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Measuring and Mapping Fiscal Imbalance Regionally in Bangka Belitung Island Province

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Abstract

Fiscal decentralisation aims to improve the efficiency of resource allocation, income distribution, and economic stabilisation. However, its implementation in the Bangka Belitung Islands Province has encountered challenges in supporting regional economic development, particularly in the form of vertical and horizontal fiscal imbalances. This study employs quantitative data comprising the Special Allocation Fund, General Allocation Fund, regional loans, total regional government expenditure, loan repayments, regional revenue, tax and non-tax revenue-sharing funds, Locally Generated Revenue per capita, Gross Regional Domestic Product per capita, and per capita expenditure. The analysis applies the correlation coefficient approach to measure vertical fiscal imbalance and the Theil Index to assess horizontal fiscal imbalance. The findings indicate that 57.15% of the regencies and municipality experienced a moderate level of vertical fiscal imbalance, while 42.85% exhibited a low level of imbalance. All regions experienced substantial expenditure shortfalls, resulting in a high dependence on fiscal transfers from the central government. In terms of horizontal fiscal imbalance, most regions displayed relatively low levels of disparity, with the exception of Pangkalpinang Municipality, which recorded a comparatively high level of fiscal inequality. These findings highlight the importance of strengthening Locally Generated Revenue, improving public expenditure efficiency, promoting economic diversification, and enhancing interregional collaboration to reinforce local fiscal independence.

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Keywords: Fiscal Imbalance; Vertical Fiscal Imbalance; Horizontal Fiscal Imbalance; Locally Generated Revenue; Development Economics.

1. Introduction

Musgrave (2000) states that fiscal decentralisation is the distribution of financial functions between the central government and local governments to achieve efficiency in the allocation of public resources, income distribution, and economic stabilisation. Fiscal imbalance is not a problem that should be completely eliminated, but rather managed through fair and efficient transfer instruments so that the fiscal system remains balanced and development objectives can be achieved. Another source states that fiscal decentralisation is a strategy that supports regional development through the delegation of authority to local governments, enabling them to take responsibility for all matters related to their respective regions while involving the community in the development process. The implementation of fiscal decentralisation in supporting regional development faces numerous challenges. One of these is the disparity between fiscal capacity (the capacity to generate revenue) and fiscal need (the need for expenditure) occurring at different levels of government. Fiscal capacity and fiscal need are consistently associated with efforts to optimise Locally Generated Revenue (LGR) and have become an issue in regional economic disparities (Li & Du, 2021).

Oates (2006) states that fiscal imbalance arises because local governments have greater expenditure responsibilities than their capacity to generate their own revenues. This condition encourages financial imbalances between the central government and local governments. Furthermore, in *On the Theory and Practice of Fiscal Decentralization*, Wallace E. Oates explains the theoretical framework and practical implementation of fiscal decentralisation, focusing on how decentralisation can improve efficiency in the provision of public services and adjust public outputs to local preferences. Fiscal imbalance consists of vertical fiscal imbalance (VFI) and horizontal fiscal imbalance (HFI) (Lhin & Zhou, 2021). Vertical fiscal imbalance occurs because there is an imbalance in revenue between the central government and lower levels of government.

Meanwhile, horizontal fiscal imbalance is caused by differences in the capacity of individual local governments to raise tax revenues in order to provide standard public services (Li & Du, 2021). In addition, Jia (2021) found empirical evidence that vertical fiscal imbalance is positively associated with undisciplined fiscal behaviour among local governments, including overspending and debt accumulation, and emphasised the importance of intergovernmental transfer design in mitigating these problems. A related study found that vertical fiscal imbalance has a significant negative effect on the transformation of industrial innovation outcomes; the greater the fiscal imbalance, the more difficult it is for provinces to realise the benefits of industrial innovation.

Regional disparities are partly caused by the distribution of authority between the Central Government, Provincial Governments, and Regency/Municipal Governments. The instruments used to address horizontal fiscal imbalance are the General Allocation Fund (GAF) and the

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Special Allocation Fund (SAF), while the instrument used to address vertical fiscal imbalance is the Revenue Sharing Fund (RSF) (Herdiyana, 2019). In addition to occurring in many countries, fiscal imbalance also exists in Indonesia, including the Bangka Belitung Islands Province. The underlying causes of fiscal imbalance in the Bangka Belitung Islands Province are reflected in economic, structural, and fiscal policy aspects. The province remains highly dependent on transfer funds from the central government, such as the General Allocation Fund, the Special Allocation Fund, and the Revenue Sharing Fund.

