STRUCTURAL TRANSFORMATION OF ECONOMY
IN SPECIAL REGION OF YOGYAKARTA

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ABSTRAK

Tujuan penelitian ini yang pertama adalah mengetahui hubungan antara laju pertumbuhan PDRB dengan laju pertumbuhan penyerapan tenaga kerja sektoral Provinsi DIY. Kedua, dengan menggunakan analisis Shift share Esteban Marquillas membuktikan apakah telah terjadi transformasi struktural ekonomi di Provinsi DIY selama tahun 2009-2014. Ketiga, mengetahui dampak pertumbuhan ekonomi sektoral Indonesia terhadap pertumbuhan agregat PDRB Provinsi DIY. Hasil penelitian ini adalah: (1) Terdapat ada tiga kondisi melihat hubungan antara laju pertumbuhan PDRB dengan laju pertumbuhan penyerapan tenaga kerja sektoral Provinsi DIY yaitu anomali, regresif dan progresif. (2) Menggunakan analisis Shift share Esteban Marquillas menemukan bahwa di wilayah DIY telah terjadi pergeseran struktur ekonomi dari Sektor Primer ke Sektor Sekunder dan Tersier. (3) Dampak pertumbuhan ekonomi sektoral Indonesia mampu mengakibatkan pertumbuhan agregat PDRB DIY sebesar Rp 539,53 miliar. Saran yang ditawarkan dari penelitian ini antara lain: (1) pengambilan kebijakan oleh pemerintah terkait pembangunan harus memperhatikan hubungan antara pertumbuhan ekonomi dan tingkat pengangguran. (2) pemerintah harus memperhatikan transformasi ekonomi dari sektor Primer hingga Tersier, terutama untuk perencanaan pembangunan; dan (3) pemerintah harus memfokuskan pembangunan ekonomi pada sektor-sektor perekonomian yang dominan di provinsi DIY.

Kata kunci: laju pertumbuhan PDRB, penyerapan tenaga kerja, transformasi struktural ekonomi,

ABSTRACT

The first aim of this study was to determine the relationship between the growth rate of GRDP and the growth rate of sectors' labor absorption in Special Region of Yogyakarta. The second objective was using the Esteban Marquillas' Shift-Share analysis to prove whether there has been a structural transformation of the economy in Special Region of Yogyakarta during 2009-2014. The third aim was to determine the impact of economic sectors' growth in Indonesia on the growth of aggregate GRDP in Special Region of Yogyakarta. Results of this study were: (1) There were three conditions used to observe the relationship between the growth rate of GRDP and the growth rate of labor absorption in Special Region of Yogyakarta namely anomalous, regressive, and progressive. (2) The use of Esteban Marquillas' Shift-Share analysis showed that in the area of Special Region of Yogyakarta there had been a shift in the economic structure from the primary sector to the secondary and tertiary sectors. (3) The economic sectors' growth in Indonesia could lead to the growth of aggregate GRDP in Special Region of Yogyakarta as much as 539.53 billion IDR. Suggestions offered by this research are as follows: (1) policy making by the government related to development has to pay attention to the relationship between economic growth and unemployment rate. (2) Government has to address the economic transformation from primary to tertiary sectors, especially for development planning; and (3) government needs to focus on economic development for the dominant sectors of economy in DIY province.

Key words: growth rate of GRDP, labor absorption, structural transformation of economy.

INTRODUCTION

A structural transformation of economy for countries that are growing and develop- ing is an inevitable process; the process of industrialization becomes one of the options in the context of diversification of economic

sectors (Xirinachs *et al.* 2014). This also occurs in provinces as part of a country's regions. World economists agree that the shift of economy simultaneously occurs as the dominance of agriculture sector has been switched to industry sector (Ungor, 2010). Indonesia has also experienced a structural change in economy from the dominance of Agriculture sector in the GDP of Indonesia into the dominance of Industry sector.

Based on the data from the Central Statistics Agency (BPS), in the Gross Regional Domestic Product (GRDP) of Special Region of Yogyakarta (here in after referred to as DIY Province or DIY), the role of

agriculture sector from 2009 to 2014 fluctuated yet tended to decline. In 2009, the contribution of Agriculture Sector fell from 15.38 percent to only 14.65 percent in 2012 and continued to decline to 14.16 percent in 2014. Meanwhile, the sector of Trade, Hotel and Restaurant became even more dominant in contributing to the GRDP of DIY Province. The Trade, Hotel and Restaurant sector accounted for 19.72 percent in 2009, turned into 20.09 percent, and rose again to 20.92 percent in 2014. Table 1 below illustrates the detail of the Value and Contribution of economic sectors to the Gross Regional Domestic Product (GRDP) of DIY Province from 2009 to 2014.

Table 1
Value and Contribution of Economic Sectors in GRDP at Current Prices of DIY Province Year 2009-2014

ECONOMIC SECTORS	2009	2010	2011	2012	2013	2014
1. Agriculture	6,366,771	6,644,695	7,373,852	8,355,326	8,861,281	9,503,754
	15.38	14.56	14.24	14.65	13.91	14.16
2. Mining & Quarrying	293,983	304,660	361,793	379,951	416,531	443,966
	0.71	0.67	0.70	0.67	0.65	0.66
3. Processing Industry	5,528,856	6,396,639	7,434,020	7,609,337	8,771,188	8,893,791
	13.35	14.02	14.36	13.34	13.77	13.25
4. Electricity, Gas, & Water	560,316	607,072	675,912	727,574	796,704	822,479
	1.35	1.33	1.31	1.28	1.25	1.23
5. Construction	4,431,411	4,833,423	5,580,599	6,186,322	6,908,381	7,272,557
	10.70	10.59	10.78	10.85	10.85	10.83
6. Trade, Hotel & Restaurant	8,165,613	9,008,181	10,246,578	11,457,201	13,152,524	14,041,853
	19.72	19.74	19.79	20.09	20.65	20.92
7. Transportation & Communication	3,809,094	4,119,970	4,572.928	4,903,522	5,400,530	5,786,459
	9.20	9.03	8.83	8.60	8.48	8.62
8. Finance, Leasing, & Business Services	4,090,675	4,552,667	5,158,229	5,876,203	6,543,153	6,977,924
	9.88	9.98	9.96	10.30	10.27	10.40
9. Services	8,160,329	9,158,283	10,381,238	11,536,320	12,840,026	13,383,054
	19.71	20.07	20.05	20.23	20.16	19.94
GRDP	41,407,049	45,625,589	51,785,150	57,031,755	63,690,318	67,125,837
	100	100	100	100	100	100

