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The role of mineral and coal mining on interregional convergence-divergence economic trend in Indonesia

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Abstract: Within the last 35 years of 1975-2010 it was shown that within 1975-2000 the trend of convergence of economy between the provincial index of gross regional domestic product (GRDP) per capita with the national index of gross domestic product (GDP) per capita figured out by the ratio of the GRDP per capita of the richest province to the poorest province equaled 21 to 25 in 1975 toward around 12 in 2000, even though on the post 2000 the provinces which were before 2000 under the national GDP per capita index (<100) declining and lesser. The provinces which have reached the points of convergence by the year of 2000 are Aceh, North Sumatera, West Sumatera, South Sumatera, East Java, Central Kalimantan, South Kalimantan and Bali. It is indicated that within the next 30 years the several other provinces which could reach the points of convergence are West Java, Central Java, DI Yogyakarta, West Kalimantan, Riau, Papua and East Kalimantan. However, the other several provinces which are not fully convergent in the meaning of almost consistently existing above the national GDP per capita (what so called the 'surplus' provinces), are Aceh, DKI Jakarta, and Bali. Moreover, on the other side, several provinces with GRDP per capita which consistently exist below the national GDP per capita (what so called the 'minus' provinces) with the downward sloping regression or with the gently upward sloping regression. Toward achieving points of economic convergence, those 'minus' provinces have to trigger their potential prime sectors, which have high economic multipliers.In generating their regional income, it is shown that almost all the provinces of Indonesia still rely on the primary sectors such as mineral and agriculture, with the consequences of low added value. It is expected that mineral and coal and its downstream industries could be able to support the 'minus' regions to converge to the national index. Augmenting the regional economic growth, the regions should develop the secondary and services industry which have high value-added multiplier to extend the across-regional trade as well as between the regions in the country with the neighbors' regions through subregional economic cooperation. Methodology applied in this study is based on regional economic modeling and observation.

Keywords: Indonesia, GDP/GRDP Per Capita, Economic Multipliers/Linkages/Convergence

1. Introduction

National development has two principle missions that may include the sectoral mission and regional one. The sectoral mission creates targeting to support the growth of the national economy. The regional mission creates targeting to support equitable development. National development in 1969-1974 priority of national economic growth, whereas after that stage was in 1974-1994 prioritizes equitable development. Based on Law No. 5 of 1974 on Regional Autonomy, in fact consciously, Indonesia has thrown regional development in an effort to create a regional development in the regions, in order to launch equitable development program.

This is reinforced by the presence of Laws No. 22 of 1999 and No. 32 of 2004 concerning Regional Government. Decentralization or regional autonomy is one of the megatrends in the 21st century (Naisbitt, and Aburdene, 1990). Indonesia has been on this trend. In the government sector, decentralization implies the creation of regional

autonomy which is a network of networks and not isolated regional autonomy and hegemonic. One indicator of the success in regional autonomy is the economic convergence between regions. One of the parameters in economic convergence is the regional income per head (capita) to the national income per head. The economic convergence would be achieved if there is potential sector pacing in the region that is able to be keeping pace with.

For more encouraging the creation of economic convergence, it is required an investment mechanism on the right sectors. This study is intended to look at the income per capita in the region within 1975 to 2012 and efforts as well as a mechanism to accelerate it forward, by looking at the role of the mining sector which are scattered in these regions but uneven. Thus, this idea can be developed into a micro-scale economic development programs in the area of the regions by diffusion or mobility of resources, production of goods and or services as well as dynamically interregional trade.

2. Theory and Methodology

2.1. Theory

a. Gross Domestic Product (GDP) and Gross Regional Domestic Product (GRDP).

GDP is the sum of state income in goods and services value form produced in a specified period, usually a year. GRDP is the sum of the income of a region (province, regency/city) in the form of goods and services produced in a specified period, usually a year.

GDP can be expressed on the basis of expenditure (Y_e) and on the basis of income (Y_i).

$$Y_e = C + I + G + X - M$$

C = consumption, I = investment, G = government expenditure, X = exports and M = imports.

Y_i = cumulative amount of revenue from all economic sectors = $\Sigma\, Y_i^j$, j = j sector.

Furthermore, Y_e symbol is the same as $Y_i = Y$, then $Y_e = Y_i = Y$.

b. GDP per capita and GDRP per capita.

GDP per capita is the GDP ($Y^N = Y$) divided by the number of national population in the same particular (Y/capita). GDRP per capita is the GDRP (Y^R) divided by the population of regional (local) related in the given same year (Y^R/capita).

c. Index of GDP/capita ($It^N = It$) and index GRDP/capita (It^R).

$I_t = Y^k{}_t$ x 100, and for the National $I_t^N = I_t = \frac{Yt^N/capita}{Yt/capita}$ x 100 = 100, and for Regional

$$I_t^R = \frac{Yt^R/capita}{Yt/capita} x100$$

in this case: I = index, t = Year, National Y_t = GDP in year t; $Y^k{}_t$ = k provincial GRDP in t year.

Furthermore Index Y/national capita notation given I_t , and Index Y/regional capita (local) notation given I_t^R.

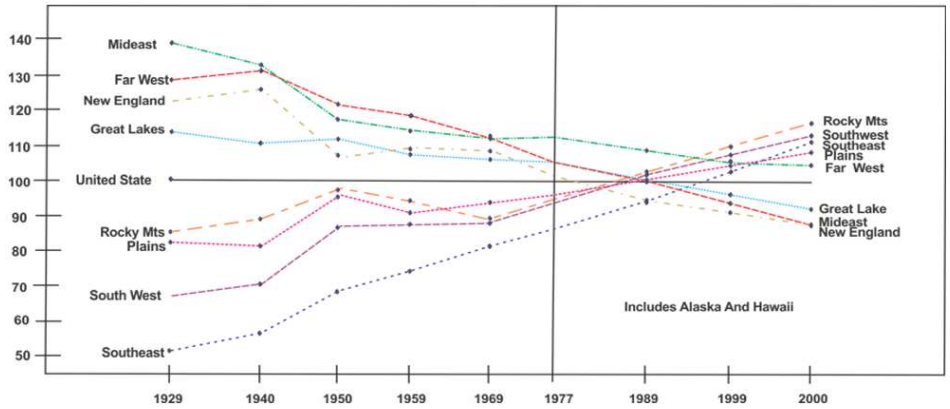
If the index Y/national capita or I_t is assigned a value index = 100, then the I_t^R can have the number 100 (= I_t) or greater than 100, or less than 100. Subsequently I_t^R greater than 100 is called the 'surplus', and I_t^R smaller than the 100 called the area 'minus'.

General formula for calculating the provincial index Y/capita provincial or lower area (regency/city) is:

$$I_t^R = \frac{Yt^R/capita}{Yt/capita} \text{ x } 100$$

Furthermore, the compiled I_t^R trend charts and I_t (100) within a certain period of years to have a look at the convergence trend and divergence of the national curve and regional ones level.

As an example can be seen in the trend of the indices charts in the U.S. economy (Figure 1).



Source : Myernick, 1982 (1929 -1977, U.S Department of Commerce, Bureau of Economy Analysis, Survey of Current Business (October 1978), p. 27).

Figure 1. *Historical Trend of GDP and GRDP Per capita Indices in the United States, 1929-2000*

To guide convergence 'minus' region (area) to the national index can be done by encouraging investment in leading sectors, whereas for the area 'surplus' policy is needed to reduce investment, or other mechanisms in terms of mobility of resources, goods and services, to be transferred to the 'minus' area. Finally, it creates an

equitable development by the presence of interregional balance of economic income or create economic convergence interregionally.

2.2. Methodology

Historical data are required in support of this analysis include provinves' GRDP in Indonesia, published by the Central Statistics Agency (BPS). From this data compiled index of national income per head and GRDP per head of each province and then compiled an index of national income per head and GRDP per head of each province and then compiled the convergence graphs. In order to see the prospects and forward investment options in order to push the convergence calculated economic multipliers (Thomas, 1982) is required Input-Output Table published by BPS in i.e. 2008. Besides, also conducted a statistical analysis of the valid results by location quotients method (LQ = location quotient) (Leontief, 1979; Miernyk, 1965, 1982; Isard, 1975; Soelistijo, 2012), and econometric models (Madala, 1977).

3. Results and Discussion

3.1. National and Regional Economic Development

a. Provincial and national indices of income per capita

Actually, by the year of 2000 Indonesia was consisted by 26 provinces, those are 8 provinces in Sumatera island, 5 provinces in Java, 4 provinces in Kalimantan, 4 provinces in Sulawesi, 1 province in Papua, 1 province in Maluku islands, 2 provinces in Nusa Tenggara and Bali Province (Figure 3). Howver, beyond the year of 2005 there were expansion program, where the formation of new provinces are alllowed by the law to be possiblity of economic development progress, then presently Indonesia has around 33 provinces (Table 1) and may be more in the future. This expansion could be clarified that Riau Islands Province was from Riau Province, Banka Belitung Islands Province from South Sumatera Province, West Sulawesi Province from South Sulawesi Province, Gorontalo Province from North Sulawesi Province, North Maluku Province from Maluku Province, and West Papua Province from Papua Province. From the data and index charts national income per capita and GDRP per capita of area in each province (Figure 2) is known that:

1).Provincial Indices that has exceeded GDP of the national head per capita index or what we called it as 'surplus' provinces (12 Province):

In the 1970s as the beginning of a five-year development program obtained index comparative rate of the highest of GRDP per capita to the lowest GRDP index per capita is approximately between 21 and 25 provinces, whereas in the 1990s the comparative rate had shrunk to about 12 provinces. In a 25-year index comparative rate of GRDP per head has dropped to approximately 50% or a trend of convergence of GRDP per head in the 1970s and the late 1990s. Since the 1970s, the provinces that have had GRDP per head up to the national GDP per head is six provinces namely NAD (Aceh), Riau, South Sumatera, Jakarta, East Kalimantan, Central Kalimantan and Papua, although Central Kalimantan declines under national index in the mid of 1980s and early 1990s.

