The education divide in Indonesia

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Why do children stay out of school in Indonesia? The impact of municipal variations and household characteristics[2]

Abstract

This paper uses an opportunity structure approach to theorize and empirically study why some children are not going to school in Indonesia. We study a set of municipality and household characteristics that could either hinder or facilitate children to be out of school by means of a dataset consisting of 221,392 children, nested in 136,182 households in 497 municipalities. We study two groups of children – those who have never started school and those who have dropped out from school – and compare them to the large majority of children who are going to school, using multilevel multinomial regression analysis. Results show that municipality and household resources both facilitate and constrain children from going to school and those children who never attend school differ from children who drop out in a limited set of predictors. At the municipality level, findings show that the higher the poverty rate and public education expenditure per capita, the higher the likelihood that children drop out. In contrast, a high(er) mean of municipality education expenditure significantly reduces children's likelihood to never attend school while a high(er) poverty rate significantly increases the likelihood of children to never attend school. At the household level, the findings show that household expenditure, household education expenditure, and head of household's educational background have a significant effect on reducing the likelihood that children are out of school. Belonging to a female-headed household increases the likelihood that children never attend or drop out from school. Finally, results show that living in a village with a school nearby decreases the likelihood of children never attending school, but this has no effect on children dropping out from school.


2.1 Introduction

United Nations General Assembly resolution 44/25/1989 on the Convention on the Rights of the Child emphasizes the pivotal role education plays in human development. Even though many countries have ratified this convention, globally, there is still a large gap between its ratification and implementation. Approximately 69 million children, mostly girls, are still deprived of their right to basic education (UNICEF, 2014). In line with the global agenda, all citizens have the essential right to access to education as declared by the Constitution of Indonesia. Eager to improve access and quality of education, the People's Consultative Assembly in Indonesia amended the Constitution in 2001 by allocating 20 percent of the state budget to education (Blöndal, Hawkesworth & Choi, 2009).

As is happening in many other developing countries, the Indonesian Government has made a push toward universal primary and junior secondary education by introducing a Free Basic Education policy (FBE) in July 2005 (Paqueo & Sparrow, 2005) to release the poor from education costs. This policy supports a nine-year compulsory education program and access to education has improved nationally, especially when the government started providing a fund (*Bantuan Operasional Sekolah*/BOS) for children in primary and junior secondary education in 2005 (MoEC, 2009).

In 2013, the government began extending universal education from nine years to 12 years (MoEC, 2013). As a matter of fact, the Indonesian education system provides educational services for more than 50 million pupils from primary to senior secondary education who are enrolled in 247,383 schools. A majority of them (about 42 million children) is registered in primary and junior secondary schools as part of compulsory basic education (Central Bureau Statistics/CBS, 2014). However, since 2006, there has been little progress in reducing the number of children who are out of school. As Figure 2.1 illustrates, the percentage of children who never attend school throughout their entire lives has not really decreased. In addition, there is only a slight decrease in the percentage of children who leave school before reaching the last grade of their nine-year compulsory education.

Figure 2.1 Trends of children out of school in Indonesia (%)
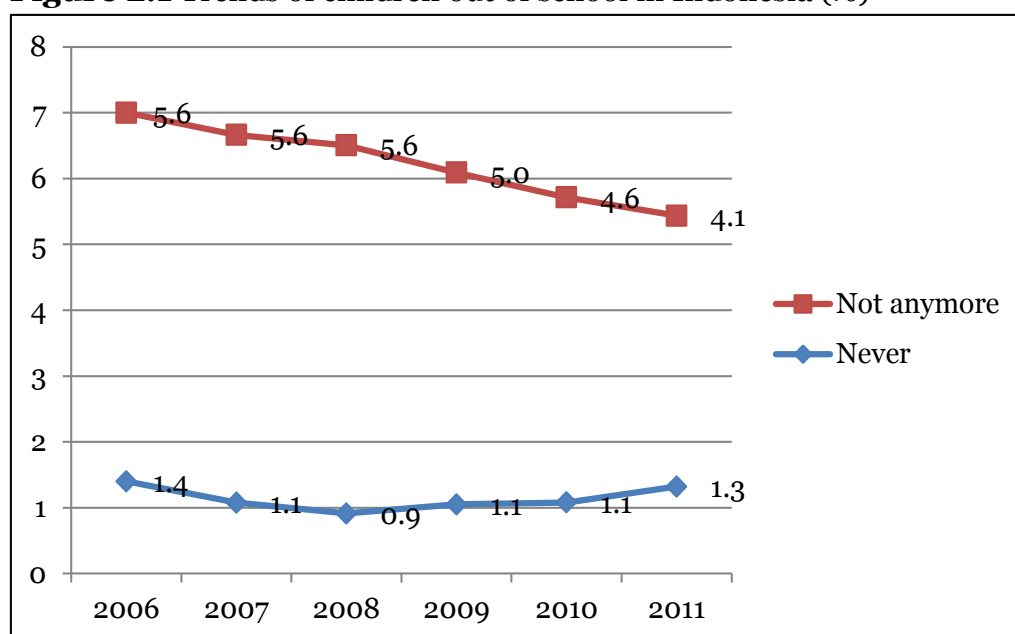
Source: Calculated from Susenas 2006-2011, CBS

Although only 5.4 percent of children are out of school, this represents a large group. For instance, in 2011, 1.77 million children left school without a diploma, and 568,086 children had never set foot in a school in their entire life. This dismal condition continues despite the Indonesian Government signing various international conventions on education that bind the state to guarantee the fundamental right to education to citizens, including the *Education For All* (EFA) agreement in 1990, the Millennium Development Goals' Joint Declaration on Education in 2000, and the Dakar Framework for Action in 2000.

This paper aims to simultaneously explain why some Indonesian children never go to school and others drop out. The concept of 'out-of-school children' generally refers to children that should be in primary school but are not (UNESCO, 2005). For this study on Indonesia, we broaden the concept to compulsory basic education, focusing on children aged 7-15 years who should be in primary and junior secondary schools.

Theoretically, we depart from an opportunity structure approach, which refers to the scale and distribution of conditions to accomplish specific outcomes (Merton, 1995, p.25) and specifically to the rules and norms that individuals are supposed to comply with in order to achieve socially desired goals. For instance, education is one legitimate opportunity structure to increase one's chances for a good job and higher income. However, not everyone will be able to follow this legitimate opportunity structure. Instead, people may use different opportunity structures to reach the same goal (e.g. good job, higher income). For the purpose of this paper, we focus on the educational

opportunities and constraints that children face at the municipality and household level, and especially in terms of the resources available to go to school.

