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IMPACT IF LAGGING REGION STATUS ON EDUCATION IN INDONESIA

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Abstract

Place-based policies are commonly used in developing countries to stimulate economic development in underdeveloped regions. One such policy implemented by the Indonesian government, spanning from the presidency of SBY to Jokowi, involves designating certain districts as "lagging regions." This study examines the impact of this designation on education during these two administrations, utilizing panel data from 2003 to 2018 across 514 districts in Indonesia. The analysis is divided into three periods, corresponding to different phases of the policy's implementation. The education indicator used is the net enrollment ratio, with the special allocation fund (DAK) serving as the mediating variable. The findings are consistent across various empirical approaches, including propensity score matching, first difference, and panel data estimation. Despite these efforts, the designated lagging regions still have a lower net enrolment ratio than the non-lagging regions. The overall results suggest that there has been no convergence in the educational outcomes between the two groups of regions. This highlights the need for adequate resource mobilization to ensure the effectiveness of such place-based policies.

Keywords: lagging region; place-based policy; education; special allocation fund; Indonesia

Introduction

Many welfare programs, such as conditional cash transfers or unemployment assistance, are person-based because they explicitly target individuals. Unlike these programs, place-based policies explicitly target specific geographic areas for special treatment. Place-based policies could theoretically attract sufficient economic activity to generate a "big push," causing massive productivity increases (Azariadis & Stachurski, 2005). This could improve welfare not only in the areas affected by these policies but also throughout the country. Place-based policies include infrastructure investments, special economic zones, treatment of lagging regions, and local economic development policies.

Place-based policies have been implemented since the Suharto era. The Indonesian Government has implemented several policies since the 1960s, including Inpres Desa Tertinggal or the Inpres Village Disadvantaged (IDT). The program began in 1994/95 and ended in 1997/98. Seven thousand villages were initially designated as "tertinggal," meaning lagging, and each selected village received a block grant of IDR 20 million (roughly $9,000) per year for infrastructure projects and job creation. Once selected, villages would decide how to allocate the annual block grant, and groups of poor people were invited to submit proposals for using the funds. Hill (1998) suggested that the IDT program had broad positive impacts, although he criticized village selection as arbitrary and lacking rigor. (Akita & Szeto, 2000) conducted a study on the impact of the Inpres Village Disadvantaged (IDT) Program in 1994 – 1996, and their findings explained that IDT significantly improved social equity at province levels.

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In President Susilo Bambang Yudhoyono's or SBY era, the mandate for alleviating lagging regions was given to the Ministry of Villages, Development of Disadvantaged Areas, and Transmigration. One of the policies was stipulating lagging region status at the district level. The status was determined through several criteria. The government has prioritized financing to encourage the lagging region to develop economically, infrastructure, and socially. Based on the Minister's regulation Number 15/2015, one of the funding sources comes from a special allocation fund or Dana Alokasi Khusus (DAK), focused on improving connectivity in rural areas, national borders, outer islands, and non-commercial areas. This policy continued in the Jokowi era with the same funding source.

The definition of a lagging region is when the region and society are less developed than others nationally. There are 514 districts/cities in Indonesia, with most of the lagging regions in eastern Indonesia. Underdeveloped areas, state border areas, and small outermost islands have great natural resource potential. The obstacles in the development of lagging regions include low access to essential services, low human resource capacity, limited access to financial institutions, markets, and economic activities, low regional accessibility and connectivity to growth centers, lack of understanding of sustainable asset and natural resource management, and a lack of attention to local social and cultural characteristics. Table 1 presents the status of the lagging region by the government from 2004 to 2024 in the SBY and Jokowi Era. It shows a large part of the distribution of lagging regions in eastern Indonesia.

Table 1. Distribution of Lagging Region District in Indonesia

Island	2004 – 2009	2010 – 2014	2015 – 2019	2020 - 2024
Sumatra	58	46	13	7
Java	17	9	6	-
Bali and Nusa Tenggara	23	28	26	14
Kalimantan	20	16	12	-
Sulawesi	43	34	18	3
Maluku	13	15	14	8
Papua	25	35	33	30
Total	**199**	**183**	**122**	**62**

Source: Ministry of Villages, Development of Disadvantaged Areas and Transmigration.

The government focuses on four priority activities to accelerate development in the lagging regions. If sorted, the main priority is to fulfill basic public services, increase accessibility/connectivity in the regions, local economic development, and increase the capacity of human resources and science and technology. The development of the lagging region will encourage economic growth to be competitive with other regions. One of the critical factors to encourage improvement in human capital is improving the quality of human resources.

The education sector is one sector that is of particular concern to the Government. Law no. 32 of 2004 stated that the central and local governments must allocate 20% of their budget to education. The regulations related to the national education system also state nine years of schooling is compulsory basic education at primary plus junior secondary school levels. The Government has invested considerable resources in education, the principal capital for human resource development, to encourage competitiveness for Indonesia's economic growth. In theory, a place-based policy focusing on poverty has an impact in the short term, while a place-based policy focusing

on improving education has a long-term impact. Education has a longer return time compared to other forms of investment. Even though it takes more time to return, education is more promising than the other forms of investment. It is held that the production of knowledge by education induces self-sustained economic growth because the marginal returns on this new factor, human capital, are not decreasing (Monteils, 2002).

Despite the spending on basic education at the district level, improvements do not correspond with the spending. (Jasmina & Oda, 2018) explained that the challenges included student access to education, especially from the primary to junior secondary level, the distribution of teachers, and the quality of education. In addition, there are also concerns regarding local governments' performance and transparency in the management of educational financial resources. The education gap in Indonesia remains, especially in rural and urban areas. Table 2 shows the Net Enrolment Ratio (NER) or Angka Partisipasi Murni (APM) based on several characteristics. The net enrolment ratio gap between rural and urban areas is increasingly visible in line with high levels of education.

