development inequality is moderate

 0.3 < *IW* < 1, then the development inequality is High.

IW = 1, then development in all districts/cities is uneven (Very High inequality)

RESULT AND DISCUSSION

The development of a region or region is said to be successful as can be seen from the economic aspect, namely from the aspect of the development of the area's Gross Regional Domestic Product (GRDP). The higher the GRDP of an area shows the ability of the area to manage regional finances and shows the stability of the regional economy (Yudistira, 2016; Sianipar L., 2020). When viewed from the PDRB at constant prices in 2010 for the province of North Sumatra based on BPS 2 data it tends to increase, as seen in the development of GRDP at constant prices 2010 for districts/cities in the province of North Sumatra based on BPS data for 2015-2021 which can be seen in table 1. following.

Table 1. ADHK GRDP Development 2010 Regencies/Cities North Sumatra Year 2016-2021 (Billion Rp)

County/City	2021	2020	2019	2018	2017	2016	2015
Nias	2666.86	2609.14	2563.03	2440.16	2325.01	2214.15	2100.11
Mandailing Natal	9585.9	9288.65	9376.46	8904.14	8416.5	7933.13	7474.42
South Tapanuli	10036.71	9721.77	9683.66	9201.96	8748.18	8314.69	7921.24
Middle Tapanuli	7149.28	6970.58	7024.15	6678.25	6348.44	6032.21	5738.32
North Tapanuli	6058.35	5851.4	5764.94	5510.19	5280.69	5070.19	4868.95
Toba Samosir	5649.1	5488.92	5503.76	5249.25	5001.43	4767.98	4553.17
Labuhan Batu	24147.56	23252.75	23232.71	22112.34	21048.17	20046.02	19079.93
Sharpen	27279.59	26299.57	26245.24	24844.87	23525.35	22302.7	21118.75
Simalungun	28648.78	27625.7	27348.7	25996.21	24715.67	23508.97	22305.43
Dairi	6641.67	6508.05	6569.81	6267.82	5968.81	5688.45	5413.75

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County/City	2021	2020	2019	2018	2017	2016	2015
Karo	14582.33	14261.47	14376.28	13744,17	13145.85	12494.87	11880.93
Deli Serdang	72173.62	70596.83	71878,69	68341	64991.87	61839.67	58722.46
Langkat	30247.39	29343.26	29597.77	28170.08	26822.6	25533.81	24321.61
South Nias	4332.63	4246.83	4221.04	4018,74	3826.62	3659,77	3506.03
Humbang Hasundutan	4219,14	4135.6	4141.1	3946.12	3756.66	3577.05	3419.57
PakPak Barat	872.4	850.79	852.3	805.01	760.55	717.89	677.18
Samosir	3162.1	3080.43	3098,74	2931.7	2776.85	2635,77	2503.73
Serdang Bedagai	19863.24	19308,46	19393.39	18421.38	17516.43	16656.17	15841.75
Batu Bara	24486.06	23923.64	23998.59	22998.6	22034.26	21165.04	20259.69
North Lawas	8593.64	8322.51	8228.45	7791.05	7378.98	6991.66	6598.3
Padang Lawas	8362.13	8053,5	7959.31	7534.3	7110.25	6725.98	6341.53
South Labuhanbatu	19620.41	18899.31	18750,16	17797.95	16907.59	16088,42	15294.17
North Labuhanbatu	17969.26	17306.59	17259,19	16413.33	15602.05	14843.99	14109,37
North Nias	2417,2	2369,36	2332.44	2228.75	2134.49	2043.91	1948
West Nias	1285.66	1257.28	1236.73	1179.91	1126,19	1074.48	1017.8
Sibolga	3595.7	3521.72	3570.33	3393.91	3224.58	3063.07	2914.51
Tanjung Balai	5898.81	5763.21	5790.37	5473.63	5174.85	4904.54	4637.5
Pematangsiantar	9547.7	9430.04	9611.74	9170.19	8750.15	8380,77	7992.32
Tebing Tinggi	4024.78	3926.39	3954.03	3760.5	3575.51	3400.75	3234.05
Medan	157689,19	153669.83	156780.58	148007.14	139739.34	132062.86	124277,48
Binjai	8162.78	7984.46	8133.54	7708.59	7309.57	6935.55	6571.2
Padangsidempuan	4346,78	4230.41	4261.32	4038.93	3830.32	3636.87	3451.08
Gunungsitoli	3519.13	3441.65	3428.45	3232.97	3049.12	2876.34	2703.5