Because of Indonesia's decentralized system, the effectiveness of national policies depends heavily on municipalities (districts and cities) since these autonomous local governments have the authority and resources to manage primary and secondary education services. We therefore expect that municipality resources – such as public education expenditure per capita, poverty rate and average household education expenditure per municipality – will explain why some children are in school and others not (Colclough *et al.*, 2000). Although local governments might provide an adequate budget to abolish the educational fee, making it free, several children still might be out of school because their household resources are limited. Thus, we reason that household resources and characteristics will also influence children's opportunities to attend school (Rumberger & Larson, 1998; McNeal, 1999; Pong & Ju, 2000). Hence, the main research question of this paper reads: *Which characteristics at the level of municipalities, households and children help to explain why children never attend or drop out from school in Indonesia?*

This study makes three contributions to current research on educational attainment. First, though much research focuses on school dropout, only few studies pay attention to children who never set foot in a school in their entire life (Shahnaz & Naeem, 2012; Suliman & El-Kogali, 2010; Shindler, 2010; Arunatilake, 2006). Second, by empirically assessing the opportunities and constraints that these children face and by relating them to those of children who do attend school or have dropped out from school, we can provide a systematic comparison of these three groups in one study. This allows us to shed light on similarities and differences between children who never attend school and those who dropped out from school (Shindler, 2010). Third, whereas previous studies have mainly focused on individual, family and community-related explanations (cf. Wenger, 2002; Rumberger, 2004; Allensworth, 2005; Anderson, 2010), we extend the focus by incorporating municipality factors and employ multilevel analysis that allows us to simultaneously examine the effects of children, household and municipal levels. Thus, this study provides insights into the effect of government resources at the municipality level on school attendance. Policy makers in Indonesia's education sector may benefit from this analysis, since it disentangles to what degree and how government investments in education generate the desired effects.

Below, we develop a set of hypotheses on the effects of municipality and household characteristics. Multilevel multinomial regression analysis is applied to a data set of 221,393 children aged 7-15 years, nested in 136,183 households in 497 municipalities. We utilize datasets from 2010, i.e. one decade after the implementation of the decentralization that empowered Indonesian municipalities to manage themselves as autonomous entities, in the education sector as well.

2.2 Theoretical framework

We base our study on opportunity structure theory, which refers to the idea that opportunity, i.e. the chance to gain certain goals, such as occupation and education, is shaped by the way society or an institution is organized or structured (Roberts, 2009; Merton, 1968). This theory suggests that people live in the social order that consists of culture and structure. While culture creates goals for persons in society, social structure may facilitate individuals to achieve those aims. A well-established society provides legitimate and appropriate ways to achieve one's goals (Merton, 1968).

Nevertheless, if there is a discrepancy between cultural goals and these structurally accessible means, individuals seek and use other means to achieve their objectives. In the case of children's education, this means that when a society (culture) holds the shared value that education is important, but the structure does not provide equal access to legitimate means for achieving the aspiration, higher levels of deviance will result. People will be more likely to create innovative alternatives for achieving the same goals everyone aspires to. For instance, the objective of education is to increase social mobility and when people are unable to attend school, they may go to work earlier.

Roberts (2009) classifies two dimensions in the opportunity structure. The push force is exerted mainly by ascribed status, such as family background and gender, and the pull factor comes from the government, as a service provider of education. In this paper, we focus on educational opportunities and constraints, particularly in terms of available resources at the macro (government) and micro (household) level.

At the municipal level, local government is a structure that may provide educational opportunities and constraints. For instance, when local governments have adequate budgets they can provide affordable and free education nearby, which also increases accessibility to schools. At the household level, we assume that mainly parents or other caretakers make the investment decision to send children to school, as in most other countries. We expect parents or caretakers to weigh future benefits of sending their children to school as an opportunity against the constraint of immediate costs. Children, but also other household members, may benefit from these investments. For example, in the absence of pension systems, children are often expected to look after their parents when they are old (Huisman & Smits, 2009). Therefore, education might be a way to increase future household income, and thus provide a better 'pension' for parents. Hence, factors at both local government level (i.e. the municipality) and household level influence educational opportunities and constraints, which in turn may influence the likelihood that children are out of school.

A similar distinction can be identified in the empirical literature on out-of-school children in developing countries, including Indonesia. This literature focuses on examining determinants of school dropout. First, explanations focus on *individual factors* associated with dropping out. Studies along this line show that grade repetition (Stearns, Moller, Blau, & Potochnick, 2007), bad health (Lleras-Muney, 2005; Albouy &

Lequien, 2009; Powdthavee, 2010), truancy behavior (Attwood & Croll, 2006; Henry, 2007; Jencks & Mayer, 1990; Wenger, 2002; Anderson, 2010), low commitment to the school, and low motivation increase the likelihood for dropping out. Second, explanations from the *institutional perspective* emphasize the role of a student's social context, particularly families, schools, communities and peers. Here, studies show that dropout increases for students from disadvantageous backgrounds (Levin, 1987; Rumberger, 2004), and the school's structure as measured by type, size and social climate (Rumberger, 1995). Other studies show that economic revival could create temporary job market opportunities so that students drop out of school (Gangl, 2002; Allensworth, 2005).

Only a few studies address children who never go to school. Using the individual and institutional categorization, some studies emphasize individual factors to explain why children never attend school. For example, Suliman and El-Kogali (2010) revealed that the opportunity costs of a child's time and a child's lack of interest in school influence children's non-participation in Egypt. Additionally, Shindler (2010) concludes that physical disability seems a substantial barrier to accessing education, especially in rural areas in South Africa.

The institutional factors associated with children never attending school vary. For instance, Arunatilake (2006) explored the determinants of non-participation of 5–14 year old children in Sri Lanka and found that various demand and supply-side factors influence the decision of parents to keep children out of school, such as poverty, direct and indirect costs of schooling, cultural factors and job market relevance. In addition, Suliman and El-Kogali (2010) found that teacher shortage, school proximity, lower awareness of parents about benefits of child education, mother's autonomy, parents' education, household ownership of farm/land, and the percentage of fathers in white-collar jobs in the community, customs and traditions are significant predictors of children out of school in Egypt.

Building upon the notion of push and pull factors, as well as micro and macro-level explanations, below we first discuss how local government resources provide opportunities for children to go to school and then continue by analyzing educational constraints and opportunities at the household level. Figure 2.2 provides a summary overview of our conceptual model. To simplify the hypotheses, we assume that the social mechanism leading to children never attending school or dropping out from school is quite similar. The analysis will see to what extent this assumption holds. Any differences detected will be discussed in the conclusion.

