THE IMPACT OF SPILLOVER LABOR ON THE ECONOMIC GROWTH OF CENTRAL JAVA PROVINCE WITH SPATIAL ECONOMETRICS MODEL APPROACH

by Akhmad Syakir Kurnia

Submission date: 26-Mar-2021 02:34PM (UTC+0700)
Submission ID: 1542827003
File name: wth_in_Central_Java_Province_A_Spatial_Econometrics_Approach.pdf (629.46K)
Word count: 4200
Character count: 21233

International Journal of Civil Engineering and Technology (IJCIET)
Volume 10, Issue 09, September 2019, pp. 16-26, Article ID: IJCIET_10_09_002
Available online at http://www.iaeme.com/ijciet/issues.asp?JType=IJCIET&VType=10&IType=9
ISSN Print: 0976-6308 and ISSN Online: 0976-6316

THE IMPACT OF SPILLOVER LABOR ON THE ECONOMIC GROWTH OF CENTRAL JAVA PROVINCE WITH SPATIAL ECONOMETRICS MODEL APPROACH

Dr. E. Caroline, SE, M.Si
Universitas Sultan Fatah, Demak

Prof. Dr. FX. Sugiyanto, MS
Fakultas of Economic and Business, Diponegoro University

Akhmad Syakir Kurnia, PhD
Fakultas of Economic and Business, Diponegoro University

Dr. Etty Puji Lestari, SE, M.Si
Universitas Terbuka

Dr. Ceacilia Sri Mindarti, M.Si
Universitas Stikubank

ABSTRACT

The impact of human capital spill over which is manifested by the migration of foreign workers into Central Java Province, and the migration of Indonesian workers abroad is a form of labor mobility that occurs in Central Java Province. Central Java Province is one of the 34 provinces in Indonesia. Central Java Province has contributed to the labor mobility policy since the enactment of the ASEAN Economic Community.

This study aims to analyze the impact of human capital of foreign workers on economic growth in Central Java Province. This research method uses spatial autoregressive model (SAR), spatial error model (SEM).

The results of this study obtained that the results of the calculation of the SAR-fixed effect is known that there are spatial interactions and spatial effects in each of the 35 districts / cities studied. This is evidenced by the spatial lag coefficient (δ) = 0.83 or the spatial coefficient rho 0.83 showing the magnitude of the interaction of the value of the regency / city GRDP with the value of the neighboring regency / city. Spatial rho 8 percent means that if a district / city grows 8 percent it will affect 35 districts / cities with a correlation of productivity of 4 percent. The results of the SEM-fixed effect calculation are known that there is a relationship of economic growth between 29 districts and 6 other cities.

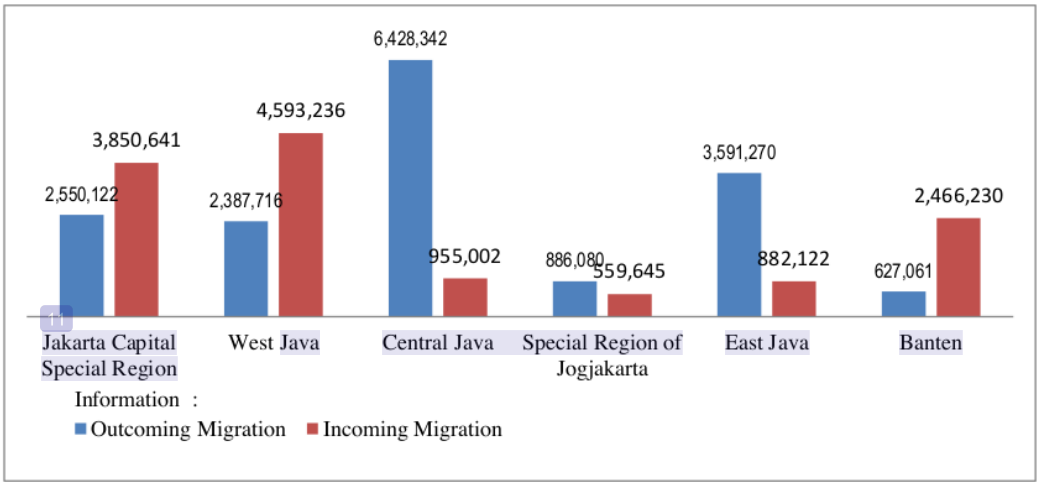
Key words: Spillover, Labor, Economic Growth, Spatial Economtrics.

