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Analysis of Economic Development Disparities Between Districts in North Sumatra

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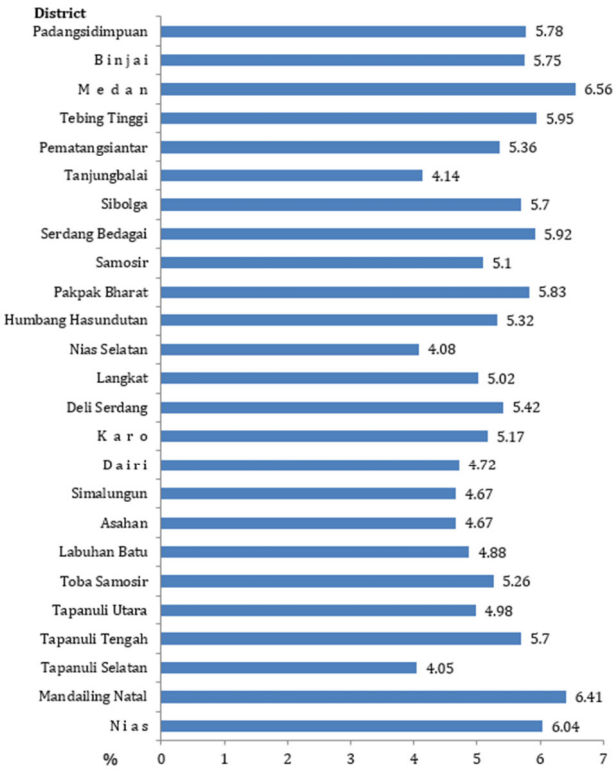
Abstract
This study aims to determine and analyze the effect of GDP, population, development expenditure and unemployment rate on the imbalance of economic development between districts / cities in North Sumatra. Data were taken from 2010 - 2017 in 33 districts throughout northern Sumatra. The data collected were analyzed using panel data regression. From the test data using Chow test and Haussmann test then the panel data regression used is fixed effect method. Collectively the GDP variables, population, development expenditure and unemployment rate affect the variables of economic inequality with R-square of 0.9949. GDP has a negative and significant effect; the number of influential population and development expenditure has a positive and significant effect on the disparity of economic development while the unemployment rate has no significant effect on economic development in North Sumatra. To reduce the inequality or disparity of economic development, the government should continue to improve the performance of the economy by finding new sources of revenue and budget efficiency that can be used for development in every sector.
Keywords: Economic Disparity, Fixed Effect Method, Panel Data Regression

Introduction

In general, national development in developing countries is focused on economic development through economic growth efforts. Where the goal of multidimensional economic development is to create growth and changes in economic structure, social change, reducing or eliminating poverty, reducing disparity, and unemployment (Todaro, 2000). The main cause of inequality is the difference of socio-economic structure and other factors.

The results of the Easterly (1999) study reveal that high levels of disparities are a barrier to prosperity, the growth of quality institutions, and the development of high quality education.

In North Sumatra if economic growth is seen between districts / cities, it will be seen how much inequality that occurs from the economic side. Following in Figure 1 economic growth between districts / cities in North Sumatra.



Source: BPS, North Sumatera In Figures Year 2017

Figure 1. Economic Growth of Regency / City of North Sumatra Year 2012 (percent)

From Figure 1 above can be seen that economic growth in North Sumatra is relatively high, but the growth is accompanied by an increasingly large regional inequality. High economic growth has often led to a widening inequality between the poor (the rich and the poor) and the inequality or disparity between regions (advanced and left behind). The increasing inequality between groups and between these areas can lead to problems of social jealousy, the vulnerability of regional disintegration and the wider and sharper economic disparities.

In terms of demography, large population is an asset for regional development, but large population will also be a burden for the government, especially local governments when the human resources are low. The uneven distribution of the population will also be a dilemma for the government when the population is concentrated in one region that will cause inequality. The centralized population will tend to be a burden for local governments to provide employment opportunities that can absorb the labor force in the region. In contrast, a relatively small number of people will also be an obstacle for regional development.