In the early 1990s there were two provinces that have been able to surpass GRDP per head is above the national are North Sumatera and Bali. In 1999 or the year 2000, there are three provinces exceeded the GRDP per head is up to the national e.g. West Sumatera, East Java and South Kalimantan.

2).The potential province that can achieve national GDP per head.

In 2000 also seen the three provinces that have had the potential to be able to quickly reach the national GDP per head namely North Sulawesi, West Kalimantan, and Yogyakarta.

In the first decade of the 21st century, there are 6 new provinces Islands by the expansion namely Riau, Banka Belitung, West Sulawesi, Gorontalo, North Maluku and West Papua. Two surplus provinces are Riau Islands province and Banka Belitung (Babel) province , while the remaining are as 'minus' areas, under the national GDP/capita.

3). The 'minus' Province (GRDP per head in province under national GDP per head) (12 Provinces):

In the 1975-1999 period there were five provinces are very slow increase in GRDP per head and is still far under the national GDP per head namely West Java, Central Java, Central Sulawesi and West Nusa Tenggara. At the same time there are two or three provinces with GRDP per head is consistently under far the national GDP per head, namely Bengkulu, South Sulawesi, and East Timor. Still, there are four provinces with GRDP per head declined namely Jambi, East Nusa Tenggara, Lampung, Maluku and Southeast Sulawesi. In addition to the 'surplus' provinces that have exceeded national GDP per capita, entered a period of 30 years, based on an econometric regression model (Table 1) data showed that the convergence of GRDP per capita of West Sumatera province in 2009, West Java 2014, in Yogyakarta in 2009, West Kalimantan in 2012, 2014 East Kalimantan, and Central Java in 2029. There are superior provinces and do not fully converge but remained consistently on top the national GDP per capita, namely Aceh and Bali. On the other hand, there are provinces with GRDP per capita have consistently been under the national GDP per capita, namely the provinces of Jambi, Bengkulu, Lampung, Central Java, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, West Nusa Tenggara, Maluku (and East Timor). Even there is a declining province and from the beginning it was under the national GDP per head, i.e. East Nusa Tenggara and Maluku. Against the 'minus' provinces, special efforts by investing in the superior sectors that have high value added multiplier are required, even if it needs to be coupled with incentives. Regional autonomy process is being done in Indonesia and it is expected to create equitable development by generating

economic convergence, as happened within over the last approximately 70 years in the United States, since the years of 1930s up to the present (Figure 1).

4). Slope coefficient index trend charts

Convergence and divergence trends of each graph index of each province can be measured by the coefficient of the graph associated index. It is assumed that each index chart trend is linear with the equation I = a + bT, in this case I = trend graph index, T = year, a = point of intersection with a line graph index ordinate axis, b = slope of the trend graph index.

- If the trend graph index over the national axis (= 100), then if the positive b axis of the graph will be diverging to national; and b negative graphs will converge.

- Conversely, if the index graph trend under the national axis, then if the positive b axis of the graph will converge to the national axis; and b negative chart will be divergent.

Table 1. *Regression Index of Provincial Y/Capita Graphs, 1999-2012*

No	Province	'Surplus' or 'Minus' Provinces	Convergent / Divergent / has been in Convergent area (TK)	Linear Regression Coefficients		
				a	b	R^2
1	Nanggroe Aceh Darussalam (NAD)	Surplus	Convergent, Increasingly minus	10599.00	-5.2328	0.8622
2	North Sumatera	Surplus	TK	649.19	-0.2782	0.0139
3	West Sumatera	Surplus	Convergent, Increasingly minus	1566.90	-0.7214	0.1110
4	Riau	Surplus	Super surplus (Naughty boy)	-5395.30	2.8195	0.1955
5	Jambi	Minus	Convergen	-3014.90	1.5377	0.6711
6	South Sumatera	Surplus	TK	-1040.50	0.5650	0.0928
7	Bengkulu	Minus	Divergent, Increasingly minus	149.40	-0.0506	0.0026
8	Lampung	Minus	Convergen	-1274.80	0.6625	0.0885
9	Banka Belitung (Babel) Islands	Minus	TK	-6489.60	3.2822	0.2064
10	Riau Islands	Surplus	TK	-13545.00	6.8548	0.0900
11	DKI Jakarta	Super Surplus	Divergent ("Naughty boy")	-394.33	0.3927	0.0081
12	West Java	Minus	Divergent, Increasingly minus	270.83	-0.0957	0.0111
13	Central Java	Minus	Divergent, Increasingly minus	-22.53	0.0408	0.0006
14	DI. Yogyakarta	Minus	Divergent, Increasingly minus	3082.00	-1.5054	0.3183
15	East Java	Surplus- convergent	TK	333.57	-0.1222	0.0082
16	Banten	Minus	Divergent (more minus)	-3443.00	1.7515	0.1040
17	Bali	Minus	Divergent, Increasingly minus	3406.70	-1.6590	0.3685
18	West Kalimantan	Minus	Divergent, Increasingly minus	3341.80	-1.6344	0.4584
19	Central Kalimantan	Surplus	TK	2198.80	-1.0528	0.1615
20	South Kalimantan	Minus	Divergent, Increasingly minus	4545.00	-2.2281	0.6061
21	East Kalimantan	Surplus	Divergent, Increasingly minus	2684.00	-1.1176	0.0129
22	North Sulawesi	Minus	Divergent,Increasingly minus	1726.10	-0.8248	0.2087
23	Central Sulawesi	Minus	Divergent, Increasingly minus	590.29	-0.2638	0.0247
24	South Sulawesi	Minus	Divergent, Increasingly minus	-936.63	0.4962	0.0833
25	Southeast Sulawesi	Minus	Flat	-2761.70	1.4049	0.4156
26	Gorontalo	Minus	Divergent, Increasingly minus	-3221.40	1.6206	0.4970
27	West Sulawesi	Minus	Divergent, Increasingly minus	-6692.30	3.5011	0.8629
28	West Nusa Tenggara	Minus	Divergent, Increasingly minus	391.34	-0.1720	0.0688
29	East Nusa Tenggara	Minus	Divergent, Increasingly minus	1078.40	-0.5239	0.6329
30	Maluku	Minus	Divergent, Increasingly minus	2683.40	-1.3237	0.8558
31	North Maluku	Minus	Divergent, Increasingly minus	336.16	-0.1559	0.0046
32	West Papua	Surplus	Divergent, Increasingly surplus	-21774.00	10.9030	0.7904
33	Papua	Surplus	TK	5432.60	-2.6366	0.2046

From Table 1 can be seen that b lists of every trend graphs and the index of each province can be concluded that:

- 'Surplus' provinces which are convergent, but continue divergent to be a 'minus' keeping away from national axis, are provinces of NAD in Sumatera, Bali, and South Kalimantan.

- Provinces which have been in the area of convergence (TK) or the index had stood at around 85- 115, namely provinces of North Sumatera, Riau Islands, South Sumatera, Banka Belitung (Babel) Islands, East Java, Central Kalimantan, and Papua.

- 'Surplus' province but instead diverges away from the axis of the national index, or can be referred to as the "bad boy", namely the provinces of Jakarta, East Kalimantan, and Riau.

- 'Minus' province is moving into the area of convergent (TK) is the province of Babel Islands.

- 'Minus' province 'minus' but became surplus and kept away from the national axis is West Papua.

- 'Minus' provinces that have slow-moving convergent are provinces of Jambi, Lampung, Central Java, Gorontalo, West Sulawesi.

- 'Minus' provinces but instead diverges away from the national index axis or more 'minus', namely provinces of West Java, Yogyakarta, Banten, West Kalimantan, North Sulawesi, Central Java, South Sulawesi, West Sulawesi, West Nusa Tenggara, East Nusa Tenggara, Maluku, North Maluku.

- 'Minus' province 'minus' that moving horizontally is Southeast Sulawesi.

The meaning of the convergence-divergence is that:

- On after the implementation of regional autonomy or after the year of 2000 the 'minus' provinces indices decreasing their Y/capita or diverging are provinces of West Java, Yogyakarta, Banten, West Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, West Sulawesi, West Nusa Tenggara, East Nusa Tenggara, Maluku, and North Maluku. This indicates that the regional autonomy funds have not been utilized efficiently or many leaks. Although there are also the 'minus' provinces converging or increased their Y/Capita indices, those are provinces of Jambi, Lampung, Central Java, Gorontalo.

- In contrast to the surplus province diverging even that can be called a "bad boy" who would leave the national axis. And there are also the provinces of the 'surplus' and have a converging trend toward national axis line.

- Against to divergent provinces need policies to be taken in order to converge, otherwise to the convergent provinces should be given policies in order are in the national axis area, so that all provinces converge toward the national axis (100) and subsequently created the equitable distribution of income through equitable development and development outcomes. The policy may include, among others, the reallocation of the budget (natural resources sharing, block grant, special grant, etc) and also through the reallocation of funds in the state budget of development/investment, including infrastructure.

b. Percentage Distribution of GRDP to Economic Growth Rate of Regions (Tables 3 and 4, Figure 3).

In 1975 there were six provinces as contributor to the national GDP amounted to approximately 70%, consisting of three provinces with GRDP per capita over the national GDP per capita or the 'surplus' province namely North Sumatera, Riau and Jakarta and 3 provinces with GRDP per capita under the national GRDP per capita namely West Java, Central Java and East Java. The six provinces have economic growth rate, for the three 'surplus' provinces between 1.06% and 11.17%, or an average of 7.25% and for the three provinces 'minus' between 3.89% and 10.75 % or an average of 7.56% (1976 rate) slightly above the province rate of 'surplus'.

