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## Effect of Economic Base and Growth on Income Distribution in West Sumatera

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### **Abstract**

This article reveals two research problems, namely: (1) The effect of economic basis on economic growth; (2) The effect of sector economic basis and economic growth on income distribution in West Sumatra. This is expost-facto research using panel data on sixteen districts/cities in West Sumatra for period of 2011-2015.Data were analyzed using panel regression (polled regression analysis). It was used statistical analysis of Chow Test and Hausmant test to determine model compatibility with existing data. The results of Chow Test and Hausmant Test show that the existing data are random effect, and then the analysis was continued with polled regression model without the requirement of classical assumptions. The results show that: (1). There is a very significant effect of economic basis on the economic growth; (2). There is a significant effect of economic basis and economic growth on income distribution. It proves that the economic basis owned by the districts/cities in West Sumatra is able to drive regional economic growth through income multiplier effect. Factually, it can be explained that the districts/cities having economic basis in more than three sectors of economic tend to have relatively higher economic growth, and then the districts/cities having more than three sectors of basis economic and higher economic growth tend to have more equitable income distribution and vice versa.

Keywords: economic basis, economic growth, income distribution.

# Introduction

Income distribution in West Sumatra for 2011 to 2015 period was in the category of medium as shown in the average Index Gini of 0,34%. The income distribution was relatively better compared to Indonesia's in the same period. Relative equitable income distribution in West Sumatra cannot be separated from employment field occupied by the general public as their income sources. The main income source of society in West Sumatra came from agriculture, industry and small-scale trade in the amount of 74% of the total population (The Indonesian Central Bureau of Statistics, West Sumatra: 2015). The research result ofAmar (2014) concluded that comprehensive mastery of households in West Sumatra was relatively narrow, which was only 0,32 hectares but it had very equitable distribution as shown by index Giniof 0,30. Furthermore, the research result concluded that the land region provides significant effect on the household income distribution.

On the other hand, in the same period, the economic growth in West Sumatra was high enough at 6,17%; the growth is relatively high compared to Indonesia's economic growth in the same period (5,47%). The economic growth that was relatively high in this region cannot be separated from economic growth in each existing economic sector. For 2011 to 2015 period, in average, sector of industry grew by 15,89%, mining 10,50%, electricity and drinking water 7,13%, construction 7,43%, trading 8,37%, banks and financial institutions 7,48%. The agricultural sector contributed 26,73%, which was the largest contributor in creating the Domestic Gross Regional Domestic Income (GRDI) of West Sumatra, whereas the trade sector contributed 24,03%, industry 12,14%, transportation and communication 9,24%, while the services sector only contributed 4,00%.

Although agriculture and trade sectors provided the largest contribution on GRDI, it is not necessarily that sector will serve as the economic basis and has advantage in the regional economy. Regional economic basis is determined by the economic potential in a region and its interaction with economic activity in other regions through the mobility of goods and services between regions. These



activities will not only create economic added value in the region but in turn, it will also create economic growth.

Economic growth is not the ultimate goal of the development process, yet it is important to take considerable efforts to create equitable income distribution between groups of people. There might be high economic growth, but it is only enjoyed by some people, as a result, there is inequality income distribution among them. That is why, Duedly Seer (in Todaro: 2012) was really concern about this issue, he started that there were three questions that must be answered in the development process, which were: (a) what was going on in poverty; (b) what happened to the unemployments; and (c) what happened to inequality income. In each development activities, it is important for development planning to pay attention to the three aformentioned things to create qualified development. The quality of the development will be seen from the increase of community's prosperity in a broader sense. The qualified development can be defined as an activity that does not only embody high economic growth but also development that creates chances and opprtunities for community to carry out economic activities in order to have more equitable income.

Income distribution in West Sumatra cannot be separated from the community role in the regional economic activity under the regional basis economy. West Sumatra has a good enough economic basis because they are supported by their potential natural and human resources. The economic basis of West Sumatra consists of several sectors, which are agriculture, trade, electricity and services; these four sectors have quite effective input and output linkages. It is suspected that they will participate in creating income distribution. West Sumatra's income per capita in the period of 2011 to 2015 was Rp. 22,04 million and it was higher than Indonesia's per capita income in the same period, which was Rp. 20,07 million, on the other side, income distribution in West Sumatra was relatively better than Indonesia in the same period. Departing from the phenomenon, this research analyzed two main issues, which were:

- 1. To what extent the effects of the economic basis on economic growth in West Sumatra.
- 2. To what extent the effects of sector of economic basis and economic growth on income distribution in West Sumatra.

