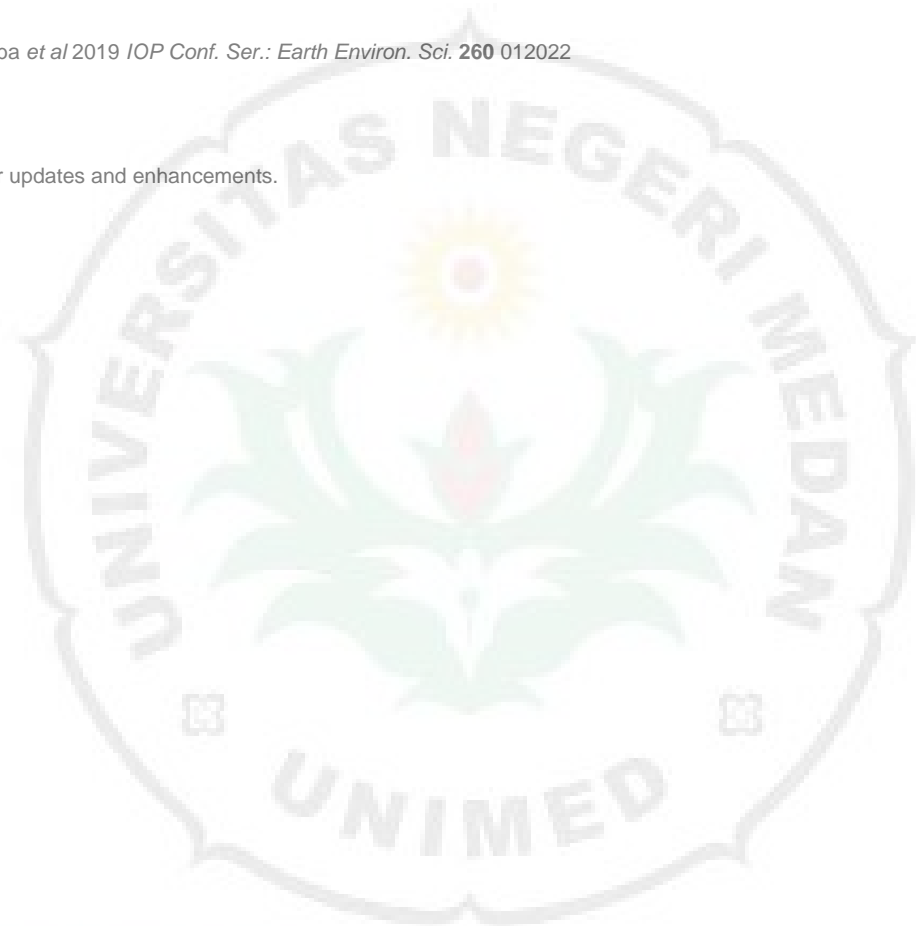


PAPER • OPEN ACCESS

The Effect of Capital Expenditure and Gross Fixed Capital Formation on Income Disparity in West Coast Region of North Sumatera

To cite this article: B Purba *et al* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **260** 012022

View the [article online](#) for updates and enhancements.



THE
Character Building
UNIVERSITY



IOP | ebooksTM

Bringing you innovative digital publishing with leading voices to create your essential collection of books in STEM research.

Start exploring the collection - download the first chapter of every title for free.

The Effect of Capital Expenditure and Gross Fixed Capital Formation on Income Disparity in West Coast Region of North Sumatera

B Purba*, R Masbar, I Maipita and A Jamal

Economics Doctoral Program, Universitas Syiah Kuala, Banda Aceh, Indonesia.

E-mail: *bonarajapurba@unimed.ac.id or bonarajapurba@gmail.com

Abstract. This study purposes to determine the effect of capital expenditure and gross fixed capital formation on income disparity among districts/cities in West Coast Region in North Sumatera–Indonesia. Analysis of economic development disparity was calculated by Williamson's Index. The research method was carried out using panel data regression. The result of this research that used annual data for 2012-2016 are: (1) the average of disparity in economic development included in the extremely low category, (2) the capital expenditure variable and gross fixed capital formation variable have significant positive effects on income disparity of the West Coast Region of North Sumatera.

1. Introduction

Disparity arises due to the absence of equity in economic development. This inequality of development is caused by differences between regions with each other. This can be seen from the existence of developed regions with underdeveloped or less developed regions. The development of new districts/cities since the 2000s in North Sumatera and decentralization is expected to encourage wider disparities between regions.

