Distribution of Government Expenditure and Demand for Education Services: The case of Indonesia

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Abstract

This paper utilizes Benefit Incidence Analysis (BIA) to analyze the incidence of government expenditure on education services to each different segment of population and logistic regression model to estimate demand for the services in Indonesia in 2005.

This paper found that (i) lower-income quintiles have a larger share of enrollment in primary school, whereas for the higher income quintiles such is true in higher education. (ii) Distribution of expenditure on primary education is in favor of lower-income population. On the other hand, expenditure on secondary education attests a distribution in favor of higher-income population. Moreover, the expenditure on university education not only favors higher-income population, but also shows a stronger inequality than the distribution of personal income. (iii) Income, education level of parents and scholarship have significant positive influence to increase the probability of a child to be sent to a school. While age of child and family size have negative correlation with probability of school attainment. However, gender, teacher-student ratio and school density variables give varied impact to school enrollment across areas and levels of education

Keywords: Benefit Incidence, Demand Analysis, Government Expenditure, Education, Indonesia

1. Background

Education is one of the most important factors of human capital development, whereas human capital has been identified as a key determinant of growth and poverty alleviation. The government of Indonesia has been paying a lot of attention on education for years. Since the beginning of 2000s, for example, Indonesia has experienced an increasing trend in government expenditure in this sector. It received 11.4 per cent of total national expenditure in 2001, increased to 14.3 in 2002, to 16.0 per cent, 14.0 per cent and 13.9 per cent, in 2003, 2004 and 2005, respectively. Moreover the Indonesian government is planning to achieve a targeted number as mandated by law to provide minimum 20 per cent of its budget to the education sector.

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Given the size of social spending in the budget and the desire to enhance the quality of fiscal adjustment while pursuing macroeconomic stability, policy makers are striving to increase the effectiveness of expenditure policy, particularly social spending, including the ability to track all pro-poor spending. This aspect of fiscal policy is regarded as an important challenge when dealing with poverty alleviation programs. Since the poor often have limited access to services that could enable them to escape from poverty, the government is expected to target the provision of such services to them. However, how does one ascertain the extent to which the existing (or an increasing) budget allocated to the poor could actually reach this share of the population? To address the question, a thorough study of budget incidence needs to be carried out to assess how much the poor benefit from goods and services provided through government budget. Establishing the incidence of government expenditures is important because not all expenditures benefit households of different income levels to the same extent. Even those government expenditures intended to benefit low income households may not do so due to poor targeting or because of obstacles the poor face to have access to public services. Therefore, a study of government budget incidence will have significant contribution to government particularly in providing information and feedback to help improve the effectiveness of programs and policies

The benefit incidence analysis is useful to determine whether services are reaching those most need, however it is less useful for evaluating the factors that act constrain household or individual use of the services. This requires behavioral analysis of the response of households to the policies that is, analysis of the demand for the services. The second part of this study, therefore, tries to analyze household behavior after the implementation of budget policies, in this case, expenditure for education service, by estimating the demand for the services

This paper focuses on education expenditure of Indonesia government in 2005 for two reasons. *First*, education, in particular, is understood to be a basic service, essential to address inequalities in distribution of income and improve the welfare of the poor. *Second*, Indonesia's

constitution states that government is one of stakeholders responsible for financing education and ensuring that each citizen is provided with education (in particular, basic education)[2]. It commands that 20 percent of state budget be spent on education. However, such percentage has never been reached. In 2007, the year of the highest share of education spending in the history of Indonesian state budget, it reached about 11.9 percent. Worth reminding, this paper focuses the analysis only for the year 2005 because it is meant to have the most recent available data. Susenas 2005 is the most recent available data from that survey and figures from 2005 are the only data available for budget realization after the implementation of the new budget accounting system[3].

The remainder of the paper is organized as follows. Section 2 describes the research questions. Section 3 describes literatures reviews, methodology of research and data sources. Section 4 explains briefly education system in Indonesia, especially a new system that has been implemented since 2003. Section 5 describes the evolution of Indonesia Budget in recent years and realization of state budget 2005. Section 6 assesses the benefit incidence of government expenditure on education section, section 7 explains the demand analysis of education services and section 8 conclusion and policy recommendations

2. Research questions

Based on explanation provided in the background above, this paper attempts to answer three questions

a. How is the incidence of expenditure on education to each different segment of population?

b. How much does the poor actually benefit from public education spending?

c. How does household / individual behave toward education services?

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[2] 1945 constitutions of Indonesia, the fourth amendment, article 31. Indonesia has implemented 9 years compulsory education.

[3] Detailed explanation of the new budget accounting system is provided in section 5 and susenas data in section 3.3 of the paper.

3. Literature Reviews, Methodology and Data Sources

3.1 Literature Reviews

Studies of benefit incidence of government expenditure on education have been done by numerous researchers. Among others, Selowsky (1979) did survey and benefit incidence analysis (BIA) of education expenditure in Colombia and Meerman, in Malaysia (1979). Both of them are pioneer of this method. Selowsky used country-wide survey of 4,019 households which were designed specially for his research. He used the survey data to trace the beneficiaries of one-third of total government expenditure. They are subsidies to education and health sector and the investment in electricity, water and sewerage. He found that total subsidy to education was distributed evenly across income quintiles, but subsidy to primary education was highly progressive, whereas the subsidy to higher education was highly regressive. Meerman used household sample survey developed by Malaysian department of Statistic. His study included four sectors having very large public expenditure that are allocated to household in Malaysia: education, medical care, agriculture, and public utilities (water, electricity, and sewerage). In education sector analysis, he also found that distribution of subsidy to primary education shows a distribution in favor of lower-income households. In contrast, however, the subsidy to higher education favored higher-income households.