In 2023, the fiscal capacity of the Bangka Belitung Islands Province was only sufficient to meet approximately 40 per cent of its regional needs, while the remaining requirements were financed through transfers from the central government. Moreover, several regencies had fiscal capacities of less than 10 per cent (Imelda, 2023). This condition indicates that the fiscal capacity of the Bangka Belitung Islands Province remains relatively low, making continued support from the central government through intergovernmental transfers essential. These circumstances suggest that the Bangka Belitung Islands Province experiences fiscal imbalance in financing regional development. This condition is reflected in transfer revenues during the period 2017–2024, which fluctuated but generally showed an increasing trend, with an average transfer revenue of IDR 1,262.61 billion throughout the study period (Directorate General of Fiscal Balance, 2024). In 2020, transfer revenues declined significantly to IDR 1,657.63 billion as a consequence of the COVID-19 pandemic, during which the central government reduced transfer allocations to the Bangka Belitung Islands Province (Fitrajaya, 2022).

Vertical fiscal imbalance can be observed through indicators such as the General Allocation Fund (GAF), Special Allocation Fund (SAF), Revenue Sharing Fund (RSF), regional revenue, regional loans, total Regional Revenue and Expenditure Budget (RREB) expenditure, and loan repayments. During the period 2017–2024, the Special Allocation Fund in the Bangka Belitung Islands Province averaged IDR 408.01 billion per year. In 2020, the Special Allocation Fund increased due to the additional allocation of the Non-Physical Special Allocation Fund to support financing in the education sector, including the Teacher Allowance Fund, Regional Civil Servant Fund, and the School Operational Assistance (BOS) Fund (Regional Office of the Directorate General of Treasury of Bangka Belitung Province, 2020).

In addition to the Special Allocation Fund, the General Allocation Fund during the same period averaged IDR 982.03 billion per year. The General Allocation Fund distributed to each region varies annually according to regional needs. The larger the General Allocation Fund received by a local government, the greater the indication that the region is unable to meet its own fiscal requirements and therefore remains dependent on financial transfers from the central government (Yan et al., 2020). The Bangka Belitung Islands Province has also obtained regional loans from PT Sarana Multi Infrastruktur under the National Economic Recovery Programme.

These loans were utilised to finance road infrastructure development, the improvement of the Sungai Batu Rusa Fish Landing Base, and the construction of radiotherapy facilities together with supporting medical equipment for Ir. Soekarno Regional General Hospital (BPKP, 2021).

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However, data on regional loans at the regency and municipal levels are unavailable, while provincial loan data are available only for 2021, amounting to IDR 152.89 billion, and for 2022, amounting to IDR 83.08 billion. Consequently, in the data processing, regional loans at the regency and municipal levels were recorded as zero.

In addition to transfer funds, the Special Allocation Fund, and the General Allocation Fund, the development of the Regional Revenue and Expenditure Budget (RREB) showed that the average total RREB expenditure during the study period was IDR 2,570.35 billion per year. Regional revenue averaged IDR 2,560.37 billion during the same period. Revenue Sharing Funds derived from taxes averaged IDR 62.51 billion throughout the study period, while non-tax Revenue Sharing Funds averaged IDR 189.28 billion. An increase in non-tax Revenue Sharing Funds occurred in 2022, partly due to the optimisation of PT Timah's contributions through tax payments and Non-Tax State Revenue (PNBP) amounting to IDR 267.8 billion, which played an important role in supporting national development financing as one of the country's major sources of revenue (Wahyuddin, R., 2022).

For the horizontal fiscal imbalance variable, the indicators analysed include Locally Generated Revenue per capita, Gross Regional Domestic Product (GRDP) per capita, per capita expenditure, and population size. Locally Generated Revenue per capita fluctuated throughout the study period, with an average value of IDR 898.93 billion. In addition to Locally Generated Revenue per capita, the development of Gross Regional Domestic Product (GRDP) per capita constitutes one of the variables forming fiscal imbalance, with an average value of IDR 55,394,127.63 million. Per capita expenditure is another indicator of horizontal fiscal imbalance, averaging IDR 13,667 thousand during the study period. Population size is also included in the fiscal imbalance analysis. At the end of the study period, the population reached 1,531,530 people, with an average population of 1,480,803 people.