Literature Review

If viewed historically, the concept of the division of the region itself was first proposed by Tiebout (1956) in an article entitled "A Pure Theory of Local Expenditure". It is argued that regional expansion is analogous to a model of perfectly competitive economy where local government has the power to maintain low tax rates, provide efficient services, and permit each individual community to express its preference for each type of service from different levels of government with "vote with their feet ". Then Swianiewicz (2002) reveals that small local communities are more homogeneous, and easier to implement policies that suit the preferences of most societies. The opportunity of the community to participate in small communities has a greater chance. Furthermore, small local governments have low bureaucracies, such as administrative functions. In this case Hofman et al (2005) said the division of the region is intended to bring public services closer to its constituents. Therefore, among districts / cities there are different needs of public services with different characteristics, then urban area should be expanded from the parent regency so that each region can specialize in the provision of public services in accordance with the characteristics of the needs of the community.

The positive impact of regional expansion was also presented in the study conducted by Percik (2007). That in New Autonomous Region (DOB) Bengkayang, Bombana and Wakatobi districts in the early years of their administration, they did not prioritize to develop PAD, but prioritized for infrastructure development. Although the division of the region is considered to bring the government closer to the community, Kerlin (2002) suggests that the goal of improving the equally important administrative efficiency is not achieved. This is where there is a failure to achieve the goal of regional expansion policy. Studies conducted by do'Carmo and Martinez-Vazquez (2001) in the Czech Republic have revealed the failure of the division.

In addition to economic growth, there are also several factors affecting regional inequality. Research conducted by Akai-Sakata (2005) and Lessman (2006) looks for factors that affect the level of regional imbalances, including economic growth, agglomeration, and the number of people employed. Agglomeration is a grouping of economic activities, generally homogeneous, the place. Agglomeration of economic activity somewhere will cause the region to experience higher economic growth. Agglomeration of economic activities for an industry will also be able to spur development in a region through the mechanisms of job creation and improvement of people's welfare.

Previous research conducted by Jaime Bonet (2006), in which Bonet analyzed the effect of agglomeration of production variables on regional inequality. The result of Bonet research shows that between the agglomeration of production and the regional income imbalance there is a positive and significant relation at α = 1%. It means that every level of production agglomeration will increase the inequality of regional income.

One of the causes of regional imbalances is the difference in geographic conditions between regions. Demographic conditions of a region include differences in growth rates and population structure, different levels of education and health, differences in labor conditions and differences in work ethics held by the local community concerned. Demographic conditions affect the magnitude of productivity of a region. Areas that have good demographic capabilities will be able to have high productivity. Levels of people working affect the productivity of a region, the higher the level of people who work in an area will cause the productivity of the area is higher than the area with the number of people who work less. According to Lessman (2006), high unemployment rates have an effect on the higher regional imbalances.

Research Method

The location of research conducted by North Sumatera Province from 2010 until 2017. Data type in this research is quantitative data and data source used is secondary data. The data source used in this research is sourced from the Central Board of Stastistic Province of North Sumatra in several publications. This research used panel data analysis to know the influence of PDRB variable, population variable (POP), development expenditure (GE), and workforce variable (AK) to economic development inequality between regency / city (VW) in Sumatera Province North. The panel data model is:

VWit = βo + β_1 GDPit + β_2 POPit + β3 GEit + β4 AKit + ε

The function models that will be used to know the imbalance of economic development among regencies in North Sumatera Province are:

$$Vw_{it} = \beta 0 + \beta 1LOG\ (GDPit) + \beta 2LOG(POP) + \beta 3LOG(GEit) + \beta 4LOG(AKi) + \mu_{it}$$

Where :

VW = Economic Inequality Index (percent)
GDP = Revenue per capita (million rupiah)
POP = Population (person)
GE = Development Expenditure (IDR)
AK = Labor Force (Person)
i = Cross Section: i = 1; , 2,3, ..., 28 District
t = Time series t = 2010 - 2017
β = Coefficient of Free Variable
μ_i = Fixed effect or random effect
μ_it = residual or error

Given the data used in this study is panel data, then to test the hypothesis used the model of Fixed Securities and Random Effects (Greene, 2000). Secondary data processing and application of the three methods above using the statistic (software) program Eviews version 6.0.