Demery (2000) estimated benefit incidence on education spending for Indonesia, Colombia and Cote d`Ivoire as one of his example on his BIA practitioner's guide paper. In case of Indonesia, he found that although the poorest quintiles reaped the benefit of education significantly less than their share in total population, it was progressively distributed-in relation to their household income/expenditure. Peter lanjouw et all (2001) did BIA on education spending in Indonesia using 1998 Susenas data. They found that (i) government spending on primary education had pro-poor distribution; (ii) most of the benefits of spending on junior secondary school accrued to the middle consumption quintiles; and (iii) for senior secondary education, benefits were distributed very regressively. The total transfer to richest quintile was more than triple that to households in the poorest

quintile. Davoodi, Tiongsan, and Asawanuchit (2003), did cross countries BIA on education spending, covering 56 nations and the time period 1960-2000. They found that *(i)* overall spending on education was on average pro-rich; *(ii)* spending on primary education was on average pro-poor and progressive; and *(iii)* spending on secondary and tertiary education primarily benefits the non-poor, with a strong evidence of middle-class capture.

Among others, Glick P et. al (2000) did demand analysis on education services in Madagascar. They used permanent household survey carried out in 1993-1994. They found that (i) household income and education are important determinant of investments in children's school. (ii) Gender does not, in most part of their research area, play a role in determining access to education , (iii) Rural secondary school enrollments are constrained by lack of access to schools, and (iv) improvement in public primary school quality will have large, pro-poor effects on primary enrollments.

3.2 Methodology of Research

This study utilizes a Benefit Incidence Analysis (BIA) to analyze the distribution of education expenditure . It is an easy-to-use tool for *ex ante* design as well as *ex post* monitoring and evaluation of effectiveness of social spending program. It brings together elements of the supply of public services and the demand for them. It also can provide valuable information on efficiencies (inefficiencies) and equities (inequities) in government allocation of resources for social services and on the public utilization of these services.

The BIA approach was pioneered by twin World Bank studies by Selowsky (1979), for Colombia, and Meermen (1979) for Malaysia. The main goal of this method is to identify who benefits from public spending and by how much. The essence of the approach is to use information on the cost of public goods and services together with information on their use by different income groups to estimate the distribution of benefits. Individual or household beneficiaries are typically grouped by income level but they may also be grouped by geographical area, ethnic group, urban and rural

location, gender, etc. Information on individual or household use of the public services is typically obtained from survey.

Benefit incidence analysis can be illustrated by some simple algebra, as applied to the case of education spending. Benefit from government expenditure on education level i (primary, secondary, and university)[4] accrued to group j[5] is estimated as

$$X_{ij} = \frac{E_{ij}}{E_i} S_i = \frac{S_i}{E_i} E_{ij} \qquad (1)$$

Where E_{ij} represents number of students enrolled in level i from group j. S_i/E_i is the unit cost of providing education in level i. Therefore, total benefit from government expenditure on all education accrued to group j is

$$Xj = \sum_{i=1}^{n} X_{ij} \qquad (2)$$

by substituting equation 1 into equation 2, it can be arranged as

$$Xj = \sum_{i=1}^{n} E_{ij} \frac{S_i}{E_i} = \sum_{i=1}^{n} \frac{E_{ij}}{E_i} S_i \qquad (3)$$

The method involves, at least, a four-step process that can be easily implemented using popular spreadsheet programs.

1. Obtain average unit cost of providing a particular public service by dividing government spending on the service by total number of users of the services: Si/Ei. Government spending must be based on actual expenditure and not on budget allocation;

2. Rank the population of users from poorest to richest using welfare measure and aggregate them into groups with equal numbers of users. Total monthly expenditure of household is taken as a proxy for welfare measure;

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[4] Spending on education may occur on more than three level, but in this paper focus on the three traditional level as majority of studies have done.
[5] Population is ranked from poorest to richest using per capita expenditure and aggregated them into quintile

3. Obtain the number of enrolled students in each level of education from each group; and

4. Derive the distribution of benefits by multiplying the average benefit by the number of users in each group.

Moreover, this research utilizes logistic regression model to estimate the demand for the services,. The logistic distribution (Logit) is used in the case when the dependent variable of the model is a dichotomous variable, that is, in this model, 1 if parents send their child to school and 0 if vice-versa. It is used because (i) the predicted value of dependent variable in logistic model is the probability of a particular choice will be made, p , should satisfy $0 \leq \hat{p} \leq 1$ Unfortunately linear regression does not ensure that is so. (ii) the observed value do not follow a normal distribution with mean p, but , in case of logistic regression, is based on the cumulative logistic probability function which is specified as (Pindyck and Rubinfeld, 1991)

$$p_i = F(Z_i) = F(\alpha + \beta X_i) = \frac{1}{1+e^{-z_i}} = \frac{1}{1+e^{-(\alpha+\beta X_i)}}$$

multiply both side by $1+e^{-z_i}$ get $(1+e^{-z_i})P_i = 1$ viding by Pi and then subtracting by 1 leads to

$$e^{-z_i} = \frac{1}{P_i} - 1 = \frac{1-P_i}{P_i}$$

since $e^{-z_i} = \frac{1}{e^{z_i}}$ then $e^{z_i} = \frac{P_i}{1-P_i}$

Finally by taking natural logarithm of both side

$$Z_i = \ln\left[\frac{P_i}{1-P_i}\right] = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_p X_{ip}$$

The dependent variable in this regression is the logarithm of the odds that a particular choice will be made.