Source: Website of Central Statistics Agency (BPS) of DIY

The sequence of economic sectors based on their contributions to the GRDP of DIY during 2009-2014 is trade, hotel and restaurant sector; services sector; agriculture sector; processing industry sector; construction sector; finance, leasing and business services sector; electricity, gas and water sector, as well as mining and quarrying sector respectively. Meanwhile, fundamental structural changes in a region may affect the changes in the economy and income inequality in the region (Dastidar, 2012). In general, a change in a particular field will bring impact to a change in the others, and in this current context, the most fundamental change is in the economic sectors, which can have an impact on the social sector, labor, and other sectors. The structural transformation of economy that has occurred in DIY Province, characterized by the dominance of trade, hotel and restaurant sector, needs to receive more attention because an increase in the value of GRDP in trade, hotel and restaurant sector should also be accompanied by an increase in the labor absorption of the corresponding sectors. Based on the aforementioned background, this study was aimed to analyze how the structural transformation of economy would affect the labor absorption in DIY.

LABOR ABSORPTION IN DIY PROVINCE

Labor is the most important factor in a company's organization similar to the spine of human body (Hong *et al.*, 2012). Without labor, a company will not be able to run properly, but labor cannot be separated from wages and incomes (Xhafa, 2014). Similarly, in a regional economy, the role of labor is vital in mobilizing every sector of the region's economy. In other words, each economic sector requires labor in order to produce output in the form of income for each sector of the economy. The on-going industrialization process today should be able to absorb more labor. The following is a detailed description of the labor absorption according to the economic sectors in GRDP of DIY Province. Judging from the ability of economic sectors to absorb labor (employment), Table 2 shows that during 2009-2014 Agriculture, Forestry, and Fisheries as well as Plantation became the largest sectors in absorbing labor with percentages between 23.97 per- cent and 30.40 percent. Despite a declining trend in every year, the agriculture sector remained dominant compared to the other sectors. In fact, this sector was not the largest sector that contributed to GRDP of DIY Province because it only ranked third; the largest contributing sector in GRDP of DIY Province was Trade, Hotel and Restaurant sector.

This indicates that in DIY, the employees' absorption is still facing problems, because the agricultural, forestry, farming and fishery sectors are not the sectors requiring high education but only absorbing low educated workers with very little skill. On the other side, this condition also indicated that the absorption of workers in DIY is likely to absorb less productive workers than other sectors, since the contributions of agricultural, forestry, farming and fishery sectors to the regional GDP of DIY are relatively low compared to other sectors. Meanwhile, the Trade, Hotel and Restaurant sector ranked second in its ability to absorb labor with percentages between 24.02 percent and 26.70 percent. This sector tended to increase every year and ranked first in contributing to GRDP of DIY. The sector that ranked third in absorbing labor was Services sector with a percentage between 17.69 percent and 19.93 percent. This sector ranked second in giving its contribution to GRDP of DIY. Considering the above explanation, it can be concluded that there has been disharmony between the ability to contribute to GRDP of DIY and the ability to absorb labor. The transformation of sectors in GRDP was deemed successful. However, in the context of employment, there was a failure because the agriculture sector remained the highest in absorbing labor.

Table 2
Number of Labor (People) and the Distribution
Per Economic Sector (%) in GRDP of DIY Province during 2009-2014

Economic Sectors	2009	2010	2011	2012	2013	2014*	Average
1. Agriculture	570,574	539,703	431,07	531,84	531,559	497,030	523,124
	30.10	30.40	23.97	27.82	28.18	25.41	
2. Mining & Quarrying; Electricity, Gas & Water	20,617	15,758	16,711	16,42	14,463	16,822	17,433
	1.09	0.89	0.93	0.86	0.77	0.86	
3. Processing Industry	237,24	247,093	266,768	286,177	251,892	273,259	258,991
	12.51	13.92	14.83	14.97	13.36	13.97	
4. Construction	145,381	109,933	133,128	132,341	104,506	146,312	131,739
	7.67	6.19	7.40	6.92	5.54	7.48	
5. Trade, Hotel & Restaurant	455,331	438,282	480,136	468,756	487,923	505,832	470,441
	24.02	24.69	26.70	24.52	25.87	25.86	
6. Ransportation & Communication	82,639	67,368	68,2	62,587	65,684	68,853	72,042
	4.36	3.80	3.79	3.27	3.48	3.52	
7. Finance, Leasing & Business Services	48,441	38,651	50,063	58,494	54,092	73,352	52,118
	2.56	2.18	2.78	3.06	2.87	3.75	
8. Services	335,425	318,36	352,519	355,105	375,954	374,386	347,719
	17.69	17.93	19.60	18.58	19.93	19.14	
GRDP	1,895,648	1,775,148	1,798,595	1,911,720	1,886,071	1,956,040	1,873,632
	100	100	100	100	100	100	

Source: DIY in figures, and *BRS May 5, 2015 Central Statistics Agency (BPS) of DIY

GDP GROWTH RATE AND LABOR ABSORPTION

GDP is the total of added value generated by the whole population in a country. Its growth rate can be a reference in measuring the country's economy since GDP measures the total goods and services produced by the economy (Chioma, 2009). While Umair and Ullah (2013) found there is no significant correlation between GDP and unemployment rate in Pakistan. As explained earlier, theoretically, the increasing rate of economic growth in an economic sector of a country will also increase the labor absorption in the corresponding sector.