Cite this Article: Dr. E. Caroline, Dr. FX. Sugiyanto, Akhmad Syakir Kurnia, Dr. Etty Puji Lestari, Dr. Ceacilia Sri Mindarti, The Impact of Spillover Labor on the Economic Growth of Central Java Province with Spatial Econometrics Model Approach. *International Journal of Civil Engineering and Technology* 10(9), 2019, pp. 16-26.
http://www.iaeme.com/IJCIET/issues.asp?JType=IJCIET&VType=10&IType=9

1. INTRODUCTION

Central Java Province is one of the provinces in Indonesia. In Central Java Province in 2018 the population will be 34.25 million people with a population aged 15 years and over there are 17.18 million workers spread across 36 Regencies / Cities which are very potential to develop. Conversely, the number of open unemployment in Central Java Province in 2018 will be 823 thousand people. The large population of Central Java Province can be a driver of economic growth. Conversely, if open unemployment is not immediately addressed it will be an obstacle to economic growth in Central Java. Central Java Province is one of the 34 provinces in Indonesia.

The existence of the ASEAN Economic Community which has been in effect since 2015 brings open labor mobility. This was realized by the impact of foreign workers who entered the Central Java Province. The existence of workers entering the Central Java Province will have an impact on increasing the economic growth of the Province of Central Java through labor productivity. Workers who enter with good performance, such as time discipline, enthusiasm for work will have a positive impact on workers in Central Java Province. Healthy competition between local and international workers will increase productivity. But if it is not anticipated the presence of foreign workers can reduce economic growth in Central Java Province.



Source: Population and Labor Mobility Statistics for 2017, processed (2019)

Figure 1 Out-migration and In-migration in Central Java Province, 2016

1.1. Importance Stata untuk Dampak Spill Over Tenaga Kerja

The impact of labor spillover is produced from the calculation of spatial weight matrices from Geo-Information technologies of GeoDa (Geo-Data), then reprocessed with stata 13 so as to provide a visual picture of the impact of labor spillover in 35 Regencies / Cities in Central Java.

This study uses a general to specific technique that is initially analyzed using the basic estimation of Ordinary Least Square (OLS) as its basis. The residual value of OLS is then tested using the Lagrange Multiplier (LM) and robust LM test. Lagrange Multiplier (LM) and robust LM tests are used to test whether the model used should use spatial lag or spatial error.

2. MATERIALS & EXPERIMENTAL PROCEDURES

2.1. Materials

2.1.1. Matriks Bobot Spasial dengan Pendekatan Euclidean Distance

Spatial weight matrices are used to calculate spatial econometrics models (SAR, SEM, SDM). Spatial weight matrices are used to determine the closeness of regions between one another on the grounds that regions that are closer will have a greater effect than regions that are farther away (Anselin, 1988). The way to obtain a spatial weighting matrix or spatial weighing (W) is to use information on the distance of the x coordinate and the y coordinate from the neighborhood, or the proximity between one region to another based on the Euclidean Distance approach (Dattorro, 2010).

Table 1 Spatial Weight Matrix with Euclidean Distance Approach

	Regency/ City	coordinate point X	coordinate point Y
1	Regency Cilacap	108,88	-7,48
2	Regency Demak	110,63	-6,91
3	Regency Grobogan	110,92	-7,11
4	Regency Banjarnegara	109,65	-7,35
5	Regency Banyumas	109,17	-7,45
6	Regency Batang	109,86	-7,02
7	Regency Blora	111,38	-7,07
8	K Regency Boyolali	110,65	-7,41
9	Regency Brebes	108,92	7,06
10	City Magelang	110,21	-7,47
11	Regency Jepara	110,76	-6,55
12	Regency Karanganyar	111,01	-7,61
13	Regency Kebumen	109,61	-7,65
14	Regency Kendal	110,15	-7,03
15	Regency Klaten	110,61	-7,68
16	Regency Magelang	110,24	-7,51
17	Regency Pati	111,04	-6,74
18	City Salatiga	110,49	-7,33
19	City Pekalongan	109,67	-6,89
20	City Semarang	110,38	-7,02
21	City Surakarta	110,82	-7,55
22	City Tegal	109,11	-6,86
23	Regency Kudus	110,86	-6,79
24	Regency Pekalongan	109,62	-7,05
25	Regency Pemalang	109,39	-7,03
26	Regency Tegal	109,15	-7,02

