Conference Paper

Disparities Analysis of Employment - A Dynamic Shift Share Approached

Lucia Rita Indrawati and Rr. Retno Sugiharti

Faculty of Economics, Universitas Tidar, Magelang Central Java Indonesia

Abstract

Naturally, regional disparities are caused by differences in regional characteristics and the degree of local sensitivity in responding the changes of business cycles. Therefor industrial growth and employment growth resulted from the regional competitiveness will be different in each region. The aims of this research was analyze the disparities in regional employment. By using Indonesian labor database retrieved from BPS (Badan Pusat Statistik- Indonesian Central Burau of Statistic), the object of these research object was 34 city/district in Central Java Province 2009 to 2013. Dynamic shift-share analysis proposed by Barff & Knight (1988) was used to calculate the extent of the difference in employment growth between each region and the national average. The regional industrial structure, or to a residual element from its calculate on can be interpreted as indicating the locational advantages of each regional economy. Disparities in employment occur in the Central Java Province. The growth rate of employment in urban areas is slower than in the districts. Finally, the positive value on the residual mix coefficient indicates that overall 35 districts/cities in the Central Java region have high competitiveness prospects so that employment will grow in line with increasing competitiveness.

Keywords: disparities, employment, dynamic shift-share

Corresponding Author:
Rr. Retno Sugiharti
retno.sugiharti@untidar.ac.id

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1. Introduction

Naturally, regional disparities are caused by differences in regional characteristics and degree of local sensitivity in responding the changes of business cycles. So that, industrial growth and employment growth resulted from the regional competitiveness will be different in each region. However, Indonesian's western and eastern regions have been showing an extremely disparities economic performance condition. At the end of 2017, BPS noted that the western region (Sumatra, Java and Bali Island) showed high-level labor force participation rate and low-level unemployment rates, but on the other hand the eastern region (Sulawesi, Maluku dan Papua Island) shows a low level

of labor force participation rate and high-level unemployment rates. If the regional disparities problem is persistent, there will be an explosion of unemployed productive age in the future.

Analyzing disparities of employment in Indonesia should consider the conditions at the provincial level. Central Java as a province located in the heart of the center of Java island has a very strategic location. However, the economic growth rate of Central Java province in 2011 - 2016 is not as high as other provinces. Nevertheless, the trend of economic growth rate of Central Java is an upward trend, and other provinces have decreased.

Table 1: Growth Rate of GRDP at 2010 Constant Market Price by Province (Percent), 2011 - 2016.

Province	2011	2012	2013	2014	2015	2016
JAWA TENGAH	5.3	5.34	5.11	5.27	5.47	5.28
JAWA BARAT	6.5	6.5	6.33	5.09	5.04	5.67
DI YOGYAKARTA	5.21	5.37	5.47	5.17	4.95	5.05
JAWA TIMUR	6.44	6.64	6.08	5.86	5.44	5.55
BANTEN	7.03	6.83	6.67	5.51	5.4	5.26
Source: BPS (2018)						

This fact shows that the optimism of the economic productivity of Central Java province is still positive but needs to be studied more deeply about how to improve the economy more quickly, effectively and efficiently.

If we look at employment data for Central Java Province, we will see a contradiction condition. First, unemployment in Central Java has a negative trend. This is in line with the increasing economic growth of Central Java, but the growth of employment opportunities which is proxied by the labor force participation rate in Central Java Province in the period 2007-2016 has experienced a downward trend.

When unemployment decreases, employment opportunities should be concluded to increase. Because the opening of employment will reduce the unemployment rates but the reality shows from the Figure 1 and Figure 2, is the opposite way.

If looking more deeply about the level of Labor Force Participation Rate (LFPR), then the average of LFPR in central java province in 2007 until 2017 is 69.69 percent, with the average growth rate of employment is -0.15 percent. The low level of labor force participation reflects the low absorption of labor that can be absorbed by employment.