Since the neoclassical economics era, development is identical with economic growth. A country will be considered to perform development, if the country is able to increase their gross domestic income from time to time. Until now, there are still many economic planners using economic growth and per capita income as an indicator of a country's development, despite the various shortcomings. Samuelson and Nordhaus (1985) are two of the economists who criticize confidence on economic growth and per capita income as a measurenment of development performance and economic progress of a country. Furthermore, according to him, per capita income and economic growth do not provide indication on how is national income distributed and who does get the most of it. If there are high economic growth and high per capita income, it does not mean that a region shall be free from all regional development issues. The possibility of the occurance of high economic growth is still followed by inequality income among individuals and groups of people.

Growth and equalization are two different dimensions and they are sometimes difficult to be embodied simultaneously because both aspects require different prerequisites. However, it is possible that both dimensions will be carried out simultaneously as long as the required preconditions are created by both dimensions through specific policy. Research conducted by Kuznets (1973) using time series data found that in the early stages of development, as a result of high economic growth, income distribution tended to be damaged, but in the long term these conditions were likely to improve. Furthermore, Kuznets argued that the occurance of trade off between growth and equalization was to the limitation of per capita income, which was US \$ 750 and the growth, which was 2.5%, and by passing through the critical condition, growth will be implemented simultaneously with equitable income distribution, this Kuznets' finding is better known as U Kuznets hypothesis.

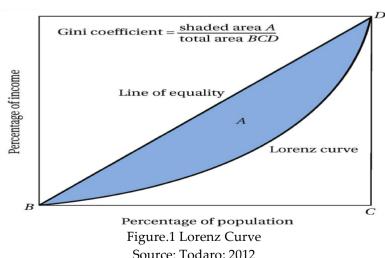
The same result was also found by Adelman and Morris (1973) using cross section data. The research concluded that there was a negative relationship between economic growth and social



prosperity differences. It wasfurther found that when new building process was started, the levels of prosperity among communities tended to be unbalanced, but if the development had been running for a long time, then the difference prosperity would be declined. However, study does not explain the time when growth and equalization can be implemented simultaneously. It is same with research result of Ahluwalia and Chenery (1979).

Trade-off between growth and distribution in the early development happens because at that period, potential economic sectors that can promote economic growth are developed, while economic sectors that are less favorable do not tend to be developed optimally. Furthermore, after passing the first phase, potential economic sectors will be able to distribute the results obtained to the economic sectors that have not developed through tricle down effect. By running the mechanism, it will provide positive impact on the growth and income distribution. Todaro (2012) suggested that there was no close relationship between economic growth and the distribution level. Furthermore Todaro also argued that the high level of growth do not necessarily damage or disturb the income. Research results conducted by Papanek (1977), in some developing countries, which were: (1) Taiwan, in the 1953 to 1961 period, Iran in the 1959 to 1968 period, and Korea in the 1964 to 1970 periods, found that there were high enough economic growth in those countries, and they were also successful in improving their income distribution, (2) in Mexico, in the 1963 to 1968 period and Panama in the 1960 to 1969 period showed that they had experienced rapid economic growth, but their income distribution was damaged, besides, the study did not show significant relationship between the growth level and income distribution, (3) in Peru, in the 1961 to 1971 period, Philippines in the 1961 to 1965 period, the low level of economic growth showed a negative effect on income distribution but in some countries, such as Sri Lanka, in the 1964 to 1970 period, Columbia in the 1960 to 1970 period, Costa Rica in the 1961 to 1971 period, and Elsalvador in the 1961 to 1969 period with the same low economic growth with the above countries, have managed to improve community income distribution.

According to Cowell (2007) income distribution consists of two approaches; first functional distribution, which is income distribution between the owners of production factors derived from the compensation received from production factors. Second, income distribution among individuals or households. Graphically, Lorenz Curved are used to find income distribution between individuals and households and quantitatively it can be calculated using Gini Index. Gini Index illustrates on how income is distributed to community groups equitably or inequitably. Gini Index will be between 0-1, if the Gini index closes to 0, then it means that the income distribution to the groups will be distributed equitably and vice versa. According Syafrizal (2014), criteria for the income distribution are grouped into three categories: Gini Index ≤ 0,40 shows fairly equitable income distribution; Index Gini > 0,40 - 0,50 ≤ shows moderate equitability, and the Index Gini > 0,50 indicates inequitable distribution.



