Analysis of Regency / City Fiscal Inequality in Java: Impact of the Central Balance Fund

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ABSTRACT
This study aims to determine the level of fiscal inequality in regencies / cities in Java which is seen from the total realization of local government expenditure, education function expenditure, health function expenditure, and economic function expenditure. The method used is the analysis of sigma convergence and conditional beta convergence to determine the impact of the central balance fund. The results obtained are based on the convergence of sigma, only the total realization of regency / city regional government spending is convergence while education function expenditure, health function expenditure, and economic function expenditure occur divergence or inequality. Different results from the estimation of beta convergence which states that all components of fiscal policy in this study lead to convergence and equilibrium funds from the center that are transferred to regency / city governments in Java can increase expenditure growth both in the total realization of regional government expenditure, expenditure functions education, spending on health functions, and spending on economic function.

Keywords: Government Expenditures, Balance Funds, Convergence, Java Island

1. INTRODUCTION

As a developing country located in Southeast Asia which has an island of 17,504 and an area of 1,990,000m², Indonesia consists of 34 provinces with a central government in Java, namely in Jakarta. The Java Island region is the most important area in Indonesia because it has a large population and is also the centre of the economy which has the largest contribution to economic growth in Indonesia. So that development and public services can run evenly throughout Indonesia, in 1999 the Indonesian government issued Law Number 22 of 1999 concerning Regional Government and Law Number 25 of 1999 concerning Fiscal Balance between the Central and Regional Governments. Fiscal decentralization began to be implemented in Indonesia since 2001, but in its implementation whether it can reduce fiscal inequality between regions needs to be further investigated and studied.

The central government has transferred balancing funds to regional governments both provincial and regency / city in Indonesia, with the amount increasing every year in 2011-2018 as shown in the figure 1. Transfer of Central Balance Funds to the Regions in 2011 amounting to Rp. 347 Trillion went up to 444 Trillion in 2012. Then in 2013 it dropped to Rp. 422 Trillons after that the Central Fund Transfer to the Regions continues to increase until 2018 to Rp. 663 trillion.

The amount of balance funds transferred to local governments in Indonesia, the largest allocation is in the area of Java, then Sumattra, and has continued to increase from 2015-2018.

Figure 1 Total Balance Funds to Regional Governments for 2011-2018

This is because the population and the largest contribution to economic growth in Indonesia are in Java. In 2018 the largest amount of funds transferred to the regions was in Java, amounting to Rp. 223 trillion and the smallest on the islands of Bali and Nusa Tenggara Rp. 43 Trillion as shown figure 2.
While research on the effect of balancing funds on regional fiscal expenditure convergence in Indonesia was carried out by Dekiawan [6] which states that convergence occurs in total government spending and goods expenditure and at different speeds. While Suwana [26] examines the impact of fiscal decentralization on regional inequality by using panel data in 33 provinces in Indonesia in 2001-2008 states that fiscal decentralization can reduce inequality between regions. Then the research conducted by Lisa and Priyagus [18] with data for 2009-2013, the results of the study showed that the Regional Original Revenue and The Balancing Fund has a positive and significant effect on Direct and Indirect Expenditures. Kusuma [17] conducted a study on fiscal decentralization using sample data of regencies and cities in the provinces of Java, Sulawesi and Papua between 2010-2013 to determine its contribution to economic growth, the results of its estimation using random effects concluded that fiscal decentralization in Indonesia had a positive impact on economic growth mainly from the contribution of spending made by local governments. Saputra and Mahmudi [23] conducted a study on the effect of fiscal decentralization on economic growth and social welfare using a sample of regencies and cities by province in Indonesia in 2005-2008 with path analysis with the AMOS software program, the results of his study showed that (1) fiscal decentralization had a negative impact on economic growth, (2) economic growth has a positive impact on people's welfare, (3) fiscal decentralization has a positive impact on people's welfare.