Figure 2.2 Theoretical framework
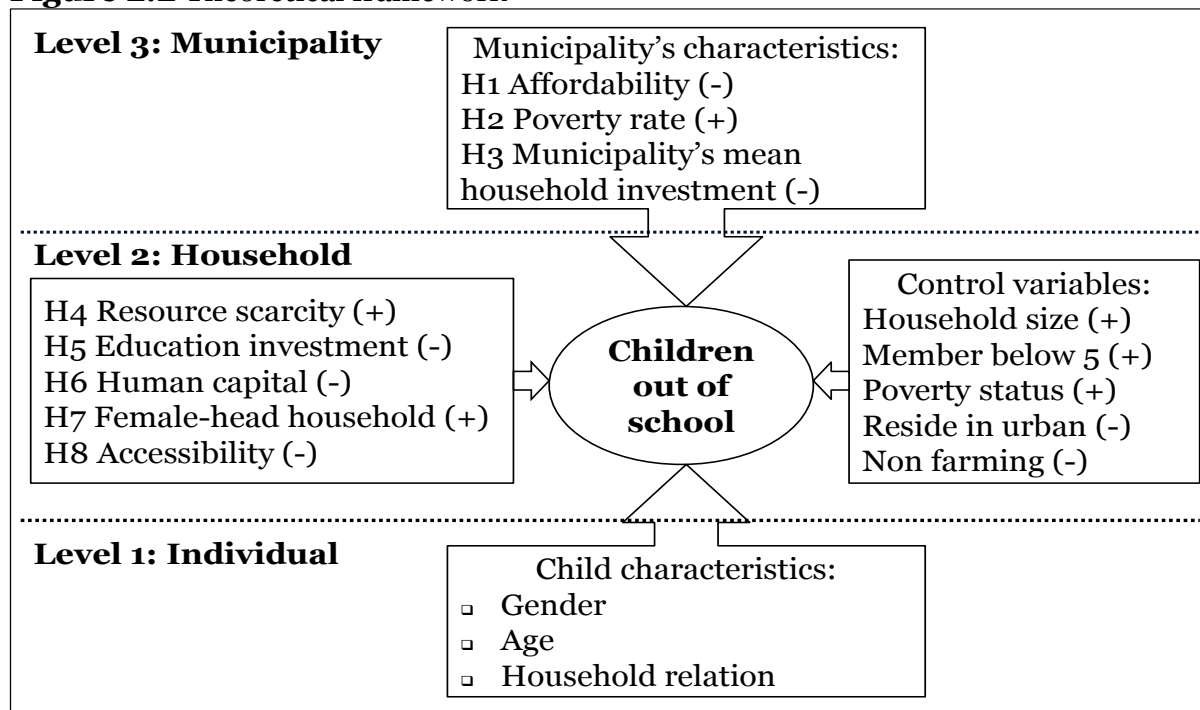
2.2.1 The impact of local (government) resources

At the municipality level, we assume that government resources are important in providing opportunities for children to go and stay in school, especially because in the Indonesian decentralized system substantial financial resources and autonomy are distributed to the local government level to implement programs and improve social services (Sjahrir & Kis-Katos, 2011). This makes local governments crucial actors in providing access to education. In such a decentralized structure, we expect variation at the local level, because local governments will differ in their public education expenditures. Such variations may influence the affordability of schools for households. For example, public schools in Indonesia collect various fees from parents, in order to support non-routine activities. Private schools accumulate fees for both routine and non-routine activities, except for primary and junior secondary education as part of universal compulsory education.

One important variation is that some local governments have decided to reduce the school fee, whereas others have not (Handa, 1999; The World Bank, 2003, Barrera-Osorio, Linden, & Urquiola, 2008). Several municipalities provide schools with money from the operational assistance fund (*Bantuan Operasional Sekolah Daerah*/BOSDA) on the condition that the school reduces or abolishes school fees. As a result, schooling might become more affordable or even free, especially for the nine-year compulsory education.

The school cost average is $52 ranging from free (0) to $6,693 while the average expenditure per capita is $ 2,641 ranging from $215 to $141,921 (Calculated from Susenas, 2010). Lower costs for education are expected to motivate parents to send their children to school, given that the costs of schooling, including fees, are often a key reason for parents to not send their children to school or to let them dropout (Rose & Al Samarrai, 2001; Hunter & May, 2003; Liu, 2004; Ackers *et al.*, 2001 in Mukudi, 2004). For example, a study of educational stakeholders in Ethiopia and Guinea showed that inability to pay the direct costs of schooling was one of the most important causes of non-attendance in both countries (Colclough *et al.*, 2000). In addition, some local governments also decided to provide more scholarships that might attract poor pupils to return to or enroll in the schooling system. This can be another incentive for parents to send their children to school. Based on these affordability arguments, *we predict that the lower the local government's public education expenditure per capita the more likely children are (a) to never attend school and (b) to drop out from school (H1).*

Second, households residing in municipalities with higher poverty rates often lack community investment in child development (Pusponegoro, 2013). Consequently, they are likely to receive less social and economic support for child development, which may in turn reduce opportunities to go to school (Brooks-Gunn & Duncan, 1997). For example, a study in the US showed that the higher the neighborhood poverty rate the more boys were likely of dropping out of school (Clark, 1992). Therefore, *we predict that the higher the poverty rate of a municipality, the more likely children will (a) never attend school and (b) drop out from school (H2).*

Third, parental investment decisions need to be made regarding the educational expenditures of their children. Parents' decision to invest in the education of their children might be influenced not only by the level of wealth but also by the community's aspirations as to education. The context and community in which they reside shape parents' decisions on educational investments. For instance, parents living in a municipality which highly values education might feel pressured to invest more in education. Conversely, parents residing in a municipality which values education less may invest less in education. We suggest that a municipality's mean household education expenditure reflects community aspirations, and these are part of the perceived opportunity structure (Shahnaz & Naeem, 2012). Consequently, *we expect that the lower the municipalities mean household education expenditure, the more likely children are to (a) never attend school or (b) drop out from school (H3).*

2.2.2 *The impact of household socio-economic status (SES)*

At the level of the household, we expect that income, educational investments, parents' educational level, household structure, and distance to school are important factors in parents' decisions on education. First, economically better off households can be assumed

to have more opportunities and resources for spending money on their children's education (McNeal, 1999; Teachman *et al.*, 1996). Less wealthy parents may either need their children to contribute to the household income, through wage-earning employment, or ask their children to take on additional tasks to free other household members for paid work (Suharti, 2013). Consequently, parents may decide not to send children to school or withdraw them from school. Additionally, household expenditure may be influential because people with more money tend to spend more money on non-basic needs, such as children's education, which decreases the probability that children are out of school. Handa's findings in Mozambique (1999) confirmed that household income significantly influences schooling choices. Consequently, *we expect the lower the household expenditure per capita in the household, the more likely that children will (a) never attend school or (b) drop out from school (H4)*.