27	Regency Temanggung	110,13	-7,25
28	Regency Wonogiri	110,99	-7,91
29	Regency Wonosobo	109,91	-7,41
30	Regency Purbalingga	109,41	-7,32
31	Regency Purworejo	109,96	-7,70
32	Regency Rembang	111,46	-6,77
33	Regency Semarang	110,47	-7,27
34	Regency Sragen	110,97	-7,38
35	Regency Sukoharjo	110,83	-7,68

Source: Data processed by GeoDa version 16.8 (2019)

Stages of analysis to address the effects of spill over labor are used Spatial Autoregressive Model (SAR), and Spatial Error Model (SEM).Several steps that must be carried out:

(1) Determine data to be used in research;

(2) Input time period (T), i.e. T = 4, and number of regencies / cities n = 35 GeoDa version 1.8.16.4 through the map of Central Java Province.shp;

(3) Calculate the spatial weight matrix using the Euclidean Distance approach using GeoDa version 1.8.16.4;

(4) Input data into Stata 13

(5) Import data from Excel 2010 version into Stata 13;

(6) Determine the effect of the Spatial Autoregressive (SAR) and Spatial Error Model (SER) dependencies with the likelihood ratio test;

(7) Determine the Likelihood Ratio (LR) to see the existence of spatial effects;

(8) Likelihood Ratio (LR) test for Spatial Autoregressive (SAR) with the following assumptions:

Spatial fixed effect dengan spatially dependent variable :

- If the probability value> 0.05 rejects the Spatial Autoregressive (SAR) with a fixed effect of the spatial variable, if the probability <0.05 goes to the next step;
- *Spatial random effect*with*spatially dependent variable*

If the probability value> 0.05 reject the Spatial Autoregressive (SAR) with a spatial variable random effect

(9) Determine whether the model to be used is a fixed effect or random effect with the Hausman Test;

(10) Perform the Hausman test on the Spatial Error Model

(11) Assumption of the Hausman test> 0.05 reject the spatial random effect;

(12) Estimating model parameters from the Maximum Likelihood Estimator (MLE) method;

(13) Calculate and analyze SAR Fixed Effect;

(14) Calculate and analyze SEM Fixed Effect;

2.1.2. Data Used and The Impact Of Spill Over Labor

The data used in this study are cross-section data, there are 35 regencies / cities in Central Java 2018. The variables used in this study are 2 dependent variables, GDP per capita, and independent variables: Capital, Mean Years of Schooling (MYS), and Labor (L). Labor is divided into local and foreign workers.

Table 2 Description of the variable used

Variabel	Indikator	Satuan	Sumber
GRDP	GRDP	US$	Central Java Statistics Agency
Capital Stock	Capital Stock	US$	Central Java Statistics Agency
Means Years of Schooling (MYS)	Means Years of Schooling (MYS)	years	Central Java Statistics Agency
Life expectancy (AHH)	Rata-rata jumlah tahun harapan hidup sekelompok orang yang lahir pada tahun yang sama, dengan asumsi kematian pada usia masing-masing tersebut tetap konstan di masa mendatang.	years	Central Java Statistics Agency
Labour (L)	Penduduk berusia 15 tahun ke atas yang bekerja selama seminggu yang lalu menurut pendidikan tertinggi yang ditamatkan (tidak/belum sekolah universitas) di negara	person	Central Java Statistics Agency

2.2. Methods Spatial Econometrics

The method used in this study is the spatial econometrics model, namely Spatial Autoregressive (SAR) or Spatial Lag Model (SLM), and Spatial Error Model (SEM)

This study uses Spatial Autoregressive (SAR), and Spatial Error Model (SEM) on the grounds that Spatial Autoregressive (SAR) is used to determine the correlation between dependent variables, Spatial Error Model (SEM) is used to determine the correlation between error terms, this study adopts the concept of spatial spillover from Lesage and Pace (2010).