The main factor of low LFPR is education that is unable to produce a quality workforce according to the demands of the labor market. While the downward trend indicates that more labor is directed to the formal sector so that when they lose jobs in the formal sector, they are frustrated and couldn't try to create their own jobs in

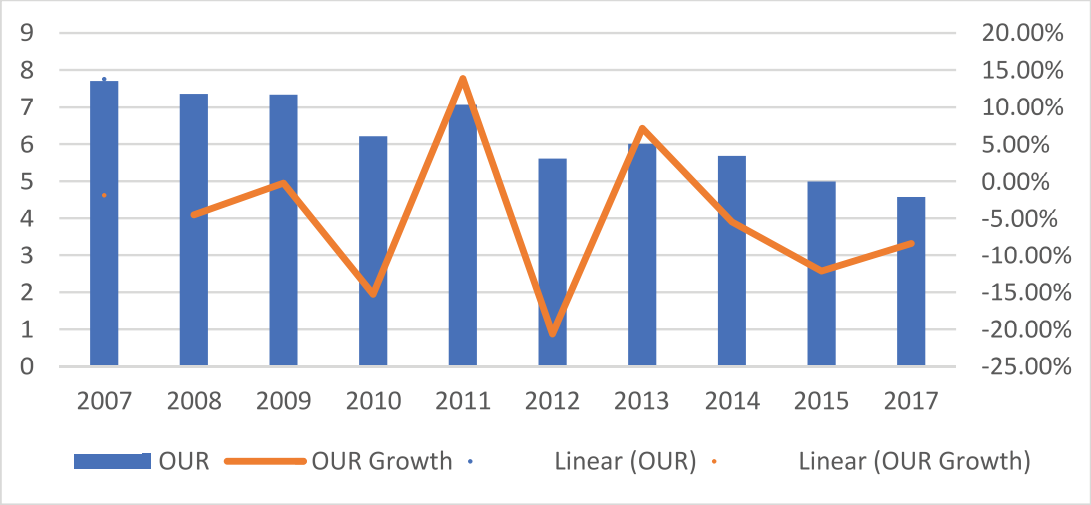

Figure 1: Open Unemployment Rate of Central Java, 2007 - 2017. Source: BPS (2018).

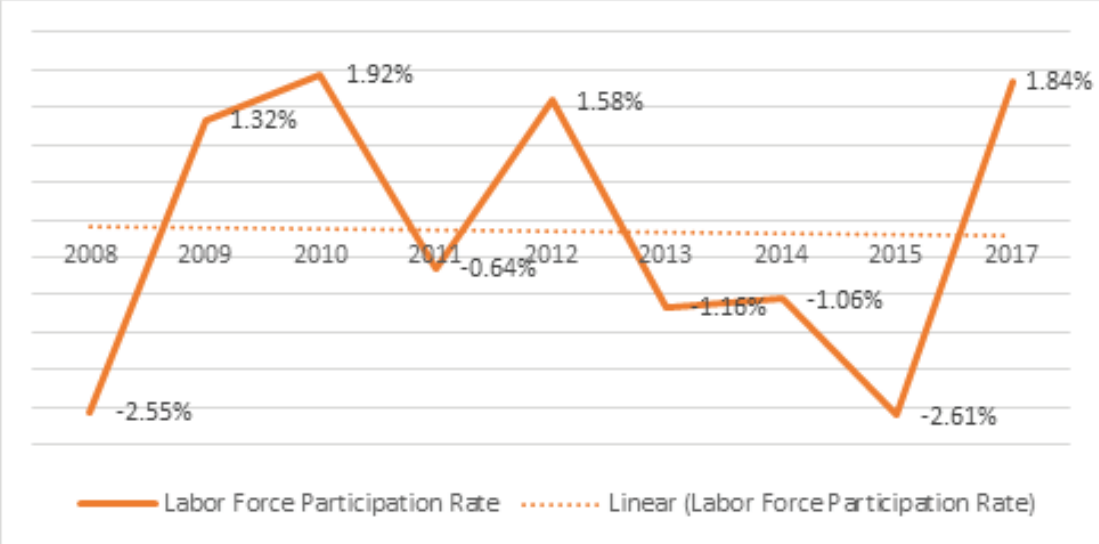

Figure 2: Labor Participation Rate of Central Java, 2008 - 2017. Source: BPS (2018).

the informal sector. Employment absorption still relies on labor-intensive projects so that when the project is completed, the workforce is unemployed again. therefore, unemployment is seen to decrease but LFPR also decreases.