Table 2. The Net Enrolment Ratio 2019

	Primary School	**Secondary School**	**High School**	**University (19-24)**
Total	97.64	79.40	60.84	18.85
Male	97.63	78.87	59.40	17.84
Female	97.65	79.96	62.38	19.84
Urban	97.97	82.05	64.43	25,30
Rural	97.25	76.36	56.27	9.60
Non Disabled	97.71	79.62	61.11	18.89
Disabled	88.84	52.90	31.44	15.06

Source: BPS, 2019

The government has formulated various policies to accelerate the alleviation of lagging regions and significantly improve human capital in the education sector. It has prioritized lagging regions and implemented a place-based policy approach. The government has established programs to support schools. The assistance provided to schools is funds and infrastructure to construct new classrooms or light and heavy rehabilitation, whose budget comes from APBN funds. Based on the Minister's Regulation Villages, Development of Disadvantaged Regions, and Transmigration Number 15/2015, one of the funding sources comes from a special allocation fund or Dana Alokasi Khusus (DAK). In the era of President SBY, the use of DAK in the education sector was focused on the construction and rehabilitation of elementary and junior high school buildings. Lagging regions receive priority for the funding where DAK allocation for each region is different based on their needs. This policy continued in the Jokowi era with the same target and funding source.

In this study, the authors analyzed the policy's impact on lagging region status on education indicators in Indonesia. The research question from this study is whether the stipulating lagging regions will improve educational outcomes measured by the net enrolment ratio. If the policies carried out by the Government on alleviating lagging regions in the education sector are good enough, there will be convergence in lagging regions. This study used the Propensity Score Matching (PSM), the first difference, and panel method to analyze the policy's impact according to the year of stipulating lagging region on 2005 - 2019. The authors tried to recalculate the determination of the lagging

region using the criteria used by the Ministry of Villages, Development of Disadvantaged Areas, and Transmigration. The selection of the net enrollment ratio as an outcome demonstrates the impact of education on the quantity aspect. Special allocation funds or Dana Alokasi Khusus (DAK) mediator used to provide school infrastructure will have an impact on increasing the net enrolment ratio.

Several studies have been conducted to see the impact of lagging region policies in some countries. (Wardenburg & Brenner, 2020) analyzed the effects of two policies drawn up by the German Government on the quality of life in the lagging region. Equalization transfers have a significant positive impact on regional net migration and contribute to regional equity. (Nasrudin, 2016) conducted a study regarding the impact of lagging region status on district poverty in Indonesia using a fixed-effect data panel combined with a propensity score matching. The results show that the lagging region status aimed to mainstream central and district's budget toward lagging regions reduced poverty rate and gap significantly.

Based on the current direction of development policies for lagging regions, the implementation is carried out through the following strategies: (1) Community economic development; (2) Improved accessibility of links to growth center; (3) Improving the quality of human resources and science and technology, (4) Fulfilling the MSS for basic public services; (5) Provision of special allowances for health, education, and agricultural extension workers; (6) Regulatory harmonization; (7) Providing incentives to private parties; (8) Guidance for underdeveloped areas that are alleviated; (9) Development of rural areas and transmigration; and (10) Acceleration of development in the Provinces of Papua and West Papua through increasing connectivity and quality of human resources, as well as developing local commodity-based community economies in customary areas. The Government pays major attention to the education sector because this sector will impact growth. Endogenous growth models explain that long-term economic growth is of telling put forward. In short, growth is a self-maintaining process taking place at a constant rate because the returns of human capital accumulation are constant. Lucas (1988) characterized field education as a central component of the growth reasons. They considered human capital a crucial factor in creating new ideas so that education plays an essential role in determining economic growth. The endogenous growth models suggest that policymakers who wish to raise the welfare have different options, not just subsidies to R&D but also subsidies to certain kinds of education. One of the policies is to increase the quality and quantity of education in lagging regions through infrastructure development from the supply and demand side, encouraging an increase in educational indicators, including the net enrolment ratio.

Under the new education policy, the central Government should allocate 20 percent of the national budget for education, and the local Government also has the same responsibility. Assuring the implementation of basic education at the district level in Indonesia, the central Government transfers its educational funds to the local governments. Figure 1 shows the central and local Government's spending on education using the national budget in 2018. Of the 20% of the national budget allocated for education, about 63% is transferred to the local Government. About 26.4% is a special allocation fund for the education sector consisting of non-physical DAK. One of the funding sources for the education sector in the lagging region came from the special allocation fund or DAK for education. The Special Allocation Fund (DAK) policy for education began to be rolled out in 2003. Based on the Decree of the Minister of Finance of the Republic of Indonesia No.544/KMK.07/2002 dated December 31, 2002, regarding

the special allocation of non-reforestation funds for the 2003 fiscal year, the use of DAK in the education sector was directed to support the implementation of the compulsory study.

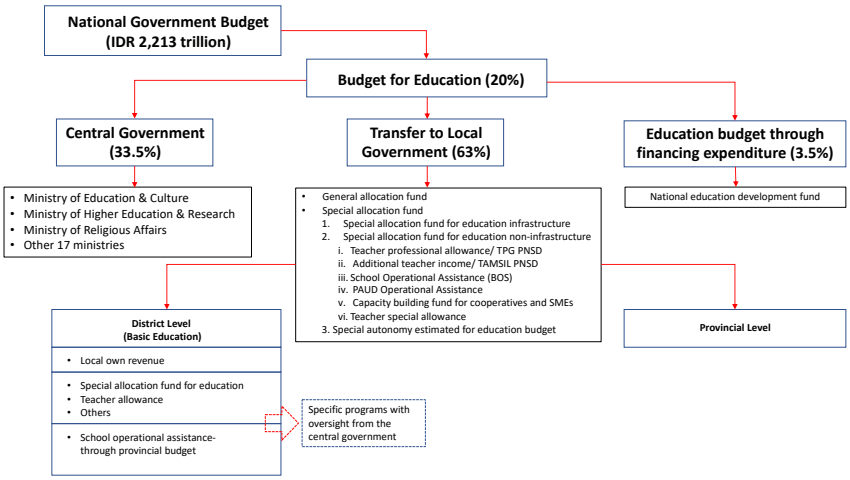


Figure 1. Education Funding Mechanism in Indonesia
Source: Author's Compilation from Ministry of Finance, 2018

Increasing special allocation funds (DAK) for the education sector to provide educational facilities and infrastructure to improve the quality and quantity of education services in primary and junior secondary schools will improve access to education and enhance educational outcomes from the supply and demand side, including net enrolment ratio. This policy is also expected to increase and indicates convergence in lagging regions.

