WPS3911

Evaluating Fiscal Equalization in Indonesia[*]

Bert Hofman
Kadjatmiko
Kai Kaiser
Bambang Suharnoko Sjahrir

This paper presents a methodology to evaluate fiscal decentralization focused on the potential mis-targeting of intergovernmental fiscal equalization transfers. The approach builds on an explicit comparison and the summary measurement of different ("horizontal") allocation distributions across states or localities. Whereas formula based fiscal transfers have the merit of being transparent and promoting revenue predictability in fiscal decentralization, in practice, two challenges emerge: (a) What are the appropriate formula designs given the sub-national data constraints evident in most decentralizing developing countries?, and (b) How costly in terms of mis-targeting to the presumed expenditure needs and fiscal capacity are deviations from these types of benchmark formulas (e.g., due to historical factors or the need to meet establishment costs such as civil service wages)? We illustrate this approach through an assessment of Indonesia's evolving intergovernmental fiscal system, instituted in the 2001 Big Bang decentralization. The discussion comes against Indonesia's recent policy decision to fully fund sub-national civil servant wages as part of the base general allocation grant (DAU) transfers, raising questions about both incentive effects for local governments and potential mis-targeting. We identify potential efficiency losses from the DAU's horizontal misallocation from half a dozen alternative scenarios found in the policy dialogue, ranging from 9 to 30 percent – on the order of USD 3.9 billion – of the overall annual size of this large intergovernmental transfer. The scale of these trade-offs highlights the importance of intergovernmental transfers in more general debates in public finance for decentralized countries.

Table of Contents

List of Figures

List of Tables

1.   Introduction

Intergovernmental fiscal transfers are a critical element of public finance in unitary and federal decentralized countries. In the context of decentralization reforms, their design and implementation has significant impacts on the potential efficiency and equity of basic public service provision. The case of Indonesia's 2001 Big Bang decentralization illustrates the challenges associated with implementing significant reforms to an intergovernmental fiscal system. Almost overnight, local governments were effectively put in charge of almost one-third of consolidated government expenditures (Hofman and Kaiser 2004; 2006;World Bank 2003). On aggregate, own revenues were only able to finance approximately seven percent of local government expenditures.

How intergovernmental transfers are best allocated across regions in practice continues to be a significant debate in both developed and developing countries. Indonesia opted to share a particular portion of revenues, most notably from oil & gas, on a derivation basis and introduced a general block transfer for the purpose of equalization.[1] The general block grant (DAU) introduced a formula based equalization grant that considered both relative measures of expenditure needs and fiscal capacities (i.e., own and shared on a derivation basis) to distribute a fixed share of national revenues across all localities (see Annex 1). However, the bulk of transfers were initially based on existing historical expenditure patterns during a transition phase, notably wages, with the full-fledged introduction of the formula envisaged over time.

---

[1] In addition the central government administers property taxes and income taxes that are transferred back to the regions. The distribution arrangement is stipulated in government regulation (PP) No. 55/2005.

The Indonesia case raises a number of generic questions about intergovernmental transfers. First is the ultimate distribution of transfers consistent with underlying criteria of fiscal equalization (i.e., fiscal capacity and expenditure needs), as well as setting appropriate efficiency incentives for sub-national governments? Second, how different are non-formula based allocations (e.g., due to discretionary, negotiated, or existing salary-based allocations) from a formula-based benchmark? Third, what are the potential implications of "mis-specifying" a formula driven distribution, given that the theory does not provide clear guidance and practice regarding implementation challenges, including the availability of data?

Whether fiscal transfers are equalizing has typically been evaluated through two empirical approaches. The first approach assesses the cumulative dispersion in final per capita revenue. This methodology assumes that transfers are equalizing if they progressively reduce the per capita dispersion in overall revenues across the country (i.e., after adding transfers to some measure of own-source revenue capacity and derivation based shared revenues). A fundamental flaw of this approach is that it implicitly assumes that equalizing per capita revenues (and hence overall expenditure capacity) is the central objective. Moreover it may ignore incentive effects of transfers such as fiscal capacity and effort generated at the sub-national level.

The second approach applies the univariate correlation or multivariate regression approaches. These approaches focus on the association between measures of fiscal capacity and expenditure needs proxies and actual per capita transfer allocations. Equalization is assessed by the degree to which fiscal capacity reduces transfers and expenditure needs (e.g., population, poverty, area, or other socio-economic indicators)

increase them. The approach however is sensitive to specification issues pertaining to the choice of selected variables for fiscal capacity and expenditure needs in the model. Hence, it is not always clear whether evaluations are benchmarking actual allocations against a preferred formula-based benchmark, or they are trying to achieve goodness of fit that explain existing allocations. The more explicit benchmarking approach compares actual allocations to some stated fiscal equalization formula (e.g., as derived from government policy documents) (see also Arze 2005). But this does not necessarily make explicit likely uncertainty about the right choice of formula.

The motivation of this paper is therefore twofold: First, to provide a more comprehensive methodology for assessing the distribution of intergovernmental transfers. Second, to provide a corresponding assessment of Indonesia's fiscal equalization to-date. We advocate the systematic benchmarking of various formula and actual (e.g., due to discretionary or prevailing expenditures) distribution against each other by understanding how different various distributions are (e.g., due to the design of particular formulas, or deviations from formula based allocations owing to any number of policy or overtly political motivations).