From the regional side in the 2007-2017 of 35 city districts in Central Java, the lowest LFPR was Banyumas with an average of 64,271 percent and an average growth rate of 0.06 percent. Meanwhile the highest LFPR is Temanggung, with the averaged 75,981percent but the average growth rate decreased at 0.56 percent. This fact is interesting because the regions with the lowest employment opportunities have an average growth trend but the highest has a downward trend. This indicates that the employment rate in Central Java is uneven. Which means energy and unemployment also has uneven distribution. There are areas with high absorption and low areas. Then

it can be concluded that there are certain sectors that support other sectors. Conditions of labor disparities occurring in Central Java lead to further research.

Dynamic Shift-share method was used by many previous researches. Labor disparities was also found in Belgium. Meunier & Mignolet (2005) analyze why employment and unemployment are unequally distributed over space in Belgium. This contrasting condition was analyze by traditional shift share, dynamic shift share and with Herath et al (2011) conducted employment data for 38 years from 1970 to 2007. This study analyzes the employment growth pattern and policy implications in the economic development of West Virginia using a dynamic shift share analysis and the results conclude that agriculture, mining and manufacturing are no longer the backbone of the economy of West Virginia. Otsuka (2016) investigate the future trends of energy demand in Japan accurately. By using dynamic shift-share analysis the results show that the energy demand fluctuations can be explained by compositional effects and regional effects.

This study aims to analyze which sector has the highest labor's share and decomposes on regional employment growth into national growth, industry mix and regional growth. Decomposition was used to identified which highest proportional share of Labor. The method used is Dynamic Shift Share analysis where an extension of traditional shift-share. By adding an intergenerational growth factor in traditional shift share analysis, the Dynamic Shift-share method is able to identify regional employment patterns.

2. Methods

The study was conducted in Central Java Province. but due to limited data availability, the period of observation took a span of time from 2007 - 2013. the takeover of the period span is still relevant because there is no economic structure changing in the next year (until now). To show the growth and performance of sectoral workers in Central Java province the SSA (Shift Share Analysis) and DSSA (Dynamic Shift Share Analysis) methods were used.

SSA is one of the most commonly used quantitative techniques for analyzing changes in regional economic structures compared to the economic structure of higher administrative regions. To see the characteristics between provinces, the decomposition of employment growth, the contribution of the regional characteristic

components and the contribution of national pull components, is used by the two sector shift share method developed by Beaud (1966) as follows:

$$g_r - g_n = \sum_{i=1}^{I} w_{in}(g_{ir} - g_{in}) + \sum_{i=1}^{I} g_{in}(w_{ir} - w_{in}) \quad (1)$$

g_{ir} and g_{in} is a change in the creation of employment opportunities in industry i in region (r) and national (n) noted i = 1,....I

$$g_r = \frac{\sum_i e_i^t - \sum_i e_i^0}{\sum_i e_i^0} \times 100 \quad (2)$$

$$g_n = \frac{\sum_i E_i^t - \sum_i E_i^0}{\sum_i E_i^0} \times 100 \quad (3)$$

e_i: Employment of an area in the sector i

Σe_i: Total employment for all sectors in a region

T: End of study period

o: Early study period

E_i: National employment in the sector i

ΣE_i: National total employment for all sectors

w_{ir} and w_{in} *is share of* industrial employment opportunities i in area (r) and national (n).

$$w_{ir} = \frac{E_{ir}^t}{\sum_i E_{ir}^t} \quad (4)$$

$$w_{in} = \frac{E_{in}^t}{\sum_i E_{in}^t} \quad (5)$$

The components of both sides to the right of equation (1) measure the structural impacts that describe regional employment growth differentials with. Regional disparities in this case are indicative only for regional specialization of industrial growth or decline. Therefore, the positive value of these structural components is a favorable or unfavorable indication of the sectoral mix of regions.