Result and Discussions

From the calculation result using williamson index method, it can be seen that disparity in North Sumatera province during 2010 until 2017 tends to fluctuate. In 2005 the index of williamson North Sumatra of 0.0523 decreased relative small in 2012 by 0.0503. Table 1 below presented williamson index of districts in North Sumatra province during 2010-2017.

Table 1. Index of Williamson District / City of North Sumatra Year 2010 – 2017

No	District	2010	2011	2012	2013	2014	2015	20116	2017
1	Nias	0.0957	0.0936	0.0918	0.0953	0.1062	0.0578	0.0578	0.0573
2	Madina	0.0811	0.0871	0.0867	0.083	0.0815	0.0797	0.0799	0.0793
3	Tapsel	0.0951	0.0918	0.0945	0.0377	0.037	0.0371	0.0385	0.0392
4	Tapteng	0.0846	0.0879	0.0893	0.0889	0.0897	0.0896	0.0898	0.0905
5	Taput	0.0469	0.0447	0.047	0.0519	0.0519	0.0539	0.0549	0.055
6	Tobasa	0.0222	0.0162	0.0165	0.0119	0.0132	0.0134	0.0114	0.0115
7	Labuhan Batu	0.0092	0.0037	0.0017	0.0025	0.0221	0.0251	0.0265	0.0275
8	Asahan	0.1167	0.113	0.0257	0.0247	0.0249	0.0266	0.0291	0.0296
9	Simalungun	0.0667	0.0677	0.0686	0.0673	0.0649	0.0639	0.0654	0.0653
10	Dairi	0.0179	0.02	0.0208	0.0247	0.0239	0.0244	0.026	0.0261
11	Karo	0.0246	0.013	0.0083	0.0111	0.01	0.0082	0.0068	0.0075
12	Deli Serdang	0.0062	0.0139	0.0234	0.0304	0.035	0.0419	0.044	0.0489
13	Langkat	0.0485	0.0604	0.0641	0.054	0.0524	0.0504	0.0523	0.0515
14	Nias Selatan	0.0785	0.0703	0.0705	0.0755	0.0756	0.0799	0.0814	0.0813
15	Humbang Has	0.0334	0.0312	0.0311	0.0384	0.0384	0.0412	0.0417	0.0419
16	Pakpak Barat	0.0265	0.0259	0.0298	0.0309	0.0314	0.031	0.0311	0.0314
17	Samosir	0.0106	0.0101	0.0111	0.0058	0.0041	0.0031	0.0037	0.0037
18	Sergei	0.0424	0.0431	0.0455	0.0407	0.0373	0.0347	0.0359	0.036
19	Sibolga	0.0095	0.011	0.0119	0.0055	0.0041	0.0033	0.0129	0.005
20	Tanjung Balai	0.0053	0.0026	0.0013	0.0016	0.0005	0.0011	0.003	0.0042
21	Pematang Siantar	0.0076	0.0073	0.0082	0.0082	0.0069	0.0066	0.0074	0.007
22	Tebing Tinggi	0.0099	0.0098	0.0101	0.013	0.0123	0.0129	0.0129	0.0124
23	Medan	0.301	0.3172	0.3272	0.3265	0.3389	0.3492	0.3562	0.3733
24	Binjai	0.0135	0.0146	0.0162	0.0148	0.0138	0.014	0.0145	0.0142
25	Padang Sidimpuan	0.0533	0.0537	0.0544	0.0049	0.0541	0.0565	0.057	0.0588