Source: Todaro; 2012



Regional economic growth cannot be separated from the economic basis owned by a region. Glasson (1974) suggested that the economic basis may role as a driving force in the regional economic growth through the effect of income and employment multification. The more base activities in the region's economy, the more flow of goods exports and services go outside the region and in turn, it will create suistainable economic growth. Particularly, basis economic reflects region that have been self-sufficient on one kind of products to meet the regional needs, while excessive production are exported to other regions to meet their regional needs. Meanwhile, the non-basis economy representation of region that has not yet been able to meet their regional needs on product, so the region must import them from outside the region. According to Tiebout (1972), regional economic growth occurs because there is spending multifier effect from the income generated through the sale of goods and services produced by a region and marketed outside the region. In order to detect the regional economic basi, Index Location Quotient (LQ) can be used. Location coeffisien is a measurement of Revealed Comparative adventage which aims to measure the relative potential from a sector on regional economy compared to the same sector in other regions. LQ index ranges from greater than 1 and lesser than 1 (1> LQ> 1). If LQ> 1 means that a region has production, which exceeses its needs and then the excess can be exported out of theregioan, and vice versa for LQ <1.

## **Methods**

This is a quantitative descriptive research using pooled regression analysis. The researcher collected the data from sixteen (16) districts and cities in West Sumatra within the period of 2011 to 2015. Then, the researcher found 80 research data. The analysis consisted of two models as seen in the following equation:

$$X_2 = a + bX_{1it + \epsilon i.}$$
 (1)  
 $Y = a + b_1X_{1it} + b_2X_{2it + \epsilon i}$  (2)

Model 1: aims to find the effect of economic basis on economic growth in West Sumatera

Model 2: aims to find the effect of economic base and economic growth on income distribution in West Sumatera.

To find the right model that is suitable with the existing data, conformance testing on the model will be performed using Chow Test and Hausman Test through hypothesis testing, so it can produce estimation of the Best Linear Unbiased Estimation (BLUE). If the hypothesis result shows Fixed Effect Model (FEM) then regression with classical assumption will be used then if it shows Random Effects Model (REM) and Common Effect Model, then regression model without classical assumption will be used.

#### Results

## A. Description of Economic Potential in West Sumatera Region

1. Economic Potential in West Sumatera

West Sumatera has six economic sectors with various degrees of excellence. Those sectors are agriculture, industry, electricity, transportation, trade and services, those six sectors do not only produce goods and services for the needs in provision but they also can be exported to other regions as a result of surplus production.

From the six sectors of basis economic, there are only three sectors of which have relatively large surplus production, those sectors are: agriculture, industry and trade. Those three sectors are the real advantage of West Sumatra region because they are supported by existing potential and human resources. The other three basis sectors, namely electricity, transportation, and services have relatively small surplus production, in which its situations are different from the previous three-sector basis. Each sector has LQ Index, which is: 1,08 for the sector of electricity and drinking water, 1.11 for transportation and communication and 1,16 for services. In the other hand, the services sector has the largest income and employement impact, which respectively are 21,95 and 30,39.



No.	Economic Sectors	2012	2013	2014	2015	2016	Average
1.	Agriculture	1,52	1,45	1,45	1,42	1,37	1,44
2.	Mining	1,02	1,12	0,77	0,87	0,85	0,89
3.	Industry	1,16	1,18	1,88	1,87	1,92	1,60
4.	Electricity and Drinking Water	1,02	1,11	1,05	1,06	1,16	1,08
5.	Transportation and Communication	1,12	1,15	1,04	1,10	1,12	1,11
6	Construction	0,70	0,75	0,73	0,72	0,75	0,73
7.	Trade	1,45	1,43	1,43	1,43	1,50	1,45
8.	Bank and Financial Institution	0,60	0,72	0,72	0,68	0,72	0,69
9.	Services	1,12	1,17	1,17	1,15	1,20	1,16

These quantities can be interpreted that for every income in the amount of one billion rupiah derived from services sector tend to create regional income of 21,88 billion and employment of 30,39. The high income and employement multiplier effects in the service sector are the implications of the economic activities that are labor intensive as indicated by the employment, which is relatively larger. The consequence is that the companies tend to pay relatively high salaries/wages. Expenditure made by the company to pay wages and salaries would be income for manpower, the income will be spent by employees and then it will be the income for the next economic actors and so on. That is how regional income created. In addition, the industrial sector has high income and employment multiplier effect with a mean of 17,01 and 26,77 onwards followed by trade sector with average income multiplier of 15,72 and employment multiplier of 16,37 for the period of 2012-2016.