3.3 Data sources

Three sets of data are used in this paper.

1. National Socioeconomic Survey (SUSENAS), BPS- statistics Indonesia, 2005. BPS-statistics of Indonesia has been conducting SUSENAS since 1963. One of the objectives of SUSENAS is to gather complete, accurate and timely data on important characteristics of the population, particularly the ones closely related to measurement of well being in various categories of the population (Surbakti, 1995). The main idea is that it would gather data from household to make available sufficient data in order to examine various social issues. Susenas 2005 covers more than one million respondents from more than 250 thousand households. The survey has been conducted in 30 provinces, 407 districts, 4,626 sub-districts and 14,565 villages in Indonesia. In this research, the survey is used to estimate (i) the welfare measure, (ii) the number of enrolled students and (iii) dependent and some independent variables of demand analysis.

2. Data of realization of government expenditure on education in 2005, from Ministry of Finance.

3. Data of enrollment in each level of education, number of school and teacher from Ministry of Education. Ministry of Education provides only actual number of students enrolled in each level of education, but it does not provide information about the welfare status of each student. Therefore, as mentioned above, the number of enrolled students in each level education coming from each income group is estimated using Susenas data. Data on enrolled students, obtained from Ministry of Education, and realization of government expenditure are used to calculate the public expenditure per student each year for each type of education. Number of school and number of teacher are used to estimated school density and teacher student ratio respectively.

4. System and Provision of Education in Indonesia

The Republic of Indonesia enacted a new Law on National Education System in July 2003. The Law has its foundations in the 1945 Constitution of Indonesia, Article 31, Section (1), of which states that each and every citizen shall have the fundamental right to education. The Law creates a legal framework for the major educational goal, policies and plans. The key targets include the expansion

and equity, the improvement of quality and relevance, and the implementation of autonomy in higher education. The law seeks to open access to education at all levels and all forms-formal, non-formal, as well as informal-for all the citizens of Indonesia. Its main thrust is to make education relevant to societal needs; to develop further community-based education; and to enhance participation by community in supporting basic education. It designs rights and obligations to citizens, parents, community, and government. An outstanding feature of the Law is the implementation of compulsory basic education, free of cost, for all Indonesian citizens. Henceforth, "Every seven to fifteen years old citizen shall have the right to receive basic education", provides the Law.

Based on the Law, the national education system is identified in terms of units, streams, types, and levels of education. A unit of education means unit of educational services providing formal, non formal, and informal education at every level and type of education. Educational streaming consists of formal education, non-formal education, and informal education, which can complement and enrich each other and can be enriched with an open system through face-to-face and/or distance learning. The system consists of seven types of education: (1) General education, which prioritizes expansion of general knowledge and improvement of students' skills - specialization is also needed in the last grade; (2) Vocational education, which enables students to master a number of specific vocational skills needed for employment; (3) academic education, which focuses primarily on improving the mastery of science; (4) professional education, which invest students primarily with specialized or job-related knowledge and skills; (5) vocational and technical education; (6) religious education, which has prepares learners to become community members who understand and practice religious values and/or acquire expertise in religious studies; and (7) special education, which is provided for learners who have difficulties in following the average learning process because of physical, emotional, mental, and social deficiencies, and also for those with proven extraordinary intelligence and especially gifted.

The level of education that includes formal school system consists of basic education, secondary education, and higher education. Apart from the levels of education mentioned above, pre-school

education is also provided. Out-of-school education can be held at the outside schools and provided by governmental and non-governmental agencies. Basic education is the foundation for secondary education. It takes the form of primary schools, that is, *Sekolah Dasar* as well as *Madrasah Ibtidaiyah* (an Islamic Primary School), or other schools of the same level, and junior secondary schools, that is *Sekolah Menengah Pertama* as well as *Madrasah Tsanawiyah* (Islamic General Junior Secondary School), or other schools of the same level. Secondary education is the continuation of basic education. It comprises general secondary education and vocational secondary education and takes the form of senior general secondary schools, that is, *Sekolah Menengah A t a s* (SMA) as well as *Madrasah A l i y a h* (an Islamic General Senior Secondary School), and senior vocational secondary schools, that is, *Sekolah Menengah Kejuruan* (SMK), as well as *Madrasah Aliyah Kejuruan* (an Islamic vocational Senior Secondary School), or other schools of the same level. Higher education is a level of education after secondary education consisting of diploma, bachelor *(s a r j a n a)*, masters and specialized postgraduate programs, and doctorate programs imparted by a higher education institution. Higher education institutions can take the form of academy, polytechnic, college, for specialization *(sekolah tinggi)*, institute, or university and shall provide education, research, and community services

Moreover, according to the law, financing education shall be the shared responsibility of the government, local governments, and community and the source of education funds shall be determined based on the principles of equity, adequacy, and sustainability. Education funds, excluding salary of educators and service education expenditure, are allocated at a minimum of 20 per cent of the National Budget (APBN) and a minimum of 20 per cent of the Regional Budget (APBD). Salary of teachers and lecturers appointed by the Government are allocated by the National Budget (APBN). Education funds provided by the Government and local governments to units of education shall be in the form of a grant in accordance with the regulations.