Such condition is explained as follows, if the growth rate of economy in a country is higher, then it indicates that the GDP value in the country experience an increased growth compared to the previous year. This increase of GDP is only possible if the economic activities in the country also experienced an improvement. The increase of economic activities also opens more opportunities for business activities to further increase their output by adding the absorption of workers to support the increase of planned output. The increase of the produced output will be absorbed by the market since the economic growth has also been increased, this also indicates that consumption activities by the population has also been increased, considering that the largest percentage of GDP in several developing countries are through the private consumption.

In addition, the employment of entrepreneurship sector has also contributed to

GDP in Romania, it was discovered by Armeanu *et al.* (2015), more detail according to the entrepreneurial sector needs to innovate in order to face the economic challenges in the country.

However, in the case of DIY Province's economy, an interesting phenomenon occurred in the relationship between the economic growth (GRDP growth rate) and the rate of labor absorption (employment) in the economic sectors of DIY from 2009 to 2014. As shown in Table 3 below, the growth of the economic sectors' contribution to GRDP of DIY Province is not always followed by an increase in the rate of labor absorption.

There were three conditions that occurred in DIY Province in relation to the causal relationship between the growth rate of GRDP (economy) and the growth rate of employment, which are: a) Anomaly, when the growth rate of GRDP (economy) resulted in a negative growth rate of employment.

This condition occurred in the Agriculture sector, Mining and Quarrying sector, Electricity, Gas and Water sector, and Transportation and Communication sector; b) Regressive, when the growth rate of GRDP (economy) led to a lower rate of employment growth. This occurred in the Processing Industry sector, Construction sector, Trade, Hotel and Restaurant sector, and Services sector; c) Progressive, when the growth rate of GRDP (economy) caused a higher growth rate of employment. It occurred in the Finance, Leasing, and Business Services sector.

THEORETICAL REVIEW

Mecik and Afsar, in one of his studies, found a significant relationship between the structural transformation of economy that occurred in the member countries of OECD (Organization for Economic Cooperation and Development) and the labor market in those countries. His findings indicated that the working labor's productivity has a negative influence on labor absorption, but it positively affects the long-term unemployment rate (Mecik and Afsar, 2014).

This indicates that a shift has happened from a less productive employment to a more productive employment. Only workers with a significant added value in GDP which will be hired by the employment market. A natural selection has happened as the modern economics become more developed, where the economic activities prefer employees with bigger contribution to the economy. The economy has become more selective in hiring employees and there has been an increased competition in the employment market. A less productive employee will be eliminated in the ever more competitive market and therefore will increase the unemployment rate.

It was similar to what happened in China. The structural transformation of economy in China was inevitable. Migration from rural to urban areas was increasing; in addition, the shift of economic sectors from agriculture to non-agriculture also occurred massively. This condition has become an attraction factor for workers from the more rural areas to migrate to the cities and attempt to change their fate and improve their living conditions. Developing industries in the cities in China with the existing technology is capable of absorbing the potential migrating workers through trainings which are intended to improve their skills, so they can compete in the industrial sectors in the urban areas

The difference was that the structural transformation of economy in China was still able to absorb labor as described by Liwen *et al.* in his paper that the urban areas in China remained able to accommodate the migration of labor from rural to urban areas (Liwen *et al.*, 2011).

Furthermore, Shijun and Lili (2010) stated that structural transformation in mining sector in China is divided into three classifications, which are 'strong', 'medium', and 'weak'. Most of the mining areas in China experienced structural transformation in the category of 'weak'. The research also

explained that for the areas which are classified as 'strong', are recommended to strengthen their scientific positions and rational exploitation so that the characteristics of the areas are more visible. For the areas in the 'medium' category still need to conduct a preparation to perfect the transformation. Meanwhile, for the areas in the 'weak' category, are recommended to change their activities from passive transformation to active transformation.

In Vietnam, too, the structural transformation of economy occurred in the import-export, investment, production and consumption sectors. Trinh in his research revealed that the contribution of TFP (Total Factor Productivity) to GDP of Vietnam during 2006-2010 decreased by 10 percent compared with the previous 2000-2005 period (Trinh *et al.*, 2012).

This caused by the struggle faced by the small and medium enterprises in dealing with the high rate of the central bank. Other obstacles faced by small and medium enterprises are including access to capitals, distribution of transportation, administrative procedure, and other extra expenses. Furthermore, the rate of tax in the country is still the highest in the world, which is about 25-27%, not to mention other expenses as well as 'hidden' inflation tax.

These factors are causing the business world in Vietnam to experience structural transformation, which put the country under pressure. As the implication, Bui Trinh gave several recommendation for policies in his research, such as control by banking regarding the policy of funding distribution especially for those with high interest rates. Government also should give a special attention to sectors such as real estate and other business. Aside from that, loval government and the authority should begin to simplify the administrative of business process, and cut all the 'hidden' cost.

Several other studies have also found the structural transformation of the countries they studied, among which are Zidek (2014) in Hungary, Armah *et al*. (2014) in several countries in Africa, Diene (2014) in Senegal, Kedir (2014) in Ethiopia, Matotay (2014) in Tanzania and Reddy & Rampersad (2012) in South Africa.

Indeed, most countries in Eastern and Southern Asia experienced rapid economic growth and structural transformation, but these were not balanced by an increase in the productivity of the corresponding sectors (Freire, 2013). Countries in the region of South Asia in the past decade is having a rapid economic growth. From 2000-2010 in average the growth of economy in South Asia is as high as 7.08% and higher than the average of the world's economic growth. However, the growth is not balanced by the structural transformation and advancement of production capacity. South Asia is populated with 24% world's population, yet it only produces 3% of world's GDP.

