

Minimum Service Delivery Standards for Decentralized Education Functions: Fiscal Needs, Financing Options, and Policy Implications

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Summary: This paper develops and implements a simple model for estimating local government physical infrastructure and fiscal requirements associated with attaining minimum participation standards in education. The initial empirical evidence suggests that an increase in physical capital of just over 15 percent might be required to meet the minimum participation rate of 80 percent for primary, junior secondary, and senior secondary levels of education. In addition, the results indicate that kabupaten/kota might also need to increase routine education expenditure by about 5.5 trillion rupiah per year in order to reach the desired level of participation; this level of spending implies a rise of nearly 20 percent over current amounts. It is important to stress that these estimates reflect fiscal implications associated with increasing access to education only. Estimates produced elsewhere suggest that needed enhancements to the quality of education would require significantly more resources—perhaps on the order of an additional 10 trillion rupiah annually (for just primary and junior secondary levels).

Obviously, attaining quantity and quality standards in the local education sector would not be inexpensive. While it is premature to make a definitive judgment regarding the affordability of minimum standards in education, and more generally, if fiscal requirements for other sectors are anything like those estimated here for education then securing needed finance across all obligatory functions will prove more than a little difficult.

Categorical grants probably offer the most feasible means for financing standards in education. Most analysts argue that such specific-purpose transfers are, from a technical point of view, the most suitable instruments for supporting central government objectives regarding the achievement of minimum standards. Obtaining the necessary funding would be hard but if MoNE were willing to exchange its significant regional DIPs for a new DAK, then the chances of acquiring at least a portion of the needed finance would increase. A resolution to the issue of financing minimum standards in education depends, therefore, very much on what MoNE itself is willing to do.

The possibilities of financing new categorical grants to support minimum standards in other sectors through DIP-DAK swaps requires further examination. In any case, a decision one way or the other on the question of creating and funding new sectoral categorical grants does not absolve MoF of its responsibility to provide regions with greater access to and control over important local tax bases, such as that for property. Such funds would prove invaluable in financing more and/or better local public services—in education and other in sectors.

If securing finance for the full array of minimum standards proves as problematic as it seems, then only two options present themselves regarding the further development, use, and financing of standards. The first option involves a series of three possible actions: reduce the number of minimum standards within sectors, focusing only on those of highest priority; (2) lower the levels at which “minimum” standards are fixed; and (3) prioritize some subset of obligatory functions for immediate action. A fewer number of standards, set at lower levels, for a more limited range of obligatory functions would be relatively more affordable, all things considered.

If achieving some realistic combination of these three actions proves impossible, then only a second option remains. This alternative posits that minimum standards function simply as general guidelines or targets for national and regional governments to employ in the context of planning, monitoring, and evaluation. Employing minimum standards in this fashion may prove very constructive, of course, if taken seriously but this seems not to be what many actors involved in the standard-setting process have in mind. Some of these participants have

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suggested a third possible option: order the achievement of minimum standards without regard to questions of the availability of finance. Experience from many countries around the world, however, suggests that unfunded minimum standards in Indonesia would either end up as de facto targets or that they would be used by the center to control and manipulate local governments. The former result reduces to option two above, arrived at via another route; the latter outcome would certainly be contrary to the government's stated goals of decentralization and needs to be aggressively avoided.

1. Introduction and Background

Starting in fiscal year 2001, in the context of the Indonesia's new fiscal decentralization program, sub-national governments assumed major new expenditure responsibilities. Substantial functions for provinces have been specifically enumerated in law and regulation.¹ Local government (kabupaten/kota) service responsibilities have been only rather vaguely defined via a "negative list"; that is, kabupaten and kota have essentially become responsible for all public services that the central and provincial governments are not explicitly charged with delivering.

At the same time, the decentralization legislation highlighted eleven important areas of local government service responsibility: public works, health, education and culture, agriculture, communications, industry and trade, capital investment, environment, land, cooperatives, and labor. This list comprises the so-called "obligatory authorities" of kabupaten/kota governments. As is clear, (most of) the items on this list are perhaps more analogous to "sectors" than they are "functions" per se. The exact functions for which kabupaten/kota have become responsible, within those obligatory sectors, have so far been left ambiguous.

Now, the Ministry of Home Affairs (MoHA), technical ministries, and regional governments in Indonesia are collectively engaged in an effort to further specify and clarify expenditure assignments across levels of government. In addition to making expenditure responsibilities more precise and clear, these agencies have begun identifying explicit minimum service standards associated with obligatory responsibilities. That is, the government is setting standards at which compulsory sub-national public services should be delivered.

The exact uses to which minimum standards of service delivery are to be put is still being debated inside the government. Some central officials would prefer that such standards serve simply as guidelines or targets for national and/or regional governments to use in planning, monitoring, and evaluation. Others argue that standards should function as mandates, that is, that the central government should hold the regions officially responsible for achieving minimum service delivery standards, presumably within some relatively short period of time.

In the course of developing minimum standards, questions regarding their impact on regional fiscal needs inevitably arise. The presumption by most observers in Indonesia seems to be that setting minimum standards would necessarily increase regional fiscal requirements. This need not automatically be the case, however. If regional governments could increase the efficiency with which they make expenditures then downward pressure would be placed on fiscal needs associated with service delivery at specified standards, all other things remaining equal. If regional governments were able to improve expenditure efficiency sufficiently, then

¹ See Law 22 of 1999 regarding Regional Government Administration and Government Regulation 25 of 2000 regarding Central Government Authorities and Autonomous Provincial Government Authorities.

fiscal requirements might not increase along with efforts to attain minimum standards. Questions regarding the improvement of sub-national government expenditure efficiency have not received much attention in Indonesia.

In any case, the extent to which fiscal resources are actually made available to cover any increase in fiscal requirements is a separate question. The targets approach to standards, for example, may not require explicit financing at all. But if standards were to be officially mandated, then it is reasonable to expect that the central government should at least be held responsible for assuring that sufficient financial resources are available to the regions to meet required minimum levels of service delivery.