5. Indonesia State Budget

5.1 Revolution of Indonesia State Budget

There were two major changes of the state budget accounting system in Indonesia in the post-crisis era. *First*, changing of state budget format from T-account to I-account format. Starting from fiscal year (FY) 1999/2000 the purpose is to increase transparency, efficiency, and effectiveness, especially in budget deficit control. S*econd,* adjustment in the expenditure format that had been made to facilitate the application of a unified budget system, which comprised the previously separated current expenditure and development expenditure, starting in FY 2005.

State budget utilized T-account from FY 1969/1970 to FY 1999/2000. The shortcoming of this format is that it does not provide clear information on deficit control and lacks of transparency. Therefore, starting from FY 2000, state budget format was changed into I-account, in compliance with Government Finance Statistic (GFS)[6] . The objectives of such change are to: (i) increase transparency in budget formulation; (ii) facilitate analysis, monitoring, and control in budget implementation and management; (iii) assist cross-country comparative analysis; and (iv) enable a more transparent calculation of balance fund to be distributed by central government to local government as warranted by Law 25/1999 on Central and Local Fiscal Balance.

The differences between the two formats are: (i) In T-account the revenue and expenditure sides are separated in different column, while in I-account they are put in the same column. (ii) T-account reflects a balanced budget, while I-account applies deficit/surplus budget. In a balanced T-account, both revenue and expenditure side should have the same total amount. If the expenditure is larger, the deficit is covered by financing from domestic and/or foreign sources. On the other hand, I-account applies deficit/surplus budget that is the gap between combined amount of revenue and grants and that of expenditure. Negative gap or deficit occurs when total expenditure is larger than total revenue and

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[6] The GFS system is developed by International Monetary Fund. It is designed to provide statistics that enable policymakers and analysts to study developments in the financial operations, financial position, and liquidity situation of the general government sector or the public sector in a consistent and systematic manner.

grants. Positive gap or surplus is when the amount of revenues and grants exceed that of expenditure. Financing sources used to cover deficit may come from both domestic or foreign. (iii) Budget expenditure is divided into central and local government. T-account does not show clear distinction between the composition of budget managed by central government and local government, as a result from centralized budget. To the contrary, I-account clearly shows the composition of the amount of budget managed by local governments.

The second change was implemented starting from FY 2005: the I-account format underwent several adjustments in the expenditure side as warranted by Law 17/2003 regarding State Finance. One purpose of the adjustments is to increase state expenditure management transparency and accountability through reducing duplication of strategic plan and budgeting in state expenditure and to create linkage between actual output and outcome to be achieved by organization budgeting. Another purpose includes complying with internationally approved classification system. The new format still separates central government expenditure from local government expenditure. However, as a result of state budget format adjustment, several changes have been made in central government expenditure. They are (i) the new adjustment implements a unified budget that performs a classification of expenditure according to type, and no longer separates current expenditure from development expenditure; (ii) classification of expenditure by function, sub-function and program was implemented to replace classification according to sector, sub-sector and program; (iii) categorization of current expenditure by type consists of personnel, material, interest payment, subsidy and other recurrent expenditure. The new format adds capital, grants and social aid expenditure; (iv) in the new format, the old development expenditure is converted and distributed into personnel, material, capital, social aid, and other sorts of expenditure.

5.2 Realization of Government Budget 2005

Realization of government budget 2005, divided by function, is presented in table 1. Table 1

shows clearly that Indonesia state budget is still facing debt payment burden. Such disbursement has absorbed about 20.7 percent of total expenditure in 2005, while education and health spending accounted for only 8.1 percent and 1.6 percent of total budget, respectively. Other important sorts of expenditure such as economy, environment, housing, public facilities, and other social expenditures have got a relatively small portion of budget. This situation has rendered difficult for the government of Indonesia to fulfill the 20 percent of budget that must be allocated to education sector.

Primary education received the largest portion of the budget, compared to all other levels of education. About 3.4 percent of total budget went to primary education, 1.1 percent to secondary education, 2.0 percent to higher education level and 1.7 percent to others. The size of budget allocated to each level of education was calculated mainly based on the number of student at each level. On the other hand, as we will see later in this paper, per student in primary school received smallest amount of budget compare to student in higher level of education.

