



Does Local Government Capacity Hamper Improvement of Basic Education? An Analysis at the District Level in Indonesia

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ABSTRACT

Due to fiscal decentralization in 2001, Indonesia decentralized the provision of public services, including basic education, to the district governments. In 2003, the country enacted a law mandating a minimum allocation of 20% of the government budget for education. Since 2009, the government of Indonesia has managed to allocate 20% of its budget for education, and on average, about 60% of the budget is transferred to the local governments. Although some early empirical studies show that education services improved after the decentralization in Indonesia, recent studies show the opposite. Increasing government spending on education at the district level does not necessarily improve education. This paper aims to empirically analyze the impact of government spending on a nine-year compulsory basic education at the district level in Indonesia. Furthermore, the paper elaborates on the issue of whether the capacity of local governments in managing their local finances might hamper the improvement of education. This paper not only employs an econometric analysis with updated secondary data of districts in Indonesia from 2010–2015, but also extends the analysis with findings from field visits to selected districts in Java, Indonesia. This paper finds that government spending on education, both local and central, has no significant impact on basic education at the district level. The greater impact of the spending prevails as the districts manage their education spending more effectively. Despite the size of the spending on education, the capacity of local government in managing and transforming the spending into education resources is imperative to enhance basic education at the district level.

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INTRODUCTION

Due to fiscal decentralization in Indonesia in 2001, the responsibility to provide primary and secondary education was shifted to from the central government to the local governments at the district level.

² In 2003, a law on the national education system of Indonesia was enacted that stipulates a nine-year compulsory basic education of primary and junior secondary level. The law includes a requirement for central and local governments to allocate a minimum of 20% of their budget on education.³ Since 2009, the central government has allocated 20% of its budget on education, 60% of which has been transferred to local governments to finance basic education. In addition, from 2010 to 2015, the local governments, at the district level, also allocated an average of 30% of their budgets for basic education.

Indonesia is among the developing countries that allocates a significant share of its government budget to education. According to the World Bank⁴, in 2015, Indonesia allotted 20.5% of total government expenditures for education, which was nearly the same as the percentages allotted by its neighboring countries. For example, in 2013, Malaysia allocated 19.7%, Thailand allocated 18.9%, and Vietnam allocated 18.5% of its budget to education. However, in terms of gross domestic product (GDP), the Indonesian government's funding on education represented only 3.6% of GDP in 2015, while in the same year, Malaysia allocated approximately 5% of GDP to education. Thailand and Vietnam allocated 4.1% and 5.7% in 2013, respectively. Furthermore, in terms of education outcomes, Indonesia still lags behind its neighbors. Regarding basic education, the net enrollment ratio for primary education in Indonesia was 89.7% in 2015, whereas for Malaysia and Thailand, these rates were 98.9% and 90.76% respectively. The difference is even more obvious regarding junior secondary education. In 2014, the net enrollment for junior secondary education in Indonesia was 72.8%, as compared to 89.5% in Malaysia and 81.2% in Thailand.

In basic education in Indonesia, public education is dominant. According to the Ministry of Education and Culture of Indonesia (hereafter MoEC), in 2016, as many as 89.5% of schools at the primary level were public schools, and 87.5% of students at the primary level were enrolled in public schools. These numbers are slightly lower for junior secondary education in that 60.4% of schools are public schools and 74.8% of students are enrolled in public schools. Because the government spending on education in Indonesia is biased toward basic education that is managed by local governments at the district level, it is imperative for these local governments to efficiently manage the funds and thus enhance education throughout the country.

However, despite the amount of money spent on basic education at the district level, improvements in basic education do not seem to correspond with this spending. Recent studies by the World Bank (2009, 2012a, 2013a), MoEC (2013), OECD and the ADB (2015) show that crucial issues persist regarding the implementation of basic education in Indonesia. Challenges include the 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 managing of financial resources for education.

Existing empirical studies on the impact of government spending on education in the districts of Indonesia show mixed results. For example, Kristiansen and Pratikno (2006), who studied four districts in Indonesia, reported that most parents perceived that the quality of their children's education improved after decentralization. However, they found a lack of transparency and accountability in government spending on education, as well as significant differences in educational outcomes among districts. At an earlier stage of decentralization in Indonesia, Hofman and Kaiser (2006) presented preliminary evidence concluding that the positive public perception of local service delivery after decentralization was biased due to low expectations. At the local level, the accountability mechanisms were not effective, and the quality of local governance varied across the country. A further study by Simatupang (2009) found that the decentralization had a positive impact on public service delivery, including education, at the district level. Lewis and Pattinasarany (2009), analyzing public satisfaction with public education, concluded that most of the public was satisfied with primary education after

² Law No. 32 of 2004 sets out the overall framework for decentralization in Indonesia, including education. This law was recently amended by Law No. 23 of 2014, which sets out the authority of district governments on primary and junior secondary education, and the authority of provincial governments on senior secondary education.

³ According to the law on National Education System No. 20 of 2003.

⁴ <http://databank.worldbank.org/data>.

decentralization, though they argued that these high levels of satisfaction were likely due to bias.⁵ Schulze and Sjahrir (2014) and Kis-Katos and Sjahrir (2014) analyzed the impacts of decentralization and democratization on governance quality and public service delivery. Their studies concluded that decentralization has improved service delivery because the public budget has become more need-oriented, but they found no clear impact on the part of democratization on the delivery of public services.

Further studies on the provision of education by local governments in Indonesia showed that the state of local governments is important in the provision of effective education services. For instance, Suryadarma (2012) concluded that in the districts with high corruption, the local government spending on education negatively affected the net enrollment ratio. Zufri and Oey-Gardiner (2012) showed that local government spending on education has no significant impact on the enrollment ratio at the district level. Al-Samarrai and Cerdan-Infantes (2013) stated that despite the increased financing of education, certain issues remain, such as the capacity of local governments to effectively allocate their resources for education.