The first component of the right-hand side of equation (1) is called residual or regional impact that compares the growth of regional and national employment for each sector. The negative value of this component indicates the region-specific lack of growth performance. The second method will be used in this research by applying DSSA. Compared to the first method, DSSA method has several advantages, first, it is independent of the reference level, second, it includes the impact compounding

component, that is, automatic regional parity changes if the impact of the domestic economic structure is not actualized, third, DSSA makes it easier to see the picture evolution of each component from time k time [1]. DSSA methods are as follows:

$$\sum_{i=1}^{T-1}\sum_{i=1}^{I}\left(\frac{E_{ir}^{t+1}}{E_{ir}^{t}}-\frac{E_{in}^{t+1}}{E_{in}^{t}}\right)\frac{E_{ir}^{t}}{\sum_i E_{ir}^{t}}+\sum_{i=1}^{T-1}\sum_{i=1}^{I}\left(\frac{E_{ir}^{t+1}}{E_{ir}^{t}}-\frac{E_{in}^{t+1}}{E_{in}^{t}}\right)\frac{E_{in}^{t}}{\sum_i E_{in}^{t}}$$

Noted that t = 1...,T

To analyze Labor disparities, the data used in this study is describe as Labor Force is the number of working-age population active in the labor market (unit of people), Proportion of working age population defined as total population aged 15-64 years compared with total population (Unit percent). Labor is the number of people aged 15-64 years who are active work (unit of people). Unemployment Rate is the number of people aged 15-64 years who are unemployed compared to the total workforce (unit in percent) and Sectoral Labor defined as the number of people aged 15-64 years who work by sector (unit of person). The data was retrieved from BPS (Badan Pusat Statistik- Indonesian Central Burau of Statistic).

3. Result and Discussion

The contribution of labor to each sector is used to see which sector absorbs the highest labor force. The comparation of labor absorption using the GRDP value assuming that the higher the amount of labor in a sector, the higher the output produced by the sector.The contribution of sectoral employment in employment in the province of Central Java is presented in the following Figure:

As displayed in Figure 3 and Figure 4, it show that the largest labor force absorbtion is the Agricultural, forestry and fishing but the largest output is comes from manufacturing. Meunier & Mignolet (2005) stated that the dynamic shift-share approach reveals that the contributions of the residual shift and of the industry mix effect are variable in time in order to explain the disparities in regional employment performances. From the calculation of SSA and DSSA is presented as follows:

Table 2: Common shift-share and dynamic shift-share of Central Java Province.

Common Shift-share				Dynamic Shift-share			
Distric	**Residual Share**	**Proporsional share**	**Total Shift**	**Distric**	**Residual Share**	**Industrial Mix**	**Total Shift**
Semarang, Kota	-0.169	-107.405	-105.803	Tegal, Kab.	0.284	0.178	0.462
Surakarta, Kota	3.340	-108.051	-109.090	Pemalang, Kab.	0.436	0.106	0.542
Magelang, Kota	11.185	-108.240	-107.681	Cilacap, Kab.	0.397	0.013	0.410