Second, parents' or caretakers' investments in education are associated with the degree of awareness of the importance of education. In modern societies, parents have fewer opportunities to achieve a good position in society for their children through direct occupational transmission or through the transfer of capital (Blau & Duncan, 1967; Treiman & Ganzeboom, 1990). As a result, education becomes more important as a vehicle of social mobility, which increases the importance parents attach to education, and therefore the price they are willing to pay. They also need to weigh off the future benefits of sending their children to school compared to the direct costs. The household education expenditure per capita thus partly reflects how parents value education: it is not only determined by household wealth but also by parents' values and preferences for education. If they value education, then we expect them to invest more in education. As a result, *we predict that the lower household education expenditure per capita, the more likely that children (a) never attend school or (b) drop out from school (H5)*.

Third, and related to the above, the parent's own educational attainment matters for their decisions on educational investment (Becker & Nigel, 1994). In line with opportunity structure theory, human capital theory points out that the objectives, availability of resources and constraints may determine parents' investment decisions regarding their children's education. Those objectives, resources, and constraints affect their preferences and expectations regarding their children's education (Haveman & Wolfe, 1994). Highly educated parents strongly prefer to increase their children's education because they recognize the importance of education. As a result, parental education is a prominent determinant of children's education and employment. Higher parental levels of education are associated with increased access to education and lower dropout rates in their children (Rose & Al Samarrai, 2001; Connelly & Zheng, 2003; Hunter & May, 2003; Duryea, 2003; Ainsworth, Beegle, & Koda, 2005; Ersado, 2005; Grant & Hallman, 2006). Non-educated parents often do not appreciate the benefits of schooling (Juneja, 2001; Pryor & Ampiah, 2003) and often cannot provide appropriate support for the children's education, which negatively influences their children's achievement and motivation. Thus, *we expect that the lower the educational level of the*

household, the more likely children are (a) to never attend school or (b) to drop out from school (H6).

Fourth, the household structure affects the availability of resources. Especially in female-headed households, children might be more constrained to go to school, because women in the developing world tend to be disadvantaged relative to men in their access to assets, credit, employment, and education (Lloyd & Blanc, 1996; Kennedy & Peters, 1992). Therefore, we expect that female-headed households are more disadvantaged than male-headed households, and that they are thus less able to invest in the education of their children. This is confirmed in empirical analyses in India (cf. Kumari, 1989). We therefore *expect that children in female-headed households are more likely to never attend school (a) or (b) will drop out from school (H7).*

Finally, accessibility is crucial for children to be able to attend school, as previous studies show (King & Lillard, 1983; Deolalikar, 1997; Alisjahbana, 1999; Handa, 1999; Amin & Suran, 2005; Gitter & Barham, 2007). Access can be hindered by the distance children have to travel to school. Especially in remote areas with poor transportation infrastructures, households in villages without a school may face prohibitive transportation times and costs. Parents might find it too dangerous to send their young children to another village and might wait until their children are older. As a result, *we expect that school availability decreases the likelihood of children (a) never attending or (b) dropping out of school (H8).*

2.3   Data, measurement and analytical procedure

2.3.1   Data

We combined three official datasets. First, we used the national socio-economic survey (*Survei sosial ekonomi nasional*/Susenas) 2010 from the Indonesian Central Bureau of Statistics (CBS) consisting of 1,178,494 individuals with 114 variables in 293,715 households with 134 variables. From this dataset, we selected the population aged 7-15 years, since it represents the official school ages during nine years of compulsory education (primary and junior secondary education). This selection results in 221,392 children in 136,182 households nested in 497 municipalities. Second, we used the Village Potential Statistics (*Potensi Desa*/Podes) from the CBS (2011). This dataset provides information on village characteristics throughout Indonesia, with a size of about 65,000 villages. Third, we used the local government expenditure (LGE) dataset of 2010 as provided electronically by the Ministry of Finance (MoF, 2013). It contains 479 districts/municipalities, which is fewer than the Susenas dataset because decentralization in Indonesia led to newly created districts and municipalities. To reconcile the Susenas dataset (497 municipalities) and the LGE dataset (484 municipalities after separating five municipalities), we added the data of the main municipalities for educational expenditure

to the new established municipalities (13 municipalities), giving the same total of districts/municipalities as the Susenas dataset (497 municipalities).

2.3.2 Measurements

Dependent variables
School enrolment was measured as a categorical variable with three categories: "1" never attended school, "2" currently attending school (used as a reference category) and "3" not attending school anymore. Table 2.1 shows that 94.9 percent of children attended, approximately 3.6 percent were no longer enrolled and 1.5 percent had never attended school.

Independent variables
At the municipality level, we constructed three predictors: The first predictor is municipality education expenditure per student. It is constructed from the municipality education expenditure divided by the number of students in primary and junior secondary school, adjusted by the poverty line in each municipality to ensure comparability with the average Indonesian rupiah (IDR) 221,660 (SD 143.82), ranging from IDR 5,370 to IDR 1,737,270. Then, to reduce the undue influence of large expenditure per capita, we take the log of these numbers, ranging from 1.68 to 7.46 as exhibited in Table 2.1. The second predictor is the mean of municipal household education expenditure. This is taken from an aggregate of the household education expenditure per capita, adjusted by the municipal poverty line with average IDR 76,460 (SD 52.81), ranging from IDR 4,660 to IDR 383,470. We also converted these numbers to the log, ranging from 1.54 to 5.95. The third predictor is the municipality's poverty rate. It is created from aggregating the household poverty status in a municipality, with an average of 15.5 percent, ranging from 2 percent to 50 percent.

Table 2.1 Descriptive statistics $N_{level1}=221,392$; $N_{level2}=136,182$; $N_{level3}=497$

Levels and variables	Min	Max	Mean	Std. Dev.
School participation (N=221,392)				
Never	0	1	.015	
Enrolling	0	1	.949	
Not_anymore	0	1	.036	
Level 3 - Municipality (N=497)				
Log of municipality public education per pupil	1.68	7.46	5.256	.545
Log of municipality's mean household education expenditure	1.54	5.95	4.129	.670
Poverty rate at municipality	.02	.50	.155	.094
Level 2 - Household (N=136,182)				
Log Expenditure percapita	3.08	9.83	5.825	.491
Head of household education: *Below primary (ref.)*	0	1	.220	
- Primary	0	1	.326	
- Junior secondary	0	1	.162	
- Senior secondary and more	0	1	.292	
Head of household gender	0	1	.087	
School availability at village	0	1	.940	
Level 1 - Child (N=221,392)				
Sex	0	1	.482	
Age (10.9 years as mid for centring)	7	15	10.883	2.574
Relation to head of household: *Child (ref.)*	0	1	.881	
- Grandchild	0	1	.077	
- Relatives	0	1	.037	
- Others	0	1	.005	
Control variables at household level (N=136,182)				
Household size	1	24	4.931	1.663
(ref.)	0	1	.645	
- One child	0	1	.301	
- Two children	0	1	.049	
- Three children	0	1	.005	
- Four children and more	0	1	.001	
Household poverty status (1= poor)	0	1	.150	
Place of residence (1= urban)	0	1	.395	
Head of household source income: *Agriculture (ref.)*	0	1	.442	
- Mining, industry and construction	0	1	.164	
- Services	0	1	.365	
- Others	0	1	.029	