Table 1 Realization of Government Expenditure by Function
(*as percentage of total*)

Code	Description	2005
01	General Services	70.8
	-Debt payment	20.7
02	Defense	6.0
03	Security and order	4.3
04	Economy	6.5
05	Environment	0.4
06	Housing and Public facilities	1.2
07	Health	1.6
08	Tourism and culture	0.2
09	Religion	0.4
10	Education	8.1
	-Primary	*3.4*
	-Secondary	*1.1*
	-University	*2.0*
	-other	*1.7*
11	Social security	0.6

00	others	0.0
Total		100.0

Source: Directorate general of Treasury, MOF, Indonesia

6. Benefit Incidence Analysis of Government Expenditure on Education

Unit cost of providing education services in each level of education is estimated by dividing realization of government expenditure by number of enrollment in each level of education. Table 2 shows that the estimated government expenditure per student for 9-year compulsory basic education[7] in 2005 was Rp. 317,019. For, secondary school, it was Rp. 627,920, almost as twice the expenses for primary school; while university expenditure per student reached Rp. 1,967,714, six times larger than costs per student in primary school. These values are reasonable since the higher the level of education the more expensive the cost of services

Table 2. Total Government Expenditure on Education, School Enrollment and Estimated Expenditure Per Student, by Level of Education, 2005

	Total Expenditure* (*billions of Rupiah*)	Enrollment** (*thousands*)	per student (*Rupiah*)
Primary School***	12,310	38,832	317,019
Secondary school	3,963	6,311	627,920
University	7,056	3,586	1,967,714

Note:
* Realization of expenditure reported by ministry of finance
** Actual data reported by ministry of education
*** Primary school consists of elementary school and junior high school, but they are combined because there is no expenditure data available for each category separately. Elementary and junior high school are considered as 9 years compulsory education in Indonesia.

Furthermore, it is estimated that lower-income quintiles had a larger share of enrollment in basic education, whereas, in higher education, predominance is true for the higher income quintiles. Table 3 shows the number of students and the expenditure for each level of education and each level of income.

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[7] Indonesia since 1994 defines compulsory basic education as nine years: six years of primary/elementary education (for ages 7-12) years and three years of junior high school (ages 13-15 years). It will be called "basic education" further in this paper

Population is ranked from the lowest to the highest, based on their monthly average expenditure per capita which is, in this paper, used as a proxy of income per capita. Afterwards, ranked population is grouped into 5 quintiles, such that quintile 1 has the lowest average income per capita. Table 3 shows that in 2005, 23.8 percent of total students enrolled in basic education belonged to the poorest quintile, while only 4 percent of total students enrolled in university came from this quintile. Still, only 15,0 percent of total students enrolled in basic education came from the richest 20 percent of the population, while 60,0 percent of university students belonged to this quintile. The observed disparity can be mainly attributed to the fact that (i) poor families tend to have more children than the rich ones, but (ii) most of them cannot afford to send their children to higher, more expensive levels of education.

Multiplying per student government expenditure in each level of education by the number of student enrolled in each level of education from each income group, we can estimate the benefit incidence of government spending on each level of education for each income group. The estimation assumes that unit cost of providing the service is equally distributed across students in the same level of education. It means that each student in a level of education, regardless of his or her income level, gender, geographical location etc, benefits equally government expenditure. Table 3 shows that the poorest quintile received Rp. 2.9 trillion of government spending on basic education, while the richest quintile received only Rp. 1.8 trillion out of Rp. 12.3 trillion of total government spending on basic education in 2005. On the other hand, from Rp. 7.5 trillion of government spending on university education, only Rp. 0.28 trillion was designated to the poorest quintile while richest quintile received Rp. 4.3 trillion.

Table 3 School Enrollment and Distribution of Expenditure on Education, by level of education and Income Group, 2005

Income quintile (poorest to richest)	Basic Education			Secondary			University		
	Number of student	% to total	Exp. on Education (billions of Rp)	Number of student	% to total	Exp. on Education (billions of Rp)	Number of student	% to total	Exp. on Education (billions of Rp)
1	9,249,394	23.8	2,932	660,701	10.5	415	143,046	4.0	281
2	8,665,874	22.3	2,747	919,514	14.6	577	203,960	5.7	401
3	8,002,639	20.6	2,537	1,209,106	19.2	759	388,072	10.8	764
4	7,094,276	18.3	2,249	1,569,229	24.9	985	698,118	19.5	1,374
5	5,819,365	15.0	1,845	1,952,835	30.9	1,226	2,152,532	60.0	4,236
Total	38,831,548	100.0	12,310	6,311,385	100.0	3,963	3,585,728	100.0	7,056

Note: Actual data of total number of student and total expenditure on education in each level of education are taken from ministry of education and ministry of finance, respectively. Then, estimated using susenas data, they are distributed into each income quintile.

Source: Susenas 2005, author calculation

Utilizing information in table 3, we may draw the Concentration curve[8] of the distribution of government spending on each level of education. Figure 3 show the Concentration curves of the distribution of expenditure on each level of education compared with the   Lorenz curve[9] of income distribution. The horizontal axis shows accumulated percentage of students, ordered according to student's per capita income, and the vertical axis shows accumulated percentage of government

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[8] Concentration curve provides a means of assessing the degree of income-related inequality in the distribution of a other variable, i.e. health and education. The concentration curve plots the cumulative percentage of the health or education variable (y-axis) against the cumulative percentage of the sample, ranked by living standards, beginning with the poorest, and ending with the richest (x-axis)