Source: BPS, North Sumatra in Figures for the Year 2004-2010

From table 1. it can be seen that GRDP at constant prices 2010 for all districts/cities in the province of North Sumatra based on BPS data for 2015-2021 it looks like it tends to increase every year, only in 2019 to 2020 as many as 19 regencies/cities have decreased but the decline is not too significant. If we look again at the overall North Sumatra Province, it also seems to continue to increase every year, except in 2019 to 2020, it has decreased, as shown in table 2. Below.

Table 2. GRDP at constant prices 2010 Provinsi North Sumatra Year 2016-2021 (Billion Rp)

	2021	2020	2019	2018	2017	2016	2015
North Sumatra	556,835.87	533,746.36	539,513.85	512,762.63	491,922.92	467,187.76	440.955.85

From table 2 above, it can be seen that from 2015 to 2015 the GRDP of North Sumatra continued to increase until it reached Rp. 539,51363 trillion , but in 2020 it decreased to the range of 533 , 74636 trillion, but will increase again in 2021 to the range of 556 , 83587 trillion. Figure 2 . The following will provide a more complete explanation of the graph of the increase in GRDP on the basis of constant prices in 2010 from 2015 to 2021

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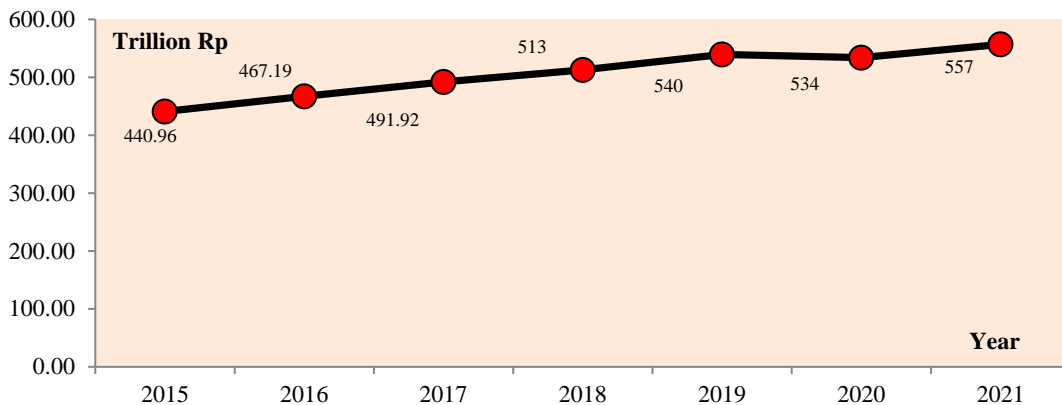


Figure 2. ADHK 2000 GRDP Development North Sumatra Year 2015-2021

Source: BPS, North Sumatra in Figures for 2005-2012

If we look at the development table GRDP on the basis of constant prices 2010 for North Sumatra province based on BPS data from every year starting from 2015-2021 then we can find estimates of GRDP on the basis of constant prices 2010 North Sumatra Province for 2021 by using QM software with the following results.