The above-mentioned studies show the impact of decentralization on the education services provided by the local government and the importance of governance in public service delivery. However, empirical studies analyzing the impact of the central and local governments, concurrently or separately, on the outcomes of basic education at the district level have not been conducted yet. Because total government spending on education at the district level in Indonesia is comprised of funding from various sources and of various types, it is essential to analyze the impact of spending by taking into account the total size of the spending. In addition, existing studies have not applied a specific measure of local government's capacity to provide education at the district level in Indonesia.

This paper aims to empirically analyze the impact of government spending on basic education at the district level in Indonesia and elaborate on the issue of local governments' capacity to manage their financial resources for education. This paper differs from previous studies by including both central and local government spending on education, as well as by applying an indicator that captures local governments' capacity to manage financial resources for education. This paper focuses its analysis on the years following 2009, when the Indonesian government allocated 20% of its spending to education. This paper not only employs an econometric analysis with updated secondary data on the districts in Indonesia but also extends the analysis with findings from field visits to selected districts in Java, Indonesia.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 lays out a brief overview of government spending and educational outcomes at the district level in Indonesia. Section 4 describes the study's methods, including the data and model specifications. Section 5 presents the results and a discussion of the empirical analysis. Finally, the last section concludes.

REVIEW OF LITERATURE

There are several reviews of the impact of decentralization on public service delivery, including education. Oates (1972) and Tiebout (1956) stated that decentralizing public service provision would make the decision-making process more relevant because the local government has a better knowledge of local needs and preferences. Decentralization can also increase accountability in the decision-making process because the local government is closer to the community than the central government, so that the stakeholders can monitor service delivery directly. However, later studies showed that the effect of decentralization on the provision of public services was ambiguous.

Bardhan (2002) elaborated on the literature on decentralization and its application in developing countries, stating that the traditional literature on decentralization cannot be directly applied to developing countries. Certain conditions in the developing countries may hinder the implementation of decentralization, including weak information and accounting systems, weak monitoring mechanisms, weak local democratic institutions and political accountability, and low-quality local government officials. Channa and Faguet (2012) reviewed empirical studies on the impact of decentralization on education and health and stated that the evidence for the impact of decentralization on public service delivery was weak, incomplete, and inconclusive. However, they

⁵ Kaiser et al. (2006) mentioned potential asymmetric information and perception bias when using public perceptions to assess public service delivery after decentralization.

found sound evidence in some studies indicating that decentralization increases technical efficiency and improves the preference matching of public services.

Further analyses by Kis-Katos and Sjahrir (2014) and Channa (2015) pointed out that decentralization can lead to the more efficient provision of public services, assuming that the local accountability mechanism is reliable and local governments have adequate capacity. Specifically, Channa (2015) reviewed cross-country experiences linking decentralization and education quality with the proposed prerequisites for effective government spending. Under decentralization, government educational policy must be designed and implemented to ensure accountability, active stakeholder participation, adequate human resources related to education services, and the continuation of the role of the central government.

Some cross-countries studies have examined the importance of a government's capacity and accountability in the provision of effective public services. For example, an earlier study by Filmer and Pritchett (1999) on public spending and health in the 1990s found that the impact of public spending on outcomes was relatively small due to the differences between actual and the potential public spending. Gupta et al. (2002) showed that an increase in public spending was associated with improvements in education and health. Svensson and Reinikka (2004) found a negative and insignificant relationship between government spending and educational outcomes in four selected developing countries due to their low efficacy in transferring funds and creating valuable educational goods and services.

A prominent study by Rajkumar and Swaroop (2008) showed that government spending on education is more effective in improving educational outcomes with good governance. Nyamongo and Schoeman (2010) concluded that education expenditure of African countries from 1995 to 2004 was negatively affected by corruption. In analyzing public spending in the health sector in developing countries from 1960 to 2005, Hu and Mendoza (2013) showed that allocated public resources might fail to reach service providers if budget institutions, including budget formulation, execution, monitoring, and auditing, do not function properly. Because the local government plays an essential role in providing education under decentralization, the efficacy of local governments in delivering quality education is essential.

In addressing the issue of the efficacy of government spending on education, Lewis and Petterson (2009) suggest the measurement of governance as a way to improve institutional performance in delivering education services. Poor governance in education may cause inefficient service provision, which leads to not only the poor performance in education but also corruption. They develop a concept of governance for education by extending the definition of good governance created by Kaufmann et al. (2003, 2007, 2010), who defined governance as the tradition and institutions by which authority in a country is exercised for the common good, which includes the process of selecting those in authority, the capacity of the government to manage, and respect for the state. Kaufmann et al. (2003, 2007, 2010) developed six dimensions of governance, and according to Lewis and Petterson (2009), the first four are directly relevant to good governance in education. The six dimensions of governance are voice and accountability, government effectiveness, regulatory quality, rule of law, control of corruption, political stability, and the absence of violence/terrorism.

Following Kaufmann et al. (2003, 2007, 2010) and Lewis and Petterson (2009), under the Basic Education Capacity Project, the MoEC of Indonesia developed an index with which to assess the governance of education at the district level in Indonesia, which was named the Indonesian Local Education Governance Index. In developing the index, two surveys were conducted, one in 2009 and the other in 2012, which covered 50 districts in Indonesia (the Ministry of National Education (2010)⁶ and the World Bank (2013c)). The index is comprised of several indicators that are compiled into five dimensions to measure the effectiveness of local government institutions in delivering education services, as well as overall district education performance. These are (i) transparency and accountability, (ii) education service provision, (iii) the management control system, (iv) the management information system, and (v) efficient resource use. The details of the indicators are presented in the Appendix. The index showed a positive correlation between local governance and education outcomes at the district level in Indonesia.