Many central officials, especially those in MoHA and the technical ministries, appear to argue for the mandates approach and stress that sub-national revenues will have to be augmented in order to finance service delivery standards. Regional officials have also advocated the need for greater resources to attain officially sanctioned minimum standards. Interestingly, these officials have not made the case for increased regional own-source revenues to help meet the presumed increase in fiscal needs associated with meeting minimum standards but have targeted intergovernmental transfers as the preferred source for increased funds.

Ministry of Finance (MoF) officials have for the most part been silent on the issue of the appropriate uses of minimum standards. But MoF bureaucrats are clearly concerned that additional transfers to the regions might have negative and severe consequences for the national budget and the macro-economy and officials have tended to argue against increases in intergovernmental assistance. On the other hand, MoF has not demonstrated much interest in awarding regions with additional own-source revenues either.

Given a lack of real possibilities for increased own-source revenues, a focus on intergovernmental transfers as the primary means to finance any increase in fiscal requirements is not illogical. If fiscal transfers were to play some role in financing minimum standards, which mechanisms might be most appropriate? There are presently three sources of intergovernmental finance available to regional governments in Indonesia to be considered in this regard: natural resource (and other types of) revenue sharing, a general-purpose grant (Dana Alokasi Umum—DAU), and a specific-purpose transfer (Dana Alokasi Khusus—DAK).²

Natural resource and most other revenue sharing allocations are based on fixed shares of national revenues and distributions are highly concentrated in a relatively few number of sub-national governments. As such, these revenues would not be suitable as a means of financing standards across all kabupaten/kota.

The DAU, on the other hand, is a formula-based grant and is designed to equalize fiscal capacities of regional governments to deliver public services with which they have been charged.³ Allocations are based on the fiscal gap, that is, on the difference between fiscal needs and fiscal capacities of regional governments. As such, these transfers would appear to

² See Lewis (2003a) for a description and analysis of the full range of intergovernmental transfers under fiscal decentralization.

³ See Lewis (2001) for an evaluation of the equalization performance of the DAU during the first year of operations.

at least be a feasible source of finance to help sub-national units cover routine fiscal needs associated with meeting minimum standards of service delivery.

The DAK is a capital grant and could, in theory, be employed to finance regional capital expenditures linked to the achievement of minimum standards. An obvious drawback to the use of the DAK in this manner concerns needed counterpart routine funds. Supposing that the DAK were used to finance the construction of infrastructure that is adequate (in size, scope, and quality) to deliver services at minimum standards, without access to augmented routine funds, services could not, in the event, be delivered at such levels. Another important constraint concerns the limited amount of funding that has, until now, been channeled through the DAK. Such amounts have been rather trivial, on the order of between two and three trillion Rupiah, annually. This level of funding would presumably not go very far in supporting capital needs associated with minimum standards across all obligatory functions.

Of course regions with sufficient fiscal capacity might also borrow to finance capital needs associated with minimum standards.⁴ A possible constraint in this regard is that current legislation in Indonesia allows regions to borrow only for cost recovery projects. While a precise definition of “cost recovery projects” has not yet been explicitly made, it appears that most central government officials would place education, health, and poverty reduction projects outside this category. The first two are sectors in which some of the leading kabupaten/kota obligatory functions are to be found.

Many observers and analysts in Indonesia have argued for the creation of new categorical grants, designed with a view to assisting regional governments to meet minimum standards in obligatory sectors. Proposals for creating new DAK-like grants (but designed to cover both routine and capital expenditures) for this purpose appear to have the strong support of MoHA and at least some technical agencies, for example. This has not been a particularly popular idea with MoF officials, however, because of the combination of current, already rather sizeable intergovernmental transfers and continuing pressures on the state budget.

The paper has three main objectives. The first purpose is to estimate the physical capital and routine fiscal implications of adopting (some) minimum standards in the education sector. The second goal is to review the possible means of financing minimum standards in education and evaluate the suitability of those mechanisms. The final objective is to draw some general conclusions about the proper development, uses, and financing of minimum standards in all obligatory sectors based on the analysis of the local education sector.

The rest of the paper is organized as follows. First, minimum standards in education are described and those selected for use in this study are highlighted. Second, the empirical model used as a basis for determining physical and fiscal resource requirements based on minimum service delivery standards is specified and estimated; estimates of needed resources are produced and discussed. Third, the various available means of financing minimum standards are considered and appraised. Finally, the paper closes with a summary of the main points and draws some conclusions important for the continuing development of central government policy related to minimum service delivery standards.

⁴ See Lewis (2003b) for an examination of local government borrowing and repayment over the past 25 years.

2. Minimum Standards in Education

As noted above, the government has begun preparing minimum standards of service delivery for the obligatory functions of sub-national governments. This is being carried out in the context of the MoHA-led effort usually referred to as the “model building exercise”. In addition to MoHA, major technical ministries and sub-national governments are also participating in the standard setting exercise.

Minimum service delivery standards across all relevant sectors are at varying stages of development. Those for education (along with those for health, perhaps) are at an advanced state of readiness, at least from the government team’s point of view, and have become something of a model for other sectors. Development of minimum standards all sectors is on-going.

Minimum standards developed in the context of MoHA’s model building exercise for the local education sector are organized by level of schooling: primary, junior secondary, and senior secondary. There are eighteen minimum standards listed in each of those three levels. Standards include those related to participation rates, student drop out rates, percentage of students passing on to next level of schooling, percentage of students succeeding in standardized examinations, final level of education attained by students, number of qualified teachers, quantity and suitability of physical infrastructure and other inputs (e.g. books), and appropriateness of school management systems, among others. The sheer number of standards is striking, as is the lack of prioritization among standards.