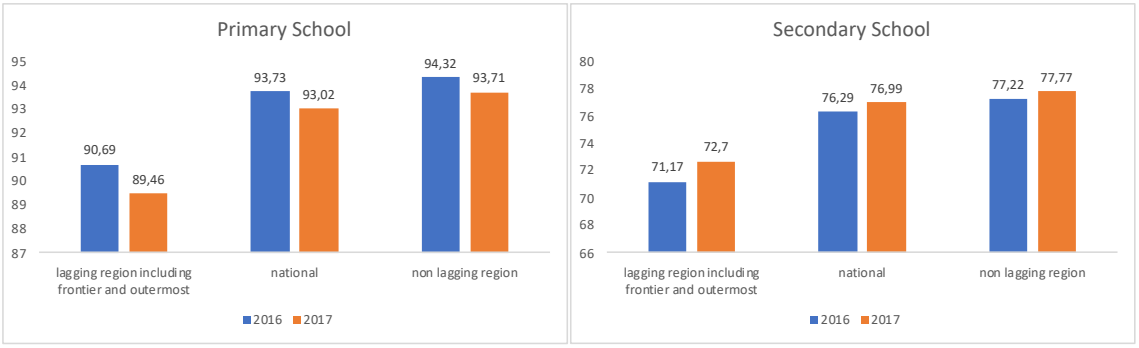


Figure 2. Average Net Enrolment Ratio in Lagging Region in 2017
Source: Ministry of Education and Culture, 2017

Figure 2 shows that, on average, the net enrolment ratio of primary schools in lagging regions has decreased significantly. This decrease does not indicate a lower educational performance. Still, the decline is influenced by primary schools inhabited by children aged 7-12 years, as in Permendikbud 17/2017, requiring the entry age of primary school children to be seven years old. In contrast to the net enrolment for primary school, the net enrolment ratio for junior secondary schools has increased compared to the previous year. Based on the Ministry of Education and Culture , the lowest net enrolment ratio for a primary school in 2017 in the lagging region was in North Kayong, West Kalimantan. This condition is because of inadequate educational facilities and infrastructure for the teaching and learning process. While for the junior secondary school level, the lowest net enrolment ratio is in Nduga. The safety factor and geographical difficulties caused the low net enrolment ratio of junior secondary schools. Therefore, in

this study, to analyze the impact of stipulating lagging regions on the net enrolment ratio, special allocation funds are used as a policy mediator variable.

Existing empirical studies on the impact of government spending on education in the districts of Indonesia show mixed results. Increased local government resources will have a positive effect because it gives local governments even more autonomy to design and plan tailor-made educational programs and promote local government ownership (Simatupang, 2009). The resulting tailor-made educational programs, based on appropriate control, are expected to lead to improved educational outcomes (Kis-Katos & Sjahrir, 2013) because these programs can incorporate the social, cultural, and geographical diversity in municipalities neglected in the centralization era due to a one-size-fits-all development policy.

Several previous studies explained some findings that decentralization had played a role in exacerbating educational disparities in Indonesia. (Jasmina, 2016; Leer, 2016) explained that decentralization does not affect some outcomes in education, namely national exam scores. (Jasmina & Oda, 2018) found that Government's spending on education, both local and central, has no significant impact on the net enrolment ratio of primary and junior secondary education at the district level in Indonesia. Decentralization may increase accountability and empower local governments to provide better education services, but only if local governments can. Therefore, decentralization increased people's educational attainment in some municipalities but not in others (Muttaqin et al., 2016). The study aims to examine the impact of this designation on education during these two administrations, utilizing panel data from 2003 to 2018 across 514 districts in Indonesia.

Research Methods

This study aims to analyze the stipulation of lagging region policies in the SBY and Jokowi eras, using panel data from 2003 – 2018 in 514 districts/cities in Indonesia. The research estimate is divided into three periods according to the stipulation of the policy. SBY I period or the first period (2005 - 2009), SBY II period or the second period (2010 - 2014), and Jokowi I period or the third period (2015 - 2019). The secondary data are from the Central Statistics Agency (BPS), Ministry of Finance, Ministry of Education and Culture, and Indonesia Database for Policy and Economic Research (INDO DAPOER) by World Bank. The primary data used in this study is the Village Potential Census (PODES), a survey of villages' potential situation and characteristics in all provinces of Indonesia by the Central Statistics Agency (BPS), conducted every three or four years. PODES data used are 2003, 2006, 2008, 2011, 2014, and 2018.

In this study, the researchers recalculated to determine lagging region using the Propensity Score Matching (PSM) method. The eligibility criteria of a lagging region status are grouped into six dimensions, involving 33 variables based on the regulation of the Ministry of Villages, Development of Disadvantaged Areas, and Transmigration Number 3/2016. When this policy was introduced in the SBY era in 2005, the stipulation of the lagging region was carried out using data from the previous year. Due to the availability of data, especially PODES data, the year for covariates or baseline year to predict common support was 2003 for the first period (2005 - 2009), 2008 for the second period (2010 - 2014), and 2014 (2015 - 2018), as shown in Figure 2. The main dependent variable used by the researchers is Net enrolment ratio (NER) or Angka Partisipasi Murni (APM) at the primary and secondary school levels in 2003 – 2018. Net enrolment ratio is the proportion of the population of a specific school age group currently attending school

at the appropriate level of education (in accordance with the age of the population with the provisions for the age at school at that level) to the population of the corresponding school age group.