Regarding to this, Freire (2013) recommends that structural transformation of the economy and the improvement of production capacity in South Asia is soon to be created by doing product diversifications and technological innovation. Goverments in all the South Asia countries have to give assistance in succeeding the product diversification as well as the innovation in technology. Other recommendation is to conduct a substitution in export and import to create incentive to improve production capacity. Hence, the structural transformation of economy as well as improvement of production capacity in South Asia can be created, with support by other policies with wider scope.

One that later became the focus of structural transformation in Asia was the entrepreneurship sector, which was considered capable of directing economic changes in both modern and traditional ways (Gries, 2010). This becomes a perfect solution considering the structural transformation of economy often leaves problems in the capabilities of the existing employement. Not all workers are ready to enter the modern sectors of economy as a result from

said structural transformation of economy. Industrial sectors (especially manufacturing and banking) are not easy sectors for workers to move from the agriculturals. It is important for the workers to have special education and skill to enter such industrial sectors. For workers who are unable to join the industrial sectors, usually hired in the informal sectors of economic activities which rely more on entrepreneurship and capabilities of the worker.

Gries (2010) added that to change the economic structure from traditional to modern through entrepreneurship sector is able to conduct in a several ways such as: (1) creating new job opportunities outside corporations; (2) absorbing workers from traditional sectors; (3) providing innovation and intermediation between production factors as well as output of the result from company production; (4) encouraging specific specialization in each company; and (5) improving productivity and welfare of the workers in the traditional as well as modern sectors.

Meanwhile, the countries in Africa experienced economic stagnation in the first five decades, but it changed after entering the new millennium. The failure at industrialization strategy, economic deceleration in the agriculture sector, and rapid growth of population has drawn the attention of many countries to conduct a structural transformation of economy immediately. Badiane *et al*. (2012) consider that the focus of African countries currently is to conduct a continuing acceleration in the basic level of improvement process, creating policies regarding the improvement of the agricultural sector's productivity, and a total revitalization in the modern industrial sector.

In order to create a successful structural transformation of economy, two strategic approaches are needed. *First,* by improving a continuing productivity in the sector of agriculture as well as rural economy, and *second,* by doing a product diversification with an added value on the service sector

and urban industry. Both of these strategic approaches need to be supported with adequate physical resources and human resources, qualified information technology and institution, and accomodative coordination and government's policy.

The approach was through a structural transformation of economy in the traditional agriculture sector in order to release the snare of economic stagnation and poverty (Kim and Ncube, 2014). Their research is inspired by the condition of African countries who mostly experienced economic stagnation and high rate of poverty. Economic stagnation in the African continent is caused by the communal ownership or land in rural areas, which makes a private ownership by farmers is very limited. While in fact the communal ownerships control the majority of agricultures, this caused a vicious cycle with a number of concerns such as lack of investments, low productivity of land, income inequality among farmers, low quality of workers, and scarcity of domestic savings to support industrial development.

Therefore, the government need to do a policy reform in accordance with the recommendation by Kim and Ncube (2014) which are as follows: (1) pursuing a large scale of commercial agriculture improvement policy package, (2) opening international economy and trade, and (3) improving agricultural sector development with a basis of wide-range areas.

One of the countries in Africa, such as Nigeria also experienced the same thing, where the process of structural transformation of the economy is running very slow. In the research, Naiya and Manap (2013) stated that despite being the country of research, Nigeria, the structural transformation is considered very minimum, yet there is a long-term significant relationship between structural transformation of economy with poverty and income inequality.

The process of structural transformation of economy in Nigeria has actually started in 1960s, yet was distracted by the

rise of oil commodity which is turned into a leading sector and hence, ignoring the other real sectors. The failure of the government to manage the outcome of the oil commodity in supporting the process of structural transformation resulting in Nigeria to become a country with a number of 'paradoxes' one of which is 'a rich country with poor people'.

Another process of structural transformation in other European countries, such as Hungary, as explained in the research by Zidek (2014) that the main goal of transformation is to change the paradigm of economy with the basis of centralistic toward the submission to the market. The process of transformation during the 1989-2004 period is considered succeeding in achieving its goal, this can be seen from the whole economic structure that has changed. Aside from that, the GDP per capita has also doubled in that period. The most obvious is that Hungary has finally been accepted as a member of European Union in its final years of the successful process of the economic transformation.

However, it does not mean that there are no occuring problems, Zidek (2014) mentioned that Hungary also face a problem of economic recession which recently has destroyed the economy in Greece. Another problem is the debt of foreign currency which is increasing due to the currency depreciation in the country.

The problem caused by structural transformation has also been experienced by Russia. Anisimov (2014) in their research has stated that the process of structural transformation in the country has caused a few negative effects, such as shadow economy, corruption, and difficulties in bureaucracy. A few scholars considered this as a deviant phenomenon, because most countries with economic transformation has been successful yet it did not happen in Russia.

The structural transformation of economy in the aforementioned countries should potentially increase the demand for labor. Meanwhile, the aggregate demand for labor

is an important measure for economic activities. Therefore, it seemed that there was a discrepancy between structural transformation of economy and the economic growth of this country (Sassi, 2011).

Up to this moment, the unemployment rate is still used to measure the rate of labor absorption; in addition, it is also used as a benchmark for wasted human resources, performance of labor market, and even for the success and failure of economic policy (Sylla, 2013).

The number of unemployment is calculated by the number of jobless individuals and are not currently looking for a job. While, the number of employment is measured by the number of working individuals despite only working for 1 hour per day, and also individuals looking for jobs. According to Sylla (2013), this type of calculation is no longer relevant, the unemployment rate is not an important indicator for the economic performance if the workers only have low qualification.