Besides having a positive influence, the issue also has a negative negative effect. Disparities can encourage other regions that are still classified as backward to be able to make economic growth positive and in the end the increasing welfare of the population is a positive influence of disparity itself. Some conditions such as economics are wasteful and inefficient, make social stability and solidarity weak, and inequality is an extreme negative influence of economy development disparities which is generally considered unfair [1]. Furthermore, the issue of inter-regional economic development always emerges and tends to expand, known as *divergence*. This means that the developed regions are progressing, while lagging is getting backward. According to [2] it is caused by a result of the *backwash effect* greater than *spread effect*. Furthermore, still according to [2], that the emergence of a balance of regional economic growth has three stages, namely; (a) prior to industrialization between regions have a low level of disparity; (b) if there is a situation where the *backwash effect* is greater than the *spread effect* will resulting in increased disparity; and (c) if it occurs where *spread effect* is greater than the *backwash effect* will result in a decrease in disparity.



In a province, the welfare of its citizens is measured in several ways, one of which is the amount of GDP per capita. If the GRDP value per capita of an area at a certain time period increases, it means that the level of welfare of the area's population is getting better. Furthermore, if the value of GRDP in an area within a certain time period gets smaller than the area experiences a level of welfare of its population which gets worse. If at any particular place the ongoing situation where economic growth it is better than some of the surrounding areas will be faced with an increased burden of ongoing due to continued migration of population in large quantities from the surrounding areas and other areas into areas that have experienced growth higher than that.

The occurrence of this condition is due to the flow of labour from the surrounding area and other areas to get work as the urban area has more employment opportunities. As a result of potential labour resources continue to flow was moving toward urban areas, the urban areas will experience of economic growth higher as developed area and also a centre of growth. Next, the labour resources that have excellent potential will become supporters and movers of the urban area as a growth centre will experience a higher accumulation of growth than before.

The territory of West Coast of North Sumatera is covering 12 districts, Nias, Mandailing Natal, South Tapanuli, Central Tapanuli, South Nias, North Padang Lawas, Padang Lawas, North Nias, West Nias, and three cities namely Kota Sibolga, Padang Sidempuan, and Mount Sitoli [3].

Table 1. GRDP Each Capita West Coast Region 2014 ADHK 2010 (IDR)

Districts / Cities	GRDP per capita
Nias	14,721,177.28
Mandailing Natal	16,504,535.54
South Tapanuli	27,609,224.74
Central Tapanuli	15,925,280.03
South Nias	11,004,991.99
North Padang Lawas	25,197,442.62
Padang Lawas	23,816,142.18
North Nias	13,881,474.21
West Nias	11,496,535.46
Sibolga	32,004,513.35
Padang Sidempuan	15,686,743.95
Mount Sitoli	19,117,332.99

Submitting in Table 1 it can be shown that in 2014 the highest average per capita GRDP in the West Coast was occupied by the City of Sibolga for IDR 32,004,513.35 followed by South Tapanuli district of IDR 27,609,224.74 and Padang Lawas Utara District for IDR 25,197,442.62 as the second and third ranks, and the lowest rank was occupied by South Nias Regency of IDR 11,004,991.99. Based on Table 1 can also be in the know that in 2014 there has been a disparity between the GDP per capita between districts / cities in the West Coast region of North Sumatera.

According to [4] study that found that the Special Allocation Fund (DAK) and the General Allocation Fund (DAU) had a negative effect (significantly reduced) on the imbalance of economic development between districts/cities in Jambi Province. Likewise, the study conducted by [5] found that in the period 2005-2010 there were still economic disparities between provinces in Sumatera, and based on quantitative analysis it was also found that the variables of investment, concentration of economic activities, and natural resources had a significant influence on inequality economy in Sumatera. Furthermore, the results of a study conducted by [6] found that in the period 1990-2008 there were still development disparities between regions in Indonesia, and based on Williamson's index analysis found that during 1990-2008 income inequality between regions was smaller than with after 2008 as indicated by the increasing Williamson index. Also [7] in his research still found that in

the period 2004-2012 there had been development disparities between regions in Indonesia, and based on quantitative analysis it was also found that there were negative and significant variables of GDP and investment variables against the development inequality between regions, then there is a positive and significant influence on the variable concentration of economic activities on development inequality between regions in Indonesia.