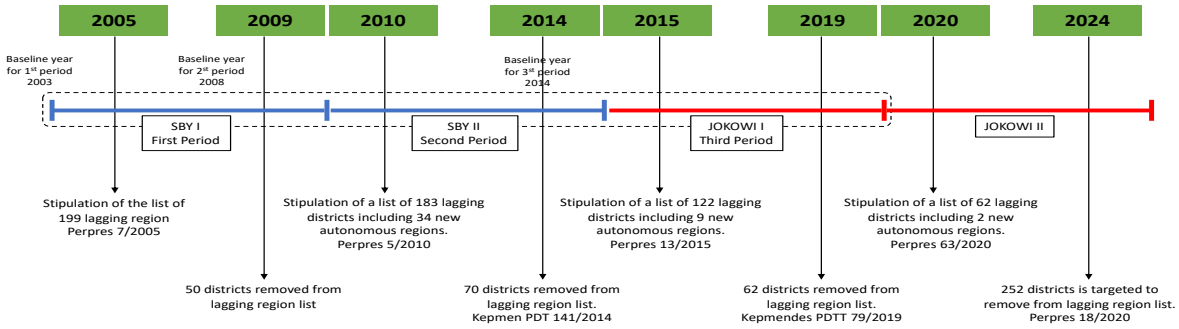


Figure 3. Timeline of stipulation of lagging region
Source: Author's compilation, 2021

The researchers selected the lagging regions by recalculation using the propensity score matching (PSM) method. It is defined as a non-parametric approach to finding a comparison group from all the non-treated so that the selected group is similar to the treatment group in terms of their observable characteristics (Blundell et al., 2005). PSM aims to create a control group with similar characteristics to the treatment group. The use of PSM in this study is to obtain control and treatment groups with the same characteristics and avoid selection bias so that the selection process will eliminate areas with extremely rich or irrelevant characteristics.

In each period, calculations are carried out using the matching method to determine the same characteristics as the control and treatment groups or common support on 514 districts/ cities. The common support area represents the similarity of characteristics between the two groups based on the similarity of the distribution of their propensity values. Common support is when a region of the support of a matching variable overlaps with the distribution of density scores from treated and untreated groups. The treated and untreated individuals must have similar probabilities or treatment. The PSM specification used to match the lagging region district with those non-lagging region districts is based on the following specification, executed using default probit specification.

$$P(x\_i)=Prob(D\_i=1|x\_i)\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

The PSM equation 1 is based on the approach by Nasrudin (2014). Where x is the set of eligibility criteria for the district to be stipulated as a lagging region. The estimation is carried into three set periods: baseline of the year 2003, 2008, and 2014 for each of the phases of lagging region policy, respectively. The author used 33 variables as eligible criteria determined by the Ministry of Villages, Development of Disadvantaged Areas, and Transmigration. The estimation step also includes an alternative matching procedure in the PSM equation to see the robustness of the common support.

For district d in period t, the main estimation is based on those used by (Sparrow et al., 2013) to analyze the impact of Indonesia's Askeskin program or social health insurance for the poor program by combining a first difference approach with propensity score matching. The specification for the propensity score matching is as follows.

$$\beta\_PSM=E(y\_d2-y\_h1 \mid T\_d=1,S\_d=1)-E(W\_d\,(y\_d2-y\_d1 \mid T\_d=0,S\_d=1))\ldots\ldots\ldots(2)$$

Where W_d=W (P(X_d)) is a weight-based on estimated propensity score P(X_d) and matching method, and S reflects the range of common support. The advantage of propensity score matching over the first difference is that we can control for observed characteristics determining lagging region status without imposing a functional form on y. The matching procedure restricts the analysis to the range of common support.
Then estimate with difference regression is done to control a set of time-variant covariates. This study takes a first difference approach by comparing districts with and without this policy before and after it was introduced.

$$\Delta y\_dt=\beta\_DD\ \Delta T\_dt+ \gamma\Delta X\_dt+ \Delta\varepsilon\_dt\ldots\ldots..(3)$$

y is the outcome, the treatment variable ΔT_dt, = 1 for lagging region district and 0 for non- lagging region district in each phase of the periods of policy implementation and 0 for all regions at the baseline period), X_dt, is the control variable consisting DAK for education and HDI, ε_dt, is error term. In addition, the authors also used the panel data estimation method to see the impact of policies throughout the year of implementation.

$$y\_dt=\beta\_k\ T\_dt\hat{}k+X\_dt\hat{}k\ \gamma+\square\_dt\ldots\ldots..(4)$$

Denoting d and t are the district and year indices, respectively, y is the net enrolment ratio, T is the dummy variable of treatment (equal 1 for lagging region district and 0 for non-lagging region district in the periods of policy implementation and 0 for all regions at the baseline period), X is the set of covariates determining the lagging region status based on policy and is the error term.

Results and Discussion

Table 3 shows the lagging region that received treatment or not in the range of common support. In the first period, there are 183 districts (111 untreated and 72 treated). Meanwhile, there are 275 common support districts in the second period, 162 untreated and 113 treated districts. The last period consists of 333 common support districts, 234 untreated, and 99 treated districts.

Table 3. Common Support in Each Period

	First Period (SBY I)	Second Period (SBY II)	Third Period (JOKOWI I)
Untreated	111	162	234
Treated	72	113	99
Total	183	275	333

Source: Author's compilation, 2021

First Period

The impact of stipulation lagging region status in the education sector can be seen in Table 4. The estimations on primary and secondary school level net enrolment ratios show negative and insignificant results, except for 2005. The results are significant, indicating that the policy has no positive impact on net enrolment ratios in the treatment to control group. Even though the coefficient is negative, the number tends to decrease every year, except in 2005. It is because in some districts, the SUSENAS survey was not carried out to determine the net enrolment ratio, and in 2004, the Aceh tsunami occurred so that the net enrolment ratio in 2005 decreased compared to the previous year). This result indicates no convergence in the treatment group after implementing this policy, as

shown in the magnitude of net enrolment ratio in primary school in 2005 is -4.327 (significant at 10%). For the secondary school level, the net enrolment ratio in 2004 is -10.61 (significant at 10%). The results also show that the net enrolment ratio at the secondary school level is lower than at the elementary school level.

