



Analysis of Vertical and Horizontal Fiscal Imbalances in the Regency/City of Bangka Belitung Islands Province for the 2017-2022 Period

Nindy Artha Della^{1*}, Devi Valeriani², and Eka Fitriyanti³

^{1,2,3} Faculty of Economics and Business, Universitas Bangka Belitung, Bangka Belitung Province 33172, Indonesia

*nindyardhadella@gmail.com

Abstract. Economic growth is one of the ways to contribute to a country's development. The government of a country, both developed and developing countries, has implemented the principle of decentralization in administering its government. The implementation of fiscal decentralization in supporting the regional development process has many obstacles. One of them is the gap between fiscal capacity (fiscal capacity / revenue capacity) and fiscal need (fiscal needs / spending needs) that occurs at the government level. This study aims to analyze and examine Vertical Fiscal Imbalance and Horizontal Fiscal Imbalance in the Regency / City of Bangka Belitung Islands Province for the 2017-2022 Period. This research falls under the category of quantitative research. The data for study comes from secondary sources, obtained from the Central Statistics Agency of all districts/cities in the Bangka Belitung Islands Province and the Directorate General of Fiscal Balance of the Ministry of Finance. The data was analyzed using the Vertical Fiscal Inequality Correlation Coefficient analysis and the Theil Index. The results showed that there was a vertical fiscal imbalance in the regencies/municipalities of the Bangka Belitung Islands Province for the 2017-2022 period as seen from the results of CV1 and CV2 experiencing unstable conditions, while CV3 experienced fluctuations. There is also a horizontal fiscal imbalance in the district/city of Bangka Belitung Islands Province as seen from Type 1 and Type 3 experiencing fluctuations. While Type 2 experiences fluctuations. However, there are two districts that have the same value.

Keywords: Vertical Fiscal Imbalance, Horizontal Fiscal Imbalance, Vertical Fiscal Inequality Correlation Coefficient, Theil Index.

1 Introduction

Economic growth is one sign of success in development [2]. The government of a country, both developed and developing countries, has implemented the principle of decentralization in administering its government. The implementation of fiscal decentralization in supporting the regional development process has many obstacles. One of them

is the gap between fiscal capacity (fiscal capacity / revenue capacity) and fiscal need (fiscal needs / spending needs) that occurs at the government level.

Fiscal imbalance is a phenomenon caused by financial imbalances between the central government and local governments [1]. Fiscal imbalance is categorized into two types: vertical fiscal imbalance and horizontal fiscal imbalance. Vertical fiscal imbalance occurs because there is an imbalance in income between the central government and lower local governments [1]. Horizontal fiscal imbalance is caused by each local government having a different capacity to collect funds derived from tax revenues in providing standard public services [2].

Fiscal imbalances also occur in Indonesia. Where, the implementation of regional development in Indonesia has been relying on funding from the central government. This condition can be seen in the APBD (Regional Budget), where two-thirds of the total regional expenditure is funded through assistance from the central government, not from revenue originating from the region itself [3]. One of the provinces in Indonesia that experiences fiscal imbalance is the Bangka Belitung Islands Province.

Bangka Belitung Islands Province is one of the provinces shapes like an island and is rich in natural resources. Despite having abundant natural resources, the Bangka Belitung Islands Province still depends on transfer assistance from the central government for regional development. It can be stated that the fiscal capacity of Bangka Belitung Province to fulfill its regional needs is still relatively low, indicating a continued need for the central government’s role in providing transfers to the region. From the issues discussed above, it can be concluded that the Bangka Belitung Islands Province is facing fiscal imbalance in its regional development efforts.