In general terms, standards can be categorized as input or output (or outcome) standards; and the latter can be classified as either related to the quantity or the quality of output. Some of standards listed above for education are input standards (the supply of books and teachers, infrastructure) and some are output standards (participation, passing to next level of school, successful examination, final level of education attained). Some of the output standards relate to quantity of education services delivered (e.g. participation) and others relate to quality of education (e.g. success rates on standard examinations); it appears that still other, unspecified quality standards are proxied indirectly by some of the input standards (adequately trained teachers, satisfactory books, appropriate school administration), although this has not been made explicit.

It is worth noting that the Ministry of National Education (MoNE) has developed a different set of standards, as well, in the context of its “education for all” (EFA) program. Standards for the latter focus on providing an “adequate” education for all school-aged children by the year 2008. The standards developed in this program are basically output (or outcome) standards and are of three types: access, quality, and equity. Access standards are essentially quantity standards as defined above and equity standards might be considered as quality standards according to the definitions employed here.

There is at least some inconsistency between the minimum standards developed in the context of the government’s model building exercise and the EFA standards. The inconsistency relates to coverage of standards (i.e. primary, junior secondary, and senior secondary under minimum standards and primary and junior secondary under EFA), the particular standards considered (an apparent operational focus on quantity or access under minimum standards and an explicit consideration of both quantity/access and quality

improvements under EFA), as well as to the levels at which standards are set, where standards are common to both programs (e.g. 80 percent participation rates under minimum standards versus 100 percent participation rates under EFA). The reasons for the lack of consistency are not clear.

The empirical study here concentrates on minimum standards related to levels of participation and physical infrastructure (as developed by the MoHA-led team). The standards examined in this paper therefore refer to increases in service “quantity” or “access” as opposed to improvements in “quality” or “equity”. The main reason for focusing on these quantity standards is availability of data. The approach developed below could plausibly be extended to include other types of standards, either those enumerated above or different ones, if and when data on relevant operational measures become available.

Minimum participation standards are operationalized in this study through use of the participation rate. The participation rate is defined as the percentage of all appropriately aged children that are actually attending school.⁵ According to official figures, as of fiscal year 2002, participation rates in primary, junior secondary, and senior secondary school were: 83.6, 72.9, and 45.6 percent, respectively.⁶ The overall school participation rate is 66.4 percent. Minimum participation rates for the three categories of school have been stated by the government team charged with developing the standards. Those minimum standards are 90, 80, and 60 percent for the three levels, respectively. The weighted average (i.e. the average of the various specified rates weighted by the relevant number of school aged children) of the stated minimum participation rates is approximately 80 percent. The latter figure is used as the minimum participation standard in this analysis.⁷

Minimum infrastructure standards have been defined by the government in a somewhat more vague manner. Official documents note that 90 percent of infrastructure in education should be “suitable”. Suitability is defined as a function of the ratio of infrastructure devoted to learning relative to total educational infrastructure, without further specificity.

The measure employed in this study for the minimum standard of physical capital in education is based on the number of primary school classrooms in kabupaten/kota.⁸ There is no information on the number of classrooms for junior secondary and senior secondary schools. The number of classrooms in primary education is used as a proxy for physical

⁵ The participation rates used in this study are the “pure” (*murni*) participation rates, as defined by the Ministry of National Education (MoNE). The pure rate is equal to the number of children in the relevant age category that are attending the appropriate level of school divided by the total number of children in the age category. The official age groups for primary, junior secondary, and senior secondary school in Indonesia are seven to twelve years, thirteen to fifteen years, and sixteen to eighteen years, respectively. MoNE also defines “crude” (*kasar*) participation rates. The crude rate is equal to the total number children attending a particular level of school divided by the number of children in the relevant age category for that level of school.

⁶ All data on school-aged children, school-aged children attending school, and participation rates are from Badan Pusat Statistik (BPS) for year 2002.

⁷ Of course the fact that a local government attains an 80 percent overall participation rate does not necessarily mean that it has reached the minimum standard set in each of the three levels of schooling. It just means that the local government has, on average, reached the minimum participation rate. The 80 percent figure is used as a proxy for minimum participation standards across all education levels in order to keep the analysis relatively simple.

⁸ The data on number of classrooms are based on a census carried out by MoNE’s regional deconcentrated offices in the year 2000.

capital in the local education sector and is operationalized via the construction of an index.⁹ The index for physical capital assets in education is defined by the following.

$$\text{Caped}_i = \left(\frac{\text{Class}_{\text{Max}} - \text{Class}_i}{\text{Class}_{\text{Max}}} \right) * 100 \quad (1)$$

where Caped_i is the capital index for kabupaten/kota i , $\text{Class}_{\text{Max}}$ is the maximum number of classrooms across all kabupaten/kota, and Class_i is the number of classrooms in kabupaten/kota i .

The paper uses capital assets in education per school aged child as the relevant variable on which minimum standards are set. The minimum value for capital assets in education per school aged child is defined as the amount of infrastructure required to attain an 80 percent (i.e. the minimum standard) participation rate. It is derived just below.

3. An Empirical Model for Estimating Physical and Fiscal Requirements

This section of the paper begins by specifying and estimating the empirical model used to determine local government education expenditure requirements associated with minimum standards¹⁰. Second, estimates of actual education expenditure and required expenditure needed to meet minimum standards are produced.¹¹ The section closes with a brief discussion of the results.

Specification and Estimation of Model

The empirical model used in the estimation of physical capital and routine fiscal resources required to meet minimum standards is given by the following two equation system.

$$y_{1i} = \beta_1' x_i + \varepsilon_{1i} \quad (2)$$

$$y_{2i} = \alpha' y_{1i} + \beta_2' x_i + \varepsilon_{2i} \quad (3)$$

where y_1 and y_2 are endogenously determined variables representing local government physical infrastructure in education and routine education expenditure, respectively; x is a vector of explanatory variables; α , β_1 , and β_2 are coefficients to be estimated; and ε_1 and ε_2

⁹ While the physical size of schools varies significantly across kabupaten/kota, the size of a classroom appears to be somewhat standardized. The standardization of classroom size allows the number of classrooms to be more meaningfully compared across places than would otherwise be the case.