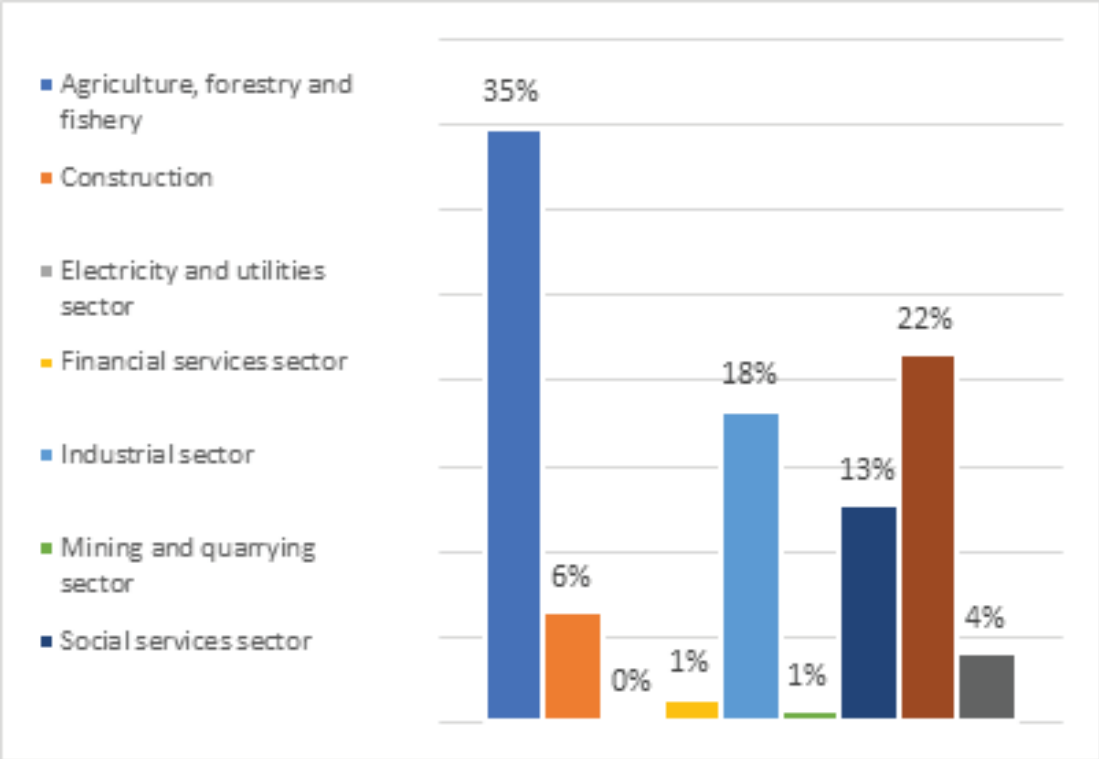

Figure 3: Contribution of Sectoral Labor in the Central Java Province, 2007 - 2013. Source: BPS (2018).

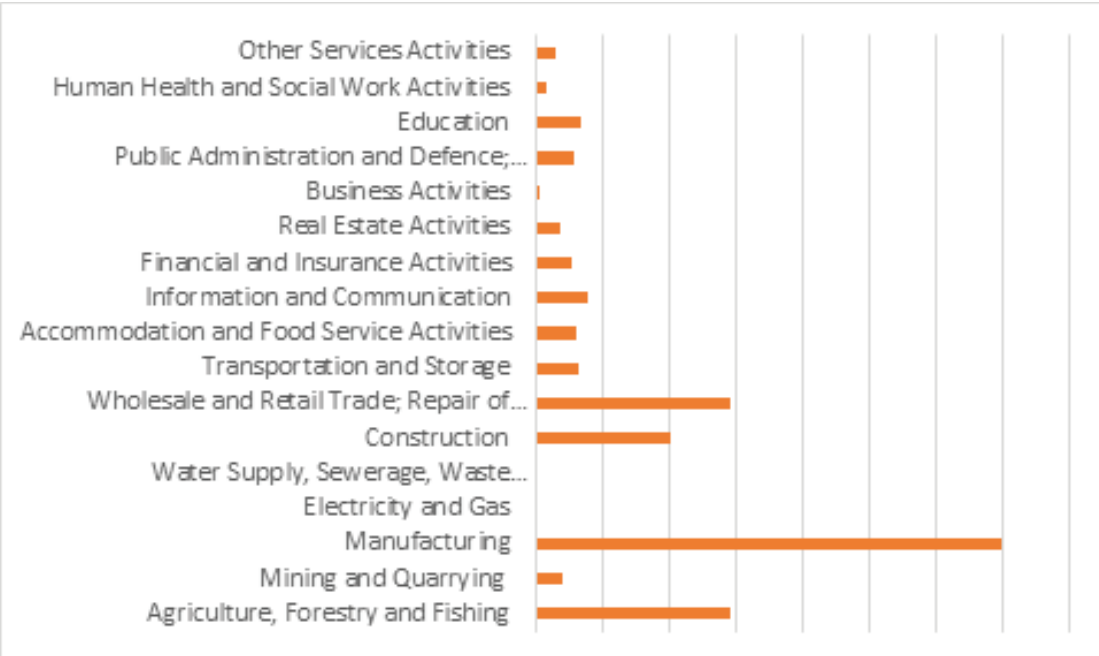

Figure 4: Contribution of GRDP by Industry in the Central Java Province, 2017. Source: BPS (2018).