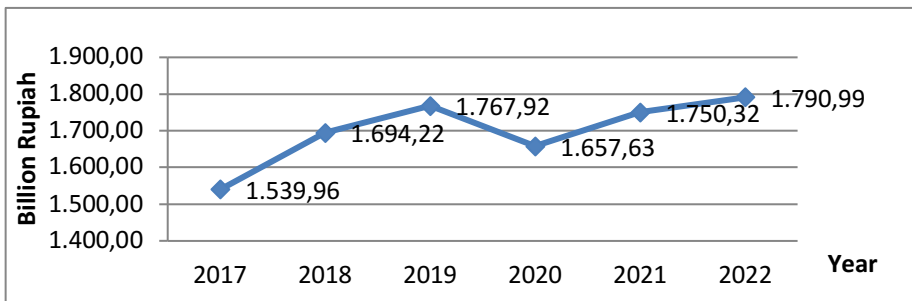


Fig. 1. Transfer Revenue of Bangka Belitung Islands Province 2017-2022 (Billion)

Based on Figure 1, It can be observed that the Transfer Revenue of Bangka Belitung Islands Province from 2017 to 2022 experienced fluctuations with an overall upward trend. The highest Transfer Revenue occurred in 2022 amounting to 1,790.99 billion rupiah and the lowest occurred in 2017 amounting to 1,539.96 billion rupiah, where the average Transfer Revenue of Bangka Belitung Islands Province over the past six years amounted to 1,700.173 billion rupiah. In 2020 there was a significant decrease with a value of 1,657.63 billion rupiah caused by the Covid-19 pandemic so that the central government reduced the transfer funds received by the Bangka Belitung Islands Province [4].

The research conducted by the researchers on the analysis of vertical and horizontal fiscal imbalances in the districts and cities of Bangka Belitung Islands Province for the period 2017-2022 differs from previous studies in terms of research objects and years. In this study, the researchers used data from 7 districts and 1 city in Bangka Belitung Islands. Researchers are interested in doing this because the more independent a region is in meeting regional needs, especially regional development, it is expected to be able to run its government without transfer assistance from the central government, but the regional fiscal capacity is still relatively low, resulting in fiscal imbalances.

2 Research Method

This research uses a quantitative approach, where the data used in the research are in the form of numbers, and the analysis is carried out using statistics [5]. This research was conducted in 6 regencies and 1 city in the Bangka Belitung Islands Province from 2017 to 2022. The sample in this study was a saturated sample with a total of 42 observations. The sample in this study consisted of 6 regencies and 1 city consisting of Bangka Regency, Belitung Regency, South Bangka Regency, Central Bangka Regency, West Bangka Regency, East Belitung Regency, and Pangkalpinang City for the 2017-2022 period. This study utilizes secondary data. The data sources for this research were obtained from the Indonesian Central Bureau of Statistics, the Directorate General of Fiscal Balance at the Ministry of Finance, as well as other supplementary data sources. This research uses analytical techniques divided into two stages, as follows:

2.1 Correlation Coefficient of Vertical Fiscal Inequality

Based on previous research by Bird and Tarasov [6], each region is analyzed through three consecutive steps to address fiscal imbalances, which are described as follows:

CV 1: Intergovernmental transfers in local government spending

$$CVI^I_j = \frac{(REV_{SH})_{SNG}}{(EXP+B)NT_{SNG}} \dots\dots\dots(2.1)$$

CV 2: Intergovernmental transfers and intergovernmental tax/non-tax revenue sharing in subnational government expenditure

$$CVI^{II}_j = \frac{(REV_{SH})_{SNG} - (IGNB)_{SNG}}{(EXP+B)NT_{SNG}} \dots\dots\dots(2.2)$$

CV 3: The portion of local government expenditure that is not covered by the local government's own revenue.

$$CVI^{III}_j = 1 - \frac{(REV + (TR_{GD} + TR_{SP}))_{SNG} - (REV_{SH}) - (IGNB)_{SNG}}{(EXP+B)NT_{SNG}} \dots\dots\dots(2.3)$$

Where:

- CVI : coefficient of vertical imbalance
- TRsp : Special Allocation Fund (DAK)
- TRgp : General Allocation Fund (DAU)
- B : Regional Loan
- EXP : Total APBD Expenditure
- IGNB : Loan Repayment
- REV : Regional Revenue
- REVsh : Tax Revenue Sharing (BHP) and Non-Tax Revenue Sharing (BHBP)