Table 2. Number of Income and Employment Multiplier of Basis Sector in West Sumatera Year of 2012–2016

No.	Economic Sector	2012	2013	2014	2015	2016	Average
1	Agriculture	2.45	2.35	2.30	2.36	2.15	2.32
		10.32	10.28	10.25	10.27	10.20	10.27
2	Industri	16.72	17.62	16.38	16.77	17.56	17.01
		25.34	30.26	24.21	27.16	26.89	26.77
3.	Trade	14.92	18.28	14.35	15.85	15.24	15.72
		15.24	19.23	14.56	16.26	16.59	16.37
4	Transportation and Communication	4.58	4.57	4.70	4.61	4.70	4.63
		9.54	9.45	10.02	9.51	10.02	9.71
No.	Economic Sector	2012	2013	2014	2015	2016	Average
5	Electricity and Drinking Water	2.15	2.30	2.60	2.56	2.72	2.47
		4.52	4.61	5.08	4.76	5.36	4.87
6	Services	21.73	21.69	22.22	21.88	22.25	21.95
		30.15	28.92	31.56	29.76	31.58	30.39
	Relative Surplus Index	1.92					
	Absolut Surplus		350.19				

<sup>\*</sup>Italic Number is Employement multiplier

Electricity and drinking water sectors are sectors having low average income multiplier, which is 2,47 and so does the employment multiplier, which is only 4,87. The low number multiplier on income and employment of electricity and drinking water sectors are the implications of a capital intensive activity, which means they do not employ too much manpower. In the capital intensive economic activity, the company does not need allocate extra expenditure for wages and salaries. The company expenditure for wages and salaray that are relatively low lead to the low employee



spending as income sources for economic agents in West Sumatra and so does the impact on the creation of regional income. According to Syafrizal (2014), process of income multiplier will take place with the assumption that if each reception in a region is spent again in the concerned region then there will be no leakage of a region.

Relative surplus index of basis economic is 1,92, while absolute surplus is Rp. 350,19 billion. Absolute surplus is a reflection of excessive production in West Sumatra exported out of the region that will increase regional income. The regional economic basis will promote the mobility of goods and services among regions efficiently through trade between regions based on the principle of comparative and competitive advantage.

#### 2. Economic Base in Each District and City

Padang and Bukittinggi have economic basis in four sectors. The economic base in Padang, namely: sector of trade, electricity & drinking water, transportation, as well as services. While Bukitinggi has the economic basis in the sector of industry, trade, transport and services. Both regions are the center of growth and development in West Sumatra. Bukttinggi is known as city tours supported by the sector of industry, trade, and transport. It is also known as a business city because it is supported by the existence of TelukBayur port and Minangkabau airport. The economic sectors supporting the city as a business city are sector of trade, electricity and drinking water as well as transportation which have sectoral linkages. Limapuluh Kota District and Payakumbuh City have economic basis in the three different economic sectors. A total of six regions, namely the Solok District, Tanah Datar District, Padang Pariaman District, and Dharmasraya District have basis on the two economic sectors. On the other hand, Pesisir Selatan District, Pasaman District, Padang Panjang City and Pariaman City have only one sector of economic basis. The four regions are included in less developed regions as shown by economic growth and per capita income lower that are lower than average income of West Sumatra.

Table 3. Economic Base in Districts/ Cities in West Sumatera

Tuble 5. Leonomic base in Districts/ Cities in West barratera								
No	Districts/Cities	A	В	C	D	E	F	Total
A.	Districts							
2.	Pesisir Selatan	V						1
3.	Solok	V	V					2
4.	Tanah Datar	V		V				2
5.	Padang Pariaman	V	V					2
6.	Agam	V				V		2
7.	Limapuluh Kota	V	V			V		3
8.	Pasaman	V						1
9	Dharmasraya	V			V			2
В	Cities							
1.	Padang			V	V	V	V	4
2.	Solok		V	V				2
4.	Padang Panjang			V				1
5.	Bukittinggi		V	V	V		V	4
6.	Payakumbuh		V	V	V			3
7.	Pariaman		V					1

Note:

A = Agriculture Sector

B =Industrial Sector

C = Trade Sector

D = Transportation Sector,

E= Electricity ans Drinking Water Sectors

F = Services Sector



#### **B.** Quantitative Analysis

The researcher performed model conformance analysis on existing data before analyzing them using the panel regression. The researcer used Model of Hausman Test and Chow Test. Hausman Test results show the value of Chie Square that is smaller than the value in the tables, while Chow test results show that the value of Chie Square is bigger than the value in the table. Therefore, it can be concluded that model, which is corresponding to the data used is Random Effects Model (REM). Subsequent analysis can be processed using Panel Data Regression Analysis (Pooled Regression) without classical assumptions as shown in the equation below.