Error Measures	
Bias (Mean Error)	19313.33
MAD (Mean Absolute Deviation)	21235.67
MSE (Mean Squared Error)	502703300
Standard Error (denom=n-2=4)	27460.06
MAPE (Mean Absolute Percent Error)	4.149%
Forecast next period	556836

From the calculation results above, it can be seen that the bias value of the data obtained is 19313.33, the mean absolute deviation is 21235.67 and the mean absolute percent error is 4.149%, so the estimated GRDP is based on constant prices 2010 North Sumatra Province for 2021. using QM software is 556,836 (Billion RP). We can also see the approximate value of

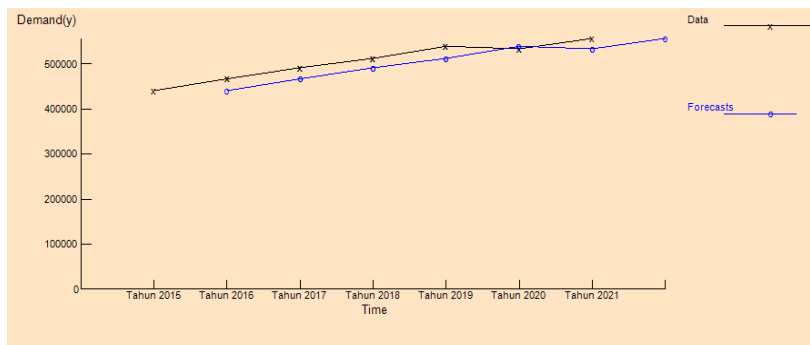


Figure 3. Estimated GRDP at constant prices 2010 North Sumatra Province for 2021.

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Next, we will look at the calculation using the Williamson index method, so that we will get the value of the disparity in the province of North Sumatra during the years 2016 to 2021 which tends to fluctuate as shown in table 2 below.

Table 3 . North Sumatra Regency/City Williamson Index Year 20 16 - 2021

No	District/City	IW 2016	IW 2017	IW 2018	IW 2019	IW 2020	IW 2021
1	Nias	0.051439	0.052505	0.051857	0.050871	0.049244	0.050115
2	Mandailing Natal	0.079121	0.078091	0.078362	0.078455	0.081551	0.082176
3	South Tapanuli	0.015591	0.014686	0.014821	0.013306	0.015586	0.016407
4	Middle Tapanuli	0.080564	0.081531	0.082552	0.083920	0.079578	0.078706
5	North Tapanuli	0.075529	0.076114	0.075990	0.075244	0.074380	0.074827
6	Toba Samosir	0.026936	0.027056	0.026755	0.026337	0.034178	0.036907
7	Labuhan Batu	0.048269	0.048307	0.046143	0.042748	0.051971	0.056082
8	Sharpen	0.018044	0.016142	0.015574	0.014237	0.018554	0.014136
9	Simalungun	0.050996	0.050070	0.049448	0.048216	0.066291	0.068224
10	Dairi	0.057195	0.057669	0.057777	0.057169	0.062620	0.066272
11	Karo	0.008950	0.011216	0.014784	0.017301	0.009299	0.012131
12	Deli Serdang	0.029867	0.031544	0.034178	0.038770	0.015191	0.011425
13	Langkat	0.068323	0.067073	0.067348	0.067820	0.063042	0.058577
14	South Nias	0.092936	0.092439	0.091532	0.090248	0.094294	0.101456
15	Humbang Hasundutan	0.048130	0.048907	0.049143	0.049066	0.049671	0.051705
16	Mr. Bharat	0.031870	0.032126	0.032398	0.032744	0.033515	0.035011
17	Samosir	0.035641	0.035146	0.034439	0.033178	0.036443	0.038419
18	Serdang Bedagai	0.039047	0.037540	0.036671	0.034539	0.042419	0.042515
19	Batu Bara	0.089484	0.087269	0.085533	0.082906	0.093412	0.093778
20	North Lawas	0.028362	0.029278	0.029876	0.031379	0.020131	0.017813
21	Padang Lawas	0.034282	0.034475	0.034864	0.037475	0.022495	0.017882
22	South Labuhanbatu	0.071043	0.072439	0.071032	0.068201	0.097637	0.099946
23	North Labuanbatu	0.035926	0.036812	0.035705	0.035124	0.032133	0.037524
24	North Nias	0.052668	0.052549	0.052514	0.051983	0.052490	0.054656
25	West Nias	0.047488	0.045618	0.045278	0.044602	0.045717	0.047713
26	Sibolga	0.008028	0.008674	0.009939	0.012251	0.010780	0.009273
27	Tanjung Balai	0.011793	0.010567	0.009064	0.007670	0.005324	0.006334
28	Pematangsiantar	0.005526	0.004074	0.001422	0.000410	0.007042	0.011918
29	Tebing Tinggi	0.035274	0.035647	0.036182	0.036521	0.038349	0.040003
30	Medan	0.347060	0.350111	0.360932	0.369474	0.322084	0.323902
31	Binjai	0.033017	0.032859	0.032492	0.031697	0.036327	0.038760
32	Padangsidempuan	0.059237	0.059308	0.059092	0.059072	0.058634	0.059557
33	Gunungsitoli	0.033839	0.032265	0.030648	0.029171	0.022381	0.022521