The phenomenon of fiscal imbalance in the Bangka Belitung Islands Province is attributable to several factors, including the province's high dependence on the tin mining and plantation sectors, limitations in the management of Locally Generated Revenue (LGR), and the relatively low contribution of LGR to total regional revenue. Another cross-country study conducted in developing countries demonstrated that fiscal imbalance affects emission reduction efforts, with vertical fiscal imbalance (VFI) tending to weaken the fiscal capacity of local governments to finance environmental policies (Zhang et al., 2021). Furthermore, disparities persist across regions in terms of infrastructure development, economic potential, natural resource endowments, and the quality of human resources. More in-depth research is therefore required to examine fiscal imbalance in the Bangka Belitung Islands Province by measuring it at the regional level for each regency and municipality, followed by analysis and description to identify the actual condition of fiscal imbalance. In addition, the causes of fiscal imbalance require further investigation to determine whether they are consistent with the findings of previous studies conducted by Li and Zhang (2019), Chu et al. (2019), and Chu and Chi (2020), which concluded that simplifying the fiscal relationship between central and local governments is necessary to minimise both vertical and horizontal fiscal imbalances.

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2. Literature Review

2.1 Fiscal Decentralisation

Bahl (2018) emphasises the importance of achieving synergy between local government authority and fiscal capacity, as well as the need for adaptive and responsive policies that reflect local dynamics in order to realise effective and sustainable fiscal decentralisation. Fiscal equalisation is essential because the central government collects tax revenues from tax bases located within regencies and municipalities. This situation results in insufficient fiscal resources for autonomous regions to finance their expenditure needs adequately. Consequently, the central government must redistribute a certain proportion of these revenues to local governments to achieve fiscal balance (Jia et al., 2021). Li (2021), in the study entitled *Vertical Fiscal Imbalance, Transfer Payments, and Fiscal Sustainability of Local Governments in China*, examined the role of transfer payments in promoting local fiscal sustainability and concluded that the structure and formula of intergovernmental transfers moderate the effect of vertical fiscal imbalance (VFI) on local fiscal risk.

2.2 Vertical Fiscal Imbalance

Digdowiseiso (2022) and Bahl (2018) explain that fiscal imbalance is based on the principle that each level of government should be able to finance its expenditure responsibilities entirely through its own-source revenues without relying on fiscal transfers. To maintain fiscal balance across different levels of government, each level should possess sufficient autonomous financial resources to meet its expenditure obligations, neither exceeding nor falling short of the required amount.

2.3 Horizontal Fiscal Imbalance

Horizontal fiscal imbalance occurs when local governments possess different capacities to generate tax revenues from their respective tax bases, which in turn affects the standard of public services they are able to provide (Suparmoko, 2011). As a result, fiscal transfers or subsidies are required to compensate for these disparities. Horizontal fiscal imbalance plays an important role in supporting fiscal decentralisation by adjusting transfer allocations according to the fiscal capacity of individual local governments, thereby enabling financial assistance to be distributed more equitably across regions. Furthermore, horizontal fiscal imbalance aims to ensure that all local governments, including the smallest and least affluent jurisdictions, have sufficient financial resources to provide essential public services.

Solihin and Lesatri (2010), Lazuardi (2013), and Khamdana (2014) found that horizontal fiscal imbalance has tended to increase over time, indicating the need for policy intervention to address widening regional disparities. Fiscal stability in overcoming horizontal fiscal imbalance can be achieved when local revenues are strengthened in accordance with fiscal capacity standards (Lewis, 2023). Lewis (2023) further argues that the Law on Central and Regional Government Financial Relations (HKPD Law) was introduced to improve vertical fiscal imbalance (VFI) and

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reduce interregional disparities through a new transfer system based on a more transparent formula.

The law also encourages the expansion of the Locally Generated Revenue (LGR) base, for example through a simpler and more integrated regional tax and levy system. However, the reform also carries the risk of over-centralisation, as local fiscal authority may be reduced due to increased regulations and control from the central government. Although the new transfer design is more transparent, it has not fully resolved horizontal fiscal disparities because fiscal capacity remains highly uneven across regions. Lewis (2023) therefore concludes that the HKPD Law represents an important step towards fiscal reform; however, its success will largely depend on effective implementation, supported by technical assistance and institutional capacity building to enable local governments to strengthen their own-source revenues.