At the household level, five measures were used: (1) household expenditure per capita adjusted by the poverty line in each municipality with average IDR 389,640 (SD 291.12), ranging from IDR 21,680 to 18,519,150. We then transformed this to the log of household's expenditure per capita adjusted by the poverty line with average 5.825 (SD .491), ranging from 3.08 to 9.83 as displayed in Table 2.1; (2) household's education expenditure per pupil adjusted by the poverty line in each municipality with mean IDR 91,090 (SD 328.86). We coded "0" for households that do not spend money on education and "1 to 20" for 20 group percentiles of household education expenditure. We also coded them in binary with "0" as no spending on education and "1" for household spending on education; (3) heads of household's education level consisting of "1" for below primary/none (22.0%), "2" for completed primary (32.6%), "3" for completed junior secondary (16.2%), "4" senior secondary and more (29.2%); (4) female-headed household coding "0" for male and "1" for female with only 8.7 percent of households being female-headed; (5) accessibility with "1" as school available in village or less than three kilometers away for primary school and six kilometers away for lower secondary school (according to the official definition of accessibility), and "0" for unavailable. In general, schools are accessible in 94 percent of the cases.

Control variables

We include children's characteristics and other household's characteristics as control variables. Children's characteristics matter for school attendance and dropout. Three have been found to be particularly important. Firstly, girls are more likely to drop out because gendered practices at the household level affect opportunities for girls, especially in developing countries. Studies indicate that many households prefer to educate boys rather than girls (*cf.* Rose & Al Samarrai, 2001; Boyle, Brock, Mace, & Sibbons, 2002; Admassie, 2003). Secondly, older children are more likely to be out of school because growing older increases the opportunity cost of their time that leads to drop out (*e.g.* Admassie, 2003; Ersado, 2005). For instance, the enrolment rates in India, Pakistan and Bangladesh drop sharply as children get older, especially from 7-10 years (UNESCO, 2008). Thirdly, a child's relationship to the head of household is a strong predictor of dropout or being out of school. Children raised in intact families complete more total years of education than those in other types of family structures (Powell & Parcel, 1997). Moreover, findings from South Africa show that children living with grandparents are significantly less likely to drop out of primary school when compared to other family structures (two-parent nuclear and single-parent), with non-relatives 3.4 times more likely to drop out (Sibanda, 2004).

Children's characteristics are important factors explaining why children are out of school but they are not the focus of our analysis. Therefore, we treat children's characteristics as control variables. At the individual level: (1) gender is coded "0" for boy and "1" for girl. Table 2.1 illustrates that the children are distributed almost equally across gender, with about 51.8 percent boys and 48.2 percent girls; (2) a child's age centered

around the mean age. Table 1 shows that children's ages range 7–15 years, the official ages for attending primary and junior secondary school in the Indonesian education system, with an average age 10.9 years (SD 2.57); (3) a categorical variable expressing the child's relation to the head of household, with "1" for child, "2" for grandchild, "3" for relatives and "4" for others. The data reveal that the majority of children are the son or daughter of the head of the household (88.1%); some are grandchildren (7.7%), or relatives (3.7%) and only a few are not an immediate relative (.5%).

At the household level, the following control variables were used: (1) household size, ranging from 1 to 24 (average being 4.9, SD 1.663); (2) households with a child below five years, consisting of none as "0" with about 64.5 percent, one child as "1" (30.1%), two or three children as "2" (4.9%) and "3" (0.5%) correspondingly, and four and more children as "4" (0.1%); (3) poverty status, with "0" for not poor and "1" for poor households, approximately 15 percent; (4) place of residence, with "0" for rural and "1" for urban, with about 39.5 percent residing in urban areas, (5) source of household income, with "1" for agricultural,(44.2%), "2" for manufacturing/mining (16.4%), "3" for services (36.5%) and "4" for others (2.3%).

2.3.3 Analytical procedure

Multilevel multinomial regression analysis (cf. Snijders & Bosker, 2012; Hox, 2010) using MLwiN 2.35 (Rasbash, Steele, Browne & Goldstein, 2015) was applied. This method allows us to consider the hierarchical nature of our data, and permits us to test the effects of children, household and municipal level variables (Snijders & Bosker, 2012). A sequence of models was estimated, building up from the individual level, to test the hypotheses at all levels, including control variables at the household level. The models were estimated using Markov chain Monte Carlo (MCMC) estimation with initial burn-in length of 20,000. This was followed by a monitoring chain with length 50,000 (with the final model rerun with 50,000 burn-in and 100,000 chains).

2.4   Results

To examine those children who are out of school within households and municipalities, we started our analysis by estimating a null model that included two random intercepts to compare both children who never attend school and children who dropped out from school to the reference category (children attending school).

Table 2.2 Multilevel multinomial regression analyses for children aged 7-15 with never attend and dropout from school as dependent variables

Variables	Model 1				Model 2			
	Never		Not anymore		Never		Not anymore	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Intercepts	5.344	(0.747)	8.417	(0.586)	2.113	(0.855)	5.793	(0.786)
Level 3 - Municipality								
Municipality education expenditure percapita (Log)	0.034	(0.083)	-0.140	(0.070) *	0.022	(0.085)	-0.175	(0.068) **
Municipality poverty rate	2.866	(0.595) ***	-3.699	(0.497) ***	2.868	(0.578) ***	-3.795	(0.507) ***
Mean of municipality household education	-0.311	(0.089) ***	-0.152	(0.071) *	-0.265	(0.093) **	-0.105	(0.073)
Level 2 - Household								
Expenditure per capita (Log)	-0.833	(0.055) ***	-1.203	(0.040) ***	-0.410	(0.077) ***	-0.860	(0.065) ***
Head of household education: _Below primary (Ref.)_								
- _Primary_	-0.468	(0.057) ***	-0.437	(0.040) ***	-0.433	(0.057) ***	-0.415	(0.041) ***
- _Junior secondary_	-0.691	(0.079) ***	-1.120	(0.060) ***	-0.635	(0.079) ***	-1.068	(0.060) ***
- _Senior secondary & more_	-0.714	(0.076) ***	-1.298	(0.059) ***	-0.690	(0.081) ***	-1.272	(0.061) ***
Head of household sex: _Male (Ref.)_								
Female	0.041	(0.081)	0.082	(0.055)	0.212	(0.082) **	0.322	(0.058) ***
School available at village: _Unavailable (Ref.)_								
available	-0.453	(0.070) ***	-0.072	(0.069)	-0.437	(0.071) ***	-0.055	(0.072)
Level 1 - Individual								
Child sex: _Boy (Ref.)_								
Girl	-0.120	(0.045) **	-0.390	(0.032) ***	-0.123	(0.045) **	-0.397	(0.032) ***
Age (grandmean)	-0.144	(0.009) ***	0.643	(0.011) ***	-0.154	(0.009) ***	0.642	(0.010) ***
Relation to head of household: _Child (Ref.)_								
- _Grandchild_	-0.285	(0.094) **	-0.466	(0.073) ***	-0.441	(0.095) ***	-0.514	(0.073) ***
- _Relatives_	0.351	(0.107) ***	0.495	(0.068) ***	0.245	(0.108) *	0.456	(0.070) ***
- _Others_	0.990	(0.254) ***	2.168	(0.141) ***	0.607	(0.258) **	2.038	(0.143) ***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2.2 Multilevel multinomial regression analyses for children aged 7-15 with never attend and dropout from school as dependent variables **(Continued)**.

