

## How is the Income Disparity in the Context of North Sumatera Province: A Conceptual Framework

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### Abstract

*The dynamics of regional income has attracted the attention of practitioners, scholars and academics. A critical issue in development for the past and current decades is the disparity or inequality of income distribution among regions. The disparity of income distribution, in this case, refers to the convergence theory of the Solow-Swan model developed by Barro and Sala-i-Martin. Accordingly, the study will identify and analyse several prepositions. The contribution of this work for the next step will provide an additional wealth of knowledge in regional economics and regional development, especially with regard to the convergence of regional income disparities. This study also will contribute to the local governments to accelerate the convergence of income disparities in the Province of North Sumatera. Later, the authors' work will provide input to local governments on the variables that converge or diverge in the process of income disparity convergence so that recommendations can be taken based on the estimated study results.*

### Keywords

disparity;  
regional autonomy;  
regional income;  
North Sumatera



## I. Introduction

The success of national development is primarily determined by city and district development performance, which will have consequences for the country's prosperity in the long run. This case is because cities and districts have a wealth of natural, human, and social resources, all of which may be utilised as development capital. Therefore, if development capital is managed and utilised properly, it will provide the greatest outcomes for city and district development and national growth. On the other hand, a failure of development in the city and district areas would have a detrimental effect on the city and district areas' development plans, which in turn, overall development.

One of the development models, particularly in the area of economic development, is regarded as the most significant of all development activities and is ranked first among such development activities. Economic growth is linked with attempts to more fairly share the benefits of development across the area and aim to increase the general public's income. Additionally, many initiatives are being undertaken to progressively decrease economic inequality, poverty, and underdevelopment (Sirojuzilam, 2008).

Economic development is relevant to the process through which gross national product (GNP) per capita or the population's average income rises over a lengthy period of time. Therefore, economic development has three major characteristics: it is a process that includes continuous change, it involves attempts to raise people's per capita income, and it requires raising people's per capita income over a long period of time. This case tends to lead to an increased income per capita and a growth rate of Gross Domestic Product, which is used to determine the speed of economic development at the national level, while Gross Regional Domestic Product is used to determine the speed of economic development at the regional level (Sirojuzilam, 2008).

Since the enactment of regional autonomy, local governments have more significant opportunities to develop the local economy. Regions increasingly have the freedom to develop their territory according to the needs of local communities (Nehen, 2010). However, not all regions will experience the same economic development process. Some areas are experiencing rapid development, while some other areas are experiencing slow development. This case causes inequality or disparity in economic development between one region and another. For example, North Sumatera Province consists of thirty-three districts/cities where the economic development of North Sumatera Province is inseparable from the economic development of districts/cities. The development of each district/city will be different because the resources possessed by each district/city are different.

Todaro (2006) states that economic development is a multidimensional process that involves significant changes in economic structure, social change, eliminating poverty, reducing inequality, and unemployment in the context of economic growth. Economic development is seen as an increase in per capita income, and the pace of economic development is aimed at using the rate of increase in Gross Domestic Product for the national level and GRDP for the regional level.

The Gross Regional Domestic Product (GRDP) is also determined by the rate of population increase, which is more than the rate of GDP growth, resulting in a shift in per capita income. Since there is a potential of the scenario occurring, thus a rise in GDP does not result in an improvement in the level of the economic wellbeing of the people. Therefore, the meaning of economic growth and economic development should be distinguished (Sirojuzilam, 2008). The disparity is a necessary condition for the acceleration of economic growth at the beginning of development. Regionally or among regions, there is also inequality in the distribution of public income. From the inter-regional perspective, inequality occurs both in terms of community income levels among one region and another; and in terms of income distribution among the population of each region. Regional inequalities in development can be identified, among others, by examining striking differences in aspects such as labour absorption, allocation of banking funds, investment and growth (Dumairy, 1996).