2.2 Theil Index

The Theil index is a method to measure the degree of dispersion where a value of 0 indicates uniformity in the variable with respect to the regional population. Bird and Tarasov [6] proposed a Theil index formula that uses three variables: PAD per capita, GRDP per capita, and expenditure per capita to measure the degree of horizontal fiscal imbalance by dividing regions into different types:

Type 1: Theil index of the level of PAD per capita equality among regencies/cities in the Province of Bangka Belitung Islands in 2017-2022.

$$T = \sum_i \left(\frac{Y_i}{\bar{Y}}\right) \cdot \frac{P_i}{P} \cdot \log\left(\frac{Y_i}{\bar{Y}}\right) \dots\dots\dots(2.4)$$

Type 2: Theil Index of the level of equity of GRDP per capita among regencies / cities in the Province of Bangka Belitung Islands in 2017-2022

$$T = \sum_i \left(\frac{y_i}{\bar{y}}\right) \cdot \frac{P_i}{P} \cdot \log\left(\frac{y_i}{\bar{y}}\right) \dots\dots\dots(2.5)$$

Type 3: Theil Index of the level of equality of per capita expenditure among regencies / cities in the Province of Bangka Belitung Islands in 2017-2022

$$T = \sum_i \left(\frac{x_i}{\bar{x}}\right) \cdot \frac{P_i}{P} \cdot \log\left(\frac{x_i}{\bar{x}}\right) \dots\dots\dots(2.6)$$

Where:

- T : Theil Index
- Y_i : PAD per capita of the ith region (regency/city)
- Y : Total PAD per capita of Bangka Belitung Islands Province
- y_i : GRDP per capita of the region (regency/municipality) to i
- y : Total GRDP per capita of Bangka Belitung Islands Province
- x_i : Per capita expenditure of region (regency/municipality) to i
- x : Total per capita expenditure of Bangka Belitung Islands Province
- P_i : Population of the region (regency/city) to i
- P : Population of Bangka Belitung Islands Province

3 Results and Discussion

3.1 Vertical Fiscal Imbalance Correlation Coefficient

According to the findings from the data analysis utilizing the Vertical Fiscal Imbalance Correlation Coefficient for the districts and cities of Bangka Belitung Islands Province from 2017 to 2022, a vertical fiscal imbalance was identified. This result can be seen in the calculation results of CV1: intergovernmental transfers in government spending, CV2: intergovernmental transfers and intergovernmental tax/non-tax revenue sharing funds in subnational government spending, CV3: the portion of local government spending that is not covered by the local government's own revenue. The outcomes of this vertical fiscal imbalance can be observed as follows:

Table 1. Vertical Fiscal Inequality Calculation Results of CV1: Intergovernmental Transfers Within Regions and CV2 Results: Intergovernmental Transfers and Intergovernmental Tax/Non-Tax Revenue Sharing Funds in Subnational Government Expenditure of Regency/City in the Province of Bangka Belitung Islands in 2017-2022

District/City	CV1 Results					
	2017	2018	2019	2020	2021	2022
Kab. Bangka	0.0821	0.1044	0.1213	0.0909	0.1264	0.2635
Kab. Belitung	0.0512	0.0771	0.0892	0.0428	0.0897	0.1780
Kota Pangkalpinang	0.0595	0.0733	0.0761	0.0499	0.0786	0.1561
Kab. Bangka Selatan	0.0716	0.0973	0.1304	0.0699	0.1167	0.2505
Kab. Bangka Tengah	0.0610	0.0816	0.1153	0.0548	0.1129	0.2081
Kab. Bangka Barat	0.0762	0.1034	0.1508	0.0736	0.1267	0.2613
Kab. Belitung Timur	0.0714	0.1002	0.1296	0.0628	0.1240	0.2621

Based on Table 1, it indicates that over the past 6 years, specifically from 2017 to 2022, Vertical Fiscal Inequality, as assessed by CV1 and CV2 among the districts and cities in the Province of Bangka Belitung Islands, has exhibited an unstable condition. Where, from 2017 to 2019 there was an increase, 2020 experienced a decrease, and 2021 to 2022 experienced an increase again. From 2017 to 2022, of all regencies/municipalities in the Bangka Belitung Islands Province, the highest value was placed by Bangka Regency in 2022 with a value of 0.2635. The lowest value was recorded by Belitung Regency in 2020, with a value of 0.0428.