Common Shift-share				Dynamic Shift-share			
Distric	**Residual Share**	**Proporsional share**	**Total Shift**	**Distric**	**Residual Share**	**Industrial Mix**	**Total Shift**
Pekalongan, Kota	0.397	-108.976	-107.987	Kendal, Kab.	0.225	0.011	0.236

Common Shift-share				Dynamic Shift-share			
Distric	**Residual Share**	**Proporsional share**	**Total Shift**	**Distric**	**Residual Share**	**Industrial Mix**	**Total Shift**
Salatiga, Kota	-0.168	-109.037	-109.170	Magelang, Kota	0.307	0.000	0.000
Tegal, Kota	1.569	-109.164	-107.511	Pekalongan, Kota	0.263	0.000	0.000
Sukoharjo, Kab.	0.173	-110.221	-108.945	Pekalongan, Kab.	0.282	-0.032	0.250
Klaten, Kab.	-0.276	-110.642	-108.926	Sukoharjo, Kab.	0.324	-0.035	0.290
Jepara, Kab.	1.347	-110.902	-109.024	Purworejo, Kab.	0.295	-0.039	0.256
Kudus, Kab.	-0.178	-111.006	-109.460	Klaten, Kab.	0.340	-0.047	0.293
Karanganyar, Kab.	-0.039	-111.545	-111.041	Banyumas, Kab.	0.351	-0.052	0.298
Banyumas, Kab.	1.012	-111.675	-110.461	Jepara, Kab.	0.308	-0.064	0.244
Pekalongan, Kab.	-0.215	-111.811	-111.490	Demak, Kab.	0.401	-0.065	0.336
Boyolali, Kab.	1.640	-112.360	-111.032	Pati, Kab.	0.300	-0.076	0.224
Purbalingga, Kab.	0.720	-112.575	-111.848	Magelang, Kab.	0.283	-0.088	0.195
Tegal, Kab.	0.088	-112.678	-112.535	Karanganyar, Kab.	0.353	-0.111	0.241
Cilacap, Kab.	0.520	-112.680	-110.598	Boyolali, Kab.	0.439	-0.117	0.322
Pati, Kab.	1.463	-112.955	-112.899	Kebumen, Kab.	0.233	-0.118	0.115
Batang, Kab.	-0.054	-113.092	-112.995	Sragen, Kab.	0.301	-0.123	0.178
Purworejo, Kab.	1.478	-113.136	-112.324	Kudus, Kab.	0.603	-0.148	0.456
Demak, Kab.	1.308	-113.251	-112.046	Wonosobo, Kab.	0.311	-0.150	0.161
Semarang, Kab.	0.912	-113.563	-111.820	Grobogan, Kab.	0.432	-0.162	0.270
Brebes, Kab.	1.060	-113.580	-111.695	Salatiga, Kota	0.465	-0.176	0.290
Kendal, Kab.	0.312	-113.628	-112.545	Brebes, Kab.	0.249	-0.183	0.066
Blora, Kab.	2.237	-113.715	-111.670	Blora, Kab.	0.226	-0.187	0.039
Kebumen, Kab.	-0.186	-113.895	-112.896	Banjarnegara, Kab.	0.247	-0.202	0.045
Sragen, Kab.	-0.429	-113.949	-112.656	Batang, Kab.	0.360	-0.207	0.153
Magelang, Kab.	0.042	-114.041	-113.366	Rembang, Kab.	0.253	-0.224	0.030
Pemalang, Kab.	1.233	-114.049	-113.858	Semarang, Kab.	0.379	-0.294	0.085
Rembang, Kab.	1.483	-114.151	-112.253	Purbalingga, Kab.	0.371	-0.305	0.066
Temanggung, Kab.	2.063	-114.609	-114.779	Tegal, Kota	0.312	-0.313	-0.001
Banjarnegara, Kab.	0.248	-114.928	-113.957	Wonogiri, Kab.	0.288	-0.352	-0.064
Wonogiri, Kab.	0.196	-115.719	-113.464	Surakarta, Kota	0.205	-0.362	-0.157
Grobogan, Kab.	1.878	-115.771	-114.757	Temanggung, Kab.	0.209	-0.427	-0.218
Wonosobo, Kab.	-0.320	-115.978	-115.395	Semarang, Kota	0.335	-0.593	-0.258