Development inequality among regions is a common aspect of the economic activities of a region. This inequality is basically caused by differences in the content of natural resources and differences in geographical conditions in each region. As a result of these differences, the ability of a region to encourage the development process also becomes different. Therefore, it is not surprising that there is usually a developed region and an underdeveloped region in each region. Furthermore, the occurrence of inequality among regions has implications for the level of public welfare among regions. Therefore, the aspect of development inequality among regions also has implications for developing regional development policies conducted by the Local Government, such as policies on regional autonomy.

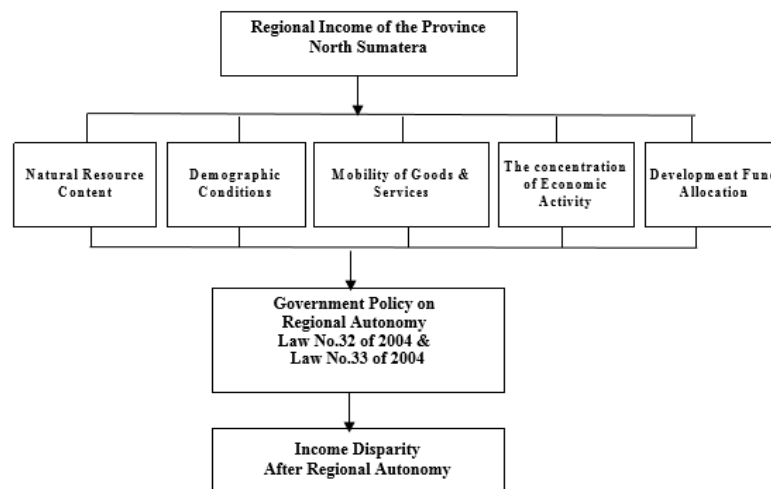
Law Number 32 of 2004 on Local Government and Law Number 33 of 2004 on Financial Balance between Central and Local Governments is the foundation for implementing decentralisation in the political, administrative and fiscal fields to realise Regional Autonomy. Law Number 32 of 2004 focuses on the division of powers and functions (power-sharing) between the central and local governments. Meanwhile, Law Number 33 of 2004 regulates the division of financial resources or financial sharing between regional centres due to the division of authority. Both laws emphasise that the development of regional autonomy is carried out by paying attention to the principles of democracy, public participation, equity, justice and taking into account the potential and diversity of regional resources. Apart from that, the law has also clarified the direction to be achieved and given flexibility for the district beyond what was there in the past.

Although efforts to reduce disparities have been implemented by implementing regional autonomy and the Development Trilogy strategy and other efforts to improve equitable development, one of the indicators in this regard is improving economic growth, but improving economic growth still leaves problems. One of the reality is that there are differences in development rates and the creation of development gaps/disparities among regions or between districts/cities and new autonomous regions due to development in North Sumatera Province.

Theoretically, according to the Neo-Classical view at the beginning of the development process of a country, development inequality among regions tends to increase. This process will occur until the inequality reaches its peak. After that, gradually, the development inequality among the regions will decrease if the development process continues. Based on this hypothesis, a temporary conclusion can be drawn that developing countries generally experience inequality of development among regions tends to be higher, while in developed countries, inequality will be lower. In other words, the development inequality curve among regions is inverted U-shape (Reserve U-shape Curve). The main factor that causes a disparity among regions is the existence; (a) considerable differences in the content of natural resources in each region, (b) differences in demographic conditions, (c) lack of mobility of goods and services, (d) concentration of regional economic activities and (e) allocation of development funds among regions.

## II. Review of Literature

The framework flow is presented in Figure 1.