Table 2. Results of Vertical Fiscal Inequality Calculation of CV3: the portion of local government expenditure that is not covered by the local government's own revenue Regency/City in Bangka Belitung Islands Province 2017-2022

District/City	Result CV3					
	2017	2018	2019	2020	2021	2022
Kab. Bangka	-0.5981	-0.5465	-0.4698	-0.4690	-0.4571	-0.3097
Kab. Belitung	-0.7292	-0.6100	-0.4857	-0.4471	-0.5205	-0.4321

District/City	Result CV3					
	2017	2018	2019	2020	2021	2022
Kota Pangkalpinang	-0.6546	-0.6433	-0.4772	-0.4908	-0.6145	-0.4402
Kab. Bangka Selatan	-0.6162	-0.5566	-0.5584	-0.5962	-0.7172	-0.5228
Kab. Bangka Tengah	-0.6381	-0.5946	-0.5660	-0.5791	-0.5284	-0.4775
Kab. Bangka Barat	-0.6719	-0.6500	-0.5340	-0.4162	-0.5049	-0.4718
Kab. Belitung Timur	-0.6969	-0.5729	-0.5456	-0.6103	-0.4856	-0.3884

Based on Table 2, it shows that in the last 6 years, namely 2017-2022, Vertical Fiscal Inequality as seen from CV3 between districts/cities in the Bangka Belitung Islands Province has fluctuated. From 2017 to 2022, the highest value was placed by Bangka Regency in 2022, with a value of -0.3097. The lowest value was reported by Belitung Regency in 2017, with a value of -0.7292.

3.2 Theil Index

The results of the data analysis using the Theil Index for the districts and cities of Bangka Belitung Islands Province from 2017 to 2022 revealed the presence of a horizontal fiscal imbalance. This result can be seen in the results of calculating three variables, namely PAD per capita, GRDP per capita and expenditure per capita.

Table 3. Results of Type 1: Theil Index of the level of PAD per capita equality among regencies/cities in the Province of Bangka Belitung Islands in 2017-2022

District/City	Type 1					
	2017	2018	2019	2020	2021	2022
Kab. Bangka	-0.0350	-0.0319	-0.0284	-0.0328	-0.0294	-0.0293
Kab. Belitung	-0.0196	-0.0186	-0.0183	-0.0185	-0.0177	-0.0164
Kota Pangkalpinang	-0.0214	-0.0198	-0.0195	-0.0212	-0.0206	-0.0205
Kab. Bangka Selatan	-0.0155	-0.0101	-0.0120	-0.0113	-0.0110	-0.0095
Kab. Bangka Tengah	-0.0156	-0.0124	-0.0137	-0.0154	-0.0131	-0.0129
Kab. Bangka Barat	-0.0151	-0.0128	-0.0127	-0.0136	-0.0110	-0.0124
Kab. Belitung Timur	-0.0109	-0.0100	-0.0102	-0.0108	-0.0100	-0.0092

Based on Table 3, it shows that in the last 6 years, namely 2017-2022, the Theil Index of the level of equity of PAD per capita among districts/cities in the Province of Bangka Belitung Islands has fluctuated. During 2017 to 2022 from all regencies/cities in the Province of Bangka Belitung Islands, the highest value was placed by East Belitung Regency in 2022, with a value of -0.0092. The lowest value was recorded by Bangka Regency in 2017, with a value of -0.0350.