Thus, the convergence trend have existed, in this case essentially the 'minus' province have a greater rate of economic growth in order to more quickly achieve the national GDP per capita. But in 2000 or after the implementation the second stage of regional autonomy, it indicates a divergence in the minus provinces or increasingly, for example, several provinces such as Bengkulu, East Java, South Sulawesi, South Kalimantan, Bali, West Nusa Tenggara, East Nusa Tenggara, Maluku, Banten; and several new provinces are North Maluku, West Sulawesi, Gorontalo. This shows the inefficiency in the use of development funds or leakage (Tables 1, 2 and 3).

Table 2. *Per Capita GRDP Indices of Every Province and Its Projection in Indonesia, 1999-2011 and Beyond 2011 +)*

Province/National	a	b	Y/capita Index						
			1999	2000	2005	2006	2007	2011	
1. NAD (Aceh)	192.93	-0.25	149	135	111	115	99	77	1978
2. North Sumatera	90.49	0.48	117	88	88	84	81	98	1992, declining since 2000
3. West Sumatera	65.59	1.02	108	80	77	76	72	83	1999, declining since 2000
4. Riau	789.38	-28.14	253	284	240	233	236	302	2000 (114)
5. Jambi	77.45	-0.74	69	59	67	64	67	83	*)
6. South Sumatera	156.48	-2.66	105	89	95	92	89	99	1999
7. Bengkulu	60.11	0.14	57	46	51	47	45	51	**)
8. Lampung	62.72	-0.55	69	51	45	45	48	69	*)
9. DKI Jakarta	184.74	6.97	375	410	372	355	410	410	***)
10. West Java	68.39	0.81	87	77	79	74	77	80	2014 (100)
11. Central Java	54.38	0.84	78	57	58	55	57	62	
12. DI Yogyakarta	45.88	1,6	97	65	58	55	65	60	
13. East Java	65.26	1.18	102	88	85	82	88	86	Declining since 2000
14. West Kalimantan	68.29	0.85	95	70	61	58	70	61	
15. Central Kalimantan	95.43	0.77	119	91	84	78	91	89	Declining since 2000
16. South Kalimantan	72.46	1.09	108	85	69	66	85	66	Declining since 2000
17.East Kalimantan	822.18	-18.5	414	415	451	399	415	433	2014 (100)
18.North Sulawesi	74.49	-0.42	92	70	65	63	70	73	*)
19. Central Sulawesi	58.56	0.03	79	62	55	52	62	67	**)
20. South Sulawesi	64.86	-0.21	70	55	53	51	55	69	*)
21. Southeast Sulawesi	64.8	-0.55	61	50	51	50	50	61	*)
22. Bali	63.94	2.39	113	83	72	69	83	75	1990, Declining since 2000

Province/National	a	b	Y/capita Index						
			1999	2000	2005	2006	2007	2011	
23.West Nusa Tenggara	41.02	0	50	46	45	44	46	43	*)
24. East Nusa Tenggara	40.29	-0.3	34	30	26	24	30	27	*)
25. Maluku	98.55	-1.77	42	32	27	25	32	25	*)
26. Papua	183.47	-1.99	191	145	158	156	145	107	2017
27. East Timor	29.59	0.71	-	-	-	-	-	-	2074 (Before Timor Leste)
28. Bangka Belitung			-	95	107	98	110	100	Increasing since expansion
29. Kepri			-	-	254	229	298	193	Increasing since expansion
30. Banten			-		92	88	82	72	Declining since 2004
31. Gorontalo			-	26	29	28	30	35	**)as corn province
32. West Sulawesi			-	-	36	34	35	41	Slow since expansion
33. North Maluku			-	38	23	20	19	23	Declining since expansion
34. West Papua			-	96	86	82	96	175	Expected increasing after LNG is strong
National			100	100	100	100	100	100	

Note: *) Because of its trend was decreased (Downward sloping), should be anticipated and accelerated economic growth, **) Though increasing, but it is very slow so that needs to be increased economic growth, ***) Because since 1975 has been on the national index, economic growth should be handled, +) With a linear regression function I = a + bt, in this case I = index, T = year, b = slope from 1975 to 1999 based on the data. As an indicator of convergence is I = 100 achieved in T year.

Table 3. *Percentage Distribution of GRDP Based on Province Against the National GDP,1975-2012*

No	Province	2012	2011	1975	1980	1990	1997	1998	2000	2007
1	NAD (Aceh)	1.17	1.44	1.79	3.97	5.08	2.89	2.80	2.45	2.08
2	North Sumatera	4.26	5.28	5.83	6.02	5.27	5.94	6.23	5.85	5.16
3	West Sumatera	1.34	1.66	1.35	1.80	1.62	1.88	2.18	1.92	1.70
4	Riau	5.69	6.96	15.31	9.18	8.57	4.69	5.26	4.75	5.96
5	Jambi	0.88	1.07	0.73	0.74	0.75	0.80	0.84	0.78	0.91
6	South Sumatera	2.50	3.05	4.51	4.64	4.33	3.52	4.06	3.92	3.12
7	Bengkulu	0.29	0.36	0.27	0.34	0.40	0.44	0.44	0.39	0.36
8	Lampung	1.75	2.17	1.97	1.74	1.70	1.84	2.27	1.99	1.73
9	DKI Jakarta	13.39	16.05	8.79	9.25	12.15	16.87	17.03	16.12	16.06
10	West Java	11.49	14.49	14.58	14.61	15.97	17.64	17.54	15.57	14.92
11	Central Java	6.75	8.39	10.93	10.4	10.79	10.52	10.36	10.15	8.86
12	DI Yogyakarta	0.69	0.86	1.24	1.04	0.96	1.24	1.20	1.11	0.93
13	East Java	12.15	14.19	15.00	16.16	14.88	15.5	16.56	15.20	15.17
14	West Kalimantan	0.91	1.11	1.42	1.48	1.40	1.78	1.80	1.53	1.20
15	Central Kalimantan	0.68	0.83	0.54	0.75	0.68	1.04	1.06	0.93	0.79
16	South Kalimantan	0.92	1.01	1.11	1.02	1.22	1.40	1.50	1.52	1.12
17	East Kalimantan	5.09	6.57	3.81	5.82	5.17	4.77	6.33	6.19	6.01
18	North Sulawesi	0.57	0.70	1.27	1.34	0.85	0.98	1.16	1.01	0.69
19	Central Sulawesi	0.62	0.75	0.48	0.51	0.51	0.61	0.81	0.71	0.62
20	South Sulawesi	1.93	2.30	3.04	3.12	2.47	2.36	2.70	2.28	1.96
21	Southeast Sulawesi	0.44	0.58	0.43	9.41	0.46	0.42	0.54	0.49	0.51
22	Bali	1.02	1.23	1.30	1.52	1.42	1.68	1.52	1.42	1.20
23	West Nusa Tenggara	0.60	0.82	0.82	0.79	0.72	0.79	0.95	1.02	0.95
24	West Nusa Tenggara	0.43	0.53	0.79	0.80	0.63	0.71	0.60	0.54	0.54
25	Maluku	0.14	0.16	0.87	0.91	0.76	0.70	0.64	0.39	0.16
26	Papua	0.94	1.28	1.80	1.49	0.97	1.65	2.34	1.78	1.57
27	East Timor	-	-	-	-	0.12	-	-	-	-
28	Banka Belitung Islands	0.42	0.50	-	-	-	-	-	-	0.51
29	Riau Islands	1.11	1.35	-	-	-	-	-	-	1.47
30	Banten	2.58	3.23	-	-	-	-			3.05
31	Gorontalo	0.13	0.15	-	-	-	-	-	-	0.14
32	West Sulawei	0.17	0.22	-	-	-	-	-	-	0.18
33	North Maluku	0.08	0.10	-	-	-	-	-	-	0.11
34	West Papua	0.52	0.61	-	-	-	-	-	-	1.22
National		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Anonymous (a0 up to (f); Central Statistics Agency, 1975-2012, and the related years, recalculated..

c. Potential Sectoral Analysis Based Location Quotients (LQ)

To explore what sectors are top priority to be developed, the technique can be used in a simple location quotient (LQ = location quotient). Basically, this technique presents a relative comparison between the ability of a sector in the area investigated by the ability of the same sector in the wider region.

Based on the results of these calculations, we can conclude several things about the mainstay sectors and provinces in Indonesia by LQ greater than 1, as follows (Table 5):

Indonesian provinces generally have excess production of the agricultural sector, with LQ values between 1.03 to 2.69, except Riau (LQ = 0.49), Jakarta (LQ = 0.01), and East Kalimantan (LQ = 0.63). In other words, that the regions that have LQ > 1 have met the requirements (self-sufficiency) in the agricultural sector, and even excess agricultural products sold ('exported') to other regions.

Provinces that have the potential for business development in mining/quarrying is NAD (Nanggroe Aceh Darussalam), Riau, South Sumatera, East Kalimantan and Papua, with LQ values between 1.84 to 7.15.

Provinces that have a potential for increased revenue for the region (GRDP) and manufacturing sectors are Aceh, North Sumatera, Jakarta, West Java, Central Java, East Java, South Kalimantan and East Kalimantan, with values between 1.00 LQ up to 1.49.

Potential provinces in the sectors of electricity, gas and water are West Sumatera, Jakarta, West Java, East Java, South Kalimantan, and Bali, with LQ values between 1.01 to 1.84.