3. RESEARCH METHODS

This research uses convergence analysis. The data used is the panel report on expenditure realization and budget of the regency and city governments in the period 2010-2018 obtained from the Directorate General of Fiscal Balance of the Republic of Indonesia. The analytical method used uses the analysis of sigma convergence and beta convergence. For the city administration and administrative regencies in the Province of the Special Capital Region because the financial statements of the regional government are one, the regions are merged into DKI Jakarta. Whereas Pangandaran Regency, which was only established in 2012 and was only able to compile financial reports in 2014, the Pangandaran Regency was merged with the Regency before it was expanded, namely Ciamis Regency so that it became the Ciamis Regency and Pangandaran Regency. The definitions of the variables used in this study are in table 1.
Table 1 Variable Definition

| Variable                          | Definition                                                                 | Source                      |
|----------------------------------|---------------------------------------------------------------------------|-----------------------------|
| Total Realization of Regional Government Expenditures | Realization of total regency/city-regional government expenditure each year compared to the total population of regencies/cities in Java. | DJPK of the Ministry of Financial |
| Government expenditure Education function | The budget allocation for the education function of the regional government is compared to the population of regencies / cities in Java. | DJPK of the Ministry of Financial |
| Government Expenditure for Health Functions | Regional government health function budget allocation compared to the population of regencies / cities in Java. | DJPK of the Ministry of Financial |
| Government Expenditure for Economic Functions | Budget allocation of regional government economic functions compared to the population of regencies / cities in Java. | DJPK of the Ministry of Financial |
| Balance Funds                    | Funds sourced from APBN revenues allocated to the Regions to fund Regional needs in the context of the implementation of Decentralization consisting of profit-sharing funds (DBH), General Allocation Funds (DAU) and Special Allocation Funds (DAK) in regencies/cities compared to the population of regencies/cities in Java. | DJPK of the Ministry of Financial |

### 3.1. Convergences Sigma (Σ)

Sigma convergence is used to find the coefficient of variation from the total realization of government spending between regencies / cities in Java each year. In research Coughlin [5] to calculate the coefficient of variation using the formula:

\[
CV_i = \frac{\left[ \frac{N}{\sum_{i=1}^{N} \left( FP_{i} - \bar{FP} \right)^2 / N \right] ^{0.5}}{\bar{FP}}
\]  

(1)

\(FP_i\) is the fiscal policy of the regency / city government i in year t while it is the average fiscal policy of the regency / city government. The fiscal policy of the regency / city government in this study is the total realization of expenditure, education function expenditure, health function expenditure, and economic function expenditure. Then the coefficient of variation is regressed to determine the level of significance using the following model:

\[
CV_i = a_1 + \beta_1 T + \epsilon_i
\]

(2)

\(CV_i\) is the coefficient of variation in period’s t and T is 2010-2018.

### 3.2. Convergences Beta (β)

Beta convergence analysis used in this study uses the conditional convergence model, the convergence model plus explanatory variables to describe the characteristics of each regency / city in Java. The model used is as follows:

\[
\text{ln} \left( \frac{FP_i}{FP_0} \right) = \beta_0 + \beta_1 \text{FP}_{i0} + \sum \beta_i X_{it} + \epsilon_i
\]

(3)

\(X_{a}\) is the explanatory variable for each regency / city i at time t used in this study, namely the balance fund.

From equation (3) the dependent variable is \(\text{ln} \left( \frac{FP_i}{FP_0} \right)\) so the equation model is changed to:

\[
Y = \beta_0 + \beta_1 \text{FP}_{i0} + \sum \beta_i X_{it} + \epsilon_i
\]

(4)

### 4. RESEARCH RESULT

#### 4.1. Sigma Convergence Estimation Results (Σ)

Sigma convergence analysis to analyse inequality by looking at the difference in the coefficient of variation to the average fiscal policy of the regency / city government per population in the island of Java each year. The smaller the coefficient of variation, the level of inequality of regency / city government spending towards convergence. The table below is the result of calculating the coefficient of variation in 2010-2018.

Table 2 Variation Coefficient of Regency / City Regional Fiscal Policy in 2010-2018

| Year | Total Realization of Regional Gov. Exp | Gov. Exp for Education function | Gov. Exp for Health Functions | Gov. Exp for Economic Functions |
|------|--------------------------------------|---------------------------------|--------------------------------|--------------------------------|
| 2010 | 0.533                                | 0.749                           | 1.036                          | 0.747                          |
| 2011 | 0.500                                | 0.703                           | 0.937                          | 1.070                          |
| 2012 | 0.478                                | 0.636                           | 0.996                          | 0.736                          |
| 2013 | 0.480                                | 0.859                           | 0.972                          | 0.880                          |
| 2014 | 0.472                                | 0.930                           | 0.962                          | 0.774                          |
| 2015 | 0.446                                | 1.251                           | 1.373                          | 1.283                          |
| 2016 | 0.474                                | 0.929                           | 0.911                          | 0.793                          |
| 2017 | 0.417                                | 0.994                           | 0.979                          | 1.253                          |
| 2018 | 0.438                                | 0.902                           | 1.063                          | 1.277                          |