[9] The Lorenz curve is a graphical representation of the cumulative distribution function of a probability distribution; it is a graph showing the proportion of the distribution assumed by the bottom y% of the values. It is often used to represent income distribution, where it shows for the bottom x% of households, what percentage y% of the total income they have. The percentage of households is plotted on the x-axis, the percentage of income on the y-axis. It can also be used to show other distribution. In such use, many economists consider it to be a measure of social inequality. It was developed by Max O. Lorenz in 1905 for representing income distribution

expenditure on education. The concentration curve for basic education is above the 45 degree line representing that distribution of expenditure on basic education was in favor of lower-income population. However, distribution of total expenditure on education and of expenditure on secondary education were in favor of higher-income population (both lines are below the diagonal). Moreover, distribution of expenditure on university education not only favored higher-income population, but also showed a level of inequality stronger than the one displayed by the distribution of personal income (the Lorenz curve of expenditure on university is not only below the diagonal line but also below the Lorenz curve of per capita income).

Figure 1. Distribution of Government Expenditure on Education and Distribution of Income, 2005
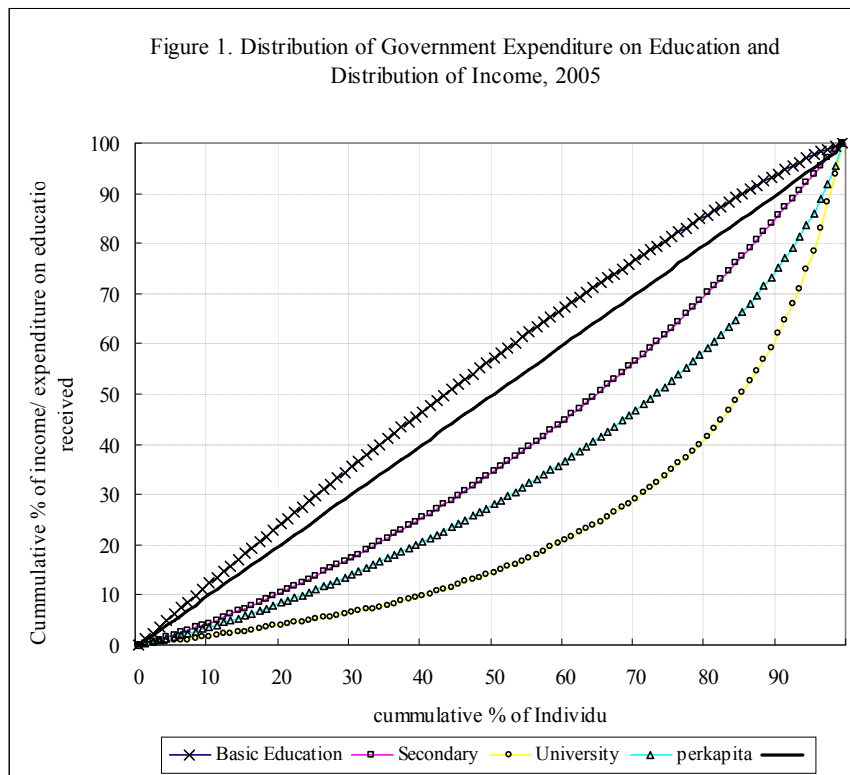
Source : Author's Calculation, estimated using susenas data

7. Analysis on Demand of Education in Indonesia

7.1 Model Specification

The decision of parent to send or not to send their child to school is a proxy of demand for schooling or education. The model estimates that demand for education depends on monthly household income (LogInc), fathers education (FE), mothers education (ME), family size (FE) which

are included as household characteristics. Moreover, individual characteristic includes age (Age) and

gender (Gdr). While scholarship (Sch), school density (Sden) and teacher-student ratio (TSratio) are

community characteristics. The model specification could be written as follows

$$Z_i = \ln\left[\frac{P_i}{1-P_i}\right] = C + \beta_1 LogInc + \beta_2 FE + \beta_3 ME + \beta_3 FamZ +$$
$$\alpha_1 Age + \alpha_2 Gdr + \alpha_3 Sch + \delta_1 Sden + \delta_2 TSratio \tag{11}$$

Where

C	C	Intercept	
HouseHold Characteristics			
β1	LogInc	Log Monthly Household Income	
β2	FE	Father Education	1 to 5
β3	ME	Mother Education	1 to 5
β4	FamZ	Family Size	
Individual Characteristics			
α1	Age	Age	
α2	Gdr	Gender	male = 1, female = 0
α4	Sch	Scholarship	Received scholarship = 1 , not received = 0
Community Characteristics			
γ1	Sden	School Density	1 to 3 (scale)
γ1	Tsratio	Teacher student ratio	1 to 3 (scale)

7.2   Estimation results

Table 4 shows that the probability of being enrolled in elementary school increases as

income increases. Rural areas show higher coefficient than urban areas, implying   higher

effect of income to elementary enrollment in rural areas than urban. Parents education

increases the probability of enrollment. Mothers education, especially in rural areas, is more a

important determinant of elementary school enrollment than fathers education. Family size

has an important impact on enrollment. The larger the number of family member the lower the

probability of enrollment, implying competition of resource.

The probability of being enrolled increases at an increasing rate with age. This is inconsistent with the hypothesis that increasing age corresponds to increasing potential labor income and then children may be withdrawn from school as they grew. Negative sign of gender coefficient shows parental preferences for girls education. Positive sign of scholarship coefficient shows scholarship increases the probability of school enrollment. The impact is stronger in rural than urban areas.