3. Methods

This study was conducted at the regional level, covering the six regencies and one municipality in the Bangka Belitung Islands Province, Indonesia, using annual data from 2017 to 2024. The study employed a quantitative research approach based on secondary data, including the Special Allocation Fund (SAF), General Allocation Fund (GAF), Regional Loans, Total Regional Government Expenditure (RREB), Loan Repayments, Regional Revenue, Tax Revenue Sharing, Non-Tax Revenue Sharing, Locally Generated Revenue (LGR) per capita, Gross Regional Domestic Product (GRDP) per capita, and per capita expenditure.

The data were obtained primarily from the Directorate General of Fiscal Balance, Ministry of Finance of the Republic of Indonesia, complemented by relevant journal articles, books, and other academic literature. Data analysis consisted of two approaches. Vertical fiscal imbalance was measured using the Fiscal Imbalance Correlation Coefficient, while horizontal fiscal imbalance was assessed using the Theil Index, following the methodology proposed by Bird and Tarasov (2002). According to Bird and Tarasov (2002), fiscal transfers are necessary to address fiscal imbalances; however, if poorly designed, they may increase fiscal dependence and weaken local fiscal accountability.

3.1 Measurement of Vertical Fiscal Imbalance

Following Bird and Tarasov (2002), vertical fiscal imbalance was measured using three coefficients.

CV1: Intergovernmental Transfers as a Proportion of Local Government Expenditure

$$CV_1 = \frac{NTSNG}{EXP + B} \quad (1)$$

where:

- CV1 = Intergovernmental transfers as a proportion of local government expenditure
- NTSNG = National Transfers to Subnational Governments
- EXP = Total Regional Government Expenditure (RREB)

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- B = Regional Loans

CV2: Intergovernmental Transfers and Revenue-Sharing Funds as a Proportion of Subnational Government Expenditure

$$CV_2 = \frac{NTSNG + REVSH + IGNB}{EXP} \quad (2)$$

where:

- CV2 = Intergovernmental transfers and tax/non-tax revenue-sharing funds as a proportion of subnational government expenditure
- REVSH = Tax and Non-Tax Revenue Sharing
- IGNB = Loan Repayments
- EXP = Total Regional Government Expenditure
- NTSNG = National Transfers to Subnational Governments

CV3: Proportion of Local Government Expenditure Not Financed by Own-Source Revenue

$$CV_3 = \frac{EXP - (REV + TRGP + TRSP + REVSH + IGNB + B)}{EXP} \quad (3)$$

where:

- CV3 = Proportion of local government expenditure not financed by local government revenue
- REV = Regional Revenue
- TRGP = General Allocation Fund (GAF)
- TRSP = Special Allocation Fund (SAF)
- REVSH = Tax and Non-Tax Revenue Sharing
- IGNB = Loan Repayments
- EXP = Total Regional Government Expenditure
- B = Regional Loans
- NTSNG = National Transfers to Subnational Governments

Classification of Vertical Fiscal Imbalance

Although no universally accepted international standard exists, several studies and policy institutions in Indonesia (e.g., Bappenas) commonly classify the coefficient of variation (CV) into the following categories.

Table 1. Classification of Vertical Fiscal Imbalance

Coefficient of Variation (CV)	Level of Fiscal Imbalance
< 0.05	Very Low
0.05–0.10	Low
0.10–0.20	Moderate
> 0.20	High

Source: Bird and Tarasov (2002).

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3.2 Measurement of Horizontal Fiscal Imbalance

Horizontal fiscal imbalance was measured using the Theil Index following Bird and Tarasov (2002).

Type 1: Theil Index Based on Locally Generated Revenue (LGR) per Capita

$$T = \sum_{i=1}^{n} \left(\frac{Y_i}{Y}\right) \ln \left(\frac{Y_i/P_i}{Y/P}\right) \quad (4)$$

where:

- T = Theil Index
- Yi = Locally Generated Revenue (LGR) per capita in region *i*
- Y = Total LGR per capita of the Bangka Belitung Islands Province
- Pi = Population of region *i*
- P = Total population of the Bangka Belitung Islands Province

Type 2: Theil Index Based on Gross Regional Domestic Product (GRDP) per Capita

$$T = \sum_{i=1}^{n} \left(\frac{Y_i}{Y}\right) \ln \left(\frac{Y_i/P_i}{Y/P}\right) \quad (5)$$

where:

- T = Theil Index
- Yi = GRDP per capita in region *i*
- Y = Total GRDP per capita of the Bangka Belitung Islands Province
- Pi = Population of region *i*
- P = Total population of the Bangka Belitung Islands Province

Type 3: Theil Index Based on Per Capita Expenditure

$$T = \sum_{i=1}^{n} \left(\frac{X_i}{X}\right) \ln \left(\frac{X_i/P_i}{X/P}\right) \quad (6)$$

where:

- T = Theil Index
- Xi = Per capita expenditure in region *i*
- X = Total per capita expenditure of the Bangka Belitung Islands Province
- Pi = Population of region *i*
- P = Total population of the Bangka Belitung Islands Province

Interpretation of the Theil Index

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The magnitude of the Theil Index reflects the degree of horizontal fiscal imbalance:

- A higher Theil Index (approaching 1) indicates a greater degree of horizontal fiscal inequality.
- A lower Theil Index (approaching 0) indicates a more equal distribution of fiscal capacity across regions.

4. Results and Discussion

Based on the results of the data analysis for the regencies and municipality in the Bangka Belitung Islands Province during the period 2017–2024, both vertical and horizontal fiscal imbalances were identified. Vertical fiscal imbalance (VFI) was assessed using the correlation coefficients of CV1 (intergovernmental transfers as a proportion of government expenditure), CV2 (intergovernmental transfers and tax/non-tax revenue-sharing funds as a proportion of subnational government expenditure), and CV3 (the proportion of local government expenditure that cannot be financed by locally generated revenue). Meanwhile, horizontal fiscal imbalance (HFI) was measured using the Theil Index based on three variables: Locally Generated Revenue (LGR) per capita, Gross Regional Domestic Product (GRDP) per capita, and per capita expenditure.

Table 2. Results of Fiscal Imbalance Calculations, 2017–2024

Region	Year	Vertical Fiscal Imbalance					Horizontal Fiscal Imbalance		
		Results CV1	Results CV2	VFI Level	Results CV3	VFI Level	LGR per Capita	RREB per Capita	Expenditure per Capita
Bangka Regency	2017	0,082	0,082	Low	0,598	High	0,395	0,138	0,089
	2018	0,104	0,104	Low	0,546	High	0,314	0,157	0,109
	2019	0,121	0,121	Moderate	0,470	High	0,215	0,170	0,123
	2020	0,091	0,091	Low	0,470	High	0,253	0,167	0,121
	2021	0,127	0,127	Moderate	0,457	High	0,247	0,201	0,126
	2022	0,264	0,264	High	0,310	High	0,361	0,224	0,136
	2023	0,133	0,133	Moderate	0,199	Moderate	0,287	0,247	0,145
	2024	0,068	0,068	Low	0,501	High	0,609	0,245	0,147
	Average	0,127	0,127	Moderate	0,443	High	0,335	0,194	0,124
Belitung Regency	2017	0,0512	0,0512	Low	0,7292	High	0,3853	0,0172	0,1374
	2018	0,0771	0,0771	Low	0,6100	High	0,3808	0,0021	0,1496
	2019	0,089	0,089	Low	0,485	High	0,3303	0,0077	0,1620

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Region	Year	Vertical Fiscal Imbalance					Horizontal Fiscal Imbalance		
		Results CV1	Results CV2	VFI Level	Results CV3	VFI Level	LGR per Capita	RREB per Capita	Expenditure per Capita
		2	2		7				
	2020	0,0428	0,0428	Very Low	0,4471	High	0,2757	0,0008	0,1585
	2021	0,0897	0,0897	Low	0,5205	High	0,3593	0,0174	0,1588
	2022	0,1780	0,1780	Moderate	0,4321	High	0,3669	0,0351	0,1746
	2023	0,1169	0,1169	Moderate	0,3614	High	0,2043	0,0538	0,1851
	2024	0,0506	0,0506	Low	0,3674	High	0,2385	0,0601	0,1879
	Average	0,0869	0,0869	Low	0,4942	High	0,3176	0,0243	0,1642
Bangka Selatan Regency	2017	0,0719	0,0719	Low	0,6159	High	0,0062	0,0269	0,0747
	2018	0,0973	0,0973	Low	0,5556	High	0,1246	0,0146	0,0935
	2019	0,1304	0,1304	Moderate	0,5585	High	0,0733	0,0074	0,1046
	2020	0,0699	0,0699	Low	0,5962	High	0,1234	0,0130	0,0996
	2021	0,1166	0,1166	Moderate	0,7173	High	0,0718	0,0027	0,0999
	2022	0,2505	0,2505	High	0,5228	High	0,0808	0,0063	0,1187
	2023	0,1722	0,1722	Moderate	0,4563	High	0,0441	0,0173	0,1281
	2024	0,0765	0,0765	Low	0,4477	High	0,0285	0,0200	0,1311
	Average	0,1232	0,1232	Low	0,5589	High	0,0691	0,0135	0,1063
Bangka Tengah Regency	2017	0,0610	0,0610	Low	0,6831	High	0,0509	0,0337	0,1184
	2018	0,0816	0,0816	Low	0,5946	High	0,0250	0,0246	0,1350
	2019	0,1153	0,1153	Low	0,5660	High	0,0209	0,0212	0,1426