¹⁰ Local governments are not the only source of finance for local education. The central government also makes expenditures on local education (although it should not be, according to the fiscal decentralization legislation) as do parents. There are no nation-wide data on these types of education expenditures at the local level. As such, the paper is forced to abstract from questions related to these kinds of local education expenditures.

¹¹ Regional government expenditures have traditionally been divided into routine and development budget categories. Development expenditures include but are not limited to capital expenditures. The quantitative significance of capital expenditures in development budgets is not known. Regional public capital expenditures are assumed by many to have been very limited since fiscal decentralization started in 2001. This paper abstracts from questions regarding the extent of capital expenditure in development budgets and treats routine and development expenditures as the same.

are the standard error terms. Endogenous and exogenous variables in the model comprising equations (2) and (3) are discussed in more detail next.

The variable y_1 is the local government capital asset index per school aged child and y_2 is total local government expenditure on education sector activities per school aged child. The exogenous variables in x comprise the school participation rate, total local government revenue per capita, gross regional domestic product per capita, the percentage of the population falling below the poverty line, cost of living index, (physical) area, population density, a dummy variable that indicates whether the local government is a kota (=1) or a kabupaten (=0) and a dummy that denotes whether the kabupaten/kota is on Java-Bali (=1) or off Java-Bali (=0).¹² All variables used in the empirical analysis here are listed and defined in Table 1 below.

Equation (2) posits that the level of infrastructure per school aged child is a function of the school participation rate, among other variables. The assumption is that as the participation rate increases, the amount of education capital assets required per child also increases, all other things remaining equal. And equation (3) asserts that routine expenditure per school aged child is a function of the participation rate and the level of infrastructure, along with other variables. It is assumed that as the participation rate increases, per child education expenditure also increases, because of a rise in the required number of teachers, teaching materials, and other inputs, for example. In addition, it is assumed that as the level of capital infrastructure per child increases, per child expenditure in education also rises, as a function of increased operations and maintenance costs, inter alia. Both equations control for local government revenues, gross regional product, poverty, cost of living, area, density, local government location, and local government type.

Note that the system described in equations (2) and (3) is triangular or recursive. As such, each equation in the system can be consistently estimated separately. Under typical conditions, each equation would be estimated by ordinary least squares (OLS). Although equation (2) can be estimated by OLS, equation (3) cannot be so estimated, as will be further discussed below.

Data are available on all variables in equation (2) for all local governments and so the equation may be estimated by OLS, as noted just above. Regression results are presented in Table 2 below. The table shows the estimated coefficient for each of the independent variables, together with the associated t value, and an indication of the coefficient's significance. At the bottom of the table, the adjusted R^2 , log likelihood test statistic, and the significance of the test statistic are provided.

As the table shows, the participation rate is a significant and positive determinant of physical capital in the education sector, as expected. Local government revenues, jurisdiction area and density, and urban status are also significant explanators the level of capital assets in education. The direction and magnitude of the influence of these latter variables can be seen in the table but these matters are not further discussed here.

The estimated model in equation (2) together with an assumed value of 80 for the participation rate and actual values for all other variables can be used to determine required

¹² Participation rate data are from BPS, as already noted; all other data are from MoF and are for the year 2001.

levels of physical infrastructure per school aged child associated with minimum participation standards in each kabupaten/kota; the relevant variable is named $Capchldmin_i$. The latter can be used to estimate aggregate minimum physical capital requirements in the education sector. It can also be employed to help estimate routine fiscal resources needed by kabupaten/kota to meet minimum standards. Both these questions will be taken up below.

Data on the dependent variable in equation (3) are only available on a sample of kabupaten/kota for the year 2001. It is typical that not all kabupaten/kota submit budgets to the central government that include a sectoral breakdown of expenditures; for 2001, only 283 out of 366 kabupaten/kota submitted expenditure budgets broken down by major sector. Obviously, the sample of places that submitted budgets in the desired manner may not be considered a random sample of local governments. As such, equation (3) cannot be estimated in a consistent and unbiased manner by OLS.

But the equation can be estimated by sample selection regression techniques. Sample selection methods provide the needed adjustments to the specification and estimation of models that employ non-randomly drawn samples¹³. A typical sample selection model comprises a selection equation and selected equation(s). The selection equation in the present model is given by:

$$z_i = \gamma' x_i + u_i \quad (4)$$

where z is a binary choice variable that designates whether 2001 education expenditure data are available for the particular kabupaten/kota ($=1$) or not ($=0$), x is the same vector of exogenous explanatory variables as above, γ are parameters to be estimated, and μ is the error term.

Equations (4) and (3) together comprise the sample selection model where the former is the selection mechanism and the latter is the selected equation. The model assumes that the error terms, and μ and ε_2 , have a bivariate normal distribution, both with mean zero, standard deviations of one and σ_{ε} , respectively, and correlation ρ .

Consistent estimation of the parameters in equations (4) and (3) can be based on a two-step procedure due to Heckman (1979). First, the selection mechanism is estimated via probit methods to obtain estimates of γ . The latter are then used to compute $\hat{\lambda}_i = \phi(\hat{\gamma}' x_i) / \Phi(\hat{\gamma}' x_i)$ where ϕ and Φ are the standard normal probability density and cumulative distribution functions, respectively and x are the exogenous variables in the selection equation¹⁴. Second, the selected equation is estimated by least squares regression of the dependent variable on the independent variables and $\hat{\lambda}$. This procedure produces consistent estimates of the parameters.

The regression results for the sample selection model are provided in Table 3. The table is broken down into two panels. The first panel presents the results of the probit estimation of the selection mechanism (equation 4) and the second panel provides the details of the two-stage least squares estimation of the selected equation (equation 3). For the explanatory

¹³ See Greene (2000) for an in-depth discussion of a range of sample selection models. For applications to Indonesia see Lewis (2003b) and Lewis (2003d).