DDSA seem to be more rational result than SSA. So, the discussion will only have focused on DSSA. Areas with the high potential for competitiveness may not necessarily have high labor growth. As by done by Estevào (2003), Mitchell & Carlson (2003)

and Carlson & Mitchell (2005) SSA dan DSSA is used to decompose sector employment growth. From the Table.2 above, consistent result areas are only Pemalang and Cilacap, but the rest of the labor force growth is negative even though the potential for competitiveness is high. Industrial mix for all municipality in negative value, so this calculation shows that the growth of the workforce over the ability of the industry/sectoral to absorb labor force is low. From the results obtained, it can be concluded that employment cannot absorb labor force.

To facilitate the analysis, 35 municipality are combined in several residencies.

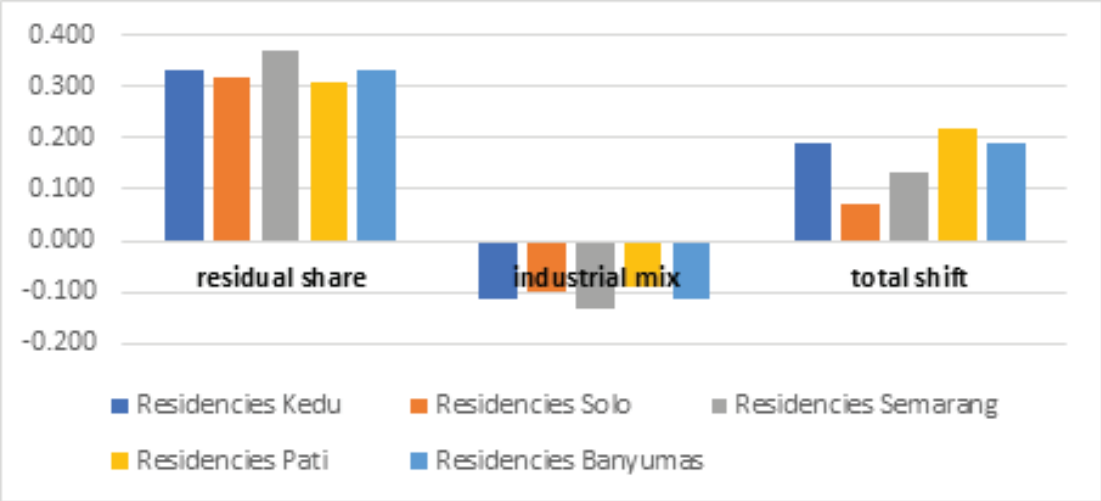

Figure 5: Dynamic Shift-share decomposition of Central Java Province. Source: BPS (2018).

4. Conclusion

Differences in the absorption of labor or employment in districts / municipalities in central java province is a complicated problem. The average growth of manpower in Central Java Province is still low. The lowest labor growth is in the Semarang city whereas the highest growth is Tegal, Kab. In the residual mix result, positive value indicates that all areas in central java province have good competitiveness potential in job creation. But keep in mind that this shift-share method is descriptive method where the ability of the analysis is to give general description on the object of research. Therefore, for the sharpness of the analysis or for policy purposes, this method is necessary to combine with a multivariate analysis to be able to see the impact of problems on other variables comprehensively [9].

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