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Region	Year	Vertical Fiscal Imbalance					Horizontal Imbalance		Fiscal
		Results CV1	Results CV2	VFI Level	Results CV3	VFI Level	LGR per Capita	RREB per Capita	Expenditure per Capita
	2020	0,0548	0,0548	Very Low	0,5791	High	0,0080	0,0292	0,1374
	2021	0,1129	0,1129	Moderate	0,5283	High	0,0013	0,0163	0,1385
	2022	0,2081	0,2081	High	0,4775	High	0,0507	0,0008	0,1542
	2023	0,1296	0,1296	Moderate	0,3650	High	0,0973	0,0160	0,1614
	2024	0,0506	0,0506	Low	0,4235	High	0,1516	0,0149	0,1625
	Average	0,1017	0,1017	Moderate	0,5215	High	0,0507	0,0196	0,1438
Bangka Barat Regency	2017	0,0762	0,0762	Low	0,6719	High	0,0160	0,1525	0,0877
	2018	0,1034	0,1034	Low	0,6500	High	0,0478	0,1753	0,1079
	2019	0,1508	0,1508	Moderate	0,5340	High	0,0552	0,2079	0,1166
	2020	0,0736	0,0736	Low	0,4162	High	0,0682	0,1814	0,1185
	2021	0,1267	0,1267	Low	0,5049	High	0,0857	0,1824	0,1164
	2022	0,2613	0,2613	High	0,4718	High	0,0198	0,1918	0,1335
	2023	0,1541	0,1540	Moderate	0,2856	High	0,0459	0,2038	0,1438
	2024	0,1094	0,1093	Moderate	0,2482	High	0,0192	0,2307	0,1469
	Average	0,1319	0,1319	Moderate	0,4728	High	0,0447	0,1907	0,1214
Belitung Timur Regency	2017	0,0714	0,0714	Low	0,6970	High	0,0936	0,0584	0,0712
	2018	0,1002	0,1002	Moderate	0,5729	High	0,0929	0,0479	0,0846
	2019	0,1296	0,1296	Moderate	0,5456	High	0,0991	0,0395	0,1020

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Region	Year	Vertical Fiscal Imbalance					Horizontal Fiscal Imbalance		
		Results CV1	Results CV2	VFI Level	Results CV3	VFI Level	LGR per Capita	RREB per Capita	Expenditure per Capita
	2020	0,0628	0,0628	Low	0,6103	High	0,0675	0,0411	0,0987
	2021	0,1240	0,1240	Moderate	0,4856	High	0,1158	0,0292	0,0997
	2022	0,2621	0,2621	High	0,3884	High	0,1261	0,0189	0,1193
	2023	0,1467	0,1461	Moderate	0,2912	High	0,1015	0,0059	0,1251
	2024	0,0572	0,0572	Low	0,3866	High	0,0720	0,0060	0,1276
	Average	0,1193	0,1193	Moderate	0,4910	High	0,0961	0,0309	0,1035
Pangkalpinang Municipality	2017	0,0595	0,0595	Low	0,6546	High	0,3172	0,0929	0,2034
	2018	0,0733	0,0733	Low	0,6433	High	0,2932	0,1121	0,2244
	2019	0,0761	0,0761	Low	0,4772	High	0,2512	0,1251	0,2350
	2020	0,0499	0,0499	Very Low	0,4908	High	0,2020	0,1128	0,2278
	2021	0,0786	0,0786	Low	0,6145	High	0,2993	0,5147	0,2295
	2022	0,1561	0,1561	Moderate	0,4402	High	0,4166	0,1767	0,2490
	2023	0,1081	0,1081	Moderate	0,4779	High	0,3047	0,2013	0,2631
	2024	0,0442	0,0442	Very Low	0,4611	High	0,3331	0,1901	0,2637
	Average	0,0807	0,0807	Low	0,5325	High	0,3021	0,7698	0,2370

Source: Compiled and processed by the authors, 2025.