Government Spending on Basic Education in Indonesia

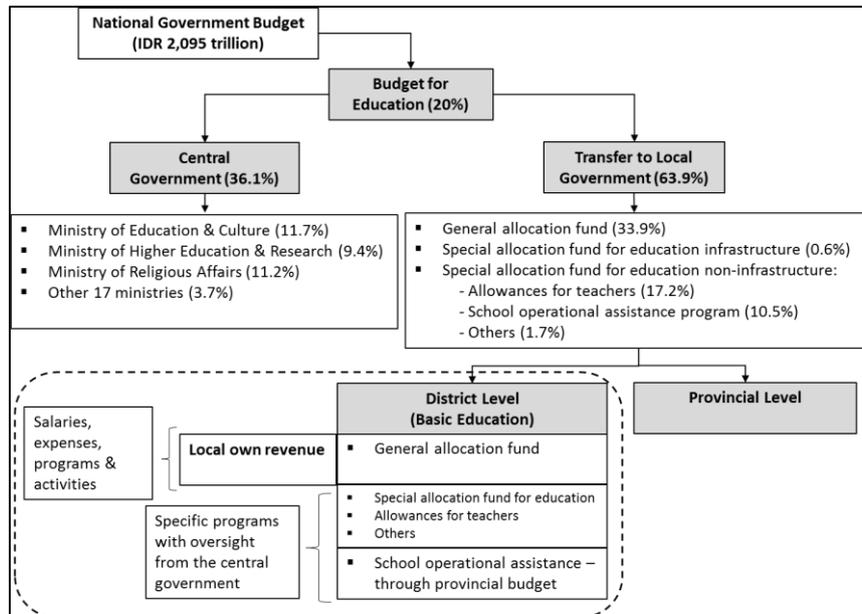
In order to assure the implementation of basic education at the district level in Indonesia, the central government transfers its educational funds to the local district governments. The transfers are mainly in the forms of: (i) a

⁶ The name of the Ministry of Education and Culture under the previous government administration.

general allocation fund (*Dana Alokasi Umum*), which is the general purpose transfer to the local governments as a part of the local governments' revenue; (ii) a special allocation fund for education (*Dana Alokasi Khusus*), which is the transfer to the local governments for a specific use in the education sector as proposed by the local governments; (iii) an allowances for teachers (*Tunjangan Profesi Guru*), which is the central government program to provide incentives for certified teachers; and (iv) a school operational assistance program (*Bantuan Operasional Sekolah*), which is the central government program to support schools' operational activities at the district level.⁷

Together with their local revenue, the local governments have the discretion to spend the general allocation fund as needed, such as for the salaries of local government officials and teachers. The special allocation fund for education and allowances for teachers are pooled into the local district government budget, while the school operational assistance program is channeled through the provincial government.⁸ Other than the general allocation fund, other transfers from the central government are implemented at the district level, with specific guidelines and oversights from the central government.

Figure 1 below shows the central and local governments' spending on education, using the national budget for the fiscal year 2016 as an illustration. As can be seen in the figure, of the 20% of the national budget allocated for education in 2016, about 64% is transferred to the local governments; these funds are transferred mostly to the district level to finance basic education. Most of the central government spending takes the form of the general allocation fund and allowances for teachers, at 33.9% and 17.2%, respectively.



Note: *The data shows government spending in 2016.

Source: Jasmina (2017)

Figure 1 Education Funding Mechanism at the District Level in Indonesia

An examination of the trends of central government spending on education from 2010 to 2016 show such spending has more than doubled from 225.2 trillion Indonesian Rupiah (IDR) to 419.2 trillion IDR (approximately 17 billion USD to 32 billion USD)⁹. In addition to the central government transfer, district government spending on education also increased during this period. In 2010, local governments spent an average of 30.8% of their budget on education; it increased to 33.1% in 2015.¹⁰ During the same period, the net enrollment ratio of primary education and junior secondary education also increased from 94.8 to 96.8 and from

⁷ Since 2016, the central government transfer on education is classified into a general allocation fund and a specific allocation fund. The specific allocation funds consists of: (i) a specific allocation fund for education infrastructure; and (ii) a specific allocation funds for education non-infrastructure, which mainly consists of the allowances for teachers and the school operation assistance program.

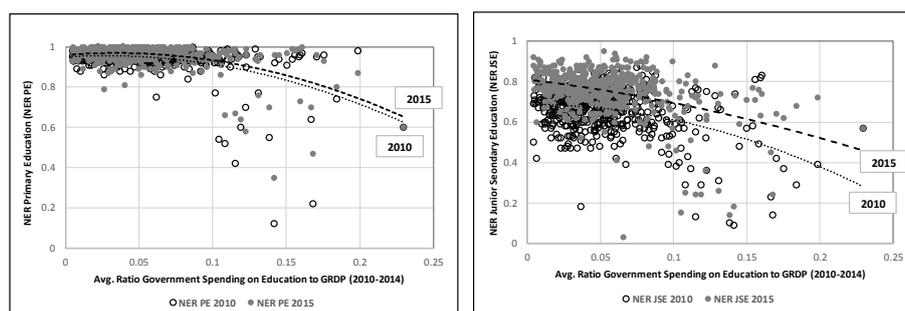
⁸ The transfer mechanism of this program has been revised since it was first established in 2005. Since 2012, the fund has been transferred through the local government at the provincial level.

⁹ As of mid-June 2017, 1 USD equals approximately 13,300 IDR.

¹⁰ It should be noted that the sources of district government spending on education include the central government transfers that are pooled into the district governments' budget.