Lesage and Pace (2010) use a first-order spatial autoregressive or spatial lag model to determine spillovers. This is supported by the research results of Anselin and Bera (1998). Anselin and Bera (1998) interpret two significant levels of the space autoregression coefficient

(ρ), is : i). As a process of spillover effects, ii). Explain the significant level of spatial autocorrelation as a mismatch between the spatial units studied and the reality processes of the spatial scales studied.

The best model in this study is the spatial autoregressive panel fixed effect model written:

$$PDRB_{it} = \rho \sum_{j=1}^{n} W_{ij} PDRB_{jt} + \beta X_{KAPITAL_{it-1}} + \beta X_{RLS_{it-1}} + \beta X_{AHH_{it-1}} + \beta X_{it-1TKI} + \beta X_{it-1TKI} + \varepsilon_i \quad (1)$$

Information

i = 1,...,n
$i \neq j$
i = Regency / City being observed
j = Neighboring regencies / cities
ρ = $i \neq j$
W = Spatial weight matrix with the Euclidean Distance approach
β = Regression coefficient

RLS = Average length of school

ε_i = error term

Another model used in the study is SEM Fixed Effec. SEM is used to tolerate variables that are not included in the model. SEM in this study was written,

$$\boldsymbol{PDRB}_{\boldsymbol{i}} = \boldsymbol{\beta}_{\boldsymbol{constanta}} + \boldsymbol{\beta X}_{\boldsymbol{iKAP}} + \boldsymbol{\beta X}_{\boldsymbol{iRLS}} + +\boldsymbol{\beta X}_{\boldsymbol{iAHH}} + \boldsymbol{\beta X}_{\boldsymbol{iTKA}} + \boldsymbol{\beta X}_{\boldsymbol{iTKi}} + \boldsymbol{\varepsilon}_{\boldsymbol{i}} \sum_{\boldsymbol{i=1, i\neq j}}^{\boldsymbol{n}} \boldsymbol{W}_{\boldsymbol{ij}} \boldsymbol{PDRB}_{\boldsymbol{i}} \quad (2.)$$

Keterangan

i = Regency / City being observed

j = Neighboring regencies / cities

ρ = Koefisien autoregresi ruang

W = Spatial weight matrix with the Euclidean Distance approach

β = Regression coefficient

RLS = Average length of school

ε_i = error term

ε = $= \lambda W\varepsilon + \mu$

λ = space autoregression coefficient

This study developed the basic model of Caselli et al. (1996) by modifying Fisher et al. (2009) and Ramos et al. (2010) on the Spatial Durbin Model (SDM) to analyze human capital spillover with a written model,

$$PDRB_{\ t} = \rho \sum_{j=1}^{n} W_{ij} PDRB_{jt} + \gamma_y lnY_{i,t-1} + \beta_{Kap} \ln\_Kap_{it} + \beta_{RLS} Ln\_RLS_{it} + \beta_{TKI} Ln_{TKI_{it}} + \beta_{TKA} Ln_{TKA_{it}} + \beta_x X_{it} + \theta_{RLS} \sum_{j=1}^{N} w_{ij} \ln\_RLS_{j,t-1} + \theta_{EWS} \sum_{j=1}^{N} w_{ij} \ln\_EWS_{j,t-1} + \theta_{UWS} \sum_{j=1}^{N} w_{ij} \ln\_UWS_{j,t-1} + \theta_x \sum_{j=1}^{N} w_{ij} X_{jt} + \alpha_t + \mu_i + \varepsilon_{it} (3)$$

Where :

i = Kabupaten/kota yang diobservasi

j = Kabupaten/kotatetangga

w is a spatial weight matrix with the Euclidean Distance (2010) approach to the Spatial Durbin Model (SDM) to analyze human capital spillover with a written model,