Table 4. Propensity Score Matching Result in First Period

	Net enrolment ratio	
	Primary School	**Secondary School**
2003	-2.1477	-2.989
	(-1.38)	(-0.49)
2004	-1.589	-10.61*
	(-1.09)	(-1.86)
2005	-4.327*	-3.352
	(-2.02)	(-0.48)
2006	-0.4911	-6.095
	(-0.57)	(-0.98)
2007	0.0921	3.1013
	(0.07)	(0.54)

Note: Robust standard errors in parenthesis. *significant at 10%, ** significant at 5%, ***significant at 1%

Table 5 using the common support for the net enrolment ratio at the primary school level, based on the first difference estimation results on primary and secondary school level net enrollment ratios. The results are negative and insignificant, indicating that the policy has no positive impact on net enrollment ratios in the treatment group. This result indicates no convergence in the treatment group after implementing this policy. These results are consistent with estimates using PSM.

Table 5. First difference Result in First Period

	NER Primary School			**NER Secondary School**		
	Baseline (1)	**Control (2)**	**Dummy (3)**	**Baseline (4)**	**Control (5)**	**Dummy (6)**
Lagging region status	-.227812	-.12305	-.15636	-.0185582	-.65204	-.65614
	(-0.62)	(-0.23)	(-0.29)	(-0.04)	(-1.00)	(-1.01)
HDI		.63528	-.05671		3.4754***	3.3852**
		(0.71)	(-0.06)		(3.22)	(3.04)
DAK percapita		.00945*	.00447		-.01921**	-.01976**
		(1.77)	(0.82)		(-2.98)	(-2.96)
Dummy Otsus			8.3764***			1.0713
			(3.29)			(0.33)
_cons	.437063	.595984	1.1858	1.24541***	1.2427	1.3158
	(1.29)	(0.71)	(1.40)	(3.17)	(1.23)	(1.27)
Observation	724	306	306	720	304	304
R2	0.0005	0.0123	0.0466	0.0000	0.0646	0.0649

Note: Robust standard errors in parenthesis. *significant at 10%, ** significant at 5%, ***significant at 1%

Second Period

Table 6. Propensity Score Matching Result in Second Period

	Net enrolment ratio	
	Primary School	**Secondary School**
2008	-1.336	-5.626
	(-1.38)	(-1.23)
2009	-0.735	-4.784
	(-0.77)	(-1.23)
2010	-0.272	-3.537
	(-0.34)	(-1.02)
2011	-0.102	-0.8994
	(-0.11)	(-0.32)
2012	-1.435	-8.001***
	(-1.46)	(-2.69)
2013	-0.971	-4.111
	(-0.88)	(-1.27)

Note: Robust standard errors in parenthesis*significant at 10%, ** significant at 5%, ***significant at 1%

Different results are shown in Table 7, the first difference estimation in the second period using the common support. The magnitude obtained in the net enrolment ratio at the primary school level is positive and insignificant in all models. This result indicates no convergence in the treatment group after implementing this policy. In models 2 and 3, the increase of special allocation funds for the per capita education sector in primary schools will significantly reduce the net enrolment ratio at the level of 5%. This result contradicts the theory, possibly due to the lack of proper targeting in determining the value of the special allocation funds for the education sector in the lagging region.

Table 7. First difference Result in Second Period

	NER Primary School			**NER Secondary School**		
	Baseline (1)	**Control (2)**	**Dummy (3)**	**Baseline (4)**	**Control (5)**	**Dummy (6)**
Lagging region status	.0889164 (0.41)	.146533 (0.63)	.17842 (0.76)	.134561 (0.30)	.161852 (0.33)	.14878 (0.30)
HDI		.067646 (0.217)	.06717 (1.23)		.164073 (1.43)	.16426 (1.43)
DAK Capita		-.00063** (-2.22)	-.00065** (-2.28)		-.00075 (-1.27)	-.00074 (-1.25)
Dummy Otsus			-.27075 (-0.83)			.110918 (0.16)
_cons	.260023 (1.65)	.181809 (1.02)	.20343 (1.13)	1.2292*** (3.73)	1.1199** (3.01)	1.1110** (2.95)
obs	1375	1250	1250	1375	1250	1250
R2	0.0001	0.0058	0.0063	0.0001	0.0032	0.0032

Note: Robust standard errors in parenthesis*significant at 10%, ** significant at 5%, ***significant at 1%

Third Period

Table 8. Propensity Score Matching Result in Third Period

	Net enrolment ratio	
	Primary School	**Secondary School**
2014	-1.712	-2.741
	(-1.28)	(-0.62)
2015	-3.722***	-2.639
	(-2.70)	(-0.62)
2016	-3.866***	-1.925
	(-3.12)	(-0.42)
2017	-3.046**	-2.652
	(-2.55)	(-0.66)
2018	-3.927***	-4.207
	(-3.31)	(-1.06)

Note: Robust standard errors in parenthesis*significant at 10%, ** significant at 5%, ***significant at 1%

This finding also occurs in the first difference estimation results in Table 9. In the Jokowi era, the coefficient showed insignificant negative results in all models, both at the primary and secondary school levels, showing no convergence in the lagging region. Significant results pesent for the dummies variable for special autonomous regions at the primary school level, the lagging region with status of special autonomous regions, experience decrease in the net enrolment ratio of 0.34176 points at the 10% level by the stipulation.