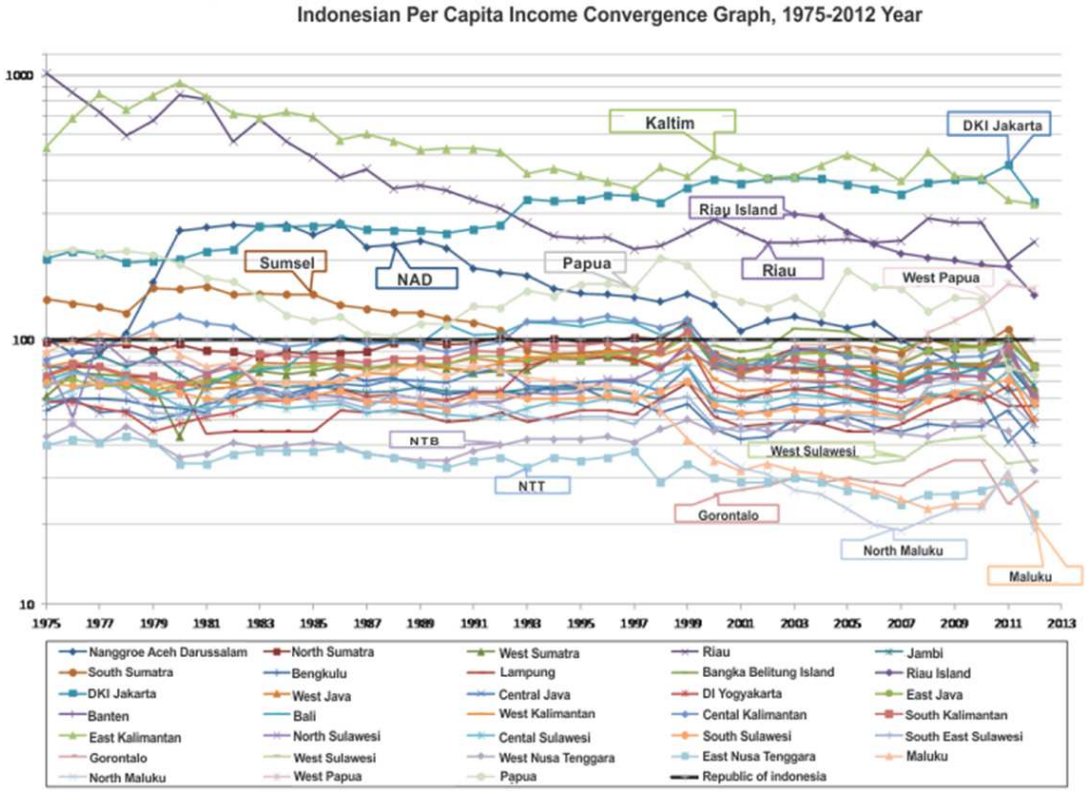


Figure 2. *Graphs of the Indonesia and Provincial Per Capita Income Indices, 1975-2012*

Potential provinces in the building sector are South Sumatera, Lampung, Jakarta, DI Yogyakarta, East Java, North Sulawesi, Central Sulawesi, Southeast Sulawesi, West Nusa Tenggara, East Nusa Tenggara, Maluku, Papua, (and East Timor), with LQ values between 1.01 to 3.09.

Potential provinces in trade, restaurants and hotels are North Sumatera, West Sumatera, Jambi, South Sumatera, Lampung, DKL Jakarta, West Java, Central Java, Dl Yogyakarta, East Java, West Kalimantan, Central Kalimantan, South Kalimantan, South Sulawesi, Bali, West Nusa Tenggara, and Maluku, with values between 1.03 to 2.08.

Potential provinces in transportation sectors and communication are Aceh, North Sumatera, West Sumatera, Jambi, Bengkulu, Lampung, Jakarta, West Java, DI Yogyakarta, East Java, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Sulawesi, Central Sulawesi, Southeast Sulawesi, Bali, West Nusa Tenggara, East Nusa Tenggara, and East Timor, the LQ values between 1.00 to 2.23.

Potential province in financial sector, building rental and service company there is only one that is DKI Jakarta, the LQ value of 1.20.

Potential provinces for development in the services

sector are West Sumatera, Jambi, Bengkulu, Lampung, DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, West Kalimantan, Central Kalimantan, South Kalimantan, North Sulawesi, Sulawesi Central, South Sulawesi, Southeast Sulawesi, Bali, West Nusa Tenggara, East Nusa Tenggara, Maluku, and East Timor, the LQ values between 1.05 to 2.82.

Table 4. *GRDP Growth Rate of Each Province in Indonesia Based on Constant Price, 1976-2012 (in Percent)*

No	Province	2012	2011	1976	1980	1985	1990	1995	1997	1998	1999
1	DI Aceh	9.28	-2.21	5.96	25.01	2.71	5.54	1.45	-0.16	-9.28	-4.52
2	North Sumatera	11.69	6.90	9.52	8.17	4.06	8.40	8.72	5.70	-10.9	2.53
3	West Sumatera	11.26	6.34	-	12.31	4.25	7.01	8.96	5.14	-6.49	1.33
4	Riau	13.38	3.41	1.06	-1.05	-4.20	7.82	4.62	3.16	-3.86	3.40
5	Jambi	14.68	6.82	5.92	4.23	7.05	9.09	8.64	3.91	-5.41	2.90
6	South Sumatera	13.13	5.84	6.28	5.83	5.29	0.20	8.68	5.08	-6.81	3.17
7	Bengkulu	13.65	6.03	14.71	12.03	7.69	7.14	8.10	3.07	-6.27	1.61
8	Lampung	13.02	5.94	-1.38	5.02	7.35	7.30	10.50	4.15	-6.95	2.64
9	DKI Jakarta	12.34	6.44	11.17	9.26	5.14	8.58	9.26	5.11	-17.49	-1.29
10	West Java	9.97	6.41	10.75	11.39	6.12	9.45	8.07	4.87	-17.77	2.02
11	Central Java	11.57	5.59	8.06	14.01	8.35	6.96	7.20	3.03	-12.24	3.99
12	DI Yogyakarta	10.14	4.31	2.16	8.89	1.42	4.85	8.21	3.53	-11.28	3.31
13	East Jawa	13.25	6.11	3.89	13.45	5.50	8.00	8.19	4.20	-16.12	0.54
14	West Kalimantan	12.13	6.02	10.68	14.79	7.00	6.80	9.50	7.53	-4.71	2.71
15	Central Kalimantan	13.92	6.06	14.49	21.91	6.31	8.45	9.03	6.29	-6.92	-0.16
16	South Kalimantan	11.35	6.01	11.49	4.19	2.88	7.03	9.07	4.57	-5.53	1.60
17	East Kalimantan	7.08	1.23	40.12	-1.83	0.75	6.80	4.01	4.45	-0.76	4.23
18	North Sulawesi	12.83	6.47	-4.54	18.37	3.41	9.19	8.63	5.38	-2.37	5.69
19	Central Sulawesi	15.23	7.99	15.40	8.23	4.85	9.61	8.51	4.71	-3.96	2.80
20	South Sulawesi	16.04	6.34	4.52	8.42	7.45	6.92	8.16	4.30	-5.33	2.83
21	Southeast Sulawesi	13.98	7.96	10.36	11.50	3.93	13.04	7.29	5.32	-5.78	2.25
22	Bali	13.39	5.92	11.32	17.01	8.56	8.84	7.92	5.81	-4.04	0.67
23	West Nusa Tenggara	1.44	4.89	8.54	9.08	3.19	8.00	8.05	5.26	-3.70	2.47
24	East Nusa Tenggara	12.91	5.15	5.48	13.15	3.76	7.57	8.81	5.62	-2.72	2.74
25	Maluku	19.48	5.62	16.87	17.62	4.33	8.97	6.51	3.50	-5.93	-26.90
26	Papua	1.58	4.28	16.49	0.26	-2.18	7.92	21.56	7.42	12.72	-3.64
27	Timor Timor	-	-	-	-	6.96	16.66	10.71	-	-	-
28	Banka Belitung Islands	12.85	4.54	-	-	-	-	-	-	-	-
29	Riau Islands	14.31	7.01	-	-	-	-	-	-	-	-
30	Banten	10.73	6.04	-	-	-	-	-	-	-	-
31	Gorontalo	13.26	7.51	-	-	-	-	-	-	-	-
32	West Sulawesi	11.83	7.43	-	-	-	-	-	-	-	-
33	North Maluku	14.56	6.01	-	-	-	-	-	-	-	-
34	West Papua	18.19	6.95	-	-	-	-	-	-	-	-
National		100.00	6.32	6.63	4.62	4.38	7.54	8.21	4.70	-13.01	0.31

Source: Anonymous (a) up to (f); Central Statistics Agency, 1975-2012, and the related years, recalculated.

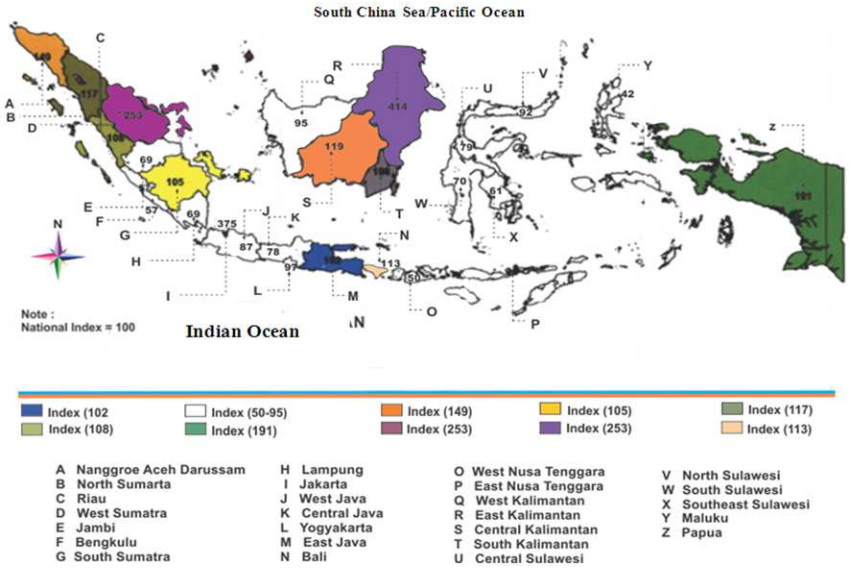


Figure 3. *National Per Capita GDP Index and Provincial GRDP Per Capita Indices in the year of 2000*

In getting regional income, it turns out almost all provinces in Indonesia still relies on primary sectors with low added value consequences. Therefore, it is necessary to develop secondary and tertiary sectors to increase local revenues and society by creating as many jobs in this sector.