$\alpha_t$is time specific

$\mu_i$is the district / city specific impact

$\varepsilon_{it}$is error in Regency / city i and time t

$\beta_x$is a direct impact of human capital

ρis the estimated value of the impact of the abundance of neighboring regency / city economic growth

$\theta_X$is an indirect effect (spillover) of control variables

θ_{RLS}, θ_{EWS}, θ_{UWS} , dan $\theta_X$is an indirect effect (spillover) of human capital in the form of RLS

RLS = Average length of school

3. DISCUSSION

3.1. Classic Regression Test "OLS" Data Panel

Before verifying the spatial regression model of panel data, a classical regression test of goodness of fit is performed, then LM and robust LM tests. LM test is used to find out what model is most suitable to be used in the model, whether the spatial lag model or the spatial error model (Anselin, 2005). Next, to test the fixed effect or error effect, the Likelihood Ratio test is used.

Table 3. identifies the results of the classical OLS Pooled regression calculation of variables that have a positive and significant effect on GRDP is RLS with a coefficient of 10337.23 at a significant level α = t%; Labor has a positive influence with a coefficient of 0.083581 at a significant level α = 1%.

Table 3 Regression Calculation Results with the Pooled OLS Method

Variable	Coefficient	t-Statistic	P>|t|
A constant	-35792.38	-0.44	0.661
Capital	-0.0215985	-1.27	0,210
RLS	10337.23*)	6.65	0.000
AHH	-2,66e-08	-0,78	0.436
Labor	0.083581*)	7.05	0.000
TKI	-0.4296311	-0.59	0.667
TKA	176.4791	1.53	0,131
Number of observations			70
R squared			0,5989

Source: processed data (2019)

Information

Dependent variable: GRDP

* significant at the 1 percent level;

** significant at the 5 percent level

3.2. Likelihood Ratio Test (LR Test)

Before doing the modeling in this study, several tests were used to determine the model used in this study, including the Likelihood Ratio (LR Test), Hausman Test;

The initial step before modeling spatial regression with spatial panel data is to test the existence of spatial effects of "fixed effects and random effects" using the Likelihood Ratio (LR) test. The specification of the panel data spatial regression model is intended to produce an unbiased equation, so that the estimation of the influence of independent variables on the dependent variable is not biased. The hypotheses used for the Likelihood Ratio test are as follows:

1. SAR / SLM Fixed Effect

H0: SLM has no effect

H1: at least one lag from SLM has had an effect

2. SAR / SLM Random Effect

H0: θ = 1; SLM has no effect

H1: θ ≠ 1 there is at least one lag from SLM that has an effect

3. SEM Fixed Effect

H0: SEM has no effect

H1: At least one error from SEM has an effect

4. SEM Random Effect

H0: SEM has no effect

H1: At least one error from SEM has an effect.

Hypothesis testing uses a significance level (α) of 5%. Likelihood test results are in Table 4

Table 4 Likelihood Ratio (LR) Test

Model	*Chi-Square*	*P-value*
SAR *Fixed Effect*	76,38	0,00
SAR Random Effect	-94.87	1,00
SEM Fixed Effect	54.32	0,00
SEM Random Effect	-83.56	1,00

Source: processed data (2019)

Information

***) is a significant level at α = 1%

The level of confidence used in this study is α = 5%

Table 4 shows that the p-value corresponding to less than α = 5% is the SAR fixed effect and the SEM fixed-effect means that the appropriate model in this study uses the fixed-effect Spatial Autoregressive Model (SAR) and the Spatial Error Model (SEM) fixed-effect. Furthermore, for proof of use the Hausman test. Hausman test results show the value of α> 5% so that the model used is the SAR fixed effect and SEM fixed effect. The best models used in this study are SAR fixed effect and SEM fixed effect. The reason is that in the inter-district / city growth model, the time-invariant or fixed-effect variable is indeed very influential, especially in Central Java Province. The most obvious example is Central Java Province whose alleged economic strength depends on its strategic location, which includes the fixed-effect variable.