Estimation using fixed effect method based on chow test result and haussman test result, where chow test result is shown in Table 2. below:

Table 2. Chow Test Results

Redundant Fixed Effects Tests			
Pool: Untitled			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	503.940360	(24,146)	0.0000

Determination of use between method of common effect and fixed effect by using chow test, where if probability> 0.05 Conversely, if the probability is < 0.05, then the use of fixed effect method is better used.From result of estimation with chow test obtained probability <0.05 so that method of fixed effect better to use.The next stage is to test the haussman to determine whether a better fixed effect or random effect method is used. Haussman test results can be seen in table 3 below:

Table 3. Haussman Test Results

Correlated Random Effects - Hausman Test			
Pool: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	37.562195	4	0.0000

Determination of use between method of fixed effect and random effect by using haussman test, where if probability> 0.05 then random effect method better use. Conversely if probablity <0.05, then the use of fixed effect method is better used. From result of estimation with haussman test obtained probability <0,10,0,0,0,0 so that method of fixed effect better to use.

Table 4. Estimation Result of Fixed Effect Method

Dependent Variable: LOG (VW?)				
Method: Pooled EGLS (Cross-section weights)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.782287	1.919361	-5.096637	0
LOG(GDP?)	-0.177096	0.050583	-3.501086	0.0006
LOG(POP?)	0.57342	0.140704	4.075369	0.0001
LOG(GE?)	0.036701	0.019571	1.875256	0.0628
LOG(TPT?)	0.014832	0.016386	0.905152	0.3669
Fixed Effects (Cross)				
_NIAS—C	1.028671			
_MADINA—C	0.947268			
_TAPSEL—C	0.553278			
_TAPTENG—C	1.103665			
_TAPUT—C	0.687944			
_TOBASA—C	-0.384188			
_LBATU—C	-1.292764			
_ASAHAN—C	-0.107045			
_SIMALUNGUN--C	0.483473			
_DAIRI--C	-0.057431			
_KARO--C	-1.07417			
_DSERDANG--C	-0.52706			
_LANGKAT--C	0.231886			
_NISEL--C	1.031321			
_HUMBAHAS--C	0.602904			
_PAKPAKB--C	0.876519			
_SAMOSIR--C	-1.205839			
_SERGAI--C	0.111041			
_SIBOLGA--C	-0.857669			
_TBALAI--C	-2.453909			
_PSIANTAR--C	-1.148807			
_TTINGGI--C	-0.466664			
_MEDAN--C	1.881713			
_BINJAI--C	-0.49247			
_PSIDEMPUAN--C	0.528333			
	Effects Specification			
	Weighted Statistics			
R-squared	0.994995	Mean dependent var		-15.30609
Adjusted R-squared	0.994035	S.D. dependent var		16.64737
S.E. of regression	0.389273	Sum squared resid		22.12385
F-statistic	1036.513	Durbin-Watson stat		1.221867
Prob(F-statistic)	0			

The F-value value is equal to 1036,513 with F-statistical probability of 0.000 which means together independent variables (GDP, POP, GE, and TPT) affect the dependent variable (DV). The estimation results have met the suitability test model for the simultaneous test, so the estimation results can be used for the analysis.

The model is said to be better if R^2 gets closer to 1. The model estimate yields R^2 of 0.9949. That is, the existence of independent variables (GDP, POP, GE and TPT) is able to explain the dependent variable (DV) of 99.49 percent, the rest of which is 0.51 percent explained by other variables outside the model. With R^2 = 0,9949 then result of estimation fulfill conformity test from coefficient aspect of determination. The estimation result is feasible to be analyzed.