67.7 to 77.9, respectively. Moreover, the mean years of schooling improved from 7.5 to 7.9. However, disparities at the district level persist. In 2015, at the primary level, 40.2% of the districts had a net enrollment ratio below the national level. At the junior secondary level, nearly 52% of the districts had net enrollment ratios below the national level. Around 50% of districts have mean years of schooling below the national level.

Figure 2 below plots the net enrollment ratio of both primary and junior secondary education in 2010 and 2015 with the average ratio of government spending on education to gross regional domestic product of each district in Indonesia from 2010–2014. The figure shows that there are improvements in the net enrollment ratio from 2010–2015 at both the primary and junior secondary level. However, negative patterns are observed in the trends. The districts that spend more on education do not necessarily have better net enrollment ratios. The following sections therefore empirically examine how government spending and the financial capacity of local governments have affected basic education at the district level in Indonesia.



Source: Jasmina (2017)

Figure 2 Net Enrollment Ratio and Government Spending on Education at the District Level, 2010 and 2015

RESEARCH METHODOLOGY

Data and Variables

In analyzing the impact of educational outcomes, this paper applies the net enrollment ratio of primary and junior secondary education as the measurement of educational outcomes.¹¹ This ratio is widely used as a measure of educational outcomes (see, for example, Barro (1991), Barro and Lee (1993), Arze del Granado et al. (2007), Zufri and Oey-Gardiner (2012), Suryadarma (2012)). However, the drawback of using net enrollment ratio as measurement of educational outcomes is that it does not reflect the quality of education; this has been pointed out by several researchers, such as Barro and Lee (2001), Hanushek (2002, 2013), Rajkumar and Swaroop (2008).¹² The district-level net enrollment data are estimated from the National Socioeconomic Survey of 2013 and 2015 of Statistics Indonesia (*Badan Pusat Statistik-BPS*).¹³

In this paper, government spending on education is categorized into (1) central government spending on education transferred to the local governments, and (2) local government spending on education. The central government spending consists of a special allocation fund for education, allowances for teachers, and school operational assistance. The budget allocated by the central government for these programs is used as a proxy of the government spending, and the data are available by request from the MoEC of Indonesia. Local government spending on education is defined as spending over which the district governments have discretion; it is represented by the local government budget on education, excluding the abovementioned central government transfer. The data on local government spending on education are publicly available from the Ministry of Finance of Indonesia. Finally, the total government spending on education is the sum of the central and local government spending on education. Following previous cross-country studies such as Barro (1991), Gupta et al (2002), and

¹¹ Net enrollment ratio is the proportion of children in each specific school age group who are enrolled at the given level of education.

¹² Kwon (2009) categorized the measurement of education outcomes into three approaches, which are: output-based, cost-based, and income-based. School enrollment rates, school attainment, adult literacy, and mean years of schooling are the most widely used measurements under the output-based approach. The quality of education is commonly referred as the learning outcome that is measured by students' standardized test scores. At the international level, the Programme of International Student Assessment (PISA) and the Trends in Mathematics and Science Study (TIMSS) are the most accepted measurement learning outcomes among countries. Unfortunately, such a measurement at the national level is currently not available in Indonesia.

¹³ The National Socioeconomic Survey (*Survei Sosial Ekonomi Nasional-SUSENAS*) is an annual nationwide socioeconomic survey at household and individual levels conducted by the Statistics of Indonesia (BPS).

Rajkumar and Swaroop (2008), the government spending is expressed as a ratio of the gross regional domestic product of the districts.¹⁴ To obtain a smooth pattern of the government spending, this paper employs data of two years average of government spending of 2010–2011 and 2012–2013, for both local and central government spending.

This paper applies one dimension of the Indonesian Local Education Governance Index developed by the MoEC and the World Bank in 2010 and 2013 to measure the capacity of local government capacity in managing their financial resources for education, which is the “efficient resource use.” The dimension of “efficient resource use” is defined to measure the effectiveness of planning, budgeting, and monitoring of local government spending on education. A planning and budgeting system is important in ensuring that the resources are allocated, so that spending significantly affects education. The indicators that capture the effectiveness of education planning and budgeting are (among others) a clear budget timetable, clear and monitored expected outcomes, and the differences between planned and executed budget (World Bank, 2013c page 17). The “efficient resource use” (hereafter efficiency index) is scored between 0 and 100, where a higher score represents better efficiency in managing education resources. Index data is publicly available from the report of the Ministry of National Education (2010) and the World Bank (2013c).

Lastly, to use socioeconomic factors as control variables, this paper applies several indicators as in some previous studies, such as Gupta et al. (2002), Arze del Granado et al. (2007), Rajkumar and Swaroop (2008), and Suryadarma (2012). The socioeconomic factors include the poverty ratio, the share of the population below 15 years old, the share of households living in urban areas, life expectancy, and a dummy variable of remote districts (which is defined as 1 for the districts in the remote eastern part of Indonesia, and 0 otherwise).¹⁵ The district-level socioeconomic data are acquired from the National Socioeconomic Survey and the Statistics Indonesia (BPS) of 2010 and 2012.

This paper constructs a data set for 50 selected districts for two-year periods, as follows: (i) the net enrollment ratio of primary and junior secondary education in 2013 and 2015; (ii) average government spending (both local and central level) in 2010–2011 and 2012–2013; (iii) the efficiency index in 2010 and 2013; and (iv) the socioeconomic factors in 2010 and 2012. The number of districts used in this analysis is relatively small compared to the total 514 districts in Indonesia in 2015. The districts are not proportionally selected to represent a nationwide condition. Hence, caution should be used in making generalizations based on the results of this paper. The summary statistics of all variables are presented in the following table.