Table 4 HausmanTest

Model	Chi-Square	DF	*P-value*	Keterangan
SAR *Fixed Effect vs* SAR *Random Effect*	1.46	2	0.5663	*not positive definite*
SEM Fixed Effect vs SEM Random Effect	0.74	2	0.6412	*not positive definite*

Source: processed data (2019)

3.3. Regression Model with Spatial Data Panel

SAR Fixed Effect

fixed effect is used to analyze whether there is a spatial correlation between independent variables. SAR fixed effect is also called the Spatial Lag Model (SLM). Spatial panel data pays attention to spatial interactions between districts / cities in Central Java Province. The spatial lag in question is the spatial lag in terms of revenue between regencies / cities in Central Java Province which are inter-related with one another in geographical proximity. For

example, when districts / cities in Central Java Province grew by X%, then it had an impact on the growth of Central Java Province by Y%.

Table 5 R^2 and $Corr^2$

Model	R^2	$Corr^2$	Variasi yang dijelaskan *fixed effect*
SAR dengan *Fixed Effect*	0.7247	0.5140	0.1942
SEM dengan *Fixed Effect*	0.2340	0.0000	0.5303

Source: processed data (2019)

Table 6 shows the criteria for good SAR fixed effects using the value of $corr^2$. The value of $corr^2$ shows that the estimation using SAR fixed effect panel data with a spatial effect results in a low $corr^2$ value of 0.5140 percent. The selection of the best model (goodness of fit) is to use the criteria R^2 and $corr^2$. The results of the criteria R^2 and $corr^2$ on SAR with fixed effects, and SEM with fixed effects it is known that the value of R^2 SAR Fixed Effect 0.7247 percent with $corr^2$ 51.40 percent, meaning that variations can be explained from the fixed effect by 27.35 percent.

Table 6 Estimated SAR Fixed Effect Parameter

Independent Variable	SAR *Fixed Effect* Coefficient	SAR *Fixed Effect* *Zhitung*
GRDP	7.61e-07	0.70
Capital	1.04e-08	1.32
RLS	-0.0020086	-0.75
AHH	0.0002957	0.52
Labor	1.53e-09	-0.04
TKI	-6.47e-07	-0.65
TKA	0.00009991	1.26
Spatial rho	0.9613635*)	5.83

Source: processed data (2019)

Information

GRDP dependent variable

*) = significant level at α = 1%

**) = significant level at α = 5%

The level of confidence used in this study is α = 5%

i = 29 Regencies and 6 cities

t =2015, 2016, 2017 dan 2018

μ_i =spatial specific effects

ε_{it} = errors are independent and identical for each i and t with mean 0 and variance σ^2.

The SAR equation with fixed-effect is written:

$GRDP_{it}$=7.61e − 07 $\sum_{j=1}^{N} w_{ij}\, GRDP_{jt}$+ .04e-08$CAPITAL_{\ it}$ − 0.0020086$RLS_{\ it}$+ 0.0002957AHH_{it}+1.53e-09$Labor_{it}$ + −6.47e − 07TKI_{it}0.00009991$TKAr_{it}$ + μ_i+ε_{it}

Furthermore, fixed-effect SAR shows significant results for Capital and spatial lag variables. The Spatial lag variable shows that there is a growth spillover between the districts / cities of 5.83%. If the average neighboring regency / city in a Central Java Province grows

around 1%, this will encourage the growth of the Central Java Province by 5.83. The results of testing spatial interactions and spatial effects in this research model showed that there were spatial interactions and spatial effects in each of the 35 districts / cities studied. This is evidenced by the spatial lag coefficient (δ) = 0.83 or the spatial coefficient rho 0.83 showing the magnitude of the interaction of the value of the regency / city GRDP with the value of the neighboring regency / city.

Spatial rho 8 percent means that if a district / city grows 8 percent it will affect 35 districts / cities with a correlation of productivity of 4 percent.