Variables	Model 1				Model 2			
	Never		Not anymore		Never		Not anymore	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Control variables at Household level								
Household size					0.162 (0.013) ***		0.154 (0.011) ***	
Member household below 5 years: *Zero (Ref.)*								
- One child					-0.160 (0.053) **		0.023 (0.040)	
- Two children					-0.342 (0.092) ***		-0.009 (0.077)	
- Three children					-0.257 (0.205)		-0.034 (0.201)	
- Four and more children					-0.774 (0.445)		-1.084 (0.507) *	
Household poverty status: *Nonpoor (Ref.)*								
Poor					0.263 (0.069) ***		0.099 (0.056)	
Household residence: *Rural (Ref.)*								
Urban					-0.021 (0.066)		-0.128 (0.044) **	
Household source income: *Agriculture (Ref.)*								
- Mining, industry, construction					-0.173 (0.081) *		-0.083 (0.052)	
- Service					-0.178 (0.071) **		-0.191 (0.048) ***	
- Others					-0.191 (0.171)		-0.651 (0.121) ***	
Random Part								
Level 3 - Municipality								
Constants	0.704 (0.068)		0.521 (0.048)		0.686 (0.067)		0.491 (0.046)	
Cons.Not anymore/cons.Never	0.170 (0.041)				0.137 (0.039)			
Correlations	0.281				0.236			
Level 2 - Household								
Constants	0.061 (0.021)		2.034 (0.138)		0.006 (0.001)		2.057 (0.117)	
Cons.Not anymore/cons.Never	0.064 (0.045)				0.025 (0.011)			
Correlations	0.173				0.219			
-2*loglikelihood:								
DIC:	60,020				59,621			
pD:	7,020				6,923			

Note: $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

The multilevel multinomial analyses show that several child-level characteristics are related to the likelihood of children being out of school. Model 1 in Table 2.2 reports that children's characteristics explain the probabilities of children not at school. Compared to boys, girls are less likely to never attend and drop out from school. As expected, the age of children out of school has different effects. Growing older significantly decreases the probability of children never attending school but it increases children's chances to have dropped out from school. Position in household is also significantly related to the likelihood of non-attendance. Compared to the position of a child, being the grandchild of the head of household significantly decreases the likelihood of children to never attend or drop out from school. In contrast, in the position of a relative or 'other' significantly increased the likelihood to never attend and drop out from school.

2.4.1 *The impact of variations in municipality characteristics*

We now turn to the hypotheses formulated on the educational opportunity structure at the municipality level. As autonomous government entities, municipalities have a crucial role in providing primary and secondary education services and thus in facilitating opportunities for households to send their children to school. However, the municipality capacity to provide accessible and affordable school varies. Our first hypothesis proposed that the lower the local government's public education expenditure per capita, the more likely children are (1a) to never attend school and (1b) to drop out from school. The multilevel multinomial analyses show that local government's public education expenditure per capita does not have a significant effect on decreasing children's likelihood to never attend school, both with and without taking into account the control variables at household level (β=.034 SE .083 and β=.022 SE .085, respectively) as exhibited in Model 2 (final model) of Table 2.2. Taking into account the variables at the household level as the final model provides clear evidence to refute hypothesis 1a: government expenditure does not decrease the likelihood of children never to attend school.

The results also show that the higher the local government's public education expenditure per capita, the lower the likelihood of children to drop out after taking into account all individual-level variables (β=-.140 SE .070). Considering all household-level variables, the coefficient estimate increases slightly to -.175 SE .068. Thus local government interventions as represented by public education expenditure per capita significantly reduce children's chances to drop out from school. Hypothesis 1b is thus supported.

The second set of hypotheses suggested that the higher the poverty rate of a municipality, the more likely that children would (2a) never attend school or (2b) drop out from school. We found that the model results support hypothesis 2a. After taking into account all individual, household, municipal level variables, the final results given in

Model 2 (Table 2.2) shows that residing in a municipality with a higher poverty rate significantly increases the likelihood of children never attending school (β=2.868 SE .578). Meanwhile, the results show that the higher the poverty rate of a municipality is significantly associated with a lower likelihood of children dropping out from school (β=-3.795 SE .507).

Hypothesis 3 predicted that the lower the municipalities' mean household education expenditure, the more likely those children (3a) never attend school or (3b) drop out from school. Without taking into account the variables at the household level, the results of Model 2 in Table 2.2 show that a high(er) municipality mean household education expenditure significantly reduces the likelihood of children to never attend school (β=-.331 SE .093) and drop out from school (β=-.152 SE .071). However, after including all household-level variables, the results change for children who drop out from school. The results suggest that a high municipality's mean household education expenditure is not significantly related to the likelihood of children to drop out from school (β=-.105 SE .073). These findings partially support hypothesis 3a: the higher the municipality's mean household education expenditure the more likely that children never attend school (β=-.243 SE .076) but there is no clear evidence of such relationship for children's dropping out from school (3b).

2.4.2 *The impact of household characteristics*

We also looked at the impact of household attributes and their effect on children's school enrollment. Model 2 in Table 2.2 presents the effects of household expenditure per capita, household education expenditure per capita, female-headed households, school (un)availability as proxy for school distance, and head of household's educational background on children out of school.

The fourth set of hypotheses predicts that the lower the household expenditure per capita, the more likely children will (4a) never attend school or (4b) drop out from school. After taking into account all individual, household and municipal levels and control variables, our results in Model 2 of Table 2.2 fully support these hypotheses 4a and 4b. The results suggest that a high(er) household expenditure per capita diminishes the likelihood of children never attending school (β=-.410 SE .077) and dropping out from school (β=-.860 SE .065). The patterns of household expenditure for children who never attend school and who drop out from school are almost similar but the effect size of the household expenditure per capita is significantly larger in reducing the likelihood of children's dropping out from school than the likelihood of never attending school.