The analysis of fiscal imbalance in the Bangka Belitung Islands Province during the period 2017–2024 indicates that vertical fiscal imbalance (VFI) generally remained within the low to moderate category. The average VFI values across all regencies and the municipality ranged from 0.08 to 0.13, with the greatest variation occurring in 2022, when almost all regions experienced a substantial increase in fiscal imbalance. This condition was consistent with the

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fiscal pressures arising from the COVID-19 pandemic, which reduced local revenue performance and increased dependence on transfers from the central government. Nevertheless, Pangkalpinang Municipality was relatively successful in maintaining fiscal balance, recording the lowest average VFI value (0.081), indicating a stronger fiscal structure than the other regencies.

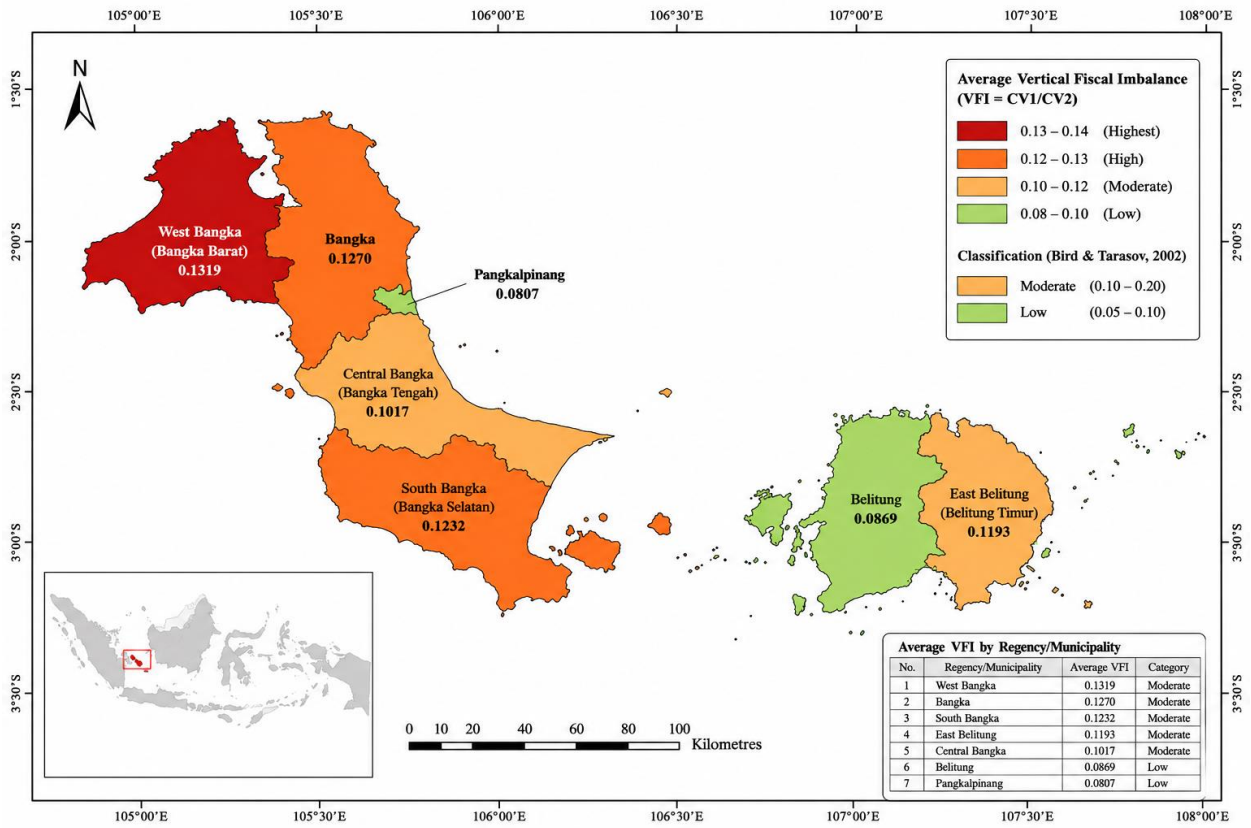

Figure 1. Spatial Distribution of Vertical Fiscal Imbalance

These findings are broadly consistent with those reported by Wang and Liew (2024), who found that vertical fiscal imbalance negatively affects the quality of economic development and that this effect depends on local tax collection efforts and the composition of public expenditure. Similarly, Qin, Chen, and Zhao (2022) suggest that fiscal reforms should be directed towards reducing local governments' dependence on central government transfers by strengthening local revenue autonomy.