Sylla added that the most important things in solving the problem of employment are as follows: (i) how to create job fields with employees that are not salary oriented; (ii) increase the productivity of the existing job fields; (iii) and equality of employment absorption for countries with large demographics.

The Indonesian Government has set itself the target of economic policy towards the welfare of the people through enhancement of employment opportunities and poverty reduction (Soeherman *et al.*, 2014). There are eight development priorities established by the government of Indonesia to improve the welfare of Indonesian people, such as (1) improvement of investment, export, and job opportunities; (2) revitalization of agricultural farm, fishery, forestry, and rural development; (3) acceleration of infrastructure development and management of energy resources; (4) improvement of education and health access; (5) decreasing the rate of poverty; (6) fight against corruption and bureaucracy reform;

Table 3
GDP Growth Rate at Constant Prices and Employment per Economic Sector (%) in DIY Province
Year 2009-2014

ECONOMIC SECTORS	2009		2010		2011		2012		2013		2014		Average		Note
	GRDP	WORK	GRDP	WORK	GRDP	WORK	GRDP	WORK	GRDP	WORK	GRDP	WORK	GRDP	WORK	
1. Agriculture	2.85	1.87	-0.27	-5.41	-2.06	-20.13	4.19	23.38	0.69	-0.05	-1.37	-6.50	0.67	-1.14	anomaly
2. Mining And Quarrying	-0.13	-2.93**	0.88	-23.57**	11.96	6.05**	1.98	-1.74**	4.92	-11.92**	2.24	16.31**	3.64	-2.97**	anomaly**
3. Electricity, Gas & Water	5.28	-	4.00	-	4.26	-	7.13	-	6.51	-	5.77	-	5.49	-	anomaly**
4. Processing Industry	-0.97	-5.30	7.00	4.15	6.79	7.96	-2.26	7.28	7.79	-11.98	4.09	8.48	3.74	1.77	regressive
5. Construction	5.40	-3.45	6.06	-24.38	7.23	21.10	5.97	-0.59	6.07	-21.03	5.74	40.00	6.08	1.94	regressive
6. Trade, Hotel, & Restaurant	5.06	-0.33	5.33	-3.74	5.19	9.55	6.69	-2.37	6.20	4.09	6.29	3.67	5.79	1.81	regressive
7. Transportation & Communication	8.68	-7.11	5.73	-18.48	8.00	1.24	6.21	-8.23	6.30	4.95	5.04	4.82	6.66	-3.80	anomaly
8. Finance, Leasing & Business Services	8.69	16.08	6.35	-20.21	7.95	29.53	9.95	16.84	6.23	-7.53	8.73	35.61	7.98	11.72	progressive
9. Services	4.60	4.08	6.44	-5.09	6.47	10.73	7.09	0.73	5.57	5.87	7.62	-0.42	6.30	2.65	regressive
GRDP	4.45	0.18	4.88	-6.36	5.17	1.32	5.32	6.29	5.41	-1.34	5.11	3.71			

Source: DIY in figures; Central Statistics Agency (BPS) of DIY
Note: At Constant Prices 2000
** Electricity, gas and water sector was combined with mining and quarrying sector

(7) increasing the internal resistance, and (8) disaster mitigation.

In relation to GDP, Holm (2014) has conducted research in Denmark, where the result stated that the structural transformation of a significant effect on the productivity of GDP, structural transformation occurred towards labor intensive than capital intensive. Likewise, as happened in Assam, India, Baruah *et al*. (2014) it is discovered that a structural transformation of the economy there occurred in the fisheries sector.

RESEARCH METHODOLOGY

The data in this study were secondary data consisting of the value and contribution of various economic sectors in Indonesia's GDP and GRDP of DIY Province. The data were taken during 2009 to 2014 period published by the Central Statistics Agency (BPS) that were summarized in Statistics of Indonesia Year 2011 and 2015, as well as DIY in Figures Year 2010-2015.

The tools for analysis were the classic shift-share analysis and Esteban Marquillas's shift-share analysis as well as LQ analysis. The classic shift-share analysis was used to analyze and determine the shift and role of economy in the region (Ma'mun and Irwansyah, 2013):

$$D_{ij} = N_{ij} + M_{ij} + C_{ij}$$

Description:

D_{ij} = $E_{ij}.t$ – E_{ij} = Changes in the regional variable of sector i in special region of Yogyakarta

N_{ij} = $E_{ij}. R_n$ = Changes in the GRDP of sector/sub-sector i in special region of Yogyakarta caused by the influence of the reference region's economic growth (larger region)

M_{ij} = $E_{ij} (r_{in} – r_n)$ = Mixed industry of sector i in special region of Yogyakarta/Changes in the GRDP of sector i in special region of Yogyakarta caused by the influence of the reference region's economic growth (larger region)

C_{ij} = $E_{ij} (r_{ij} – r_{in})$= Competitive advantage of sector i in special region of Yogyakarta

E_{ij} = GRDP of sector i in Yogyakarta special region in the initial year of analysis

$E_{ij}.t$ = GRDP of sector i in special region of Yogyakarta in the final year of analysis

R_{in} = $(E_{in}.t – E_{in})/E_{in}$ = growth rate of sector i in the reference region

r_{ij} = $(E_{ij}.t – E_{ij})/E_{ij}$ = growth rate of sector i in the analyzed special region of Yogyakarta

r_n = $(E_n.t – E_n)/E_n$ = growth rate of the reference region

$E_{in}.t$ = GRDP of sector i in the reference region in the final year of analysis

E_{in} = GRDP of sector i in the reference region in the early initial of analysis