Table 4. Results of Type 2: Theil Index of the level of GDP per capita equality among regencies/cities in the Province of Bangka Belitung Islands in 2017-2022

District/City	Type 2					
	2017	2018	2019	2020	2021	2022
Kab. Bangka	-0.0309	-0.0309	-0.0291	-0.0307	-0.0309	-0.0310
Kab. Belitung Kota	-0.0141	-0.0141	-0.0141	-0.0139	-0.0139	-0.0139
Pangkalpinang	-0.0186	-0.0186	-0.0186	-0.0195	-0.0199	-0.0201
Kab. Bangka Selatan	-0.0153	-0.0153	-0.0152	-0.0147	-0.0146	-0.0144
Kab. Bangka Tengah	-0.0141	-0.0140	-0.0138	-0.0143	-0.0143	-0.0145
Kab. Bangka Barat	-0.0198	-0.0198	-0.0201	-0.0195	-0.0191	-0.0189
Kab. Belitung Timur	-0.0088	-0.0088	-0.0088	-0.0089	-0.0089	-0.0089

Based on Table 4, it shows that in the last 6 years, namely 2017-2022, the Theil Index of the level of GDP per capita equality among districts/cities in the Bangka Belitung Islands Province has fluctuated. However, there are two districts that have the same value. The same value is from 2017 to 2019 and from 2020 to 2022. Where, the two districts are Belitung Regency and East Belitung Regency. During 2017 to 2022 from all districts/cities of the Bangka Belitung Islands Province, the highest value was placed by East Belitung Regency in 2017 to 2019, with a value of -0.0088. The lowest value was recorded by Bangka Regency in 2022, with a value of -0.0310.

Table 5. Results of Type 3: Theil Index of the level of equality of per capita expenditure among regencies/cities in the Province of Bangka Belitung Islands in 2017-2022

District/City	Type 3					
	2017	2018	2019	2020	2021	2022
Kab. Bangka	-0.0051	-0.0047	-0.0034	-0.0028	-0.0030	-0.0035
Kab. Belitung Kota	0.0040	0.0028	0.0031	0.0033	0.0032	0.0029
Pangkalpinang	0.0163	0.0157	0.0155	0.0162	0.0163	0.0160
Kab. Bangka Selatan	-0.0052	-0.0051	-0.0048	-0.0046	-0.0046	-0.0043
Kab. Bangka Tengah	0.0013	0.0008	0.0005	0.0005	0.0006	0.0003
Kab. Bangka Barat	-0.0034	-0.0031	-0.0032	-0.0026	-0.0026	-0.0025
Kab. Belitung Timur	-0.0035	-0.0038	-0.0031	-0.0030	-0.0030	-0.0027

Based on Table 5, it shows that in the last 6 years, namely 2017-2022, the Theil Index of the level of equality of per capita expenditure between districts/cities in the Province of Bangka Belitung Islands has fluctuated. During 2017 to 2022 from all districts/cities of the Bangka Belitung Islands Province, the highest value was placed by Pangkalpinang City in 2017 and 2021, with a value of 0.0163. The lowest value was recorded by South Bangka Regency in 2017, with a value of -0.0052.

4 Conclusions

Based on the findings and analysis from the research on vertical and horizontal fiscal imbalances in the districts and cities of Bangka Belitung Islands Province for the period of 2017 to 2022, the following conclusions are obtained:

1. There is a vertical fiscal imbalance in the district/city of the Bangka Belitung Islands Province during the 2017-2022 period. Vertical fiscal imbalances in the last 6 years, namely 2017-2022, seen from CV1 and CV2 among districts/cities in the Province of Bangka Belitung Islands experienced unstable conditions. While CV3 among districts / cities in the Bangka Belitung Islands Province experienced fluctuations.
2. There is a horizontal fiscal imbalance in the district/city of Bangka Belitung Islands Province for the period 2017-2022. Horizontal fiscal imbalances in the last 6 years, namely 2017-2022, are seen from Type 1: Theil Index of the level of equity of PAD per capita and Type 3: Theil Index of the level of equity of per capita expenditure between districts/cities in the Province of Bangka Belitung Islands experiencing fluctuations. Type 2: Theil's index of the level of equity of GRDP per capita among districts/municipalities in the Province of Bangka Belitung Islands also experienced fluctuations. However, there are two districts that have the same value in 2017 through 2019 and 2020 through 2022.

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