¹⁴ As noted in the text, in the present case, a common set of exogenous variables is used in the selection and selected equations. This creates no problems for the consistent estimation of the coefficients.

variables in each equation, information on the estimated coefficient, the associated t value, and an indication of the statistical significance of the estimated coefficient is provided. In addition, for each of the regressions, the likelihood ratio test statistic (L-Ratio TS) is given and its level of significance is shown.

Panel A demonstrates that kabupaten/kota in the sample have significantly worse participation rates, lower per capita revenues, and higher levels of per capita gross regional domestic product than do local governments that are not in the sample. Among other things, these results illustrate the potential for selection bias when using non-random samples.

Panel B demonstrates that the participation rate is a positive and significant explainer of local government routine education expenditures per school aged child, as expected. Note, however, that the level of physical infrastructure does not appear to be significant in the determination of education expenditures. This result is most likely a function of strong association (i.e. multicollinearity) between physical infrastructure and some of the other independent variables, as demonstrated in the OLS regression above. Other variables that are of apparent importance in explaining variation in local government education expenditure include local government revenues, gross regional domestic product, poverty, cost of living, area, and urban status. Again the sign and magnitude of the estimated influence can be seen in the table but these results are not discussed further here. Finally, the table demonstrates the significance of lambda, the variable constructed as part of the two stage procedure described above; this demonstrates the importance of correcting for selection bias associated with using non-random samples. The results of the sample selection regression will be used below in the estimation of routine fiscal needs associated with specified standards.

Estimation of Physical Capital and Routine Fiscal Requirements

Physical capital in education is proxied by the index of capital assets (Caped) defined at the outset of the paper and by the index value per school aged child (Capchld), as described above. The index value and its per school aged child counterpart are known for all kabupaten/kota in the country. As a result, per child short-falls in physical capital from minimum standard amounts, (Capchldmin) as derived above, can be calculated for those places with a capital deficit. That is:

$$CSFchld_j = Capchld_{min_j} - Capchld_j \quad (5)$$

where CSFchld is the per child shortfall in education capital and the subscript j refers to those kabupaten/kota with an infrastructure deficit, that is, those places for which $Capchld_{min} > Capchld$.

A sum of per child capital shortfalls times the number of school aged children across relevant places, j, gives an estimate of incremental physical capital requirements in the sector to meet minimum standards. In equation form:

$$ICR = \sum_j (CSFchld_j * Chld_j) \quad (6)$$

where ICR is the total incremental capital requirement and Chld is the number of school-aged children.

ICR plus the sum of all current index values across all places equals total estimated requirements for physical capital associated with the minimum participation rate. That is:

$$TCR = ICR + \sum_i \text{Caped}_i \quad (7)$$

where TCR is the total capital requirement.

It might be useful to stress the point that minimum levels of capital cannot be subtracted from surpluses of physical capital in education (that is, surpluses relative to minimum amounts) to generate capital “savings”. Existing capital infrastructure is fixed, of course, and cannot be destroyed in surplus regions and reallocated to deficit regions, for example.

Derived physical capital implications are provided in Table 4. As the table shows, physical capital requirements in education under minimum standards increase by 16.3 percent over the present levels. It is not possible to value the capital requirements in monetary terms.¹⁵ Nevertheless, it is clear that the amount of money required to increase local education capital stock by this amount would not be insignificant.

Predicted values of the dependent variable in estimated equation (3) can be used to estimate current expenditure on education per school aged child for all kabupaten/kota. A sum of the latter times the number of school-aged children across all places provides an estimate of aggregate education expenditure for local governments in 2001. Equation (3) can also be used to estimate the per child routine fiscal needs associated with minimum standards for all kabupaten/kota. Derived values of the dependent variable in equation (3) that employ the maximum of minimum standard and existing values for both participation and capital assets and existing values for all other variables for all kabupaten/kota provide such “counterfactual” estimates. The sum of those values times the number school-aged children across all places provides an estimate of total requirements associated with minimum standards for 2001.

A review of the main outcomes of the analysis with regard to routine fiscal needs as described above appears in Table 5 below. The table summarizes the data on current and minimum standard participation rates in education. In addition, the table provides estimated actual education expenditures in 2001 and estimated minimum requirements for the same year. Finally, the table supplies information on total local government expenditures for 2001(actual) and estimated requirements based on minimum standards of service delivery in education.

The costs associated with reaching minimum participation and infrastructure standards in education are not inconsequential. As the table shows, kabupaten/kota fiscal needs in education increase from an estimated actual of Rp 28.5 trillion to Rp 33.9 trillion under the assumption of minimum service delivery standards. This represents an annual increase of Rp

¹⁵ Recall that kabupaten/kota physical capital in education is proxied by an index that is based on the number of primary school classrooms. There are no readily available data on the cost of constructing primary school classrooms and, moreover, no data at all on the monetary value of a broader range of education capital assets at the kabupaten/kota level.

5.4 trillion Rupiah or 19.0 percent over current levels. Total APBD expenditure budget needs rise from Rp 70.1 trillion to Rp 75.5 trillion, an increase of 7.7 percent.

Discussion

How plausible are the above estimates of minimum standard expenditure requirements in education? There are no independent estimates of physical capital resources required to meet specified standards in education and so the estimates provided above must be taken at face value. However, other empirical work has recently been carried out for MoNE on routine expenditure requirements related to the implementation of the Ministry's EFA program described briefly above. The estimates produced in that work can be used as a basis for comparison.¹⁶

The most recent MoNE study estimates costs associated with increasing participation rates to 100 percent by 2008 for primary and junior secondary students only. The study argues that increasing participation of primary students at the margin is costless and, in fact, might even generate some savings as the number of potential primary students decreases as a function of declining fertility. The analysis estimates that increasing the participation of junior school students to 80 percent (along the way to full participation) might cost kabupaten/kota an additional 3.5 trillion rupiah (valued at 2003 prices) annually.