Table 9. First difference Result in Third Period

	NER Primary School			**NER Secondary School**		
	Baseline (1)	**Control (2)**	**Dummy (3)**	**Baseline (4)**	**Control (5)**	**Dummy (6)**
Lagging region status	-.04055 (-0.29)	-.06822 (-0.47)	-.03453 (-0.24)	-.095452 (-0.28)	-.08319 (-0.23)	-.09256 (-025)
DAK Capita		-.44742 (-0.36)	-.64251 (-0.52)		-4.8747 (-1.58)	-4.8204 (-1.56)
Dummy Otsus			-.34176* (-1.73)			.09511 (0.19)
_cons	0.35874*** (3.78)	.39884*** (3.91)	.4368*** (4.19)	.54674** (2.33)	.44683* (1.76)	.43624* (1.68)
obs	1332	1200	1200	1332	1200	1200
R2	0.0001	0.0003	0.0028	0.0001	0.0022	0.0022

Note: Robust standard errors in parenthesis. *significant at 10%, ** significant at 5%, ***significant at 1%

Panel Data Estimation

Table 10. Panel Estimation

	NER Primary School				**NER Secondary School**			
	Baseline (1)	**All Year (2)**	**SBY Era (3)**	**Jokowi Era (4)**	**Baseline (5)**	**All Year (6)**	**SBY Era (7)**	**Jokowi Era (8)**
Lagging region status	-3.409*** (-20.28)	0.848*** (5.43)	1.314*** (6.96)	-0.0099 (-0.04)	-9.89*** (-34.70)	-1.616*** (-5.35)	-1.031** (-2.75)	-2.793*** (-5.61)
earthquake		0.00608	0.00862*	-0.0013		0.0467***	0.0483***	0.0426***

		(1.85)	(2.28)	(-0.22)		(7.36)	(6.43)	(3.56)
landslide		-0.00404	-0.0108	0.00553		-0.0258**	-0.0247*	-0.0315*
		(-0.84)	(-1.83)	(0.72)		(-2.79)	(-2.10)	(-2.15)
flood		0.00871*	0.00941*	0.00581		0.000843	0.00056	-0.000840
		(2.51)	(2.81)	(1.07)		(0.13)	(0.07)	(-0.08)
electricity		0.170***	0.149***	0.248***		0.361***	0.347***	0.419***
		(43.78)	(33.28)	(33.82)		(48.19)	(38.92)	(30.00)
_cons	94.84***	78.79***	79.86***	72.93***	72.55***	38.73***	37.84***	37.73**
	(1029.51)	(205.20)	(181.05)	(98.98)	(464.59)	(52.18)	(43.19)	(26.84)
obs	7142	6366	4323	2043	7138	6366	4323	2043
R2	0.0546	0.2769	0.2355	0.4388	0.1446	0.3754	0.3608	0.4294
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parenthesis*significant at 10%, ** significant at 5%, ***significant at 1%

The net enrolment ratio at the secondary school level is shown in model (5); the resulting coefficient is -9,890, significant at the 1% level. The negative coefficient equals the estimate using the propensity score matching and first difference methods. In model (6), with the addition of the control variable, the value is better (-1,616, significant at the 1% level). Model (7) is the estimation result in the SBY era (2015-2018), showing the improving results where the negative coefficient is getting smaller (-1,031, significant at the 10% level). While in the Jokowi I period, shown in model (8), the negative coefficient increased by -2,793, significant at the 1% level. The lagging region policy can explain these results; the net enrolment ratio was better in the era of SBY than in the era of Jokowi.

Table 11. Panel Estimation With Common Support

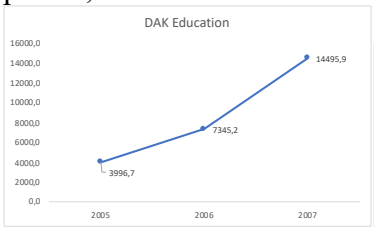
	NER Primary School				**NER Secondary School**			
	All Observation (1)	**First Period (2)**	**Second Period (3)**	**Third Period (4)**	**All Observation (5)**	**First Period (6)**	**Second Period (7)**	**Third Period (8)**
Lagging region status	1.063*** (6.90)	-0.155 (-1.08)	-0.522*** (-3.94)	-0.258 (-1.48)	-1.649*** (-5.53)	-3.780 (-8.42)	-1.681*** (-4.25)	-2.582*** (-4.62)
earthquake	0.00547 (1.67)	0.00178 (0.58)	0.00668* (2.17)	0.00240 (0.64)	0.0470*** (7.40)	0.0362*** (3.74)	0.0339*** (3.69)	0.0472*** (3.94)
landslide	-0.00393 (-0.82)	0.00293 (0.72)	0.00666 (1.52)	0.0131* (2.40)	-0.0257** (-2.78)	-0.0557*** (-4.36)	-0.0258* (-1.97)	-0.068*** (-3.94)
flood	0.00867* (2.50)	0.00476 (1.41)	0.00847** (2.72)	0.00285 (0.73)	0.000942 (0.14)	-0.0195 (-1.84)	-0.00419 (-0.45)	-0.00927 (-0.74)
electricity	0.173*** (44.18)	0.0599*** (12.22)	0.0579*** (13.47)	0.0767*** (13.48)	0.359*** (47.25)	0.242*** (15.71)	0.346*** (26.94)	0.217*** (11.93)
_cons	78.37*** (200.88)	89.41*** (186.25)	89.91*** (213.56)	88.13*** (161.07)	38.93*** (51.55)	50.36*** (33.46)	40.54*** (32.27)	51.60*** (29.48)
obs	6366	2551	3013	1600	6366	2551	3013	1600
R2	0.2790	0.0759	0.1104	0.1439	0.3756	0.1933	0.2897	0.1740
FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parenthesis*significant at 10%, ** significant at 5%, ***significant at 1%