Note:

8 x 0.5 percent = 4 percent

The assumption: ceteris paribus has an average effect

SEM Fixed Effect

The fixed effect SEM in this study is used to analyze whether there is a spatial correlation between errors in the model. Table 6 identifies the estimated results of the Spatial Error Model (SEM) parameters with fixed impact using the Maximum Likelihood Estimator (MLE) method. Based on the output of the results of Stata version 13, the results of the SEM fixed effect indicate a spatial dependence on error.

Table 7 Fixed Effect SEM Parameter Estimation

Independent Variabel	**SEM *Fixed Effect***	
	Coefficient	***Zhitung***
Capital	9.19e-09	1.19
RLS	-0.0023678	-1.06
AHH	0.0002807	0.50
Labor	-1.62e-08	-0.54
TKI	-5.73e-07	-1.47
TKA	0.000895	1.18
Spatial Lambda	0.9758649*)	76.92

Source: processed data (2019)

Information

GRDP = dependent variable

*) = significant level at α = 1%

**) = significant level at α = 5%

The level of confidence used in this study is α = 5%

i = 29 districts and 6 cities in Central Java Province

t = 2015, 2016, 2017 and 2018

ε_i = error term

ε = $\lambda W\varepsilon + \mu$

λ = is the autoregression coefficient of space

The role of Lambda is very important in the Lambda SEM coefficient of fixed effects. This is proven by Lambda having a positive and significant sign at 1%, meaning that there is a

link between economic growth among 29 regencies and 6 other cities. This means that the economic growth of Central Java Province is influenced by the economic growth value of other regencies / cities and has the same characteristics.

Next the fixed-effect SEM equation is written:

$GRDP_{it}$= 9.19e-09$Capital_{it}$- -0.0023678RLS_{it}+0.0002807AHH_{it}-1.62e-08$Labor_{it}$-5.73e-07 TKI_{it} + 0.000895TKA_{it}0,8661064 $\sum_{j=1}^{N} w_{ij}\, GRDP_{jt}$

4. CONCLUSION

The results of the calculated SAR-fixed effect are known that there are spatial interactions and spatial effects in each of the 35 districts / cities studied. This is evidenced by the spatial lag coefficient (δ) = 0.83 or the spatial coefficient rho 0.83 showing the magnitude of the interaction of the value of the regency / city GRDP with the value of the neighboring regency / city. Spatial rho 8 percent means that if a district / city grows 8 percent it will affect 35 districts / cities with a correlation of productivity of 4 percent. The results of the SEM-fixed effect calculation are known that there is a relationship of economic growth between 29 districts and 6 other cities.

REFERENCES

[1] Anselin, L. (1995). Local indicators of spatial association—LISA. *Geographical analysis*, *27*(2), 93-115.

[2] Anselin, L., & Getis, A. (1992). Spatial statistical analysis and Georaphic information systems. *The Annals of Regional Science, Vol 26*, pp. 19-33.

[3] Anselin, L., & Hudak, S. (1992). Spatial econometrics in practice: A review of software options. *Regional science and urban economics*, *22*(3), 509-536.

[4] Caroline, Sugiyanto, FX., et,. al (2017). Human Capital Category Interaction Pattern To Economic Growth of Asean Member Countries In 2015 By Using Geoda "Geo-Information Technology Data". International Journal of Civil Engineering and Technology (IJCIET) Volume 8, Issue 11, November 2017, pp. 889–900.

[5] Caroline, Sugiyanto,FX., et,. al (2018). Spatial Human Capital Interaction Pattern To Indonesian Economic Growth. International Journal of Civil Engineering and Technology (IJCIET) Volume 9, Issue 1, January 2018, pp. 713–727.

[6] Dube, J., & Legros, D. (2013). Spatial Econometrics and Spatial Data Pooled Over Time Toward an Adapted Modelling Approach. *Paper Regional Science, vol. 92*(no. 1), pp. 19-30.

[7] Getis, A., & Ord, J. K. (1992). The analysis of spatial association by use of distance statistics. *Geographic Analysis, Vol. 24*(No. 3).

[8] LeSage, J. P. (1999). Spatial econometrics.

[9] LeSage, J. P., & Pace, R. K. (2010). Spatial econometric models. *Handbook of applied spatial analysis*, 355-376.