These estimates are not directly comparable to those produced in this paper. As noted, the study did not consider increasing participation among senior primary school students, a group that is comparable in size to junior secondary students (and one for which the difference between initial and minimum participation levels is relatively greater)¹⁷. Still, all things considered, the results of the more bottom-up approach to costing applied in the MoNE study would appear to lend support for the plausibility of the estimates provided in this paper.

One qualification to the results obtained in this study relates to the issue of quality of education. As noted, the estimated requirements here are based on minimum standards related to increasing the quantity of education services delivered. The estimates do not explicitly consider needed improvements to the quality of education as indicated by the minimum standards developed in the model building exercise. Such enhancements may be accounted for indirectly if increasing access to education and infrastructure levels are empirically associated with better quality education services in the 2001 data employed here. But this cannot be tested directly without additional data.

In any case, such an implicit consideration of quality improvements would not likely incorporate all envisioned advancements in this regard. And so the questions remains: how much might it cost to improve the quality of local education to minimum standards? The MoNE study provides some useful information in this regard. That examination estimates that quality improvements to both primary and junior secondary might cost local governments an additional 10 trillion rupiah per year (in 2003 prices), on average, between 2003 and 2014. (The costs of improving the quality of education at the senior secondary level have not yet been estimated.)

¹⁶ See McMahon et. al. (2001) and McMahon (2003).

¹⁷ The MoNE study also apparently uses different data on initial participation rates. Rates used in the MoNE study are higher, in general, than those provided by BPS and employed in the analysis in this paper.

A second qualification to empirical results obtained here relates to the question of expenditure efficiency. The examination in this paper has been based on actual physical capital and actual local government expenditures in kabupaten/kota. These data represent current local government expenditure behavior and performance in the education sector. As such, they do not explicitly account for desirable and achievable increases in technical efficiency, for example. If efficiency could be improved, then less money would be needed to meet standards, all other things remaining the same.

Interestingly, the empirical results derived here do, however, implicitly recognize some increases in technical efficiency as participation rates rise. Given a current school participation rate of 66 percent, kabupaten/kota spend about Rp 765 thousands per pupil, on average; under the minimum participation standards, whereby a minimum of 80 percent of school aged children are attending school, average per pupil expenditure decreases to around Rp 750 thousands. Whether further increases in expenditure efficiency could be realized is a question that cannot be answered here.

Finally, estimated growth in total APBD expenditure requirements based on presumed increases in fiscal needs in education does not consider potentially needed and possible shifts in budget allocations from other sectors to education. To the extent that gains in efficiency via shifts in budget allocations could be reaped, then fiscal resources required to meet minimum standards would be less than the estimates of such provided above, *ceteris paribus*.

The degree to which the MoNE studies considered questions related to improving expenditure efficiency is not known. While some of the cost analysis is based on “best practice” schools, issues related to expenditure efficiency are not explicitly addressed. This is clearly an area in which more research is needed.

4. Financing Mechanisms to Support Minimum Standards

As suggested at the outset of this paper, there appear to be three potential sources of finance that could be used to support the achievement of minimum standards: DAU, DAK (or categorical grants, more generally), and own-source revenues. As a source of finance, the DAU has several advantages. First, the grant channel already exists. Second, minimum levels of funding are guaranteed in law and increases to the minimum levels would not require a change of law. Third, DAU allocations are based on the notion of the fiscal gap—the difference between fiscal needs and fiscal capacity. As such, it offers a framework within which the estimation of fiscal needs associated with minimum standards, in general, could be operationalized. Fourth, there is already a plan in place inside MoF to “sectoralize” the estimation of fiscal needs in the DAU; the “sectoralization” focuses on dividing fiscal needs estimation into several of the most important categories of expenditure: education, health, infrastructure services, etc. The implementation of this plan would facilitate the estimation of fiscal needs in education.

There are at least three important downsides to the DAU as a source of finance to assist in achievement of minimum standards in education. First, although there are no legal roadblocks to increasing the DAU there are severe budget constraints to doing so. It is unlikely that MoF would, in the near term, back significant increases to the DAU pool of finance, which would directly decrease national revenues available to the center. Second, while it may be possible

to estimate fiscal needs based on minimum standards in the context of the fiscal gap method, there are practical constraints to consider; the lack of data on a wide range of standards and the technical complexity of the estimation procedures are most important in this regard. Third, even if the DAU pool of finance could be increased in order to fund increased education expenditures associated with minimum standards, there is no guarantee that enhanced DAU block allocations, would, in the event, be spent to help meet those standards. These constraints probably make DAU an unlikely source of finance to promote the realization of minimum standards.

Categorical or specific grants, such as the DAK, have at least two important positive attributes with regard to supporting minimum standards. First, because money can be tied—that is, provided for specific tasks—categorical grants are well equipped for getting sub-national units to spend money on particular central government sectoral or functional objectives. Such grants, either with or without matching components, are typically promoted by economists and as the preferred means of transferring money to lower level governments in order to support the achievement of nationally mandated minimum standards. Second, the design and implementation of a categorical grant to fund the routine fiscal (and perhaps capital) needs in support of minimum standards in education could benefit greatly from the significant sector and project-level expertise that exists in MoNE. The greater level of relevant knowledge related to local public education would presumably lead to better outcomes than might be the case if the grant were organized and run by a institution with broader (albeit still important) concerns like MoF.

But there are problems with this approach as well. First, such a grant does not presently exist and would have to be created from scratch. The creation and operationalization of a new intergovernmental grant is not something that can be done quickly; it might take a couple of years to operationalize, even after agreement on its establishment were reached. Second, and perhaps most importantly, it is not at all clear that sufficient fiscal resources could be raised to fund such an instrument. This is essentially the same question regarding resource constraints raised above with regard to the DAU.