$E_n.t$ = GRDP of the reference region in the final year of analysis

E_n = GRDP of the reference region in the early year of analysis

The shift-share equation for sector i in the analyzed area (j) is:

$$D_{ij} = E_{ij}.r_n + E_{ij} (r_{in} – r_n) + E_{ij} (r_{ij} –r_{in})$$

To determine the level of economic specialization in an area the Esteban Mar quillas' Shift-Share (SS-EM) is used. To determine the allocation effect, the following formula can be used:

$$A_{ij} = (E_{ij} – E^*_{ij}) (r_{ij} – r_{in})$$

Description:

$(E_{ij} – E^*_{ij})$: level of specialization of sector i in special region of Yogyakarta

$(r_{ij} – r_{in})$: level of competitive advantage of sector i in special region of Yogyakarta

The equation means that if a region has a specialization in certain sectors, these sectors will certainly benefit from a better competitive advantage. From Esteban Marquillas' modification of shift-share analysis, the following formula is found (Ma'mun and Irwansyah, 2013):

Dij = Eij (rn) + Eij (rin – rn) + Eij (rij – rin) + (Eij – E*ij) (rij – rin)

The possibilities that will occur due to the allocation effect are illustrated in Table 4 below:

Table 4
Esteban Marquillas' Shift-Share Analysis

No	Eij – E*ij	rij – rin	Specialization	Competitive Advantage
1	> 0	> 0	Yes	Yes
2	< 0	> 0	No	Yes
3	> 0	< 0	Yes	No
4	< 0	< 0	No	No

The Location Quotient (LQ) Analysis is a comparison between the scale of the role of a sector in an area and the scale of the role of the sector nationally. In this study, LQ is a method for calculating the relative ratio between the added-value contribution of a sector in DIY Province and the added-value contribution of the corresponding sector in Indonesia. LQ analysis can also be used to find the basic economic activity as the region's mainstay sector. The formula to calculate LQ is as follows:

LQ = (Xr/GRDP)/(Xn/GDP)

Description:
Xr = GRDP of sector i in special region of Yogyakarta
GRDP = Gross Regional Domestic Product of special region of Yogyakarta
Xn = Gross Regional Domestic Product of sector i in Indonesia
GDP = Gross Domestic Product of Indonesia

If LQ> 1, it means the sector is a basic sector, so the role of this sector in the region is more prominent than the role of this sector nationally. Whereas if LQ <1, it means the sector is a non-basic sector, so this sector's role is less than the sector's role nationally.

ANALYSIS AND DISCUSSION
Shift-Share Analysis

An increase in economic activities indicated by a rise in GRDP of a region can be decomposed into three influencing factors/components (Sjafrizal, 2008). In detail, the three influencing factors are, first, the increase in GRDP caused by external factors (national/provincial policy) or often referred to as the effects of regional economic growth (Nij). The second influence is the effect of the growth structure of a sector and sub-sector or often called industrial-mix effect (Mij), and the last influence is the effect of competitive advantage in the study area (Cij).

However, recently a fourth effect emerges as the effect of regional economic specialization (Aij). The addition of this effect was developed by Esteban Marquillas presented in the model of reinterpreted shift-share analysis written in the Regional and Urban Economist journal entitled *A Reinterpretation of Shift-Share Analysis* (Esteban Marquillas, 1972). The Shift-Share Analysis by Esteban Marquillas is then known as the SS-EM.

Table 5 also shows that from 2009 and 2014 there was an increase in GRDP of DIY Province as much as IDR 4,078,210,000. Based on the SS-EM analysis, the rise in DIY Province's GRDP was dominated by two economic sectors, which were services sector by IDR 1,130,420,000 and trade, hotel and restaurant sector by IDR 1,055,990,000. The GRDP increase in DIY Province was greatly influenced by four factors: the impact of GRDP aggregate economic growth of DIY as much as IDR 5,434,970,000, the impact the growth of economic sectors at the national level that led to the growth of

Table 5
Components of Economic Growth in DIY Province for 2009 dan 2014

ECONOMIC SECTORS	Billion IDR					Percent		
	Effect of National Eco-nomic Growth (Nij)	Effect of Indus-trial Mix (Mij)	*Differential Shift* (DS) Cij		Total Increase in GRDP (Dij)	Contribution of Economic Sector to the Total Increase in GRDP		
			Competi-tive Advantage (Cij')	Speciali-zation (Aij)				
1. Agriculture, Animal Husbandry,Forestry & Fisheries	986.73	-545.87	-636.64	-160.44	-356.23	-8.73	Primary sector	-13.78
2. Mining & Quarrying	37.58	-34.78	20.95	-229.65	-205.9	-5.05		
3. Processing Industry	707.20	-88.66	-125.91	127.28	619.91	15.20	Secondary sector	29.38
4. Electrocity, Gas & Water	50.27	-4.95	0.04	0.01	45.37	1.11		
5. Construction	521.09	93.38	-61.53	-20.22	532.73	13.06		
6. Trade, Hotel & Restaurant	1,127.43	365.32	-368.64	-68.12	1,055.99	25.89	Tertiary sector	84.41
7. Transportation & Communication	576.59	685.60	-645.13	-108.72	508.35	12.47		
8. Finance, Leasing & Business Services	515.59	82.62	151.18	-1.80	747.58	18.33		
9. Services	912.48	-13.13	160.64	70.43	1,130.42	27.72		
Total	5,434.97	539.53	-1,505.05	-391.23	4,078.21	100.00		

Source: Central Statistics Agency (BPS), processed

aggregate GRDP of DIY Province by IDR 539,530,000, the effect of competitive advantage giving a negative growth of aggregate economy of Yogyakarta special region as much as IDR 1,505,050,000, as well as the influence of economic specialization in DIY Province, which could give a negative growth of IDR 391,230,000.

The position of province as a forming part of the national territory makes the policy made by the central government affect the regional economy (province) as well either directly or indirectly. The development of Indonesia's economy as indicated by the rate of economic growth will affect the economic development in DIY Province.