[10] Ord, J. K., & Getis, A. (1995). Local spatial autocorrelation statistics distributional issues and an application. *Geographical Analysis, Vol 27*(No. 4).

[11] Ord, K. (1975). Estimation Methods for Models of Spatial Interaction. *Journal of the American Statistical Association, Vol. 70*(No. 349), pp. 120-126. doi: 10.1080/01621459.1975.10480272

THE IMPACT OF SPILLOVER LABOR ON THE ECONOMIC GROWTH OF CENTRAL JAVA PROVINCE WITH SPATIAL ECONOMETRICS MODEL APPROACH

ORIGINALITY REPORT

11%	8%	8%	3%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	docplayer.net Internet Source	2%
2	mafiadoc.com Internet Source	1%
3	www.digilib.its.ac.id Internet Source	1%
4	repository.its.ac.id Internet Source	1%
5	Tsung Huang, Tsun-Feng Chiang, Jiun-Nan Pan. "Fertility and Crime: Evidence from Spatial Analysis of Taiwan", Journal of Family and Economic Issues, 2015 Publication	1%
6	R Wasono, A Karim, M Y Darsyah, D H Ismunarti, Suwardi. "Modelling of spatial lag of X regression in the School Operational Aid", Journal of Physics: Conference Series, 2020 Publication	1%

7	www.econstor.eu Internet Source	<1%
8	www.scribd.com Internet Source	<1%
9	Submitted to Universitas Jenderal Soedirman Student Paper	<1%
10	Hao, Yu, Yiming Liu, Jia-Hsi Weng, and Yixuan Gao. "Does the Environmental Kuznets Curve for coal consumption in China exist? New evidence from spatial econometric analysis", Energy, 2016. Publication	<1%
11	Submitted to STIE Perbanas Surabaya Student Paper	<1%
12	Submitted to Universitas Sebelas Maret Student Paper	<1%
13	Hao Wang, Zhaohui Du, Xianjun Wang, Yunxia Liu, Zhongshang Yuan, Yanxun Liu, Fuzhong Xue. "Detecting the association between meteorological factors and hand, foot, and mouth disease using spatial panel data models", International Journal of Infectious Diseases, 2015 Publication	<1%
14	Submitted to Heriot-Watt University Student Paper	<1%

15	doaj.org Internet Source	<1%
16	ro.ecu.edu.au Internet Source	<1%
17	www.hindawi.com Internet Source	<1%
18	www.tandfonline.com Internet Source	<1%
19	Submitted to University of Edinburgh Student Paper	<1%
20	Anetta Caplanova, Rudolf Sivak, Estera Szakadatova. "The Impact of Trust in Public Institutions on Compliance With Epidemiological Measures to Slow Down the Spread of COVID-19", Research Square, 2020 Publication	<1%
21	Submitted to Badan Kebijakan Fiskal Kementerian Keuangan RI Student Paper	<1%
22	Hanen Ragoubi, Sana El Harbi. "Entrepreneurship and income inequality: a spatial panel data analysis", International Review of Applied Economics, 2017 Publication	<1%
	Hongyan Liu, Yanrong Song. "Financial	

23	development and carbon emissions in China since the recent world financial crisis: Evidence from a spatial-temporal analysis and a spatial Durbin model", Science of The Total Environment, 2020 Publication	<1%
24	R Wasono, A Karim, M Y Darsyah, Suwardi. "Budgeting school operational assistance in Central Java using three spatial process modelling", Journal of Physics: Conference Series, 2019 Publication	<1%
25	Ruther, Matt. "The effect of growth in foreign born population share on county homicide rates: A spatial panel approach : County homicide rates: A spatial panel approach", Papers of the Regional Science Association, 2014. Publication	<1%
26	SpringerBriefs in Regional Science, 2014. Publication	<1%
27	dspace.lboro.ac.uk Internet Source	<1%
28	regroningen.nl Internet Source	<1%
29	www.ncjrs.org Internet Source	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

THE IMPACT OF SPILLOVER LABOR ON THE ECONOMIC GROWTH OF CENTRAL JAVA PROVINCE WITH SPATIAL ECONOMETRICS MODEL APPROACH

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11