Source: BPS, North Sumatra in Figures for the Year 20 16 -20 21

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From table 3 above, it can be seen that from the results of calculations using the Williamson index method from 33 regencies/cities in North Sumatra, Medan City has the highest disparity value every year, starting from 2016-2021. If we look at the disparity value for all Medan cities, we get the disparity value at $0.3 \leq IW < 0.4$ which means that the inequality of economic development in the city of Medan has been seen with the criteria of "moderate" inequality, while for other districts / cities it is in the criteria of $0 < IW < 0.3$ which means that the inequality of economic development that occurs in districts / cities in the province North Sumatra is very low.

Next will be discussed about GRDP and inequality of economic development in North Sumatra Province. By using QM Software to predict the closeness between GRDP to inequality in economic growth of a region where the data used is North Sumatra GRDP data from 2016 to 2021 and disparity data in North Sumatra from 2016 to 2021, by conditioning the GRDP in North Sumatra and The inequality of economic development in North Sumatra is increasing according to the data. From the calculation results obtained the following results.

Error Measures	
Bias (Mean Error)	52652.17
MAD (Mean Absolute Deviation)	52652.17
MSE (Mean Squared Error)	2772364000
Standard Error (denom=n-2=4)	64486.79
MAPE (Mean Absolute Percent Error)	99.027%

From the calculation results above, it can be seen that the closeness between GRDP to inequality that occurs in North Sumatra from 2016 to 2021 is $100 - 99,027 = 0.973$ %. This states that if the income in an area is increasing, the possibility of deviation is getting smaller.

DISCUSSION

The existence of development results is sometimes uneven and there are still gaps between regions. To advance development in an area, especially regarding the process of growth and equity of development, regional autonomy is needed. because the nature of regional autonomy is to promote the regional economy is the main goal and full responsibility for implementing Regional Autonomy. So we can say that regional development can enable regions to manage their economic resources so that they are useful and successful for regional progress and people's welfare.

IMPLICATION

Whereas data on GRDP development at constant 2010 prices for all regencies/cities in North Sumatra province from 2016 to 2021, the result is that inequality in Medan City is in the "moderate" criterion, while inequality for other Regencies/Cities is "very low". Using data on the development of GRDP at constant 2010 prices for the province of North Sumatra from 2015 to 2021, the estimated GRDP for North Sumatra Province for 2021 using QM software is 556,836 (billion RP).

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CONCLUSION

By using North Sumatra's GRDP data from 2016 to 2021 and disparity data in North Sumatra from 2016 to 2021, it can be calculated that the closeness between GRDP and inequality that occurs in North Sumatra from 2016 to 2021 is 0.973% which states that If income in an area increases, the possibility of irregularities will decrease.

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