For the secondary sector which seems to can be developed are in the provinces of West Java with LQ = 1.84 and East Java with LQ = 1.84, i.e. manufacturing and electricity, gas and water. As for the tertiary sector has been visible progress with LQ values above 2, respectively (Table 5) for the building sector in Jakarta; trade, restaurant & hotel in Bali; transport and communication in the provinces of Bengkulu, North Sulawesi, and Bali; services, in the provinces of West Sumatera, Bengkulu, DI Yogyakarta, North Sulawesi, Southeast Sulawesi, West Nusa Tenggara, East Nusa Tenggara, (and East Timor). Although it has been seen from the figure LQ leading sector today, but there are provinces that still have the potential leading sector value with a higher multiplier value added than leading sectors today. Thus, a potential leading sector in this particular province needs to be nurtured by investment priorities so that future LQ has a high rate as well. Examples can be seen in Table 5.

Table 5. *Sectoral Location quotients (LQ) of Each Province in Indonesia*

No	Provinces	Location Quotients								
		Primary Sector			Secondary Sector / Manufacturing Industry			Tertiary Sector		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	NAD (Nanggroe Aceh Darussalam)	1.54	3.62	1.21	0.15	0.69	0.36	1.00	0.08	0.66
2	North Sumatera	1.65	0.32	1.24	0.84	0.63	1.29	1.42	0.38	0.76
3	West Sumatera	1.41	0.82	0.69	1.01	0.95	1.17	1.87	0.29	2.06
4	Riau	0.49	7.15	0.83	0.35	0.42	0.48	0.42	0.20	0.35
5	Jambi	1.86	0.47	0.84	0.65	0.93	1.23	1.72	0.23	1.32
6	South Sumatera	1.47	1.84	0.97	0.58	1.16	1.19	0.79	0.28	0.85
7	Bengkulu	2.45	0.48	0.14	0.71	0.91	0.93	2.31	0.22	2.22
8	Lampung	2.62	0.23	0.62	0.43	1.31	1.05	1.06	0.26	1.18
9	DKI Jakarta	0.01	0.00	1.00	1.47	2.10	1.49	1.30	1.20	1.26
10	West Java	1.03	0.70	1.53	1.84	0.92	1.24	1.00	0.25	1.16
11	Central Java	1.50	0.15	1.49	0.66	0.64	1.42	0.63	0.25	1.27
12	DI Yogyakarta	1.20	0.02	0.67	0.65	1.51	1.07	1.88	0.52	2.49
13	East Java	1.14	0.24	1.34	1.50	1.01	1.45	1.05	0.30	1.31
14	West Kalimantan	1.58	0.17	0.93	0.73	0.89	1.37	1.44	0.34	1.65
15	Central Kalimantan	2.69	0.30	0.57	0.27	0.87	1.23	1.59	0.15	1.05
16	South Kalimantan	1.56	0.96	1.02	1.15	0.85	1.15	1.72	0.24	1.07
17	East Kalimantan	0.63	4.37	1.42	0.27	0.45	0.58	1.52	0.17	0.27
18	North Sulawesi	1.81	0.44	0.41	0.61	1.67	0.83	2.23	0.27	2.28
19	Central Sulawesi	2.64	0.38	0.37	0.49	1.30	0.85	1.40	0.23	1.88
20	South Sulawesi	2.59	0.57	0.55	0.88	0.82	1.03	0.96	0.31	1.44
21	Southeast Sulawesi	2.21	0.38	0.46	0.48	1.78	0.74	1.17	0.23	2.40
22	Bali	1.33	0.10	0.38	1.03	0.72	2.08	2.17	0.36	1.87
23	West Nusa Tenggara	2.53	0.39	0.22	0.37	1.24	1.10	1.54	0.16	2.15
24	East Nusa Tenggara	2.63	6.21	0.12	0.73	1.28	0.81	1.68	0.23	2.59
25	Maluku	1.79	0.77	0.82	0.65	1.03	1.33	0.91	0.31	1.38
26	Papua	1.21	6.89	0.19	0.29	1.05	0.30	0.57	0.11	0.84
27	Banka Belitung Islands	1.25	1.40	0.85	0.90	0.76	1.39	0.50	0.36	1.02
28	Riau Islands	0.31	0.63	1.97	0.80	0.76	1.43	0.68	0.69	0.25
29	Banten	0.54	0.01	1.96	4.73	0.35	1.34	1.40	0.53	0.53
30	Gorontalo	1.93	0.10	0.21	0.73	0.69	0.80	1.39	1.48	2.55
31	West Sulawesi	3.29	0.07	0.31	0.70	0.40	0.94	0.32	0.80	1.67
32	North Maluku	2.45	0.42	0.52	0.75	0.31	1.76	1.16	0.53	0.65
33	West Papua	0.83	0.55	2.29	0.37	0.64	0.45	0.66	0.23	0.62

Description: Primary sector: (1) Agriculture; (2) Mining and Quarrying; Secondary sector: (3) Manufacturing;Tertiary sector: (4) Electricity, Gas and Water; (5) Building; (6) Trade, Restaurants and Hotels; (7) Transportation and Communications; (8) Financial, Ownership Building, and Business Services; (9) Services.
Source: Calculation result based on data from the Central Statistics Agency, 2012.

In Table 6, the effect of value-added multiplier of four provinces is shown that already have Input-Output Table, the provinces of East Java, Maluku, South Sumatera and Papua, and which is obtained by using the Input-Output analysis. Based on the analysis of location quotients turns out that Papua province whose value is greater than 1 in

general only be clustered in four sectors, namely agriculture sectors, mining and quarrying, and construction.

Based on Input-Output analysis turns out that other sectors such as manufacturing, if excavated properly and able to provide value-added integrated large enough. This is evident from the magnitude of the value-added multipliers, especially for the food industry sector, beverage, tobacco by 6.69, the restaurant/hotel industry of 2.57 and 1.80 for other goods. In general, based on the value of the multiplier, it turns out almost all economy sectors in Papua province is expected to give effect to the improvement of regional economic growth.

In South Sumatera, potential sector that can be developed in addition to the sectors of agriculture, mining and quarrying, construction, trade, as well as restaurants and hotels, it turns out other sectors that have opportunities to be developed for other goods industries, electricity, gas/water , and transport/communications, because it has multiplier greater than 1 (values of 1-5).

In East Java, the potential that can be developed in addition to the sectors of agriculture, the processing industry, electricity, gas and water, building, trade, restaurants and hotels, transport and communication, and services, it appears that the mining/quarrying has chance to develop because the multiplier value added is greater than 1.

Whereas in Maluku Province, the potential that can be developed in addition to the sectors of agriculture, building, trade, restaurants and hotels, and services, it appears the other sectors that have a chance to develop is food industy, beverages, tobacco, and industrial goods Alternatively, for a value exceeding multiplier than 2.

In order to enhance economic growth in each province did not miss and role of the Government and Local Government as facilitator in order to find a partner in the form of cooperation among regions in the country and with neighboring countries outside the state, although the role and remain as key economic actors.

Table 6. *Each Sector's Economic Multiplier of Several Provinces based on Price Manufacturer Parameter*