In the case of a new categorical grant, however, there is at least some reason for optimism that the financial constraint might be overcome. That is, if MoNE could be persuaded to reduce or relinquish entirely their rather sizable regional DIPs, as in fact required by law, then that money could be turned into categorical grant funds. Such a swap would not directly draw down on the revenue side of the state budget and thus might be more acceptable to many MoF officials; indeed a plan to do just this was designed by MoF in the run up to the start of decentralization in 2001. An important obstacle to this strategy is that MoNE appears (as most technical ministries similarly seem) to prefer DIPs over DAK-like instruments. This is largely because they have more control over funds associated with former than they would have over funds related to the latter. Unlike DIPs, any categorical grant finance would be deposited directly into local budgets and controlled to a large extent by local authorities.

A final pool of funds that might be used to finance minimum standards is the own-source revenues of local governments. Currently kabupaten/kota own-source revenues are minimal; they make up only around 10 percent of local revenue budgets. Enhancing local revenues would clearly be welcome from a variety of points of view. Increasing local own-source revenues would be best accomplished by awarding local governments with rate control over

some significant local tax base, such as that for property¹⁸. Eventually, more of the administration of the property tax could also be turned over to local governments.

There are at least four positive features related to decentralizing the property tax in the current context. First, doing so would not significantly deplete central tax revenues since the vast bulk of associated funds (91 percent—the remaining nine percent is used to support collections in the field) are already transferred to sub-national governments anyway; as such, the action should not be opposed by those in charge of state budget matters inside the MoF. Second, local governments, given their proximity, better knowledge about the property tax base, and perhaps greater motivation, might be expected to generate greater amounts of property tax revenue relative to those that have been produced by the central government. Third, providing local governments with a decent source of marginal revenues via the property tax would assist local officials themselves in discerning and responding to changing local preferences regarding the desired amount and/or quality (i.e. standards) of various public services, thereby enhancing efficiency in the process. Fourth, residents would be more apt to attempt to hold local governments accountable for delivering the education (and other) services that they want at the standards they desire since tax payments would be more explicitly linked to service delivery.

There are at least two impediments to increasing local own-source revenues via decentralizing the property tax as suggested above. The first problem is one internal to MoF: the Directorate General of Tax (DG Tax) does not want to relinquish control over the tax. This stance appears to be a function of its desire to avoid the employment uncertainty that decentralizing the property tax would create among its staff. The second obstacle related to decentralizing control over the property tax is that the proposal to do so lacks a strong constituency outside MoF. Thus far, neither regional governments nor citizen groups, for example, have voiced much support for the idea of a local property tax. Like local governments the world over, most kabupaten/kota prefer to have resources granted to them (with as few strings as possible) as opposed to going through the effort to generate revenue through highly visible and unpopular local taxes. And like citizens the world over, Indonesians are not eager to pay higher property taxes. In the end, this is something that a forward-looking MoF will have to force upon just about everybody else. Past experience suggests that this is an action that is not likely to come soon.

6. Summary and Conclusions

As noted at the outset of this paper, the government is currently engaged in an effort to set minimum standards of service delivery for all obligatory functions of kabupaten/kota. An examination of the standards set for local public education reveals a number of weaknesses regarding the number, type, and consistency of standards. The analysis for local public education suggests several conclusions regarding the further development of minimum standards in other sectors.

First, the relevant government officials should concentrate on developing a fewer number of minimum standards, focusing only on those of highest priority and on those that can actually

¹⁸ See Lewis (2003c) for an appraisal of the central government's administrative performance related to the property tax.

be operationalized. This would facilitate the proper estimation of fiscal resources that are required to meet standards and also assist in monitoring the extent to which standards are in fact being achieved. Second, officials in charge would do well to focus on output or (outcome) as opposed to input standards and should consider setting output standards related to both the quantity and quality of service provision where feasible. There is widespread agreement among analysts that standards for service delivery should focus on the achievement of outputs or outcomes and that both quantity and quality of service delivery are important.¹⁹ Finally, the various actors involved in the “model building exercise” need to work harder to ensure consistency of its standards with those that are independently developed inside individual ministries. This will help to make sure that limited human and financial resources available for development (and costing out) of standards are used efficiently and reduce confusion among observers and participants with regard to the real goals and objectives of government programs.

The paper has developed and implemented a simple model for estimating local government infrastructure and routine fiscal requirements associated with attaining minimum education participation standards. The initial empirical evidence produced here suggests that an increase in physical capital in education of just over 15 percent might be required to meet the minimum participation rate of 80 percent (on average) for primary, junior secondary, and senior secondary school aged children. In addition, the results indicate that kabupaten/kota might also need to increase routine education sector expenditure by about 5.5 trillion rupiah per year in order to reach the desired level of participation; this level of expenditure implies a rise of around 20 percent over current amounts devoted to local education. It is important to stress that these estimates reflect fiscal implications associated with increasing access to education only. Estimates produced elsewhere suggest that needed enhancements to the quality of education would require significantly more resources—perhaps on the order of an additional 10 trillion rupiah annually (for just primary and junior secondary levels).

Obviously, attaining quantity and quality minimum standards in the local education sector would not come cheaply. The fiscal implications of achieving minimum standards in other sectors have not yet been examined. The question of affordability of minimum standards, in general, cannot be adequately answered without knowledge about fiscal requirements in all sectors. While it is premature to make a definitive judgment regarding the general affordability of minimum standards, if fiscal requirements for other sectors are anything like those estimated here for education, then securing needed finance across all obligatory functions would seem improbable.

Categorical grants probably offer the most feasible means for financing standards in education, all things considered. Most analysts argue that such specific-purpose transfers are, from a technical point of view, the most suitable instruments for supporting central government objectives regarding the achievement of minimum standards. In Indonesia, the creation and implementation of such a grant for local education could usefully draw on the significant human resources and experience of MoNE. As suggested above, obtaining the necessary funding for a new education sector transfer at the levels indicated in this study would be difficult. But if MoNE were willing to exchange its significant DIPs for a new DAK, then the chances of acquiring at least some of the needed finance would increase. A

¹⁹ Of course, in costing out such output or outcome standards, input standards will be of use where the link between inputs and outputs can be made clear.

resolution to the issue of financing minimum standards in education depends, therefore, very much on what MoNE itself is willing to do.