From table 2 in 2010 the coefficient of variation in regency / city regional government expenditure by 0.533 decreased to the lowest level in 2017 of 0.417 then in 2018
it rose to 0.438 but in a downward trend or convergence occurred.
The coefficient of variation of spending on education functions has an upward trend from 2010 of 0.749 to 0.902 in 2018 so that spending on education functions does not occur convergence between regencies / cities in Java.
While the coefficient of variation from spending on health functions also increased from 2010 by 1,036 to 1,063 in 2018. Likewise, the coefficient of variation from spending on economic functions experienced an increase from 2010 by 0.747 to 1,277 in 2018.
For more details, you can see the trend's descending line in the chart below.

**Figure 3** Coefficient of Variation of Fiscal Policy in Regional Regencies / Cities in Java Year 2010-2018

After knowing the results of the calculation of the coefficient of variation in 2010-2018 then it was revised to find out the coefficient and the significance of the decrease. The results of the regression coefficient of variation of regency / city government spending on Java in the period 2010-2018 are as follows:

**Table 3 Results of Sigma Convergence Estimates**

|                  | Total Realization of Regional Gov. Exp | Gov. Exp Education function | Gov. Exp for Health Functions | Gov. Exp Economic Functions |
|------------------|----------------------------------------|-----------------------------|-------------------------------|----------------------------|
| Intercept        | 22.888610 **                          | -81.84921                   | -14.601287                    | -109.37490                  |
| 0.00121 **       | 0.0780 .                               | 0.712                       | 0.0833 .                      |
| T                | -0.011131                               | 0.04108                     | 0.007759                      | 0.05479                     |
| 0.00136 **       | 0.0755 .                               | 0.693                       | 0.0811 .                      |

Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 1

From the estimation results in table 3, the coefficient of variation of total expenditure realization has decreased significantly 0.011131 annually. The coefficient of variation of spending on education functions rises 0.04108 annually.
annually at a significant level of 10%. Likewise, the coefficient of variation from spending on economic functions rises 0.05479 annually. While the coefficient of variation in spending on health functions increases but the probability value is not significant.

4.2. Beta Convergence Estimation Results ($\beta$)

From the results of the panel data test using the Chow Test and the Hausman Test in table 4, the most appropriate model for analysing the conditional beta convergence of regency / city fiscal policy in Java for the period 2010-2018 uses fixed effects.

Table 4 Test Results of Panel Data Models

| Fiscal Policy                  | Chow Test       | Hausman Test    | Conclusion       |
|-------------------------------|-----------------|-----------------|------------------|
|                               | F   | Prob  | Chsq | Prob  |                     |
| Total Realization of Regional Gov. Exp | 2.2158 | 3.4e-10 | 269.47 | 2.2e-16 | Fixed Effect |
| Gov. Exp Education function   | 3.0014 | 2.2e-16 | 583.88 | 2.2e-16 | Fixed Effect |
| Gov. Exp for Health Functions | 3.2104 | 2.2e-16 | 424.07 | 2.2e-16 | Fixed Effect |
| Gov. Exp Economic Functions   | 3.3102 | 2.2e-16 | 468.48 | 2.2e-16 | Fixed Effect |

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The results of table 4 show that the probability values of the Chow test and the Hausman test of all conditional beta convergence models of fiscal policy show significant results that are less than $\alpha = 5\%$. The results of the Beta Convergence Estimation of the conditional policies of the regency / city area in Java.

Table 5 Estimated Results of Beta Convergence

| Total Realization of Regional Gov. Exp | Gov. Exp Function | Gov. Exp for Health Functions | Gov. Exp for Economic Functions |
|---------------------------------------|-------------------|-------------------------------|-------------------------------|
| LnFP0                                 | -0.413709         | -1.042521                     | -0.804521                     | -0.880458 |
| LnDAPER                               | 0.363875          | 0.363792                      | 1.462869                      | 0.931276 |
| $R^2$                                  | 0.39954           | 0.53326                       | 0.41825                       | 0.43799 |
| Adj. $R^2$                            | 0.31278           | 0.46582                       | 0.33419                       | 0.35679 |
| $F$-stat                              | 262.494           | 450.726                       | 283.621                       | 307.45  |

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

From the estimation results in table 5, it shows that all variables of the fiscal policy of the regency / city government in Java are converging. This is evidenced by the negative and significant value of the fiscal policy variable in the previous year (LnFP0).