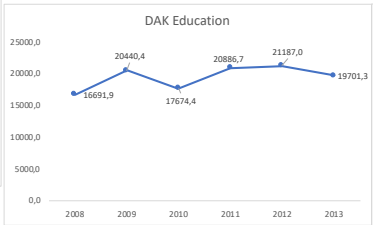
The authors estimate the impact of stipulation lagging region status on education indicators using a panel model with common support in the year of policy implementation in Table 11. Model (1) explains the basic model of panel data estimation using control variables. The coefficient shows a positive result (1.063), significant at the 1% level. This policy positively impacts the net enrolment ratio of 1,063 units. For the next model, the observation uses common support for each period used for all years of implementation. The use of this common support is to identify which areas have been successfully eradicated from the status of lagging region and expansion (pemekaran) areas. In model (3), a lagging region is only found in the first and second periods, with the coefficient of -0.522 (significant at the 1% level) and -0.258 (insignificant), respectively. The rest shows secondary school level. Model (5) shows the panel regression results with a coefficient of -1.649, significant at the 1% level. Model (6) shows the lagging region only found in the first period. The coefficient is negative and insignificant. Model (7) describes that the lagging region is only found in the first and second periods. The coefficient is -1.681, significant at the 1% level. The latest model shows a figure of -2.582, significant at the 1% level. This number indicates that the stipulation of the lagging region status affects the decline in net enrolment schools at the secondary school level by 2,582 points compared to the control area at common support.

The estimation results using several approaches, propensity score matching, first difference, and panel data show consistent results between the three models. Generally, the results show that the implementation of the policy on lagging region status does not positively impact the net enrolment ratio at the primary and secondary school levels. The overall results do not indicate convergence in the treatment group or lagging region. The mixed and inconclusive results show that no pattern can conclude convergence (RodrÃguez-Pose et al., 2018).

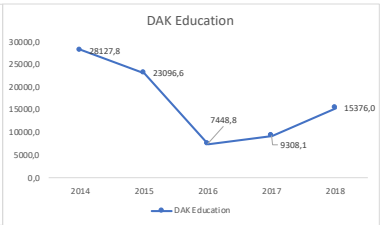
One of the main components in funding lagging regions, especially the education sector, is the special allocation fund or Dana Alokasi Khusus (DAK). The main objective of the DAK for education is to help finance special activities in specific regions following national priorities, mainly to finance the needs of basic public service facilities and infrastructure that have not yet reached specific standards or to encourage the acceleration of regional development. Graph 2 shows the distribution of special allocation funds in the education sector for lagging regions based on common support per period. In SBY I and II periods, the allocation increased although decreased in several years. In the Jokowi I period, the allocation is decreased due to new policies that changed the DAK posture.



DAK for education in common support in first period (72 lagging regions)



DAK for education in common support in second period (113 lagging regions)



DAK for education in common support in third period (99 lagging regions)

Figure 3. DAK for education in common support (in thousand rupiah)
Source: Ministry of Finance

Note: from 2016 onwards, there was a change in regional transfers, DAK being physical and non-physical. In this table, the calculation uses physical DAK, which consists of regular DAK per district, not including affirmation DAK. The DAK consist of twelve year compulsory education program (Iammarino et al., 2019).

In addition, the authors estimate the variable mediator, the special allocation fund or DAK for the education sector per capita. This estimation aims to see the special allocation funds for the education sector as a funding source in lagging regions used as mediators in the study. Estimation using a panel fixed effect with control variables, such as literacy rate and the number of schools.

Table 12. Panel Estimation for The Special Allocation Fund

	Special Allocation Fund for Education			
	Baseline	**All Period**	**SBY Era**	**Jokowi Era**
	(1)	**(2)**	**(3)**	**(4)**
Lagging region status	0.0511*** (27.39)	0.0369***	0.0370***	0.0365***
		(10.51)	(8.79)	(7.37)
Literacy rate		-0.00164***	-0.00191***	-0.000360
		(-10.38)	(-10.25)	(-1.52)
Number of schools		-0.000061***	-0.000071***	-0.000033*** (-7.02)
		(-15.53)	(-14.39)	
_cons	0.0370*** (33.93)	0.222***	0.254*** (14.10)	0.0783*** (3.39)
		(14.53)		
obs	6219	2124	1640	484
R2	0.1079	0.2377	0.2517	0.2366
FE	Yes	Yes	Yes	Yes

Note: Robust standard errors in parenthesis *significant at 10%, ** significant at 5%, ***significant at 1%

Table 12 shows that regions stipulated as lagging regions will increase the special allocation fund for the education sector per capita by 3.69%, significant at the 1% level. Even though the result is significant, but the magnitude is small. This result also indicates that the special allocation fund for the education sector is a significant mediator of funding for lagging regions. Increasing DAK for the education sector every year does not considerably impact the net enrolment ratio in lagging regions. This finding raises some indication. First, the special allocation fund for the education sector is used for the provision of educational infrastructure in the form of school buildings, in this case, the number of school buildings is not as large as the number of students or unable to accommodate students to carry out the learning process, causing net enrolment ratio in lagging regions under non-lagging regions.

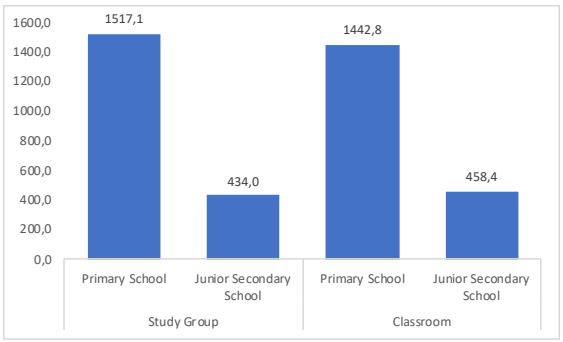


Figure 4. Study Group and Classroom in 99 Lagging Region in Third Period
Source: Author's compilation from Neraca Pendidikan Daerah 2018

Based on the 2018 Regional Education Balance or Neraca Pendidikan Daerah (NPD) of the Ministry of Education and Culture in Graph 3, the average study groups in 99 lagging regions in the third period were 1517.1 for elementary schools and 434 for junior secondary schools. The average classroom in the third period was 1442.8 and 458.4 for junior secondary school. The adequacy of educational facilities is calculated using the ratio of study groups per classroom, namely the ratio between the number of study groups and the number of classrooms at the SD/MI or primary school education level. For each study group, there is one classroom equipped with enough tables and chairs for students and teachers, as well as a blackboard (Permendikbud No.23 of 2013 article 2). The ratio of study groups per classroom in the lagging region at the primary school level is 1.05, while it is 0.946 at junior secondary school. These results explain that the availability of classrooms in primary schools is less than that of junior secondary schools. This proves the hypothesis that the increase in DAK for education in lagging regions for infrastructure provision is limited compared to the number of school-aged children. This indicates that the demand and supply of education in lagging regions are unbalanced.