Positive sign of school density indicates higher school availability increases probability of parents decision to send their children to school. It is assumed that the lower the teacher-student ratio the higher the school quality. Negative sign indicate higher school quality increases the probability of enrollment

Table 4 Logistic Regression : Demand for Elementary School

Variable	All			Urban			Rural		
	B	Exp(B)	ΔP_i	B	Exp(B)	ΔP_i	B	Exp(B)	ΔP_i
LnInc	1.23	3.41	0.31	1.23	3.43	0.31	1.26	3.51	0.31
FE	0.25	1.29	0.06	0.23	1.25	0.06	0.26	1.30	0.07
ME	0.29	1.34	0.07	0.21	1.24	0.05	0.34	1.40	0.08
FamZ	-0.15	0.86	-0.04	-0.13	0.87	-0.03	-0.15	0.86	-0.04
Age	0.27	1.32	0.07	0.27	1.31	0.07	0.28	1.32	0.07
Gdr	-0.17	0.84		-0.19	0.83		-0.17	0.84	
Sch	0.62	1.85		0.58	1.78		0.63	1.87	
Sden	0.05	1.05	0.01	0.07 **	1.08	0.02	0.04	1.05	0.01
Tsratio	-0.11	0.89	-0.03	-0.14	0.87	-0.03	-0.10	0.90	-0.03
Location	0.07 **	1.07							
Constant	-6.93	0.00		-6.68	0.00		-7.22	0.00	

Note: Significant at 5 %   ** Significant at 10 %

Table 5 presents the logistic regression of determinant of junior high school enrollment. The probability of being enrolled in Junior high school also increases as income increases. Rural area has higher coefficient than urban. Higher parents education increases the

probability of enrollment. Fathers education, however, in case of junior high school has more important determinant than mothers education. The larger the number of family member the lower the probability of junior high school enrollment.

The probability of being enrolled increases at a decreasing rate with age. This is consistent with the hypothesis that increasing age corresponds to increasing potential labor income and then children may be withdrawn from school as they grew. Negative sign of gender coefficient shows parental preferences for girls education both in all and rural region. This may imply in this age, boys, especially in rural areas, have more potential labor income than girls. Scholarship also has positive coefficient, implying the importance of scholarship for school enrollment.

School density variable has positive significant sign in urban areas, while negative but insignificant coefficient in rural areas. It may be because the transportation cost to school is higher in urban than rural areas. Negative sign of teacher-student ratio indicate higher school quality also increases the probability of enrollment in junior high school level.

Table 6 presents the logistic regression of determinant of senior high school enrollment. The probability of being enrolled in senior high school also increases as income increases. Rural areas also has higher coefficient than urban. Parents education increases the probability of enrollment. Fathers education, same as in case of junior high school, has more important determinant than mothers education. Family size also has an important impact on senior high

school enrollment.

Table 5 Logistic Regression : Demand for Junior High School

Variable	All			Urban			Rural		
	B	Exp(B)	ΔP$_i$	B	Exp(B)	ΔP$_i$	B	Exp(B)	ΔP$_i$
LnInc	1.217	3.376	0.304	0.992	2.696	0.248	1.350	3.858	0.338
FE	0.431	1.539	0.108	0.375	1.454	0.094	0.464	1.590	0.116
ME	0.385	1.470	0.096	0.327	1.387	0.082	0.424	1.528	0.106
FamZ	-0.119	0.888	-0.030	-0.150	0.861	-0.037	-0.110	0.896	-0.028
Age	-0.568	0.567	-0.142	-0.552	0.576	-0.138	-0.575	0.563	-0.144
Gdr	-0.071	0.932		0.061 ***	1.063		-0.113	0.894	
Sch	0.628	1.874		0.619	1.857		0.632	1.882	
Sden	0.002 ***	1.002	0.000	0.045	1.046	0.011	-0.007 ***	0.993	-0.002
Tsratio	-0.027	0.973	-0.007	-0.053	0.948	-0.013	-0.020	0.981	-0.005
Location	0.182	1.200							
Constant	1.455	4.284	0.364	3.037	20.852	0.759	0.621	1.860	0.155

Note: Significant at 5 %   *** variable is not significant

The probability of being enrolled increases at a decreasing rate with age. This is also consistent with the hypothesis. Positive sign of gender coefficient shows parental preferences for boy education. Scholarship also has positive coefficient. Negative sign of teacher-student ratio indicate higher school quality increases the probability of enrollment.