No	Sectors	Multiplier Effect											
		East Jawa (2006)			Maluku (2007)			South Sumatera (2006)			Papua (2003)		
		Add Value	Income	Employment	Add Value	Income	Employment	Add Value	Income	Employment	Add Value	Revenue	Labor
1	Paddy	1.05	1.12	1.30	1.09	1.11	1.07	1.10	1.45	1.51	1.05	1.06	1.09
2	Other foodstuff plant	1.07	1.15	1.43	1.08	1.12	1.09	1.07	1.35	1.17	1.07	1.09	1.37
3	Plantation plant	1.12	1.18	1.13	1.21	1.19	1.20	1.13	1.24	1.21	1.21	1.21	1.22
4	Livestock & products	1.51	1.75	1.66	1.41	1.38	1.23	1.61	1.53	1.23	1.53	1.50	1.44
5	Forestry	1.09	1.21	1.02	1.04	1.07	1.19	1.11	1.54	1.20	1.15	1.24	1.12
6	Fishery	1.19	1.30	1.06	1.14	1.17	1.05	1.33	1.54	1.15	1.10	1.11	1.13
7	Industrial Minerals/C group minerals	1.08	1.15	1.13	1.07	1.04	1.05	1.12	1.60	1.04	1.09	1.07	1.05
8	Coal Mining	0.00	0.00	0.00	-	-	-	1.27	1.64	1.01	-	-	-
9	Other Mining	1.08	1.11	1.55	-	-	-	1.12	1.34	1.69	1.17	1.25	1.02
	Oil Mining and Gas	-	-	-	1.11	1.39	1.29	-	-	-	1.06	1.24	1.07
	Nickel Mining	-	-	-	1.27	1.25	1.06	-	-	-	-	-	-
	Tin Mining	-	-	-	-	-	-	1.27	1.57	1.00	-	-	-
10	Food, Beverages, Tobacco	2.91	2.41	1.75	11.94	12.94	1.48	-	-	-	6.69	6.21	2.22
11	C Group Mineral Industry User	2.00	1.88	1.40	2.49	2.98	1.00	1.59	1.48	1.10	1.92	2.13	1.01
12	Other Industry Group	1.78	1.45	1.40	2.56	2.35	4.80	2.28	1.29	5.24	1.80	1.72	1.44
13	Petroleum Industry and Gas Refinery	1.75	1.30	1.01	0.00	0.00	0.00	2.65	1.22	2.51	0.00	0.00	0.00
14	Electricity, Gas, and Water	1.47	1.53	1.54	1.80	1.52	1.41	2.90	1.56	1.47	1.75	1.63	1.39
15	Building	2.06	1.73	1.39	3.30	2.06	1.39	2.08	1.51	1.90	1.53	1.29	1.25
16	Trade	1.14	1.23	2.63	1.07	1.10	1.89	1.05	1.50	1.75	1.07	1.11	1.80
17	Restaurant and Hotel	1.95	1.52	1.14	2.31	1.80	1.13	2.35	1.48	1.11	2.57	2.14	1.19
18	Transportation and communication	1.34	1.25	1.44	1.46	1.48	1.59	1.64	1.59	1.13	1.29	1.28	1.60
19	Financial Institution, Business Building	1.24	1.33	1.58	1.15	1.20	1.51	1.12	1.42	1.27	1.13	1.23	1.14
20	Government	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
21	Services	1.35	1.31	1.25	1.55	1.24	1.11	1.28	1.56	1.04	1.21	1.11	1.13
22	The activity that not clear of its limit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*) The results of calculation based on Input-Output Transactions Table of the newest in East Java Provinces (2006), Maluku (2007), South Sumatera (2006), and Papua (2003); Add Value = Added Value

3.2. Future Prospects

a. Interregional linkages among territories and across-countries. Encouragement of development in the region in cross-sector has to be followed by territorial cross-sector namely interregion. Both interregions in the country and among interregions with the neighboring country territories through subregional economic cooperation such as Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT), Indonesia-Malaysia-Singapore Growth Triangle (IMS-GT), Brunei Darussalam-Malaysia-Philippines-lndonesian East Asean Growth Area (BIMP-EAGA) and the Australia-Indonesia Development Area (AIDA) are complementary (mutually supportive). IMT-GT includes three provinces in Indonesia (Aceh, North Sumatera, West Sumatera), four states in Malaysia (Perlis, Perak, Kedah, Penang) and five provinces in southern Thailand (Narathiwat, Songkhla, Pattaya, Satun, Yale). IMT-GT covers two provinces in Indonesia (West Sumatera and Riau), a state in Malaysia (Johor) and Singapore. BIMP-EAGA covers 10 provinces in Indonesia (four provinces in Kalimantan, the four provinces in Sulawesi, Maluku and Papua), Southern Philippines, the two states in Malaysia (Sabah, Sarawak) and Brunei Darussalam. AIDA covering 13 provinces in the Eastern Indonesia and Bali, as well as all states in Australia.

1) Interregional trade

Diffusion of resources among regions may include factors of capital, labor, primary commodities or materials, information and technology, as well as the diffusion of merchandise in commodities form and services.

Of the leading sectors in each region will clearly require the input of resources as a factor of production which will result in a leading commodity as trading currency including services for interregional trade. From the diffusion of production factors and the merchandise, each region needs to have the specifications as a leading commodity that can be obtained optimal value added state for territory.

2) Across-regional trade

With the leading commodities of each territory in the country in the long term sectors that have a high LQ (higher than 1) and specific to each region, then these areas requires a broader market that across-regional markets that had been pioneered intergovernmental and private sector and relevant countries.

Lately, IMT-GT across-region has held the built market with organizing meeting in Thailand for the development of across-regional market with the main target sectors of transport, telecommunications, human resource development den agriculture, by encouraging private sector is in the front, while the government acts as a facilitator.

IMT-GT territory has obvious economic interaction with his trade among other minerals eg granite, sea sand. Regional economic cooperation covering favored sectors: infrastructure, services, agriculture and natural resources, human resources and mobility, tourism, and industry and services.

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BIMP-EAGA territory has developed coal trade between the East and South Kalimantan island of Mindanao (Southern Philippines), andesite stone trade and East Kalimantan with Brunei Darussalam, and the various kinds of agricultural products. Subregional economic cooperation are favored that may include telecommunications, including marine transportation / shipping, tourism, fisheries, agro-industry, forestry, human resources, capital accumulation/financial services, construction and building materials, energy and management/environmental protection.

AIDA territory has a long history in tourism and trade in addition, of course, mining. Subregional economic cooperation focusing on the sectors of agriculture, fisheries and livestock, education and training, energy den mining, tourism, transport, trade and industry. In the future this sub-regional economic activity should be encouraged as a growth pole so beneficial for mutual complement economic cooperation (Soelistijo, 1997, 1999).

b. Role of Mining Sector

1). Net social benefits of mining companies.

In acting as prime movers in the region, mining/quarrying basically able to make a positive impact in the development of the region both in the creation of employment opportunities and create economic linkages in the form of final demand among others foodstuffs, household goods, etc. From some of the results of studies conducted by Mineral and Coal Technology R&D Center against some mining production units of PT INCO (nickel), nickel production unit Pomalaa PT Antam, nickel production unit Gebe Island PT Antam, Cilacap Iron Sand Mining PT Antam, Bauxite PT Antam, PT Adaro Coal Mining, Tanjung Enim coal mine and Ombilin Coal Mine PT Bukit Asam Coal Mining, and PT FI (PT Freeport Indonesia) (Table 7), it can be seen that the net social benefits (net social gain) of the production units ranged from 0.83% (or coefficient of 0.0083) to 17.42% (or coefficient of 0.1742), and from this figure still needs to be and can be improved through, among others, more intensive regional development programs including community development (Soelistijo, 2012). Also including production units of mining and other energy sources, namely oil and gas, metals and coal mining that are capable of supporting regional development programs in the future. 'Surplus' provinces which incidentally have also the area of mining production, the share of revenue compared to the central region of 80/20 for general mining royalties, 30/70 for the result of natural gas and 15/85 for the oil, thus the portion to the central government is still quite high which can be used as a means to divert it to the 'minus' provinces in order to achieve the national GDP per capita in the context

of convergence. In addition, of course, the portion of the funds to the central government, including the portion of the sources of income, will also be used by the central government to pay for the burden of defense, foreign relations and foreign debt. 'Minus' provinces for example in Java must develop growth centers to pursue their GDP growth and GDP per capita index that can reach and converging with the national per capita GDP. Post-mining areas can be developed as a pole of economic growth in order to support the convergence process of 'minus' provinces such as gold mine closure at Pongkor PT Antam West Java, as the center of agro-industry, tourism, and underground mine education and training.

Table 7. *Net Social Gain of several mining companies in Indonesia*

Variable	PT Inco Tbk (2005) **)	Tj.Enim PT BA (1989)	Ombilin Coal PTBA (1990)	Nickel Gebe Island PT Antam (1990)	Bauxite Kijang PT Antam (1990)	Nickel Pomalaa PT Antam (1990)	Cilacap Iron sand (2003)	PT Adaro Coal Mining (2000) ***)	PT FI (1990)
Output	8677854.9	131310.4	41500.97	108179.39	32027.20	105914.27	9376.33	2583896.21	PM
Input	6525743.4	129636.84	40955.65	107987.59	31829.46	105595.53	31099.99	2497278.00	PM
I. Economic Rent	2108224.8	1673.60	544.32	191.80	197.73	318.74	(12789.5)	86619.00	PM
II. Net External Effect	218991.33	2148.11	2823.89	4771.43	3151.58	4143.44	1384.39	20617.68	PM
Consisted of:									
- Upstream-Downstream Lingkage	65.65	1296.73	415.25	522.58	1233.16	575.52	*)	*)	*)
- Fiscal Lingkage	204489.60	346.96	577.55	2939.50	890.07	843.08	413.42	5346.40	*)
- Final Demand Lingkage	1566.08	477.02	1460.53	1006.96	981.81	2491.00	469.68	47894.86	*)
- Teknological Lingkage	12870.00	27.40	370.66	302.39	46.53	233.84	501.29	1833.72	*)
III. Net Sosial Gain/ NSG	220574.7	3821.71	3369.21	4963.21	3349.31	4462.18	1633.21	23100	19860
IV. Net Gain Coefficient NGC= NSG / output	0.0254 (2.54%)	0.0291 (2.91%) (4.31%, 1999)	0.0812 (8.12%)	0.0459 (4.59%)	0.1046 (10.46%)	0.0421 (4.21%)	0.1742 (17.42%)	0.0080 (0.80%)	0.0083 (0.83%)
V. Total Asset	*)	1126243.0	109031.5	*)	*)	9771.23	*)	*)	*)
VI.NSG/Total Asset ratio	*)	0.0034	0.0309	*)	*)	0.0747	*)	*)	*)

*) No data to be calculated, **) The results of the calculations by Amrullah, 2006, ***) Mujib, 2003; PT Antam = PT Aneka Tambang; PT BA = PT Bukit Asam Coal; PT FI = PT Freeport Indonesia; PM= Pro Memory
Source: Center for Mineral Technology Research and Developmen; Soelistijo, 2012; Amrullah. 2007; Mujib., 2003.