The fifth set of hypotheses suggests that the lower household education expenditure per capita, the more likely it is that children will (5a) never attend school or (5b) dropout from school. The results in Model 2 of Table 2.2 support these expectations. Findings show that the household education expenditure per capita significantly reduces

the likelihood of children both never attending (β=-4.681 SE .059) and dropping out from school (β=-4.795 SE .074). We also found that after including the variables at household level, the coefficient increased slightly both for children not attending school and dropping out from school. Although the patterns of household education expenditure per capita for children who never attend school and who drop out from school are in a similar direction, the magnitude of the household education expenditure per capita on lowering the likelihood of children's never attending school is larger than those of children's dropping out from school.

In addition, we examined both decile and percentile groups of the household education expenditure per capita and their effects. The results (not shown in Table 2.2) reveal that even though the household education expenditure per capita significantly decreases the likelihood of children being out of school, there is no difference in estimated effects among either decile or percentile groups of the household education expenditure per capita. Based on these results, we used the binary household education expenditure variable in the final model to simplify the model.

The sixth set of hypotheses predicts that the lower the educational level of the household head, the more likely children are to never attend school (a) or to drop out from school (b). After including all individual, household, and municipal levels and control variables, Model 3 in Table 3 shows that compared to heads of households with below primary school education, a higher educational level of the head of the household significantly decreases the likelihood of children being out of school. Moreover, compared to children living in households where the head's education is below primary, children from households whose heads completed primary, junior and senior secondary or higher education are less likely to never attend school by β=-.433 (SE .057), β=-.635 (SE .079) and β=-.690 (SE .081), respectively.

Additionally, the same patterns are found for children who drop out from school but the estimated effects are bigger than for those who never attend school with β=-.415 (SE .041), β=-1.068 (SE .060) β=-1.272 (SE .061), respectively. In summary, our findings fully support the hypotheses that the lower the education level of the household head, the more likely children are to never attend school (6a) or to drop out from school (6b).

The seventh set of hypotheses states the expectation that children in female-headed households are more likely to (7a) never attend school or (7b) dropout from school. Before considering the control variables at the household level, no significant association is found between female-headed households and the likelihood of children attending school and dropping out from school, as illustrated in Model 1 of Table 2. After including the variables at the household level, Model 2 of Table 2.2 reveals that being part of a female-headed household increases the children's probability to never attend school (β=-.212 SE .082) and to drop out from school (β=-.322 SE .058). The analysis also suggests that the effect of the female-headed households on children to drop out from school is stronger than on those never attending school. Hypotheses 7a+b are thus supported.

Finally, the eighth set of hypotheses predicts that school availability decreases the likelihood of children to (8a) never attend or (8b) dropout from school. When we look at Models 1 and 2, we see that the effects of school availability are mainly the same. The findings reveal that school availability significantly reduces the children's likelihood of never attending school and this associated negatively although not significantly with children's chances for dropout. Then, after including the variables at the household level, Model 2 in Table 2.2 illustrates that the results are almost similar. School availability in a village significantly diminishes the likelihood of children to never attend school (β=-.437 SE .071) but it is insignificantly related to reduce the likelihood of children to drop out from school (β=-.055 SE .072).

All in all, the findings suggest that if schools are unavailable in a village and there is a need to transport children more than three kilometers for primary school and more than six kilometers for junior secondary school, children are less likely to attend school. Therefore, school availability significantly reduces the probability of children to never attend school (8a). This indicates that school unavailability is important to understand why some children never attend school but seemingly it is not a defining factor to explain why children drop out from school (8b). Concerning accessibility, as indicated by school availability in a village and distance to school, our findings reveal that the effect of school availability on children never attending school is stronger than for children dropping out.

We have summarized the results of all our analyses in Table 2.3.

Table 2.3 Overview of the hypotheses and findings of our analyses

No.	Hypotheses	Never attend school (a)	Drop out from school (b)
1	The lower the local government's public education expenditure per capita the more likely children are (a) to never attend school and (b) to drop out from school.	X	√
2	The higher the poverty rate of a municipality, the more likely those children will (a) never attend school and (b) drop out from school.	√	X
3	The lower the municipalities mean household education expenditure, the less likely the proportion of children who (a) never attend school or (b) drop out from school.	√	X
4	The lower the household expenditure per capita in the household, the more likely that children will (a) never attend school or (b) drop out from school.	√	√
5	The lower household education expenditure per capita, the more likely that children (a) never attend school or (b) drop out from school.	√	√
6	The lower the education level of the household had, the more likely children are (a) to never attend school or (b) to drop out from school.	√	√
7	Children in female-headed households are more likely to children never attend school (a) or (b) drop out from school.	√	√
8	School availability decreases the likelihood of children (a) never attend or (b) drop out from school.	√	X

Notes:
√ = The findings are in line with the hypothesis.
X = The hypothesis is rejected by the findings.

2.5   Discussion and conclusions

This paper sought to answer the question of which characteristics of municipalities, households and children explain why children never attend or drop out from school in Indonesia. Opportunity structure theory was used to argue that macro and micro attributes at both municipal and household levels facilitate or constrain children from attending school.

Using a multilevel approach, we included school affordability measured at the municipality level by the public education expenditure per capita, the poverty rate, and the mean of household education per capita. At the household level we used household education expenditure per capita, household education per capita, head of household educational background, and female-headed household, and school availability in a village. In addition, we incorporated important child characteristics, consisting of age, gender and relation to head of household.

2.5.1 Impact of the municipality level

The hypotheses at the municipal level were supported only partially. First, efforts to improve access to schooling as indicated by the public education expenditure significantly reduce the likelihood that children drop out from school but no clear evidence was found that they decrease children's likelihood to never attend school. One may conclude from this that the government – through its expenditure – can help prevent children from dropping out from school but it may not help sufficiently to attract/encourage all children to attend school for the first time, such as children isolated in remote areas and street children in urban areas.

However, the association between municipality education expenditure and school enrollment might be related to other factors as well. Our analyses did not include information on the type of activities financed by the education budget or the quality and process of public education spending. For example, corruption might be an important obstacle to effective and efficient government spending. Public education expenditure appears to have a positive and relatively large effect in less corrupt regions (Suryadarma, 2012). Also, the ranking on the transparency and allowance index – part of the World Bank governance index – is significantly associated with an increase in enrollment rates (World Bank, 2013). Corruption also influences the effectiveness of educational interventions. Suryadarma's analysis (2012) confirmed this: higher perceived levels of corruption decrease the effectiveness of public education spending on enrollment. Our analyses could not shed light on the effect of these matters.

Second, regarding municipality poverty rate, our findings showed that residence in a municipality with a higher poverty rate significantly increases the likelihood of children to never attend school but it decreases the likelihood of children dropping out. This

suggests that the poverty rate at the municipal level has an opposite effect on children to never attend or drop out from school. These interesting findings could be explained as follows.