*Figure 1. Framework Flow*

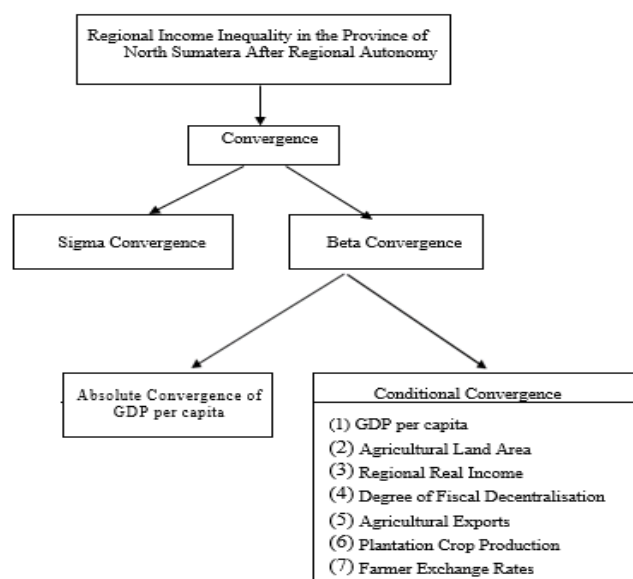
Based on the research framework flow, this study will analyse the disparity of regional income in North Sumatera province with the thought of sigma and beta convergence (absolute and conditional) conducted after decentralisation using secondary data sourced from BPS. In this case, the income distribution disparity refers to the convergence theory of the Solow-Swan model developed by Barro and Sala-i-Martin (1991). Convergence is a traditional approach widely used by experts to measure steady-state velocities, which is a method developed by Barro and Sala-i-Martin. Convergence was the core of the theory of economic growth in 1990, based on the hypothesis put forward by Barro and Sala-i-Martin (1995) using neoclassical economic growth models.

Convergence generally consists of  $\sigma$ -convergence (sigma convergence) and  $\beta$ -convergence (beta convergence). Sigma convergence is the most conventional measure of measuring the level of disparity among regions in a given period and is also called a static analysis tool. Barro and Sala-i-Martin (1992, 1995) measure sigma convergence through dispersions that occur between economies. This view is called  $\sigma$ -convergence, which is measured based on the standard deviation of real per capita income among regions. If the dispersion of real per capita income among regions decreases, it means that there is a slowdown in economic growth or, in other words, impoverished areas are increasingly chasing affluent areas. Beta convergence (convergence  $\beta$ ) Barro and Sala-i-Martin state that convergence occurs when the economies of poor areas tend to grow faster than those of affluent areas. It indicates a negative relationship between per capita income at the beginning and per capita income growth. This opinion is called conversion-convergence, which is also called a dynamic analysis tool.

The speed of convergence can be known by analysing beta convergence. One concept related to the speed of alignment is half-life alignment which means the time it takes to meet the initial half-disparity (Sirojuzilam, 2008). While decentralisation is defined as the handover of government authority by the central government to the local government to regulate and take care of the regional fiscal sector in the system of the Unitary State of the Republic of Indonesia, Fiscal decentralisation is a significant component of decentralisation. In carrying out its functions effectively and gaining freedom in making expenditure decisions in the public sector, the Local Government must support adequate financial sources; both derived from Regional Income (PAD), Tax and Non-Tax Revenue Shares, Loans, and Subsidies Assistance from the Central Government.

GDP per capita can be used as one indicator to detect economic development success in a region. Kuznets (in Arsyad, 2010) explains that development in a country at certain limits can trigger economic inequality (disparity) among its citizens. In his analysis, Kuznets found a relationship between income distribution disparity with the inverted U-shaped per capita income level, which states that income distribution will deteriorate in the early stages of growth. However, in later stages, income distribution will improve in line with increasing per capita income.

Based on the theoretical approach, the conceptual framework of the research is proposed as follows.



**Figure 2. Conceptual Framework**

Accordingly, we propose the following research hypotheses.

- H1: There is a convergence of regional income disparity, either sigma, absolute and conditional among districts/cities, districts and districts/cities of new autonomous regions resulting from the expansion in North Sumatera Province after regional autonomy.
- H2: The speed of convergence and how long it takes to close half of the initial gap (half-life of convergence) faster among districts/cities than districts and districts/cities of new autonomous regions due to expansion in the Province North Sumatera after regional autonomy.
- H3: Agricultural land area, regional income, degree of fiscal decentralisation, agricultural exports, plantation crop production, farmers' exchange rate and per capita income have a significant effect on the conditional convergence of regional income growth disparities among districts/cities, districts and districts/cities new autonomous regions as a result of expansion in North Sumatera Province after regional autonomy.
- H4: The amount of Regional Income and GDP per capita of the parent district is greater than the GDP and GDP per capita of the new autonomous districts/cities due to expansion after regional autonomy.