Partial test is also called the test of significance. The GDP t-value is equal to -3.501086 with the probability of 0.0006 smaller than $\alpha = 0.05$ which means the GDP variable significantly affects the DV negatively, the POP t-statistic value is equal to 4.075369 with the probability of 0, 0001 smaller α = 0,05 meaning POP variable significantly influence DV positively, GE variable with t-statistic value equal to 1,875256 with probabilita equal to 0,0628 smaller α = 0,05 meaning that GE variable significantly influence DV positive. While the variable TPT t-statistical value of 0.905152 with probabilita of 0.3669 bigger than $\alpha = 0.05$ which means TPT variable does not significantly affect the DV. Thus, the model estimation results have met the suitability test of the partial test

aspect. Model estimation results can be analyzed.

Regression model is to be exposed to multicolinearity when there is a perfect linear relationship between some or all independent variables of a regression model. In this study multicollinearity test using partial correlation method, partial correlation test results can be seen in table 5 below;

Table 5. Coefficient of Determination Among Dependent Variables

Dependent Variabel	Independent Variabel	R^2	Result
GDP	POP, GE, TPT	0,988	No Multicollinearity
POP	GDP, GE, TPT	0,984	No Multicollinearity
GE	GDP, POP, TPT	0,857	No Multicollinearity
TPT	PDRBP, POP, GE	0,705	No Multicollinearity

Table 5 shows that the regression result of the independent variables (partial correlation) yields the determination coefficient (R^2) as follows: $R^2_{PDRB\ (POP,\ GE,\ TPT)}$ equal to 0.988; $R^2_{POP\ (PDRBP,\ GE,\ TPT)}$ equal to 0.984; $R^2_{GE\ (PDRB,\ POP,\ TPT)}$ equal to 0.857; $R^2_{TPT\ (GRDP,\ POP,\ GE)}$ equals 0.705 Compared with $R^2_{\ (PDRBP,\ POP,\ GE,\ TPT)}$ of 0.995 then the coefficient of determination of free variables PDRBP, POP, GE and TPT smaller. This means the model is good and can be analyzed.

The estimation experiment was conducted on variables considered to have an effect on income disparities, such as GRDP, population, development expenditure and unemployment rate. The result of significant estimation given the GRDP variable, population and development expenditure.

Estimation results in all districts in North Sumatra province based on the amount of intercept disparities income estimation results above also can be seen that the average increase in regional income disparity is constantly unaffected by other factors is the largest compared with other regional income disparity is City of Tanjung Balai is equal to -2.453909. While the increase of regional income disparity in the second rank is the disparity of income of Medan that is equal to 1.881713. In the third order increase in income disparity is Labuhan Batu district that is equal to -1.292764.

Increase in income disparity of the lowest area is in Dairi regency of 0.057431 followed by Asahan regency of -0.107045 and Serdang Bedagai regency of 0.111041.

High regional development disparities are caused by large population where from estimation result, coefficient of high is variable of population, variable of GRDP and variable of economic growth and variable of unemployment rate. The city of Medan and the city of Tanjung Balai has a relatively high population and unemployment rate. While Labuhan Batu district has GRDP and, economic growth and population are relatively low. Meanwhile Dairi district with GRDP and population is relatively low, while Asahan and Serdang Bedagai districts PDRB and the relatively moderate population with relatively low unemployment rate.

This result is in accordance with previous theories and hypotheses which suggest that the increase of GRDP and government spending will decrease disparity, in contrast to increasing population and unemployment rate will increase disparity.

The PDRB regression coefficient equals -0.177096. This means that if GRDP rises 100 percent, then the income disparity will decrease by 17.71 percent. Conversely, if the GRDP drops 100 percent then the income disparity will rise by 17.71 percent. The effect of this GRDP variable is relatively high and significant at 90 percent confidence level. This shows that GRDP has a negative and significant impact on income disparities in North Sumatra.

The regression coefficient of the population variable is 0.573420 which means that when the population increases 100 percent will increase the disparity of economic development of 57.34 percent. The influence of population to the disparity of economic development is the highest relative of other independent variables and positively and significantly influence at 90 percent confidence level to the disparity of economic development in North Sumatra.

Inequality in this study is divided into two namely the imbalance in the province and the imbalance between provinces. Regression analysis tools are also used to examine possible factors as determinants of income inequality within provinces.