Firstly, the industrialized municipality might increase the average household income and provide job opportunities in the unskilled labor market. This may attract children to work and that leads to their dropping out from school. Because jobs are not available in non-industrialized municipalities, children residing there may stay longer at school. This situation is supported by the finding that children who live in households whose head works in the transportation, storage and communication sector have an increased likelihood to drop out from school (McCulloch & Grover, 2010).

Secondly, the central government significantly increased educational expenditure since 2009 as mandated by constitutional amendments. The budget was spent mainly on students completing universal compulsory education. As a result, primary and junior secondary schools, included in universal compulsory education, benefited from this policy. This is in line with previous experiences in economic crises, which showed that educational interventions such as providing nation-wide scholarships successfully prevented children from dropping out from primary school (Sparrow, 2007). This policy provides more scholarships to higher poverty rate municipalities and that might be reducing the dropout rate. Since scholarships are distributed to children in school, not to children out of school, this policy will not decrease children's likelihood of never attending school.

These different results imply that wealth and type of income are very important to understanding the likelihood of children never attending and dropping out from school. For instance, the poverty status of female-headed households is higher (16.8%) than those of male-headed households (14.9%) because the proportion of unemployed head-of-households is larger for the female-headed households (14.9%) than for male-headed households (1.8%).

Furthermore, the results show that the higher the municipality's mean of household education expenditure, the higher the children's likelihood of never attending school. Although the municipality's mean of household education expenditure is also related to reducing children's likelihood of dropping out, the effect is not strong enough to be significant. This thought-provoking finding implies that the size of average household education expenditure could be explained by other factors, which by themselves could be sufficient to have children stay at school. For instance, some municipalities had decided to abolish school cost with a consequent reduction in average household education expenditure at the municipality level (Paqueo & Sparrow, 2005). In addition, school-based management policy enables schools to determine their own school fee or make it free. This might increase school fee variations (Yonezawa & Muta, 2001). Consequently, the effect of the mean of household education expenditure may be weaker.

2.5.2 *Impact of household and individual levels*

At the household level, factors such as a household's wealth, investment in education and educational background of the head of the household are all significantly related to reduce children's' never attend and dropout rates. If the household is richer, invests more in education, and the household head has a higher level of education, the likelihood of children to never attend and dropout from school decreases significantly. Meanwhile, the fact that a woman is head of the household is not significantly related to the likelihood of children attending and dropping out but this relationship becomes significant after including the variables at the household level. It indicates that variables such as poverty and source of income are very important for the children's likelihood to never attend and drop out from school if they live in a female-headed household, mainly unemployed widows.

The findings show that school availability decreases the likelihood of children to never attend school but does not mitigate the chance of dropping out of school. If we look at the municipal level, these different mechanisms could be explained by the opportunity structure as follows. The proportion of children never attending school ranges from 10–87 percent in 16 municipalities in Papua Island (calculated from Susenas, CBS 2010). It indicates that the reasons for parents not sending their children to school may relate to school distance, difficult transportation and lack of infrastructure. When there is no school in or near the village, there is no alternative for children to go to school and parents hesitate to send their children to a school a long distance away. Hence, school distance is a constraint for the head of the household sending children to school.

Surprisingly, the largest proportion of dropout, ranging from 8–10 percent does not occur in Papua Island (calculated from Susenas, CBS 2010). This indicates that school availability in a village is not clearly related to children dropping out from school. The dropout rate probably relates to labor market opportunity both in industrialized municipalities, such as Gorontalo, Serang, Bogor, Purwakarta, Cirebon and in agricultural municipalities, such as Bantaeng, Wajo, Hulu Sungai Selatan, Polewali Mamasa (Calculated from Susenas, CBS 2010). While job opportunities in industrialized municipalities attract children to drop out from school permanently, similar opportunities in agriculture municipalities attract children to work temporarily. Those job opportunities become a constraint for children going to school. Surprisingly, seven municipalities with zero dropout are mainly in Papua Island (six municipalities) (calculated from Susenas, CBS 2010).

At the individual level, girls are more likely to attend and stay in school. Growing older significantly decreases the likelihood of children to never attend school but increases the likelihood of children dropping out from school. Regarding the likelihood to never attend and drop out from school, the best position in a household is grandchild and the worst is other, such as a maid.

School non-participation has always been linked to a limited opportunity structure in developing countries. Our findings suggest that in the Indonesian case, resources (expenditure and education) matter, especially at the household level. However, the impact of various components of the opportunity structure at the municipal, household and individual level are mixed and interrelated. We found that factors explaining why children never attend and drop out from school are quite similar for most of the variables included, but are substantially different for a limited set of factors, namely, public education expenditure per capita, poverty rate per municipality, municipality's mean household education expenditure, and the availability of schools.

2.5.3 Policy implications

What policy recommendations can be inferred from this study? First, as this study shows, government expenditure can have a positive effect on preventing school dropout. However, one should be aware that the amount of government money alone does not entirely explain the effect of government interventions on children's school enrollment. Focus on spending and quality of spending, in terms of corruption for example, are potentially equally important explanations.

In terms of focus on spending, unfortunately our analyses could not shed light on the effect of various government interventions or educational activities on improving school enrollment. Also, we could not include indicators for the quality of spending. We are therefore careful to draw policy implications from the effect this study lacks, namely of government expenditure on children's likelihood to go to school for the first time. However, in combination with the strong positive effect of household wealth and head of household's educational level, which are stable and independent of all other factors and circumstances included, one could conclude that better off households with more knowledge are in a better position to send their children to school and keep them there. Therefore, one could consider the use of direct financial support to poorer households and empowering interventions as possible solutions, especially for children living in a female-headed household.

Our study might indicate that government intervention at the institutional level might not be the sole solution. Government interventions may need to shift gradually from providing institutional support at the national or regional level, to giving support channeled through institutions, such as municipalities and schools, to households and children, or to apply solutions at both institutional and individual levels simultaneously. New government interventions, such as household socio-economic empowerment, the national program for community empowerment (*program nasional pemberdayaan mandiri*/PNPM) and cash transfer programs (*bantuan tunai langsung*/BLT) may be promising initiatives in this respect, next to scholarships to children from poor families.

Finally, though school availability is no barrier for children in urban areas, it is still a constraint for children in rural areas, particularly in geographically challenging areas, such as Papua Island. Our results make clear that living in village without a school or with one located a long distance away substantially increases the likelihood of children never attending school. These findings imply that building schools in rural villages and remote areas might be a solution. If this is impossible due to the low population density in remote rural areas, an alternative might be to provide a "mini-school model" for primary school, and provide boarding schools and long-distance learning systems for junior high school (ISPA, 2013). This is how an important constraint to attending school could be overcome.