The following Table 6 shows the performance of the Indonesian economy that proved to have a major contribution to the economic performance of Yogyakarta special region. In reality, this external growth has resulted in increased GRDP of DIY Province as much as 5434.966 billion

IDR. This condition indicates that the 133.27 percent increase in GRDP of DIY Province was caused by the aggregate economic growth in Indonesia, which was the external factor of DIY Province. By sectors, the influence of the Indonesian economy was evident in several sectors, such as Processing Industry Sector (114.08 percent), Transportation and Communication Sector (113.42 percent), Electricity, Gas and Water Sector (110.82 percent), and Trade, Hotel and Restaurant Sector (106.76 percent).

The influence of the national economy in some sectors was due to the policy from outside DIY Province, such as the central government policy to provide assistance to the industry sector as well as a variety of assistance from the central government to the local government (DIY Province). In addition, the Indonesian economy that tends to improve in recent years has contributed greatly to the increase in GRDP of DIY.

Table 6
Effect of Indonesia's Economic Growth on the Increase in GRDP of DIY Province
In 2009 and 2014

ECONOMIC SECTORS	Billion IDR		Percent
	Effect of National Economic Growth Nij	Total Increase in GRDP Dij	Influence of External Factors
1. Agriculture, Animal Husbandry, Forestry, and Fisheries	986.7261	-356.225435	-276.995
2. Mining and Quarrying	37.58378	-205.895984	-18.2538
3. Processing Industry	707.1974	619.906224	114.0814
4. Electricity, Gas and Water	50.27468	45.3665141	110.8189
5. Construction	521.0934	532.726601	97.81629
6. Trade, Hotel and Restaurant	1,127.426	1,055.9887	106.7649
7. Transportation and Communication	576.5893	508.346172	113.4245
8. Finance, Leasing and Business Services	515.5921	747.58415	68.96777
9. Services	912.4834	1,130.41736	80.72093
Total	5,434.966	4,078.2143	133.2683

Source: Central Statistics Agency (BPS), processed

Effect of Indonesia's Industrial Mix on the Economy of DIY

The effect of industrial mix or the structure of economic growth in Indonesia could increase GRDP of DIY. This effect occurred because the Indonesian industry greatly affected the growth of GRDP of DIY.

In Table 7, it can be seen that the effect of industrial mix has caused GRDP of DIY Province to increase by Rp 539.53 billion. The rise in GRDP of DIY Province shows that the structure of the national economic growth could boost the economy of DIY Province as much as 13.23 percent. The economic sectors in DIY Province that obtained a positive impact from Indonesia's industrial mix were Transportation and Communication sector (Rp 685.60 billion), Trade, Hotel and Restaurant sector (Rp 365.32 billion), Construction sector (Rp 93.38 billion) and Finance, Leasing and Business Services sector (Rp 82.62 billion).

Then, the sectors that received a negative effect from the national industrial mix were Agriculture, Animal Husbandry, Forestry and Fisheries sector (Rp 545.87 billion), Mining and Quarrying sector (Rp 34.78 billion), Processing Industry sector (Rp 88.66 billion), Electricity, Gas and Water sector (USD, 4.95 billion) and Services sector (Rp 13.13 billion). The advantage of SS-EM is that it is capable of detecting the economic sectors that have a competitive advantage and specialization in an area. An economic sector is considered to have a competitive advantage as well as specialization at once when its growth and role are better than the growth and role of the same sector in the national economy.

Table 8 shows that some economic sectors had both a competitive advantage and specialization in DIY Province. The sectors that had a competitive advantage were Mining and Quarrying sector, Electricity, Gas, and Water sector, Finance, Leasing and Business Services sector, and Services sector. Meanwhile, the sectors with specialization were Agriculture, Animal Husbandry, Forestry and Fisheries sector, Electricity, Gas, and Water sector, Construction sector, and Services sector.

Then, the sectors that had both a competitive advantage and specialization were Electricity, Gas, and Water sector as well as Services sector.

Table 7
Impact of the Growth of National Economic Sectors
On the Increase in GRDP of DIY in 2009 and 2014

ECONOMIC SECTORS	Billion IDR		Percent
	Effect of Industrial Mix (Mij)	Total Increase in GRDP (Dij)	Effect of External Factors
1. Agriculture, Animal Husbandry, Forestry, and Fisheries	-545.87	-356.225435	153.2373
2. Mining and Quarrying	-34.7848	-205.895984	16.89434
3. Processing Industry	-88.6585	619.906224	-14.3019
4. Electricity, Gas and Water	-4.95386	45.3665141	-10.9196
5. Construction	93.38413	532.726601	17.52947
6. Trade, Hotel and Restaurant	365.3203	1,055.9887	34.5951
7. Transportation and Communication	685.6041	508.346172	134.8695
8. Finance, Leasing and Business Services	82.615	747.58415	11.05093
9. Services	-13.1279	1,130.41736	-1.16133
Total	539.5282	4,078.2143	13.22952

Source: Central Statistic Agency (BPS), processed

Table 8
Identification of Competitive Advantage
And Specialization in the Economy of DIY Province in 2009 and 2014

ECONOMIC SECTORS	rij – rin	Eij – E*ij	Competitive Advantage	Specialization
1. Agriculture, Animal Husbandry, Forestry, and Fisheries	-0.17477	918.0073746	No	Yes
2. Mining and Quarrying	0.15102	-1,520.65428	Yes	No
3. Processing Industry	-0.04823	-2,639.11105	No	No
4. Electricity, Gas & Water	0.000214	27.79230685	Yes	Yes
5. Construction	-0.03199	632.0437434	No	Yes
6. Trade, Hotel and Restaurant	-0.08857	769.0713488	No	Yes
7. Transportation and Communication	-0.30308	358.7036438	No	Yes
8. Finance, Leasing and Business Services	0.079426	-22.6966373	Yes	No
9. Services	0.047686	1,476.843555	Yes	Yes

Source: Central Statistics Agency (BPS), processed

LQ Analysis

A region's leading sector can give a major contribution not only to the region itself but also to the fulfillment of the needs of other regions. The Location Quotient (LQ) analysis tool can be used to identify the competitive advantage of economic activities in DIY Province by comparing it to the National. If the economy has a number of LQ> 1 then the sector is a sector basis where the sector is more prominent role than the role of the sector nationally. It has a meaning that the sector in the region will be a surplus of certain products and can be exported to other regions and become the leading sectors in an area that has great potential to be developed as a driver of the regional economy.