Table 1 Summary Statistics of the Variables

Variable	Observation	Mean	Standard		
			Deviation	Minimum	Maximum
Net enrollment ratio primary education	100	0.944	0.075	0.440	1.000
Net enrollment ratio junior secondary education	100	0.729	0.142	0.133	0.950
Average total government spending to GRDP	100	0.051	0.023	0.014	0.124
Average local government spending to GRDP	100	0.035	0.017	0.005	0.098
Average central government spending to GRDP	100	0.016	0.008	0.004	0.052
Poverty headcount ratio	100	0.199	0.085	0.040	0.440
Share of population below 15 year old	100	0.302	0.055	0.210	0.450
Share of households living in urban areas	100	0.300	0.232	0.000	1.000
Life expectancy	100	68.563	4.502	57.210	75.720
Efficient resource use score	100	0.512	0.165	0.108	0.871

Source: Authors' calculation using data from the National Socioeconomic Survey, the Statistics Indonesia-BPS, and the Ministry of Finance on Indonesia.

¹⁴ As this paper analyzing at the district level, it can apply the measurement of government spending as the previous studies at the country level. Most of the cross-country studies applies the share of government spending on education to gross domestic product of the respective country as it reflects the size of government spending in comparison to the country's economy. Other studies focusing at micro level, such as at school or student levels apply different measurements for the government spending on education, such as government spending per school or government spending per student. A thorough reviews of literature on the government spending on education can be seen for instance in Schwartz et al (1998), Leclercq (2005) and Carnoy (2009).

¹⁵ The remote eastern districts are defined as the districts located in the provinces of East Nusa Tenggara, North Maluku, Maluku, West Papua, and Papua.

Model Specification

In estimating the model, a panel of data for 50 districts for a two-year period is applied. As the government spending on education likely affects the educational outcomes after a certain period, three-year lags of the net enrollment ratios are used; this enables taking into account the lags of the government spending. The basic estimated regressions are as follows:

$$NERPRIM_{i,t+3} = \alpha + \beta' GOV_{i,t} + \gamma INDEX_{i,t} + \delta' X_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$NERJSE_{i,t+3} = \alpha + \beta' GOV_{i,t} + \gamma INDEX_{i,t} + \delta' X_{i,t} + \varepsilon_{i,t} \quad (2)$$

where the dependent variables for district i at year $t+3$ are $NERPRIM_{i,t+3}$ and $NERJSE_{i,t+3}$, which are the net enrollment ratio of each district in 2013 and 2015 in primary and junior secondary education, respectively.

The explanatory variable of $GOV_{i,t}$ is a set of variables representing government spending on education at district i at year t . For each dependent variable of primary education (Eq. 1) and junior secondary education (Eq. 2), there are two sets of regressions to: 1) examine the impact of total government spending on the net enrollment ratio; and 2) to examine the impact of local and central government spending separately on the net enrollment ratio. As we also wanted to test a possible non-linear impact of government spending on education, each regression includes the square of the respective government spending as an explanatory variable.¹⁶

In order to capture the impact of local government capacity on educational outcomes, the variable $INDEX_{i,t}$ is imposed as an explanatory variable in the regressions. This variable is the efficiency index for district i at time t , which was developed under the Basic Education Capacity Project for 50 selected districts. Finally, a set of control variables representing socioeconomic factors in district i at year t is captured in $X_{i,t}$. All the regressions employ the same control factors as the explanatory variables.

The vector coefficients of β' and δ' show the impact of government spending on education and the impact of the control variables on the net enrollment ratio in district i at year t for each regression, respectively. The coefficient of γ shows the impact of the efficiency index on the enrollment ratio. Lastly, the term $\varepsilon_{i,t}$ denotes the error term in the regression.

In order to further examine the impact of local government capacity in managing its financial resources on education, following Rajkumar and Swaroop (2008) and Suryadarma (2012), this paper further extends the analysis by applying interaction variables between government spending and the efficiency index for district i at time t in the regressions, which is defined as: $GOVINDEX_{i,t} = INDEX_{i,t} \times GOV_{i,t}$. Hence, the estimated regressions are as follows:

$$NERPRIM_{i,t+3} = \alpha + \beta' GOV_{i,t} + \gamma' GOVINDEX_{i,t} + \delta' X_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$NERJSE_{i,t+3} = \alpha + \beta' GOV_{i,t} + \gamma' GOVINDEX_{i,t} + \delta' X_{i,t} + \varepsilon_{i,t} \quad (4)$$

Eq. (3) and Eq. (4) are similar to Eq. (1) and Eq. (2) respectively, with γ' as the vector coefficients of the interaction variables.

RESULTS AND DISCUSSION

Table 2 presents results of the basic regressions. In estimating the models, the random-effects method is applied. The fixed-effect method was first applied by taking into account the district-specific characteristics and treating them as fixed within the district. However, the Hausman test shows that differences in coefficients using the fixed-effects and random-effects methods are not systematic. Hence the random-effects method is the most appropriate method for the estimation.¹⁷ The first column shows the impact of total government spending on the net enrollment ratio of primary education (Eq. 1.1), whereas the second column shows the impact of local and central government spending separately (Eq. 1.2). The third and fourth columns show similar regressions for junior secondary education, Eq. 2.1 and Eq. 2.2 respectively.

¹⁶ In the empirical studies by Rajkumar and Swaroop (2008), the squared term of government spending as one of the explanatory variables is used to analyze the nonlinear impact of government spending on educational outcomes.

¹⁷ The Hausman test results are provided at the end of the table for each regression.