Table 8. *Several Locations Mineral and Coal Development Project in Indonesia*

No	Location	Provinces	Y/capita Index1975-2000 Period (or began expansion year)-2012 *)					Crossing National Axis in the Year of *)
	I. Sumatera							
1	Tanjung Api-Api (Railways)	South Sumatera	142	-	105	-	110	1993
2	Tj. Enim (Coal power plant)	South Sumatera	142	-	105	-	110	1993
3	Lampung (Gold)	Lampung	74	-	69	-	56	
	II. Java							
4	Cibinong (Cement/Limestone)	West Java	73	-	87	-	83	
5	Cilacap (Cement/Limestone)	Centaral Java	58	-	78	-	41	
6	Gresik (Cement/Limestone)	East Java	68	-	102	-	102	
7	Cilegon (Tin chemicals)	Banten	...	-	83	-	99	
8	Pongkor (Gold)	West Java	73	-	87	-	83	
9	Pulo Gadung (Gold)	DKI Jakarta	202	-	375	-	457	
10	Lumajang (Iron ore)	East Java	68	-	102	-	102	
	III. Kalimantan							
11	Tayan-Sanggau (Alumina)	West Kalimantan	79	-	95	-	76	
12	Sanggau: Special Econ.Estate	West Kalimantan	79	-	95	-	76	
	IV. Sulawesi and North Maluku							
13	Halmahera (Nickel)	Maluku Utara	...	-	38	-	32	
14	Pomalaa (Feronickel)	Southeast Sulawesi	66	-	61	-	59	
	V. Bali – Nusa Tenggara							
15	West Sumbawa (Copper)	West Nusa Tenggara	43	-	50	-	45	
	VI. Papua Maluku							
16	Nabire (Gold/Copper)	Papua	213	-	191	-	78	2011
17	Wetar (Copper)	Maluku	90	-	42	-	31	1997, 1980
18	Mimika (Gold/Cu smelter)	Papua	213	-	191	-	78	2011
19	Gag (Nickel)	West Papua	...	-	96	-	163	2008

Source: Anonymous (e), 2011, plus the results of convergence study *)

2). Linkages with Indonesian Economic Corridor (MP3EI).

Five of the 22 main economic activities in the framework MP3EI (Master Plan for Expansion and Acceleration of Economic Development of Indonesia 2011-2025) (Anonymous (e), 2011), is of the energy and mineral resources sector, i.e.: oil and gas, coal, bauxite, nickel, and copper. Besides, there are various upstream-downstream activities in the other mineral and coal mining sectors, for example lead in NAD, gold in North Sumatera, tin in Bangka Belitung, iron sand in Java, bauxite in Kalimantan, Sulawesi and Maluku, nickel, gold and copper in Papua, and others (Table 8 and Figure 4). Mineral and coal projects will be able to boost the per capita income index related areas and increase per capita (Soelistijo, 2014).

By the Government policy of the necessity of increasing added value to natural resources, thus the mineral and coal are still expected as the prime mover and the leading sectors to boost economic activity in the sixth Indonesian economy corridors, especially the 'minus' provinces to converge nationally. Also the construction the first phase of coal fired power plant (10,000 MW) and Phase II (10,000 MW), although the location of coal deposits are mainly in two main areas, namely South Sumatera and South-East and East Kalimantan, but the location of the steam power plant were scattered in various provinces (Figure 4)(Soelistijo et al, 2014). Downstream sector of coal even this can be a prime mover of economic development related provinces, even the surrounding areas, because the steam power plant products as electric in interconnection automatically it will give positive impact on economic and social development in the area of the interconnection. Construction of 10,000 MW coal-fired steam power plants phase I would consume 32 million tons of coal per year, while 2,626 MW coal fired power plant out of 10,000 MW phase II would require 8.37 million tons of coal per year, the remainder are consisting of 6200 MW geothermal power plants, and 1174 MW hydro power plant (Anonymous (e), 2011). In addition to the steam power plant, in the second stage of the project there are 12 geothermal power plant in Sumatera, 19 geothermal power plant in Java-Madura-Bali, 4 geothermal power plant in Nusa Tenggara, Sulawesi 5 geothermal power plant, 3 geothermal power plant in Maluku, 1 hydro power plant each in Souhtern part of Sumatera and West Java respectively. Clearly, since coal will provide a dual effect on the relevant 'minus' province where steam plant is located, then the electrical energy will act as engine of economic growth (Tables 9 and 10). In turn, the provincial index of per capita would be lifted toward the convergence of the national index.

Table 9. *Locations of coal fired steam power plant projects I, 10,000 MW*

No	Location	Provinces	Y/capita Index in 1975-2000 Period (or began expansion year)-2012 *)					Crossing National Axis Year *)
	I. Sumatera (1425 MW)							
1	Meulaboh (2x110 MW)	Nanggroe Aceh Darusalam	100	-	149	-	80	1978, 2007
2	Pangkalan Susu(2x220 MW)	North Sumatera	98	-	117	-	101	1992,2000,2001
3	Teluk Sirih (2x112 MW)	West Sumatera	61	-	108	-	89	
4	Bengkalis (2x10 MW)	Riau	1017	-	253	-	197	
5	Selat Panjang (2x7 MW)	Riau	1017	-	253	-	197	
6	Tj.Balai Karimun (2x7MW)	Riau Island	…	-	298	-	189	2003,2009
7	Tenayan (2x100 MW)	Riau	1017	-	253	-	197	
8	Bangka Baru (2x30 MW)	Banka Belitung Islands		-	95	-	98	2003,2009
9	Belitung 2x16.5 MW)	Banka Belitung Islands		-	95	-	98	2003,2009
10	Tj. Selaki (2x100 MW)	Lampung	74	-	69	-	56	
	II. Java-Bali (7490 MW)							
11	Suralaya (1x625 MW)	Banten	…	-	83	-	99	
12	Labuan (2x300 MW)	Banten	…	-	83	-	99	
13	Lontar (3x315 MW)	Banten	…	-	83	-	99	
14	Indramayu (3x330 MW)	West Java	73	-	87	-	83	
15	Pelabuhan Ratu (2x350MW)	West Java	73	-	87	-	83	
16	Rembang (2x315 MW)	Cental Java	58	-	78	-	41	
17	Cilacap Baru (1x660 MW)	Cental Java	58	-	78	-	41	
18	Pacitan (2x315 MW)	East Java	68	-	102	-	102	
19	Paiton ((1x660 MW)	East Java	68	-	102	-	102	
20	Tj.Awar Awar (2x350MW)	East Java	68	-	102	-	102	
	III. Nusa Tenggara Islands (117 MW)							
21	Bima ((2x10 MW)	West Nusa Tenggara	43	-	50	-	76	
22	Lombok (2x25 MW)	West Nusa Tenggara	43	-	50	-	76	
23	Ende (2x7 MW)	East Nusa Tenggara	40	-	34	-	94	
24	Kupang (2x16.5 MW)	East Nusa Tenggara	40	-	34	-	93	
	IV. Kalimantan (605 MW)							
25	Parit Baru (2x50 MW)	West Kalimantan	79	-	95	-	78	
26	Bankayan (2x27.5 MW)	West Kalimantan	79	-	95	-	76	
27	Pulang Pisau (2x60 MW)	Central Kalimantan	84		119		94	1978, 1999
28	Asam-Asam (2x65MW)	South Kalimantan	73		108		93	

No	Location	Provinces	Y/capita Index in 1975-2000 Period (or began expansion year)-2012 *)					Crossing National Axis Year *)
29	Balikpapan (2x100 MW)	East Kalimantan	532	-	414	-	337	
	V. Sulawesi (220 MW)							
30	Amurang (2x25 MW)	North Sulawesi	83	-	92	-	90	
31	Anggrek (2x25 MW)	Gorontalo	…	-	26	-	24	
32	Kendari (2x10 MW)	Southeast Sulawesi	66	-	61	-	59	
33	Barru (2x50 MW)	South Sulawesi	69	-	70	-	71	
	VI. Maluku Islands (46 MW)							
34	Tidore (2x8 MW)	North Maluku	…	-	38	-	32	2011
35	Ambon (2x15 MW)	Maluku	90	-	42	-	31	1997, 1980
	VII. Papua (34 MW)							
36	Timika (2x7 MW)	Papua	...	-	96	-	163	2011
37	Jayapura (2x10 MW)	Papua	213	-	191	-	78	2011

Source: Anonymous (e), 2011 and based on the research results.

Table 10. *Locations of Power Plant Project Phase II, 10,000 MW (2,616 MW Coal Fired Power Plant)*