In the model of total government expenditure realization, each 1% increase in total regency / city government expenditure in the previous year will reduce the growth in total realization of regency / city government expenditure by 0.413709. The increase in the amount of the Balancing Fund from the centre to the regency / city 1% will increase the growth of government spending realization by 0.363875.

The model in education function expenditure shows that an increase of 1% in education function expenditure last year will reduce education function expenditure by 1.042521 and a 1% increase in central balance funds to regencies / cities will increase education function expenditure growth by 0.931276.

Then from the health function expenditure model it can be explained that a 1% increase in health function expenditure in the previous year will reduce health function expenditure by 0.880458. Balancing funds from the centre to regencies / cities increased by 1% will increase the growth of spending on health functions by 1.462869.

While the economic function expenditure model explains that an increase of 1% of economic function expenditure in the previous year will increase economic function expenditure growth by 0.880458 and the balance funds from the centre to the regions can increase economic function expenditure growth by 0.931276.

4. DISCUSSION

From the estimation results of sigma convergence to the fiscal policy of total expenditure realization, education function expenditure, health function expenditure, and economic function expenditure, significant convergence occurs only in total expenditure realization that can be seen from the downward trend line and the coefficient which is negative while function expenditure, health function expenditure, and economic function expenditure occur divergence or increasingly imbalanced.

Different things from the estimation result of beta convergence which shows that all components of fiscal policy studied significantly towards convergence and balancing funds from the centre to the regency / city can increase the growth in the total realization of expenditure, education function expenditure, health function expenditure, and economic function expenditure. During 2010-2018 with different speed levels. This is consistent with research conducted by Skidmore and Deller [25], Önder, Deliktas, and Karadağ [22], Coughlin [5], and Dekiawan [6] which state that fiscal spending is headed for convergence.

5. CONCLUSION

From this study the conclusions that can be drawn are as follows:
1. Regency / city government expenditure on Java during 2010-2018 there was a convergence using both sigma convergence analysis and beta convergence.
2. Education function expenditure, health function expenditure, and economic function expenditure based on sigma convergence estimation results do not occur convergence or imbalance, but from the beta convergence estimation results show that all components of fiscal policy used in this study lead to convergence which can be seen from the variables fiscal policy of the previous year (LnFPt0) which is negative.

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## Appendix 1 Administrative Region Map

![Administrative Region Map](image)

### Keterangan :

| No. | Province/Area |
|-----|---------------|
| 01  | DKI JAKARTA   |
| 02  | KAB. BOGOR    |
| 03  | KAB. SUKABUMI |
| 04  | KAB. CIANJUR  |
| 05  | KAB. BANDUNG  |
| 06  | KAB. GARUT    |
| 07  | KAB. TASIKMALAYA |
| 08  | KAB. CIAMIS & KAB. PANGANDARAN |
| 09  | KAB. KUNINGAN |
| 10  | KAB. CIREBON  |
| 11  | KAB. MAJALENGKA |
| 12  | KAB. SUMEDANG |
| 13  | KAB. INDRAMAYU |
| 14  | KAB. SUBANG   |
| 15  | KAB. PURWAKARTA |
| 16  | KAB. KARAWANG |
| 17  | KAB. BEKASI   |
| 18  | KAB. BANDUNG BARAT |
| 19  | KOTA BOGOR    |
| 20  | KOTA SUKABUMI |
| 21  | KOTA BANDUNG  |
| 22  | KOTA CIREBON  |
| 23  | KOTA BEKASI   |

### List of Provinces and Cities:

- 01 DKI JAKARTA
- 02 KAB. BOGOR
- 03 KAB. SUKABUMI
- 04 KAB. CIANJUR
- 05 KAB. BANDUNG
- 06 KAB. GARUT
- 07 KAB. TASIKMALAYA
- 08 KAB. CIAMIS & KAB. PANGANDARAN
- 09 KAB. KUNINGAN
- 10 KAB. CIREBON
- 11 KAB. MAJALENGKA
- 12 KAB. SUMEDANG
- 13 KAB. INDRAMAYU
- 14 KAB. SUBANG
- 15 KAB. PURWAKARTA
- 16 KAB. KARAWANG
- 17 KAB. BEKASI
- 18 KAB. BANDUNG BARAT
- 19 KOTA BOGOR
- 20 KOTA SUKABUMI
- 21 KOTA BANDUNG
- 22 KOTA CIREBON
- 23 KOTA BEKASI

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