Table 2 Regression Results

Dependent Variable	NER Primary		NER Junior Secondary	
	Eq. (1.1)	Eq. (1.2)	Eq. (2.1)	Eq. (2.2)
Independent Variables				
Average total government spending to GRDP	0.4671 (1.1206)		3.2840* (1.8044)	
(Average total government spending to GRDP) ²	-7.4374 (8.2991)		-32.4695** (13.1297)	
Average local government spending to GRDP		1.3411 (1.4300)		3.4985 (2.2744)
(Average local government spending to GRDP) ²		-19.3972 (14.3895)		-42.1080* (23.0264)
Average central government spending to GRDP		-2.4807 (2.7534)		-0.6098 (4.3741)
(Average central government spending to GRDP) ²		34.9614 (51.1441)		-50.8740 (78.8125)
Poverty headcount ratio	-0.3929*** (0.1011)	-0.3965*** (0.1036)	-0.5235*** (0.1762)	-0.5515*** (0.1796)
Share of population below 15 year old	-0.0405 (0.1965)	-0.0746 (0.2005)	-0.2369 (0.3225)	-0.2686 (0.3292)
Share of households living in urban areas	-0.0405 (0.0369)	-0.0477 (0.0391)	-0.0252 (0.0647)	-0.0450 (0.0681)
Life expectancy	-0.0016 (0.0023)	-0.0020 (0.0024)	0.0048 (0.0040)	0.0045 (0.0041)
Dummy of remote districts	-0.0552*** (0.0229)	-0.0490** (0.0237)	-0.0662* (0.0399)	-0.0622 (0.0411)
Efficiency index	0.0010*** (0.0003)	0.0011*** (0.0003)	0.0018*** (0.0005)	0.0020*** (0.0005)
Constant	1.1178*** (0.2019)	1.1623*** (0.2063)	0.4413 (0.3440)	0.5046 (0.3505)
R-squared	0.5087	0.5009	0.6046	0.6067
Observation	100	100	100	100

Notes:(1) F test that all $u_i = 0$ (Prob > F) 3.89 (0.000) 4.10 (0.000) 5.75 (0.000) 5.40 (0.000)(2) Hausman test χ^2 (Prob > χ^2) 7.06 (0.3149) 12.15 (0.1445) 5.56 (0.4737) 6.63 (0.5769)

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are in the parentheses.

Source: Authors' estimates

Eq. (1.1) and Eq. (1.2) show that at the primary level, the government spending on education, both combined or separately, has no significant impact on the net enrollment ratio. However looking at the index, both regressions show that the indices significantly and positively affect the net enrollment ratio. If everything is held constant, a 1% increase of the efficiency index would increase the net enrollment ratio by approximately 0.10%.

At the junior secondary level in Eq. (2.1) and Eq. (2.2), the total government spending shows a significant nonlinear relationship with the net enrollment ratio. When spending is disaggregated, the local government spending shows a slightly nonlinear relationship with the net enrollment ratio, but the central government shows no significant impact. The nonlinear relationship of government spending with the net enrollment ratio implies that the impact of the spending depends on the value of the spending. For example, in Eq. (2.1), the maximum net enrollment ratio will be reached when the ratio of local government spending to GRDP is 0.051.¹⁸ At the mean level of total government at 0.051 (as in Table 1), a 1% increase in total government spending increases the net enrollment ratio by 0.033%. As for the efficiency index, as in the primary level, both combining and disaggregating the spending, significant positive relationships between the government spending and the net

¹⁸ Supposing that the net enrollment ratio is y and the local government spending is x , given the nonlinear function of $y = \alpha + 3.2840x - 32.4695x^2$ (as in Eq. 2.1), the net effect of x on y is $\frac{dy}{dx} = 3.284 - 64.939x$. The effect of x on y depends on the value of x and the maximum value of y that occurs at $x^* = \frac{3.284}{64.939} = 0.0506$.

enrollment ratio are found. An increase by 1% of the efficiency index will increase the net enrollment ratio at the junior education level by around 0.18–0.20%.

The socioeconomic factors that have consistent results are the poverty ratio, which shows a significant negative relationship with the net enrollment ratio of both primary and junior secondary education. An increase of 1% in the poverty ratio will decrease the net enrollment ratio by nearly 0.40% at the primary level and around 0.50% at the junior secondary level. The results imply that as the number of poor households in the districts increases, access to education at both primary and junior secondary level is unlikely to improve. In addition, the dummy variable for remote districts shows a significant negative impact on the net enrollment ratio at the primary and junior secondary levels. The results show that the net enrollment ratio of the districts in the eastern part of Indonesia is significantly lower compared to those of in the western part. Other socioeconomic factors do not show a significant impact on the net enrollment ratio at either the primary or the junior secondary level.

As our interest is to see how the capacity of local governments to manage their spending affects net enrollment ratio, regression results applying the interaction variables between government spending and efficiency index, as in Table 3, offer a better understanding. As in Table 2, the first and second columns show the results for primary education (Eq. (3.1) and Eq. (3.2), respectively), and the third and fourth columns show the results for junior secondary education (Eq. (4.1) and Eq. (4.2), respectively).