Meanwhile, if an economic sector has a number of LQ <1 then it means that the role of the sector is smaller than the role of the sector nationally. It implies that the sector is only able to meet the needs for the region only and does not constitute a dominant sector and less potential to be developed as an economic sector driving the regional economy.

Based on this LQ analysis, with the value of LQ>1 DIY Province had seven economic sectors that owned a competitive advantage, namely: Agriculture, Animal Husbandry, Forestry and Fisheries sector, Electricity, Gas, and Water sector, Construction sector, Trade, Hotel and Restaurant sector, Transportation and Communication sector, Finance, Leasing and Business Services sector, and Services sector.

Then, the sectors that had LQ <1 indicated that these sectors were not the basic sectors in DIY; they were Mining and Quarrying sector (0.091) and Processing Industry (0.504).

Table 9
Value of Location Quotient in DIY Province per Economic Sectors Year 2009-2014

ECONOMIC SECTORS	2009	2010	2011	2012	2013	2014	Average
1. Agriculture, Animal Husbandry, Forestry, and Fisheries	1.337	1.311	1.258	1.269	1.239	1.182	1.266
2. Mining and Quarrying	0.084	0.082	0.092	0.093	0.096	0.099	0.091
3. Processing Industry	0.497	0.515	0.524	0.489	0.501	0.497	0.504
4. Electricity, Gas and Water	1.176	1.176	1.186	1.206	1.218	1.220	1.197
5. Construction	1.489	1.496	1.531	1.524	1.522	1.509	1.512
6. Trade, Hotel and Restaurant	1.227	1.204	1.174	1.168	1.175	1.193	1.190
7. Transportation and Communication	1.203	1.136	1.122	1.093	1.061	1.019	1.106
8. Finance, Leasing & Business Services	0.988	1.007	1.030	1.067	1.057	1.084	1.039
9. Services	1.781	1.810	1.827	1.876	1.884	1.913	1.849

Source: Central Statistics Agency (BPS), processed

CONCLUSIONS AND SUGGESTIONS

Three conditions that occurred in DIY Province relating to the influential relationship between the growth rate of GRDP (economy) and the growth rate of employment were: a) Anomaly, when the growth rate of GRDP (economy) resulted in negative employment growth rate. This condition occurred in the Agriculture sector, Mining and Quarrying sector, Electricity, Gas and Water sector, and Transportation and Communication sector; b) Regressive, when the growth rate of GRDP (economy) led to a small growth of employment rate. This condition occurred in the Processing Industry sector, Construction sector, Trade, Hotel and restaurant sector, and Services sector. c) Progressive, when the growth rate of GRDP (economy) caused a higher growth rate of employment. This condition occurred in Finance, Leasing, and Business Services sector.

The shift-share analysis results showed that in DIY Province in the period of 2009-2014 a positive growth occurred with GRDP value as much as Rp 4078.21 billion, in which the contribution of sectors to the shift of total GRDP growth in DIY Province for Primary sector reached -13.78 percent, for Secondary sector as much as 29.38 percent and 84.41 percent for Tertiary sector. This means that in the area of DIY Province there has been a structural transformation of economy from the Primary sector to the Secondary and Tertiary sectors.

Based on the LQ analysis, with LQ> 1, seven leading sectors had the potential to be developed as a driving force of the economy in DIY Province, which would further encourage the development of national economy. They were Agriculture, Animal Husbandry, Forestry and Fisheries sector, Electricity, Gas and Water sector, Construction sector, Trade, Hotel and Restaurant sector, Transportation and Communication sector, Finance, Leasing and Business Services sector, and Services sector. Then, the sectors that had LQ value <1 indicated that they were not the basic sectors of DIY,

namely Mining and Quarrying sector (0.091) and Processing Industry sector (0.504). The sectors with LQ value <1 mean that these sectors were not basic sectors and less potential to be developed as a driving force for the economy of DIY Province.

Based on the findings of the research, there are three suggestions this paper would like to offer. First, Local governments, in making the development policy in the province, must pay attention to the relationship between economic growth rate and the employment rate, so it can determine the proper field, especially for the absorption of a large workforce. As for progressive employment, it occurred in the Finance, Leasing and Business Services sector. Regressive employment occurred in the Processing Industry sector, Construction sector, Trade, Hotel and Restaurant sector, and Services sector.

Second, the economic transformation that occurred in the province from the Primary sector to the Secondary and Tertiary sectors should be noticed by policy makers, especially those relating to development planning.

The final suggestion of the research is that local governments can be more focused in developing economies of the DIY Province in several dominant sectors of the economy, namely Agriculture, Animal Husbandry, Forestry and Fisheries sector, Electricity, Gas and Water sector, Construction sector, Trade, Hotel and Restaurant sector, Transportation and Communication sector, Finance, Leasing and Business Services sector, and Services sectors.

Lastly, it important to acknowledge that the data used in the research is retrieved from BPS (Central Bureau of Statistics) so that the accuracy of the data depends on the BPS. It is also crucial to take a note that the research was conducted at the provincial level of DIY, so the findings generated are only specified for Yogyakarta province and could not apply in general to other provinces in Indonesia.

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