No	Location	Provinces	Y/capita Index 1975-2000 Period (or began expansion in year of)-2012 *)					Crossing National Axis Year*)
	I. Sumatera (540 MW)							
1	Sabang (2x4MW)	Nanggroe Aceh Darusalam	100	-	149	-	80	1978, 2007
2	Pangkalan Susu (2x200MW)	North Sumatera	98	-	117	-	101	1992,2000,2001
3	Nias (2x7MW)	North Sumatera	98	-	117	-	101	1992,2000,2011
4	Tj. Balai Karimun (2x10MW)	Riau Islands		-	298	-	189	2003,2009
5	Tanjung Batu (2x4MW)	Riau Islands		-	298	-	189	2003,2010
6	Tanjung Pinang (2x15MW)	Riau Islands	…	-	298	-	189	2003,2011
7	Bangka (2x30MW)	Banka Belitung Islands		-	95	-	98	2003,2009
	II. Java-Madura-Bali Islands (1600 MW)							
8	Indramayu (1x1000 MW)	West Java	73	-	87	-	83	
9	Madura (1x400 MW)	East Java	68	-	102	-	102	
10	East Bali (2x100 MW)	Bali	70	-	113	-	82	1990,2000
	III. Nusa Tenggara Islands (36 MW)							
11	Sumbawa (2x10 MW)	West Nusa Tenggara	43	-	50	-	45	
12	Waingapu (2x4 MW)	East Nusa Tenggara	40	-	34	-	29	
13	Larantuka (2x4 MW)	East Nusa Tenggara	40	-	34	-	29	
	IV. Kalimantan (634 MW)							
14	Parit Baru (2x50 MW)	West Kalimantan	79	-	95	-	76	
15	Putussibau (2x4 MW)	West Kalimantan	79	-	95	-	76	
16	Ketapang (2x 10 MW)	West Kalimantan	79		95		76	1978, 1999
17	Sampit (2x25 MW)	Central Kalimantan	84		119		94	
18	Kotabaru (2x7 MW)	South Kalimantan						
19	South Kalimantan (2x100MW)	South Kalimantan	73	-	108	-	93	
20	Petung (2x7 MW)	East Kalimantan	532		414		337	
21	Melak (2x7 MW)	East Kalimantan	532		414		337	
23	East Kalimantan (2x100 MW)	East Kalimantan	532		414		337	
22	Nunukan (2x7 MW)	North Kalimantan						
	V. Sulawesi (384 MW)							
24	Tahuna (2x4 MW)	North Sulawesi	83	-	92	-	90	
25	Moutong (2x4 MW)	Central Sulawesi	58	-	79	-	76	
26	Luwuk (2x10 MW)	Central Sulawesi	58	-	79	-	76	
27	Mamuju (2x7 MW)	South Sulawesi	…	-	36	-	34	
28	Takalar (2x100 MW)	South Sulawesi	69		70		71	
29	Selayar (2x4 MW)	South Sulawesi	69		70		71	
30	Kolaka (2x10 MW)	Southeast Sulawesi	69		61		59	
31	Kendari (2x25 MW)	Southeast Sulawesi	69		61		59	
32	Bau-Bau (2x10MW)	Southeast Sulawesi	69		61		59	
	VI. Maluku Islands (38 MW)							
33	Tual (2x4 MW)	Maluku	90	-	42	-	31	1997, 1980
34	Masohi (2x4 MW)	Maluku	90	-	42	-	31	1997, 1980
35	Tidore (2x7 MW)	North Maluku	…	-	38	-	32	
36	Tobelo (2x4 MW)	North Maluku	…	-	38	-	32	
	VII. Papua (116 MW)							
37	Klalin/Sorong (2x15 MW)	West Papua	...	-	96	-	163	2008
38	Andal (2x7 MW)	West Papua	…	-	96	-	163	2008
39	Biak (2x7 MW)	Papua	213		191		78	2011
40	Nabire (2x7 MW)	Papua	213		191		78	2011
41	Jayapura (2x15 MW)	Papua	213		191		78	2011
42	Merauke (2x7 MW)	Papua	213		191		78	2011

Source: Anonymous (e), 2011, plus the results of the study.

Source: Ministry of Energy and Mineral Resources, 2011; Soelistijo et al, 2014, reprocessed and superimposed.

Figure 4. *Locations of Power Plant Projects Phase I - II and Coal/Mineral Projects in Indonesia, 2011-2025 (MP3EI)*

4. Conclusion and Recommendation

a. The development process in Indonesia within the last three and a half decades ago resulted a trend of interregional economic convergence with the national GDP per head at the end of the 20th century, although there were several provinces remain above the national GDP per capita in addition there were also some provinces appear to be permanent under the national GDP per head that had a declining trend or away from the national GDP per capita axis (index). It is expected that with the growing strength of regional autonomy program in the post-2000 economic convergence can be achieved in an approximate period of about within the next 30 years, i.e. for the provinces of West Sumatera, West Java, DI Yogyakarta, East Java, West Kalimantan, East Kalimantan, and Central Java . There is superior province rand not fully converge but remained consistently above the national GDP per capita, i.e. DI provinces of Aceh, North Sumatera, DKI Jakarta, Central Kalimantan (since 1993), and Bali. On the other hand, there are provinces with GRDP per capita having consistently been under the national GDP per capita, namely the provinces of Jambi, South Sumatera, Bengkulu, Lampung, Central Java, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, West Nusa Tenggara , East Nusa Tenggara, Maluku. In fact, there are a declining province and from the beginning they are under the national GDP per head, which are East Nusa Tenggara and Maluku. For 'minus' provinces, the economic convergence still requires a very long time. The efforts can be done through investment encouragement in the leading sectors that have a high LQ numbers and with high value added multiplier that exist in each province with due regard to the creation of employment opportunities and increasing income per capita in each region, especially in the present province those are under the national GDP per capita. In addition, it also created the existence of the ease of diffusion or mobility of resources and interregional trade currency and the neighbor areas through subregional economic cooperation.

There is a divergence of symptoms in some 'minus' provinces in the on-going regional autonomy (in the first decade of the 21st century), namely the Provinces of West Java, Yogyakarta, Banten, West Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, West Sulawesi, West Nusa Tenggara, East Nusa Tenggara, Maluku, North Maluku. This indicates that the areas have not utilized the autonomy funds efficiently or many leaks. Although there are also the 'minus' provinces converging or increasing Y/capita index of those provinces of Jambi, Lampung,

Central Java, Gorontalo, West Sulawesi.

b. Development areas and or the integrated economic development regions mainstay in every province, both in Western Region of Indonesia and Eastern Region of Indonesia, should be directed to the creation of interregional trade and the neighboring areas complementarily. In policies and programs MP3EI key region in the form of six economic corridors can be continued boost to the 'minus' regions by accelerating the growth of the leading sectors in each region as well as attention to the linkages between regions and between sectors.

c. The role of the mining sector still needs to be improved toward developing its downstream industries of increasing added value in donating the net social gain to the local area so simultaneously and cumulatively with other sectors to create employment opportunities and increase in per capita regional income in order to support the interregional economic convergence. In addition, the role mineral and coal sectors within the framework of the MP3EI six corridors through the development of Indonesia both increased value added upstream-downstream mineral and coal to support the accelerated development of the coal power plant phase I and phase II respectively of 10,000 MW and 2,676 MW, is across-region fertilization, and strongly supports the development of 'minus' provinces to converge to per capita national income index.

References

[1] A. Amrullah, "Kajian peranan PT INCO (Tbk) dalam mendukung pembangunan ekonomi Kabupaten Luwu Timur-Sulawesi Selatan era ekonomi daerah:pendekatan antar-industri," Tesis Program Studi Rekayasa Pertambangan Institut Teknologi Bandung, 2006, unpublished.

[2] Anonymous (a), "Produk Domestik Regional Bruto Provinsi-Provinsi di Indonesia Menurut Lapangan Usaha, 1975-1999," Badan Pusat Statistik, 2000, Jakarta.

[3] Anonymous (b), "Tabel Input-Output Indonesia 2005 Update 2008," Badan Pusat Statistik, 2005, Jakarta.

[4] Anonymous (c), "Statistik Indonesia, 1984-1995," Badan Pusat Statistik, 1996, Jakarta.

[5] Anonymous (d), 1997, "Peta Tematik Kegiatan, Sarana dan Prasarana Pertambangan dan Energi di Kapet Luar Jawa Bali," Departemen Pertambangan dan Energi.

[6] Anonymous (e), " Master Plan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia." (MP3EI), Kementerian Perekonomian RI, Istana Bogor 2011.

[7] Anonymous (f), "Statistik Indonesia 2012." Badan Pusat Statistik, Jakarta, 2012.

[8] G.S. Madala, 1977, "Econometrics," Mc. Graw-HilI, Book Company, New York, 1977.

[9] J. Naisbitt & P. Aburdene, 1990, "The Ten Directions For the 1990's Megatrends 2000," Avon Books, New York, 1990.

[10] Mujib, R. Saleh, D. Sugandi, B. Yunianto, "Studi manfaat regional dalam pertambangan batubara terhadap pengembangan wilayah di Tanjung Enim Kabupaten Muara Enim Propinsi Sumatera Selatan," Laporan Pengembangan Mineral Regional No. 67, PPTM, Bandung, 1992.

[11] U.W. Soelistijo, "Mining and Energy Sector Development Program in Eastern Indonesia," ISSN 0854-9931, Indonesian Mining Journal, volume 5 number 3, October, 1999.

[12] U.W. Soelistijo, "Pengaruh Ekonomi Makro Regional Tambang Emas Pongkor – PT Antam Jawa Barat dan Potensi Transformasi Pasca Tambang." Seminar Pembangunan Provinsi Jawa Barat, 12-13 Juni 2012, Jatinangor, Bandung, 2012.

[13] U.W. Soelistijo, "Beberapa Aspek Terkait Investasi Dalam Usaha Pertambangan," Pendidikan dan Pelatihan Analisis Potensi Untuk Penilaian Kelayakan Investasi, Pusdiklat Mineral dan Batubara, Bandung 13-15 Maret 2012.

[14] U.W. Soelistijo, "Pengembangan Regional Berkelanjutan." Fakultas Teknik Pertambangan dan Perminyakan ITB, 2012.

[15] U. W. Soelistijo, L.O. Aswandi, 2014. "Future Trend of Mineral Industries Development in Indonesia." Earth Science. Vol. 3, No. 2, 2014, pp. 58-67. doi: 10.11648/j.earth.20140302.14, 2014

[16] V.B. Thomas, "Input-Output Analysis in Developing Countries: Sources, Methods and Applications," John Wiley & Sons Ltd, New York, 1982.

[17] W. lsard, "Introduction to Regional Science," Prentice-Hall, Inc. Englewood Cliffs, New Jersey,1975.

[18] W. Leontief, " Input-Output Economics," Oxford University Press, New York,1979.

[19] W.H. Miernyk, "The Elements of Input-Output Analysis," Random House, New York, 1965.

[20] W.H. Miernyk, "Regional Analysis and Regional Policy," Oelgeschlager, GunnHain, Publishers, Inc. Cambridge, Massachusetts,1985.