### **III. Research Methods**

This type of research is quantitative that aims to explain an empirical phenomenon accompanied by statistical data, characteristics and patterns of relationships among variables—the quantitative approach to empirical studies to collect, analyse, and display data in numerical form. This research was conducted in North Sumatera Province. First, the time-series data that has been determined is after regional autonomy, namely the period 2009 - 2018. Then the type of data used in this study, namely secondary data derived from BPS, is quantitative, and the method used is the panel data regression method. Finally, this study aims to analyse whether the region's economy in the Province of North Sumatera has a convergence of per capita income both in sigma, absolute and conditional and the factors that affect the convergence.

#### **3.1 Data Collections & Sources**

The data used in this study is secondary data obtained from BPS. Secondary data is data obtained from published sources and are ready for use (Wijaya, 2013). This data is panel data, which is a combination of time series and cross-section data for the period 2009–2018, which consists of 33 districts/cities in North Sumatera Province after regional autonomy. The data examined are categorised as independent variables of Gross Regional Domestic Product per capita, Regional Real Income, agricultural land area, agricultural exports, plantation crop production, degree of fiscal decentralisation, and Farmers' Exchange Rate. The data collection technique in this study uses documentation techniques. According to Sugiyono (2010), documentation techniques are a form of records of events that have passed, such as writings, drawings, or monumental works of someone. The data collected and used of this study are Gross Regional Domestic Product per capita, Regional Real Income, agricultural land area, agricultural exports, plantation crop production, degree of fiscal decentralisation, and Farmers Exchange Rate period 2009-2018.

### 3.2 Data Analysis

Data analysis used to answer research questions, namely using panel data regression analysis consists of descriptive analysis and inferential analysis. The inference analysis used in this study is a regression analysis of panel data using the help of Eviews 9.0 software. The type of data used is panel data, which is a combination of time-series data, which is time-series data in 2009-2018 and data among individuals (cross-section), which is 33 districts/cities in North Sumatera Province. According to Shuai et al. (2017), the advantage of panel data will accommodate the existence of serial correlation, heterogeneity among individuals and increase the degrees of freedom to increase the accuracy of the estimates made. In addition, panel data is used in analysing data dynamics because it can measure effects that cannot be captured by pure cross-section data and pure time-series data (Hsiao, 2003 and Klevmarcken, 1989 in Baltagi, 2008). To test the factors that affect the income disparity as hypothesised, then used regression analysis of panel data. Factors that are expected to affect disparity are GDP per capita, agricultural land area, regional income, degree of fiscal decentralisation, agricultural exports, plantation crop production, and farmers' exchange rate. Further, to see whether or not there is a convergence of regional income disparities and the speed of convergence and how long it will take to close half of the initial gap (half-life of convergence) as hypothesised, it is estimated with a convergence model.

### 3.3 Model Significance Testing

In order to make estimates with the panel data regression method, there are three models that can be used, namely the common effect model, fixed effect model and random effect model (Baltagi, 2008). Later, testing the three models to determine the most appropriate model must be tested, namely the F test and the Hausman test. Model selection test can be done with Fixed Effect Model Significance test, Random Effect Model Significance test, and Hausman test. If the random effect model is selected, then the test to select an estimator with a better residual variance-covariance structure is not performed. In addition to meeting the assumptions, the regression model must also meet the regression evaluation criteria. The assumptions that must be met in the regression analysis are normality, non-multicollinearity and stationery.