The possibilities of financing new categorical grants to support minimum standards in other sectors through DIP-DAK swaps requires further examination. In any case, a decision one way or the other on the question of creating and funding new sectoral categorical grants does not absolve MoF of its responsibility to provide regions with greater access to and control over important local tax bases, such as that for property. Such funds would prove invaluable in financing more and/or better local public services—in education and other in sectors.

If securing finance for the full array of minimum standards proves as problematic as it seems, then only two options present themselves regarding the further development, use, and financing of standards. The first option involves a series of three possible actions. First, the number of minimum standards could be reduced within sectors, focusing only on those of highest priority. Second, the “minimum” levels at which standards are fixed could be lowered. Third, some sub-set of kabupaten/kota obligatory sectors/functions could be prioritized for immediate action. A fewer number of standards, set at lower levels, for a more limited range of obligatory functions would be relatively more affordable, all things considered. It might be useful to think of the above three measures as resulting in a transitional arrangement; a greater number of standards, set at higher levels, for additional functions could be phased in over time, if and as funds permit.

If achieving some realistic combination of these three actions proves impossible for one reason or another, then only a second option remains. This alternative posits that minimum standards function simply as general guidelines or targets for national and regional governments to employ in the context of planning, budgeting, monitoring, and evaluation. Employing minimum standards in this fashion may prove very constructive, if taken seriously.

But such a use seems not to be what many actors involved in the standard-setting process have in mind. Some of these participants have suggested a third possible option: order the achievement of minimum standards without regard to questions of the availability of finance. Experience from many countries around the world, however, demonstrates the problems associated with such unfunded mandates. Such experience indicates that unfunded minimum standards in Indonesia would either end up as de facto targets or that they would be used by the center to control and manipulate local governments. The former result reduces to option two above, arrived at via another route; the latter outcome would certainly be contrary to the government’s stated goals of decentralization and needs to be aggressively avoided.

Table 1: Variable Names and Definitions

Endogenous Variables

OLS Equation

Capchld	Natural logarithm of the value of capital assets index per million of school aged children.
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Selection Equation

Inout	Binary choice: 1 if local government produced expenditure budget in 2001 with education sector breakdown, else 0.
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Selected Equation

Expchld	Natural logarithm of local government routine and development expenditure on education per school-aged child for 2001.
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Exogenous Variables

All Equations

Rate	Participation rate: percentage of school-aged children in school, 2002.
Revpc	Natural logarithm of local government revenue per capita, 2001.
Grdppc	Natural logarithm of gross regional domestic product per capita, for 2001.
Pov	Percent of population classified as poor, 2001.
Col	Cost of living index, 2001.
Area	Natural logarithm of area of the jurisdiction in square kilometers, 2001.
Density	Natural logarithm of population per square kilometer, 2001.
Kota	Dummy for urban status: 1 if local government is a kota, else 0.
Java	Dummy for region: 1 if local government is located on Java-Bali, else 0.

**Table 2: Ordinary Least Squares
Regression Results**

Dependent Variable: Capchld

<u>Variable</u>	<u>Coefficient</u>	<u>t value</u>
Constant	5.166	5.255 *
Rate	0.006	3.092 *
Revpc	0.194	2.744 *
Grdppc	0.018	0.435
Pov	0.000	-0.176
Col	-0.002	-1.089
Area	-0.116	-2.330 *
Density	-0.158	-2.838 *
Kota	-0.363	-3.276 *
Java	-0.034	-0.435
Adj R2	0.365	
Log-L TS	161.664	
Sig:	0.000	

* and ** denote that the coefficient is significant at the 0.05 and 0.10 level, respectively.

**Table 3: Sample Selection
Regression Results**

Panel A: Dependent Variable: Inout

<u>Variable</u>	<u>Coefficient</u>	<u>t value</u>
Constant	6.276	1.594
Capchld	-0.227	-1.066
Rate	-0.022	-1.805 **
Revpc	-0.580	-2.250 *
Grdppc	0.275	1.738 **
Pov	0.006	0.791
Col	-0.005	-0.626
Area	-0.090	-0.440
Density	0.125	0.561
Kota	0.479	0.939
Java	-0.351	-0.989
Log-L TS	60.847	
Sig:	0.000	

Panel B: Dependent Variable: Expchld

<u>Variable</u>	<u>Coefficient</u>	<u>t value</u>
Constant	4.834	3.340 *
Capchld	0.101	1.487
Rate	0.011	4.825 *
Revpc	0.364	2.960 *
Grdppc	-0.185	-3.567 *
Pov	-0.007	-3.366 *
Col	0.005	1.796 **
Area	-0.111	-1.789 **
Density	-0.065	-1.002
Kota	-0.259	-2.157 *
Java	0.063	0.691
Lambda	-0.265	-1.749 **
Log-L TS	150.463	
Sig:	0.000	

* and ** denote that the coefficient is significant at the 0.05 and 0.10 level, respectively.

Table 4: Summary of Results on Kabupaten/Kota Capital Requirements in Education, Actual and Based on Minimum Standards, FY 2001

	FY 2001 Actual	FY 2001 Based on Minimum Standards	Percent Increase
Total Physical Capital (Sum of Index Values)	6,603.8	7,683.0	16.3

Table 5: Summary of Results on Kabupaten/Kota Routine Fiscal Needs in Education, Estimated Actual and Based on Minimum Standards, FY 2001

	FY 2001 Actual (Estimated)	FY 2001 Based on Minimum Standards	Percent Increase
Participation Rate (Percent)	65.9	80.0	14.1
Total Fiscal Needs in Education (Rp 000)	28,532,915,473	33,945,886,862	19.0
Total APBD Fiscal Needs (Rp 000)	70,066,247,569	75,479,218,958	7.7
Education as Percent of APBD	40.7	45.0	4.3

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