Table 3 Regression Results with Interaction Variables

Dependent Variable	NER Primary		NER Junior Secondary	
	Eq. (3.1)	Eq. (3.2)	Eq. (4.1)	Eq. (4.2)
Independent Variables				
Average total government spending to GRDP	-0.9656 (1.1749)		2.5941 (1.9461)	
(Average total government spending to GRDP) ²	-5.3880 (7.8811)		-36.5132*** (12.9585)	
Average local government spending to GRDP		-0.9563 (1.5138)		1.4807 (2.5487)
(Average local government spending to GRDP) ²		-10.8702 (14.0580)		-38.0181 (23.8404)
Average central government spending to GRDP		-2.2089 (2.5507)		1.5551 (4.2778)
(Average central government spending to GRDP) ²		17.9408 (47.3980)		-100.889 (77.8945)
Poverty headcount ratio	-0.3558*** (0.1004)	-0.3641*** (0.1007)	-0.5138*** (0.1766)	-0.5556*** (0.1800)
Share of population below 15 year old	-0.0672 (0.1908)	0.0843 (0.1925)	-0.2751 (0.3234)	-0.2856 (0.3319)
Share of households living in urban areas	-0.0365 (0.0363)	-0.0460 (0.0377)	-0.0170 (0.0641)	-0.0350 (0.0675)
Life expectancy	-0.0014 (0.0023)	-0.0015 (0.0023)	0.0049 (0.0040)	0.005 (0.0041)
Dummy for remote districts	-0.0502** (0.0225)	-0.0484** (0.0228)	-0.0652* (0.0397)	-0.0677* (0.0408)
Efficiency index × average total government spending to GRDP			0.0240*** (0.0054)	0.0281*** (0.0087)
Efficiency index × average local government spending to GRDP		0.0365*** (0.0081)		0.0420*** (1.0034)
Constant	1.1577*** (0.1973)	1.1825*** (0.1989)	0.5068 (0.3427)	0.5480 (0.3508)
R-squared	0.5241	0.5301	0.6146	0.6176
Observation	100	100	100	100

Notes:

(1) F test that all $u_i = 0$ (Prob > F) 4.28 (0.000) 4.25 (0.000) 5.32 (0.000) 4.96 (0.000)

(2) Hausman test χ^2 (Prob > χ^2) 5.45 (0.6048) 6.09 (0.6373) 7.19 (0.4096) 9.05 (0.3378)

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Standard errors are in the parentheses.

Source: Authors' estimates

The interaction variables in all the regressions show a significant positive impact on the net enrollment ratio at both the primary and junior secondary levels. The results show that the government spending per se, aggregated or disaggregated, does not have a significant impact on the net enrollment ratio. However, looking at the interaction variable which has a significant positive impact, the net impact of government spending on the net enrollment ratio depends on the efficiency index.¹⁹ The results imply that given the size of government spending, its impact is higher if the local governments can effectively manage their spending.

When analyzing the efficiency index at the sample mean of 51.24 (see Table 1), an increase of 1% of total government spending will increase the net enrollment ratio of 0.12% and 1.44% for primary and junior secondary education, respectively (see Eq. (3.1) and Eq. (4.1)). By disaggregating the government spending, an increase of 1% in local government spending will increase the net enrollment ratio of 0.12% and 2.15% for primary and junior secondary education, respectively (see Eq. (3.2) and Eq. (4.2)).²⁰ To further illustrate the results, we analyze the impact of government spending on education by applying a different sample mean of the efficiency index for the districts located in the western and eastern parts of Indonesia. The results show that government spending has a higher impact on the net enrollment ratio of the districts located in the western part, with a higher mean efficiency index of 53.91, compared to those located in the eastern part, with a lower mean index of 42.76.

The efficiency index employed in this paper measures the effectiveness of the planning, budgeting, and monitoring of local government spending on education, which includes the measurable educational outcomes of the local government's programs, activities, and annual budget; the difference between planned and executed spending, and the education absorption rate. Further analysis of the 50 selected districts suggests that a local planning and budgeting process has been implemented by nearly all of the selected districts; however, significant disparities between the planned and executed budgets from 2009 to 2012 were found (World Bank, 2013c). Based on data available from the Ministry of Finance, from 2010 to 2012, the national average difference between the planned and executed local government budgets for education was 9.19%; the western part of Indonesia showed better performance with an 8.47% difference, whereas the eastern part showed a 13.07% difference.²¹

The empirical results are consistent with those of previous studies, such as those of Suryadarma (2012), who showed that government spending on education was more effective in terms of improving education in less-corrupt districts. Moreover, a report by the World Bank (2013c) concluded that poor performance and a lack of transparency in local governments in terms of managing financial resources for education might affect the impact of spending on education at the district level. The most recent study by Muttaqin et al. (2016) found despite an increase in educational attainment after decentralization, progress is now slower than prior to decentralization. Moreover, education attainment has become more divergent among districts after decentralization.

In order to further analyze the findings in this paper, in-depth interviews with policymakers and selected local governments in Indonesia were conducted.²² The findings from the interviews suggest that in addition to the planning and budgeting system, the ways in which local governments efficiently allocate their spending and transform it into educational inputs represent essential material for future research. Local governments have the discretion to spend the central government's transfers in the form of a general allocation fund. This spending can be used for salaries, expenses, programs, and educational activities in their districts. Under decentralization, the district governments are not only responsible for providing education services but also responsible for human resources management and the development of teachers as local government civil servants. The findings from the field show that the local governments spend most of their funds on teachers' salaries (Jasmina, 2017); this is in accordance with the studies by Al-Samarrai and Cerdan-Infantes (2013) and the World Bank (2013a), which show that about three-quarters of local government spending on education is allocated to teachers' salaries.

¹⁹ The net impact of government spending on the net enrollment ratio of primary education is $\frac{dNERPRIM_{t+3}}{dGOV_{t,t}} = \beta_1 + 2\beta_2 GOV_{t,t} + \gamma INDEX_{t,t}$.

²⁰ As government spending does not significantly affect the net enrollment ratio in all of the regressions, the impact of government spending on the net enrollment ratio depends solely on the efficiency index.

²¹ Calculated based on the available data of 480 districts from the Directorate General of Fiscal Balance, the Ministry of Finance (www.djpk.depkeu.go.id).

²² The interviews covered the government officials of the Ministry of Education and Culture, Ministry of Finance, Local Education Offices, and Local Development Planning Agencies in four selected regencies in Java, namely Bogor, Majalengka, Sleman, and Kulon Progo. A thorough qualitative analysis based on the field visits is presented in Jasmina (2017).