### 3.4 Convergence Analysis Model

This analysis model consists of Sigma Convergence ( $\sigma$ -convergence) and Beta Convergence ( $\beta$  convergence) analysis. After the static, sigma convergence is further complemented by measuring the dynamic beta convergence. Beta convergence consists of absolute convergence and conditional convergence.

### 3.5 Operational Definition of Variables

The variables in this study are grouped into (1) dependent variables, (2) independent variables. In this case, the disparity of GDP growth per capita is a dependent variable, while the independent variables are; (1) GDP per capita, (2) Agricultural Land Area, (3) Regional Income, (4) Degree of fiscal decentralisation, (5) Agricultural Exports, (6) Plantation crop production, (7) Farmers Exchange Rate. In this study, convergence and decentralisation are expected to affect income disparity.

## IV. Results and Discussion

- Income Disparity - is the difference in economic prosperity between the rich and the poor. This case is reflected in income disparities (Baldwin, 1986). The problem of income disparity is often also summarised, that the real income of the rich continues to increase while the poor continue to decrease. It means that the real income of the rich grows faster than that of the poor (Herrick and Kindleberger, 1988). The variables measurement use the dispersion of income such as standard deviation and or the coefficient of variation.
- GDP per Capita or Economic growth - is the process of changing the economic condition of a country continuously towards a better situation over a period. The higher the level of economic growth, the faster the process of increasing regional output, so that the better prospects for regional development. The economic growth of this study related to the growth of GDP per capita. GDP per capita is a description and average income received by each resident for one year in a region. The measurement of this variable uses a nominal scale.
- Agricultural Land Area - measured the area of agricultural cultivation on a piece of districts/cities land in the Province of North Sumatera during the research period in hectares.
- Regional income - is the total Regional Income of districts/cities in North Sumatera Province for the last year. This variable is measured in rupiah units (Billion Rupiah). According to Setiyawati and Ardi (2007), Regional Income which serves as a source of development financing plays a positive role in accelerating regional economic growth.
- Degree of Fiscal Decentralisation - comparison of the Regional Income component with the Total Regional Income of districts/cities of North Sumatera Province during the study period. This variable is measured in percentage units.
- Agricultural Exports - are the sale of agricultural goods abroad using the payment system, quality, quantity and other sales terms that the exporters and importers have approved of districts/cities in North Sumatera Province. This variable is measured in units of millions of USD. The inelasticity of countries' demand for exports of developing countries has led to a deterioration in the exchange rate (term of trade) for countries expanding trade with developed countries.
- Plantation Crop Production - activities to create or add value to plantation crops' utilisation to meet needs and improve living standards and per capita income.
- Farmer Exchange Rate - are a proxy indicator of farmers' welfare. Farmer Exchange Rate compares the price index received by farmers (It) with the price index paid by farmers (Ib).

## V. Conclusion

The study will identify the convergence of regional income disparities in sigma and beta (absolute and conditional convergence) among districts/cities, districts and districts/cities of new autonomous regions resulting from the expansion in North Sumatera Province after regional autonomy. Later, this study will analyse the speed of convergence and the time required to close half of the initial gap (half-life of convergence) of the regional income disparity among districts/cities, districts and districts/cities of autonomous regions—new expansion results in North Sumatera Province after regional autonomy. Furthermore, the study will analyse the influence of agricultural land area, regional income, degree of fiscal decentralisation, agricultural exports, plantation crop production,

farmer exchange rate and GDP per capita on the conditional convergence of disparity of regional income growth among districts/cities, and new autonomous districts/cities as a result of expansion in North Sumatera Province after regional autonomy. Finally, this study will identify the amount of regional income and GDP per capita of the parent district and the districts/cities of the new autonomous region due to the expansion after regional autonomy.

The research contribution is expected to provide an additional wealth of knowledge in regional economics and regional development, especially with regard to the convergence of regional income disparities. This study will contribute to the local governments to accelerate the convergence of income disparities in the Province of North Sumatera. We will provide input to local governments on the variables that converge or diverge in the process of income disparity convergence so that recommendations can be taken based on the estimated results obtained.

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