In contrast, horizontal fiscal imbalance (HFI) was found to be more pronounced than vertical fiscal imbalance. The results indicate that almost all regions fell within the high disparity category with respect to LGR per capita, with average values exceeding 0.30. This reflects a substantial disparity between regions with a strong locally generated revenue base, such as Pangkalpinang Municipality, and those with relatively weak fiscal capacity, including South Bangka Regency and Central Bangka Regency. These disparities become even more apparent

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when considering GRDP per capita, where Pangkalpinang Municipality recorded the highest average value (0.770), reflecting the concentration of economic activity in the provincial capital. In contrast, several regencies continue to face limitations in stimulating local economic growth. These findings are consistent with those of Liu, Sun, and Cao (2024), who concluded that fiscal transfers from the central government have not been fully effective in addressing regional fiscal disparities and, in some cases, have instead created greater fiscal dependence.

The findings for both horizontal and vertical fiscal imbalance are also in line with the study by Martinez-Vazquez and Timofeev (2010), which demonstrates that a high level of vertical fiscal imbalance tends to exacerbate the soft budget constraint, as local governments become increasingly dependent on transfers from the central government rather than improving their own fiscal independence. From the perspective of per capita expenditure, fiscal disparity was relatively lower, with average values ranging between 0.10 and 0.23. This suggests that although substantial differences exist in fiscal capacity and economic bases across regions, household consumption patterns are relatively similar. Nevertheless, this trend warrants careful attention because persistent disparities in LGR per capita and GRDP per capita may, in the long term, affect the ability of local governments to provide comparable levels of public services, thereby widening socio-economic disparities across regions.

5. Conclusion

The findings of this study indicate that the principal fiscal challenge in the Bangka Belitung Islands Province lies in horizontal fiscal disparities across regions rather than vertical fiscal imbalance. This condition suggests that fiscal policy strategies should place greater emphasis on strengthening local economic bases and optimising Locally Generated Revenue (LGR) in regions with limited fiscal capacity. These objectives may be achieved by improving the quality of local public financial management, diversifying sources of locally generated revenue, and promoting the development of region-specific leading economic sectors. Such measures are expected to reduce interregional fiscal disparities and foster more balanced regional development.

From a quantitative perspective, the results show that the average disparity value based on the CV1 and CV2 coefficients during the period 2017–2024 was 57.15%, indicating a moderate level of fiscal disparity in Bangka Regency, Central Bangka Regency, West Bangka Regency, and East Belitung Regency. The remaining 42.85% fell within the low disparity category, including Belitung Regency, South Bangka Regency, and Pangkalpinang Municipality. Meanwhile, based on the CV3 coefficient, which measures the proportion of local government expenditure that cannot be financed by locally generated revenue, all regencies and municipalities in the Bangka Belitung Islands Province were classified as having a high level of fiscal imbalance throughout the 2017–2024 period.

The Theil Index analysis further indicates that, based on the variables of LGR per capita and per capita expenditure, the average level of horizontal fiscal disparity across all regencies and municipalities during the study period was characterised by coefficient values approaching zero, indicating relatively low and declining fiscal inequality. Similarly, calculations based on GRDP

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per capita show that, on average, 85.71% of the regencies and municipalities recorded coefficient values close to zero, suggesting that horizontal fiscal disparities were relatively low and continued to decline over the period 2017–2024. Only 14.29% of the regions recorded coefficient values approaching one, indicating relatively high levels of horizontal fiscal inequality. These findings are consistent with those of Martinez-Vazquez and Timofeev (2010), who argue that an appropriate balance should be maintained between fiscal autonomy and fiscal oversight, and that intergovernmental transfer systems should be designed to promote local fiscal responsibility rather than create long-term dependence on central government transfers.

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