1. The effect of economic basis on economic growth.

Based on the results of the regression analysis, it is found that there is significant effect between economic basis measured by the number of the economic basis and economic growth in West Sumatra, as shown by the following equation. $X_2 = 0.572 + 0.327 X_1$ 

(3,161)

Standard Error  $X_1 = 0.092$ , Significant Probability = 0.001

The equation means that if the economic basis has increased by one single unit, then regional economic growth will increase of 0.245 units. Further, it can be explained that the economic basis owned by aregion will be able to promote economic growth. Furthermore, based on data distribution, it is found that Padang city, Bukittinggi city have economic basis in four sectors, while Payakumbuh City and Limapuluh Kota District have economic basis in three sectors, indeed the four districts/cities have economic growth, which is above average of West Sumatera during the same period. On the other hand, economic growth in Pesisir Selatan District, Pasaman District and Pariaman City are below the average of West Sumatra's economic growth, instead they only have economic basis in only one sector. The occurrence of that condition is as a result of value-added created by each economic sector through its surplus production that can increase regional income sustainably embodied by the regional economic growth as suggested by Tibout (1972) and Glason (1974).

1. The effect of Economic basis and Economic Growth on Income Distribution

Independent Regression Standard t- test Significant. Probability Variable Coerffisien **Eror Economic Base** -0.4070,041 9,832 0,000 **Economic** -0,313 0,089 3,511 0,001 Growth Constant 0,071 0,152 0,000 4,664

Tabel 4 Panel Data Regression Analysis

Variable of economic base shows negative and significant effect on income distribution. The regression coefficient provides information that if the regional economic basis increases by one unit, then the Gini index will decline in -0.102. This means that if regional economic basismore increase, the income distribution will be more equitable and vice versa. Based on the existing data distribution in districts/cities, such as the Padang City, Bukittinggi City, Payakumbuh City and Limapuluh Kota District have the economic basis in more than three economic sectors indeed they have a Gini index below 0.40.On the other side the districts/citiesthat has economic base under two sectors of the economy tend to have Giniindex above 0,40. In contrast, the districts/cities that have economic basis in two sectors of the economy tend to have Gini index above 0.40. Significance of the effect of region's economic basis on income distribution is a reflection of economic activity in regions of West Sumatra dominated by small-scale economic activity and labor-intensive, played by more than 70 percent of the population in West Sumatra. The implication of small-scale activities is that the income received by the perpetrators is spent in their own region. The activity provides positive impact in driving the activity of other economic sectors such as trade and transportation and other service activity, which constitue income sources for community.



Economic growth in West Sumatra provides significant and negative impact on the income distribution. Furthermore, it means that the higher economic growth in a region, the better income distribution will be. Regression coefficient of -0.124 means that if economic growth increases by 1%, then Gini index would be decreased by 0.124 units. The significant effect on economic growth is as the effect of productivity of basis sector in producing goods and services, and then the exessive products will be exported out of West Sumatra region, which eventually generate income and regional economic growth through income multiplier effect. The six economic sectors becoming Economic basis in West Sumatra are small scale economic sectors and they are generally labor-intensive. They also create relatively large amounts of employment. This research is in line with the result of Papanek (1977) in Taiwan in the period of 1953 to 1961, Iran in the period of 1959-1968 and Korea in the period of 1964 to 1970. Those countries had experienced high enough economic growth and also had been successful in improving their income distribution. The same result was also found by Kuznets (1973), Hoolin B Ahluwalia and Chenery (1976).

#### Conclusions

Income distributions in the districts/cities of West Sumatra are quite varied. The Variety is affected by the amount of economic basis and its economic growth. Districts/cities having economic basis in more than 3 sectors tend to have more equitable income distribution (Gini Index <0.40), compared to districts/cities having economic basis in lesser than two sectors. The research results explain that there is a very significant effect of economic basis on economic growth and significant effect from both variables on income distribution. This proves that the economic basis owned by the districts/cities in West Sumatra is able to drive regional economic growth through income multiplier effect. Furthermore, small scale economic basis, which is capital intensive, played by more than 70% population in West Sumatra are able to create a more equitable income distribution. Significance of the effect of economic growth on income distribution, in fact can be explained that the districts/cities having above average economic growth in West Sumatra (6.17%) tend to have more equitable income distribution and vice versa.

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