Based on the description in the background, it can be assumed that government capital expenditure and gross fixed capital formation affects the disparity in economic development in the region and among regions, so that research on disparity in economic development in the West Coast Region of North Sumatera - Indonesia is very important.

2. Research Method

The equation that can be used to analyze the dominant factors of inter-regional development disparity according to [8], then the model replaces the dependent variable with the Williamson Index resulting in:

$$I(y) = \theta \cdot Yc^\beta \cdot (LQ)^\gamma \cdot M^\delta \cdot I^\pi \quad (1)$$

Equation (1) can be done by regression after transformation by using logarithms so that it can be formulated as follows:

$$\text{Log } I(y) = \text{Log } \theta + \beta \text{Log } Yc + \gamma \text{Log } (LQ) + \delta \text{Log } M + \pi \text{Log } I + \varepsilon \quad (2)$$

where $I(y)$ is the Williamson Index, Yc is the GDP per capita, LQ is the concentration of regional economic activity, M is labor migration (in percent), I is the investment allocation (in percent), and θ , β , γ , δ , π , is the regression coefficient.

2.1. Disturbance term

To examine the factors that influence the regional economic development disparity between regions the equation (2) model is modified and developed into a composite data regression model (panel data) as follows:

$$\text{LnDPE}_{it} = \text{Ln}\alpha_0 + \alpha_1 \text{LnBM}_{it} + \alpha_2 \text{LnPMTB}_{it} + \varepsilon_{it} \quad (3)$$

Where:

DPE_{it} = Disparity in Economic Development in region i in year t

BM_{it} = Regional Capital Expenditure i year t

PMTB_{it} = Establishment of Gross Regional Fixed Capital i year t

ε_{it} = Error term

α_0 = Constant

α_1, α_2 = Regression coefficient

3. Results and Discussion

3.1. Williamson index in the west coast region

The state of economic development disparities in the West Coast region of North Sumatera for the 2012-2016 period is indicated by the Williamson Index in Table 2. The highest level of economic development disparity in 2012 was in the Central Tapanuli Regency, which was 0.0765, followed by Padang Lawas Regency which was 0.0707, and the lowest was Gunung Sitoli Regency which was

0.0075. Then in 2014 the highest level of economic development disparity was occupied by South Nias Regency at 0.0836, followed by Mandailing Natal Regency at 0.0602, and the lowest in North Padang Lawas District at 0.0006. Furthermore, in 2016, the highest level of economic development disparity was still occupied by South Nias Regency by 0.0821, followed by Central Tapanuli District by 0.0599, and the lowest was still occupied by Padang Lawas regency Utara by 0.0000.

Table 2. Williamson Indexs District / City West Coast 2012-2016

No.	Regency / City	2012	2013	2014	2015	2016	Average
1	Nias	0.0468	0.046	0.0407	0.0386	0.0404	0.0425
2	Mandailing Natal	0.0567	0.0557	0.0602	0.0558	0.0576	0.0572
3	South Tapanuli	0.0125	0.0126	0.0143	0.0185	0.0150	0.0146
4	Central Tapanuli	0.0765	0.0768	0.0576	0.0562	0.0599	0.0654
5	South Nias	0.0654	0.0658	0.0836	0.0821	0.0842	0.0762
6	North Padang Lawas	0.0707	0.0714	0.0006	0.0038	0.0000	0.0293
7	Padang Lawas	0.0749	0.0759	0.0068	0.0044	0.0082	0.0340
8	North Nias	0.0471	0.0466	0.0434	0.0417	0.0433	0.0444
9	West Nias	0.0459	0.0455	0.0422	0.0410	0.0404	0.0430
10	Sibolga	0.0143	0.0152	0.0219	0.0256	0.0237	0.0201
11	Padang Sidempuan	0.0431	0.0436	0.0447	0.0432	0.0455	0.0440
12	Gunung Sitoli	0.0073	0.007	0.0234	0.0213	0.0227	0.0163
Average		0.0468	0.0468	0.0366	0.0360	0.0367	0.0406

3.2. Estimation Result and Discussion

In Table 3, the estimation results of the influence of variables of Regional Government Capital Expenditures (BM) and Gross Fixed Capital Formation (PMTB) are shown on income disparities (DP) in 12 districts / cities in the West Coast region in North Sumatera Province in 2012-2016.