The estimation results show the regression coefficient of development expenditure variable of 0.036701. Means that every increase in development expenditure of 100 percent then the disparity of economic development will increase by 3.67 percent. The influence of development expenditure variable on the disparity of economic development positively and significantly at 95 percent confidence level.

The results obtained from this study that investments negatively affect the disparity of economic development, the number of labor force negative affects the disparity of economic development, the allocation of development assistance funds from the central government is uneven and evenly distributed areas that receive areas that get too much help can increase the level disparity between regions. This is due to the concentrated development in the developed regions compared to the regions still lagging, as the developed regions compare to the remaining areas, as the developed regions have better facilities than the less developed ones.

Conclusions and Recommendations

The coefficient of determination on the estimation result of economic development disparity variable in North Sumatera can be explained by the variables of GDP, population, and development expenditure and unemployment rate with the model used. The variables used to explain the variables of economic development disparity show the direction of influence in accordance with the hypothesis. GDP has a negative and significant effect; the number of influential population and development expenditure has a positive and significant effect on the disparity of economic development while the unemployment rate has no significant effect on economic development in North Sumatra. The coefficient value of the variables describing the disparity variable of economic development, the largest is the population variable, followed by the GDP variables, development expenditure, and unemployment rate. To reduce the inequality or disparity of economic development, the government should continue to improve the performance of the economy by finding new sources of revenue and budget efficiency that can be used for development in every sector. It is better for the government to open new jobs by making it easier for investors to invest in the regions by issuing regulations and policies that encourage the growth of these investments. With the growth of investment in the area will absorb a lot of labor, which in turn will reduce unemployment. The government should do more socialization about the importance of family planning in regulating the birth rate by providing cheap and free contraceptives to new partners, providing counseling and making health facilities convenient and accessible to the public. There should be more research on inequality with wider and more complex coverage and methods and with varied support variables that will add and enrich the knowledge treasury.

References

Akai, Nobuo and Masayo Sakata. 2005. Fiscal Decentralization, Commitment and Regional Inequality: Evidence from State-level Cross-sectional Data for the United States. CIRJE Discussion Papers. http://www.cirje.e.u-tokyo.ac.jp/research/dp/2005/2005cf315.pdf

Bonet, Jaime. 2006. Fiscal Decentralization and Regional Income Disparities: Evidence from The Colombian Experience. Ann Reg Sci 40:661-676. http://www.springerlink.com/content/36595348343m6660/fulltext.pdf

Do Carmo, O.J., and Martinez-Vazquez, J. (2001). Czech Republic intergovernmental fiscal relations in the transition Europe and Central Asia. Poverty Reduction and Economic Management Series, World Bank Technical Paper, (517).

Forbes, Kristin J. 2000. Reassessment of The Relationship Between Inequality amd Growth. The American Economic Review, Vol. 90 No. 4, hal 869-887. Amerika Serikat. http://web.mit.edu/kjforbes/www/Papers/Inequality-Growth-AER.pdf.

Hofman, B., Fitrania; F., and K. Kaisera. Unity in diversity? The creation of new local governments in a decentralising Indonesia. Bulletin of Indonesian Economic Studies, 41(1): pp. 57-79.

Lessman, Christian. 2006. Fiscal Decentralization and Regional Disparity: A Panel Data Approach for OECD Countries. Ifo Working Papers. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=936874.

Percik. 2007. Proses dan Implikasi Sosial-PolitikPemekaran: Studi Kasus di Sambas dan Buton. USAID Democratic Reform Support Program (DRSP) dan Decentralization Support Facility (DSF), Jakarta.

Swianiewicz, P. 2002. Consolidation or Fragmentation? The Size of Local Governments in Central and Eastern Europe. Local Government and Public Service Reform Initiative, Open Society Institute Budapest, Budapest.

Tiebout, C.M. 1956. A Pure Theory of Local Expenditures. The Journal of Political Economy. 64(5): pp. 416-424.