The second indication is the change in the posture of DAK for education to physical and non-physical DAK, causing the non-optimal provision of infrastructure so that the net enrolment ratio in the lagging region is negative. Graph 4 explains the proportion of DAK for the education sector at the district level consisting of physical DAK or DAK for educational infrastructure and non-physical DAK or DAK for educational non-infrastructure (Teacher professional allowance, Additional teacher income, Special teacher allowance, and PAUD operational assistance). The largest proportion is for teacher professional development allowances, with an average of 46.83 billion in disadvantaged areas in the third period in 2018. For physical DAK, the average is 15.38 billion. This figure indicates that the Government's focus is on improving the quality of education through teacher welfare so that infrastructure development based on the quantity is unable to increase the net enrollment ratio.

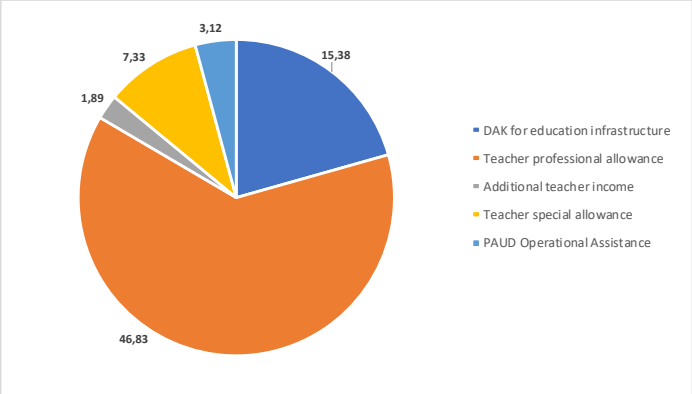


Figure 5. Proportion of DAK for Education 2018 (in billion rupiah)
Source: Author's compilation from Neraca Pendidikan Daerah 2018

This proportion does not include the uniform fund managed at the provincial level, namely the School Operational Assistance or Bantuan Operasional Sekolah (BOS), worth 44.36 billion in total, nationally. This figure is much higher than the national physical DAK for education (8.8 billion) in 2018. Education sector policies in the Jokowi era are more focused on uniform funds, where the budget for school infrastructure development through physical DAK is smaller. In addition, a new uniform fund policy is also

established, i.e., the Smart Indonesia Program or Program Indonesia Pintar (PIP). PIP is a program to help school-aged children from poor/vulnerable/ priority families continue to receive education services until they finish secondary education. Based on the 2018 Neraca Pendidikan Daerah or National Education Balance, 6.2 million elementary school students and 3.1 million junior high school students have benefited from the program. This policy not only focuses on lagging regions, but eligible individuals can become beneficiaries. These differences encourage policymakers to determine funding priorities for policies to improve the education sector to encourage an increase in the net enrolment ratio in lagging regions and cause overlap in the implementation of programs for alleviating lagging regions. Based on these data, the allocation to the uniform fund is greater than the special allocation fund for increasing the number of schools. The distribution of uniform funds is undifferentiated for lagging regions so that it does not have a significant impact on the net enrollment ratio in basic education and indicates no convergence in lagging regions. The policy should be implemented comprehensively and focus on alleviating lagging regions as a top priority. When eradicating lagging regions, it is crucial to increase the quantity of the education sector, which must be adapted to each region's needs and characteristics to improve each individual's capabilities.

Conclusion

The overall results show that Indonesia's policy on stipulating lagging region status does not positively impact the net enrolment ratio at the primary and junior secondary school levels. The overall results do not indicate convergence in the treatment group or lagging region. The mixed results and inconclusive results show that no pattern can conclude convergence. Implementing this policy has not encouraged the improvement of the quantity of education in the primary and junior secondary schools, resulting in persistent inequality. The most striking finding is that the central government transfers to the regions are more focused on uniform funds from the demand side than the provision of infrastructure on the supply side to encourage an increase in the net enrolment ratio from the quantity side, ultimately leading to no convergence in lagging regions.

The policy of stipulating lagging regions is expected to encourage the improvement of human capital so that these regions have competitiveness and catch up. It has not been implemented in countries with wide socio-economic diversity and characteristics. Differences in regimes and distribution priorities of funding sources in special allocation funds (DAK) are one of the factors that slow down the acceleration of eradicating lagging regions even though policies have been formulated in such a way as to encourage their development. Based on the result, this study suggests the following recommendations. First, one size fits all policy cannot solve problems in lagging regions. Place-based policies must be adapted to the characteristics and needs of each region and cannot be generalized. With a place-based approach, the alleviation of the lagging region will be right on target. Regional differences in incomes and economic activity seem likely that place-based policies will continue to play an important role in Indonesia for the next several decades. Second, the allocation funds aimed at lagging regions have the highest priority scale nationally to improve the quality of human resources, especially in basic education. Third, introducing a uniform fund could undermine resources dedicated to place-based policy. The number of policies drawn up can distract lagging regions from developing their regions. This study focuses on basic educational outcomes as the impact of the policy of lagging region stipulation using various econometric approaches. The

variables used to determine lagging regions are based on policies set by the Ministry of Villages.

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