The data from MoEC suggest an oversupply of teachers, with a national average student-teacher ratio of 16:1 for primary and junior secondary education;²³ hence, most teachers work less than the standard minimum of 24 hours per week (MoEC, 2016b). Unfortunately, some studies show that hiring more teachers does not lead to better educational outcomes (see, for example, Fahmi et al. (2011), Chang et al. (2014), the World Bank (2012b, 2013a), MoEC (2013), and de Ree et al. (2015)), which indicates inefficiency in the managing of local government spending on education. Although the further analysis of this issue is beyond the scope of this paper, it should be noted that local governments' lack of capacity to effectively manage and transform their education spending into education resources may hamper the improvement of education in their districts. As stated by Muttaqin et al. (2016), "Decentralization may increase accountability and empower the local governments to provide better education services but only if the local governments have the capacity to do so" (p. 97).

CONCLUSIONS

This paper empirically analyzes the impact of government spending on the net enrollment ratios at the district level, and imposes an indicator that captures the effectiveness of local governments in planning, budgeting, and monitoring their education spending. This paper then extends the analysis by taking a further look into how the local governments efficiently allocate their spending and transform it into educational inputs. This paper shows that government spending by itself does not have a significant impact on the net enrollment ratio of primary and junior secondary education at the district level in Indonesia. However, the impact prevails if the district can effectively manage its education spending. It does not necessarily follow that the districts that spend more on education have better educational outcomes. If the spending is poorly managed, it might hamper the improvement of basic education in the districts. The districts located in the eastern part of Indonesia are less effective in managing their spending on education compared to those in the western part; hence, the impact of their spending on education is relatively lower.

In addition to the capacity of local governments to plan and budget their education funds, the ways in which the local governments effectively execute the spending and transform it into education inputs is essential. As most of the local government education spending is allocated for teachers, the local governments basically have limited fiscal space to spend on other educational programs in their districts. Despite the size of the spending on education, the capacity of the government to effectively manage and transform the financial resources into educational resources affects the improvement of basic education at the district level.

This paper limits its analysis on the impact of government spending on the quantity of education. Hence, future analysis on the impact of government spending on the quality of education, such as students' performance, should be conducted. Moreover, this paper indicates that there is an issue with the ways in which local governments efficiently spend their money and transform it into educational inputs. In addition, an analysis at the district level might overlook characteristics of households, schools, and teachers as prominent factors affected education outcomes. Hence, it is recommended to further analyze this issue at micro-level. Finally, within the scope of this paper, observation of a larger number of districts will provide a clearer picture of the nationwide condition.

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²³ Compared to the international average of student-teacher ratio of 24:1 (World Bank, 2017).

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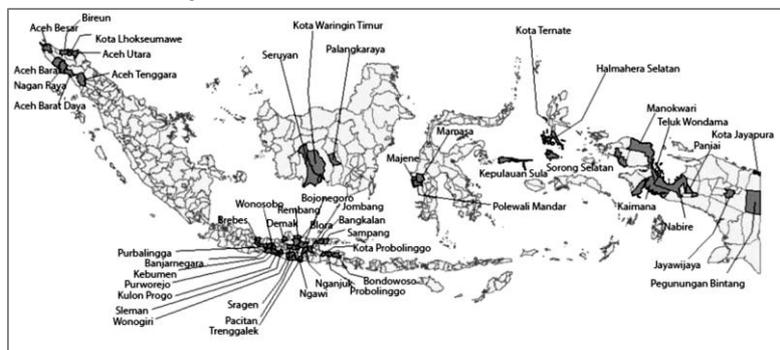
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APPENDIX

The Indonesian Local Education Governance Index (ILEGI) was developed under the Basic Education Capacity Project Trust Fund, begun in 2009, by the Ministry of Education and Culture (at that time it was called the Ministry of National Education). It was a longitudinal survey, conducted in 2009 and 2012, in 50 selected districts in Indonesia. The results were published in 2010 and 2013 (the Ministry of National Education (2010) and the World Bank (2013c)). The index was developed in order to assess the state of local education governance at the district level in Indonesia. Though the 50 selected districts were not selected to represent the entire country, they are scattered throughout the five major islands of Indonesia. The survey consisted of a set of questionnaires. Information was collected primarily through interviews with prominent resource persons in the respective districts. The locations of the districts are indicated in the following figure.

Figure A1. Locations of the Selected Districts



Source: The World Bank (2013c)

In developing the index, the concept of governance is defined along five dimensions to measure effectiveness of local government institutions in delivering education services, as well as the overall district education performance. A set of indicators was used in each dimension, for a total of 56 indicators. These are: (1) transparency and accountability–10 indicators; (2) education service provision–13 indicators; (3) management control system–17 indicators; (4) management information system–4 indicators; and (5) efficient resource use–12 indicators.

This paper applies the dimension of “efficient resource use” to measure the capacity of local governments in managing their financial resources for education, which is comprised of the following indicators:

- 1) Tariffs for the use of assets are adjusted periodically.
- 2) Education council has been involved in drafting of strategic plan for education.
- 3) Annual budget policy includes measurable outcome indicators.
- 4) Budget priorities and ceilings are set before the budgeting process in the local government offices starts.
- 5) Education planning and budget calendar have been drafted.

- 6) Education medium term and annual plans include indicative budget ceilings and take budget limits into account.
- 7) A poverty alleviation program in the education sector exists.
- 8) Planning and budgeting documents can easily be accessed by the community.
- 9) The Local Education Unit produces progress reports on planned activities and realization, including budget.
- 10) Programs and activities in the Local Medium Term Development Planning can be measured quantitatively.
- 11) The difference between planned and realized expenditures was less than 10% in the last 3 financial years.
- 12) Education budget absorption rate in last quarter of 2011 (2008) is 90% or more.