Table 3. Estimation Results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-4.400855	1.331138	-3.306086	0.0018
BM	0.079845	0.034026	2.346600	0.0233
PMTB	1.444611	0.108451	13.32047	0.0000

Table 3 explained that the effect of capital expenditure variable of local governments provides a significant positive towards income disparity in the West Coast region in North Sumatera Province. The results of this study contradict with [9] who found that capital expenditure variables have a significant negative effect on income inequality between provinces in Indonesia for the period 2009-2013.

Furthermore, Table 3 also explains that gross fixed capital formation variables have a significant positive effect on income disparity in the West Coast region in North Sumatera Province. The results of this study are in line with the results of [10] that study in Bali Province which found that investment variables had a positive and significant effect on the inequality of income distribution between districts / cities in the period 2007-2013. The results of this study also support the results of [5] which found that investment variables have a positive and significant effect on income inequality between provinces on the island of Sumatera in the period 2005-2010. Furthermore, the results of this study

contradict the results of the [5] which found that investment variables have a negative and significant influence on income inequality between regions in Indonesia during the period 2004-2012. Gross Fixed Capital Formation variable gives a greater influence (1.444611) and the smallest effect is given by the variable regional capital expenditure (0.079845).

4. Conclusion

Based on the results of the research and discussion that has been done, some conclusions can be drawn as follows : (a) the average disparity in economic development with the data period 2012 -2016 year on the West coast of North Sumatera included in the category of extremely low at 0.0406; (b) capital expenditure of local government variable has a significant positive influence on income disparity in the West Coast Region of North Sumatera; and (c) gross fixed capital formation variable has a significant positive influence on income disparity of the West Coast Region of North Sumatera .

References

- [1] Todaro M P 2003 *Ekonomi Pembangunan di Dunia Ketiga [Development Economy in the Third World]* (Jakarta, Indonesia: Erlangga)
- [2] Myrdal G 1976 *Bangsa-bangsa Kaya dan Miskin [Rich and Poor Nations]* translator: P Sitohang (Jakarta, Indonesia: PT Gramedia)
- [3] BPS-Statistics Indonesia 2017 *Indikator Ekonomi Provinsi-provinsi di Indonesia Tahun 2001-2016 [Economic Indicators of Provinces in Indonesia Year 2001-2016]* (Jakarta, Indonesia: BPS-Statistics Indonesia)
- [4] Zasriati M 2015 Analisis pengaruh belanja modal terhadap indeks pembangunan manusia dan pertumbuhan ekonomi di Provinsi Jambi [Analysis of the effect of capital expenditures on the human development index and economic growth in Jambi Province] *Jurnal Sosial dan Humaniora* **1** 2 pp 1-8
- [5] Yeniwati 2013 Ketimpangan ekonomi antar provinsi di Sumatera [Economic inequality between provinces in Sumatra] *Jurnal Kajian Ekonomi* **2** 3 pp 1-12
- [6] Delis A, Rosmeli and Sari N 2013 Analisis ketimpangan pendapatan antar wilayah di Indonesia periode 1990-2008 [Analysis of income inequality between regions in Indonesia in the period 1990-2008] available at <https://haniballhamidi.files.wordpress.com/2013/06/kesenjangan-01-rusdi.pdf>
- [7] Ginting E and Aji P 2015 *Summary of Indonesia's economic analysis* [ADB Papers on Indonesia No 2] (Metro Manila,Philippines: Asian Development Bank)
- [8] Sjafrizal 2012 *Ekonomi Regional: Teori dan Aplikasi [Regional Economics: Theory and Application]* (Padang,Indonesia: Baduose Media)
- [9] Qomariyah N, Suharno and Priyarsono D S 2017 Dampak transfer fiskal (conditional grant) terhadap pembangunan pertanian, kemiskinan, dan ketimpangan di Indonesia : analisis data panel [The impact of fiscal transfers (conditional grant) on agricultural development, poverty and inequality in Indonesia: panel data analysis] *Agroekonomika* **6** 2 pp 164-73
- [10] Fauzi A and Budiana D N 2016 Faktor-faktor yang mempengaruhi secara langsung maupun tidak langsung Ketimpangan distribusi pendapatan Provinsi Bali [Factors that influence directly or indirectly the inequality of the income distribution of Bali Province] *E-Jurnal EP Unud* **5** 6 pp 668-91