Table 6 Logistic Regression : Demand for Senior High School

Variable	All			Urban			Rural		
	B	Exp(B)	ΔP$_i$	B	Exp(B)	ΔP$_i$	B	Exp(B)	ΔP$_i$
LnInc	0.87	2.38	0.22	0.37	1.44	0.09	1.32	3.76	0.33
FE	0.36	1.44	0.09	0.35	1.42	0.09	0.39	1.47	0.10
ME	0.25	1.28	0.06	0.18	1.20	0.05	0.34	1.40	0.08
FamZ	-0.06	0.94	-0.01	-0.09	0.92	-0.02	-0.05	0.95	-0.01
Age	-0.63	0.53	-0.16	-0.71	0.49	-0.18	-0.60	0.55	-0.15
Gdr	0.09	1.09		0.21	1.23		0.02 ***	1.02	
Sch	0.48	1.62		0.44	1.56		0.51	1.66	
Sden	0.00 ***	1.00	0.00	0.03 ***	1.03	0.01	0.01 ***	1.01	0.00
Tsratio	-0.03	0.98	-0.01	-0.04	0.96	-0.01	-0.01 ***	0.99	0.00
Location	0.26	1.29							
Constant	4.56	95.51	1.14	9.40	#######	2.35	1.01	2.73	0.25

Note: Significant at 5 %   *** variable is not significant

8.Conclusions and Policy Recommendations

8.1 Conclusion

Lower-income quintiles have a larger share of enrollment in basic education, whereas, at higher levels of education, such predominance is true for higher income quintiles. In the most of education level, government spending is regressive, meaning that rich and middle-income groups are the main beneficiaries.

Income, parents education, family size, age, scholarship, and teacher-student ratio have significant influence to demand for education. While gender and school density give varied impact to school enrollment across areas and levels of education. Household income is a very important determinant of school enrollment. It is proved that in all levels of education, the probability of being enrolled in school increases as income increases. Moreover, the probability to be enrolled as income increases is higher in rural areas than urban. In general parents education increases the probability of enrollment. It may reflect the income potential of household and may be also the attitude towards education. Scholarship give significant impact to increase the probability of enrollment in all levels of education. The impact is higher in rural than urban areas. The larger the family size, the lower the probability of enrollment, implying competition of resources. The probability of being enrolled in junior and senior high school increases at a decreasing rate with age. This is consistent with the hypothesis that increasing age corresponds to increasing potential labor income and then children may be withdrawn from school as they grew. However, positive coefficient of age variable in elementary level may imply that parents have not yet considered potential labor income for elementary school age

range. It is assumed that the lower the teacher-student ratio the higher the school quality. Negative sign indicate higher school quality increases the probability of enrollment. In general, but not in all cases, school density has positive sign. It indicates that higher school availability increase the probability of school enrollment.

8.2 Policy Recommendation

Given the size of educational spending in the budget, government should place more emphasis on expenditures for basic education level. A bigger share of disbursements on basic schooling characterizes a pro-poor budget, since it was proved that expenditure on such level of education is in favor of the lower-income share of the population. Moreover, significant positive coefficient of household income and scholarship variables shows the importance of these variables to increase the probability of school enrollment. Therefore, increasing government budget for scholarship is a very important policy to increase school enrollment. It may increase the opportunity of children from low-income household to access schools. Increasing the number of schools and teachers are also a very important policy to increase school enrollment. Increasing number of schools means increasing the accessibility of the schools. Increasing number of educated teachers may increase the quality of education. Finally, government should continue family-planning policy, since it will create a small-prosperous family. Moreover, children from small family has higher probability than children from big family to be sent to school.

References:

Arjun S. Bedi Ashish Garg, "The effectiveness of private versus public schools: the case of Indonesia", Journal of Development Economics, Vol. 61, (2000) 463–494

Cogneau, Denis et, al, "Poverty, Education and Health: The case of Madagascar", Development Center Studies, OECD, 2002.

David W. Hosmer and Lemeshow, Stanley, "Applied Logistic Regression", A Wiley-Interscience

Publication, John Wiley & Sons, Inc, 2000

Davoodi, R Hamid, Tiongson, R Erwin and Asawanuchit, S Sawitree (2003),"How Useful Are Benefit Incidence Analyses of Public Education and Health Spending", IMF Working Paper WP/03/227

Demery, Lionel (2000),"Benefit Incidence: A Practitioner's Guide", Poverty and Social Development Group African Region, The World Bank.

Glick, Peter, Razafindravonona, Jean and Iarivony Randretsa et al. 2000. "Education and Health Services in Madagascar: Utilization Patterns and Demand Determinants." Cornell Food and Nutrition Policy Program Working Paper No. 107. Cornell University, Ithaca, NY

Kenneth Train, "Qualitative Choice Analysis:. Theory, Econometrics, and an Application. to Automobile Demand", The MIT Press. Cambridge, MA. 1986, third printing 1993.

Lanjau Peter, Pradan Menno, Saadah Fadia, Sayed Haneen, Sparrow Robert (2001) "Poverty, Education and Health in Indonesia: Who Benefits from Public Spending?", World Bank, Policy Research Publication No 2739.

Meerman, Jacob (1979),"Public Expenditure in Malaysia, Who Benefits and Why?", World Bank Research Publication, Oxford University Press.

Paul Glewwe and Hanan G. Jacoby, "Economic growth and the demand for education: is there a Wealth effect?", Journal of Development Economics , vol. 74, (2004) 33– 51.

Pindyck, Robert S. and Daniel L. Rubinfeld (1991), "Econometric Models & Economic Forecasts", Third Edition, McGraw-Hill, United State of America.

Sabir, Muhammad (2003),"Benefit Incidence Analysis of Public Spending on Education," NIPA Karachi Vol-8 No 3, pp. 49-67.

Selowsky, Marcelo (1979),"Who Benefits From Government Expenditure? A Case Study of Colombia", World Bank Research Publication, Oxford University Press.