The need for fiscal equalization stems from the fact that only the richest sub-national governments will typically have enough revenues with some reasonable level of revenue effort to finance a basic set of expenditure responsibilities/needs (e.g., depending on assignments for basic education, health, infrastructure, and administration). Thus the basic challenge for fiscal equalization transfers is to address this gap through the appropriate design and implementation of intergovernmental transfers. Our contribution focuses on the horizontal distribution of fiscal transfers, but not on the total absolute

aggregate amount being allocated across all districts. Put differently, given that a country

has decided to equalize based on the transfer a certain vertical share of revenues (e.g., as

a percentage of revenues or absolute amount), do these fiscal transfers appear to be

effectively targeted across individual districts? The approach offers both summary

measures of equalization performance, as well as helping identify those localities that are

likely to be under-resourced according to some benchmark allocation.[2]

We proceed in four sections. Section 2 sets out the main conceptual issues for

empirically evaluating the distribution of fiscal equalization transfers. Section 3

describes the main elements of Indonesia's fiscal devolution to-date. Section 4 evaluates

the distributional performance and apparent constraints to Indonesia general block grant

(DAU). Section 5 concludes.

2.   Fiscal Equalization in Practice

The design and implementation of intergovernmental transfers is a key issue in

public finance for both federal and unitary decentralized countries. Owing to economies

of scale and historical legacies, higher levels of government will typically control the

bulk of the domestic revenue base. Lower levels of government however will generally

have relatively higher levels of expenditure responsibilities.

The practical challenge in any intergovernmental setting is to address ensuing

vertical imbalances, to allow for revenues and expenditures at each level of government

are approximately equal, while averting poor incentive effects. The characteristics of a

---

[2] At the same time we would caution that this empirical approach should not succumb an exercise in "fiscal
dentistry" (Bird and Smart 2002), that crudely seeks to fill the gap between revenue collection and some
absolute measure of expenditure needs. It provides one component of a broader approach that incorporates
both incentive effects and absorptive capacity when assessing an intergovernmental fiscal system.

good transfer system include *stability* and *flexibility*. Bird and Smart (2002:901) suggests

that the best way of balancing stability in sub-national government revenues and

flexibility for the central government is to base transfers upon an overall share of central

government revenues (i.e., the vertical share).

A key principle for the horizontal distribution is that transfers do not provide a

dis-incentive for mobilizing own revenues. The spirit of equalization from a capacity

perspective is to provide each local government with sufficient funds – own-source

revenues with similar effort plus transfers – in order to deliver a centrally pre-determined

minimum level of services. Consistent with the principles of transparency and

accountability, a good transfer system should distribute resources based on a formula

rather than on a discretionary or negotiation basis.

Essential ingredients for general transfer formulas are *needs*, *fiscal capacity,* and

fiscal effort. The determination of needs will depend on the prevailing assignment of

functional roles and responsibilities to sub-national governments. For example, primary

education is often an important function assigned to sub-national governments. Hence

formulas will need to decide whether they take sector-specific indicators of expenditure

needs (e.g., school age population), or select generic needs indicators such as population.[3]

Generally, expenditure needs will need to be measured by some proxy available for all

---

[3] Education based examples highlight the need to consider the incentive issues in the choice of needs
indicators. For example, allocating resources on the basis of school aged population may provide few
incentives to increase enrollment to all children or for that matter consider incentives for a better mix of
public and private education at a local level.

sub-national entities, given that direct sub-national measures of expenditure needs are too effort and information intensive.[4]

The measurement of sub-national fiscal capacity and effort is especially complex. The main principle here is that transfers to not discourage own revenue efforts. An egregious example includes Russia, where transfers in effect negated extra revenue efforts on the part of sub-national governments (Zhuravskaya 2000). However, measuring actual capacity and effort may be very information intensive. Formula based allocations need to strike a compromise that, at the very least, does not penalize localities that are collecting revenues at an average representative benchmark of collection. For example, the benchmark could be some function of regional incomes (RGDP).[5]

In practice, there may be a significant degree of uncertainty about what the most appropriate distribution of resources would be, given the available data (i.e., design considerations). The choice of formula may also be inherently political, in the sense that it is driven by the extent to which individual players will gain from one type of formulation.[6] Debates about the formula may also be more technical. For example, questions of how to best measure expenditure needs may focus on the treatment of regional cost differentials. As we will see, in a large archipelago such as Indonesia this is

---

[4] For example, World Bank (2003) shows that a sample of *communes* in Madagascar were significantly under-resourced from the perspective of education financing in absolute terms. These types of studies can be implemented for a sample of case studies, but cannot generate the information for allocating resources across all localities.

[5] Fiscal capacity will be a function of both the revenue base assigned to local governments (e.g., property), as well as their autonomy over determining/rate setting within these parameters. However, at the central level it will typically be very difficult to distinguish with exactness whether observed differences in revenue realization are due to differences in the base and/or fiscal effort. Hence, from a formula basis, the emphasis will be on proxying anticipated realizations given some basic average level of effort (e.g., by exploiting the relationship between observed local income (GDP) and local revenues.

[6] In Pakistan for example, the dominant province of Pakistan has staunchly defended the use of a population based distribution formula. The remote and lagging provinces of Balochistan and NWFP argue for great weight for area and human development indicators (Kaiser 2005).

significant. Given the distributive bargaining inherent to any transfer design, the lines between technical and political drivers of formula design are likely to be blurred.

Deviations from formula based design may be traced back to a range of motivations. As transfers are increasingly based on a formula, countries may initially wish to institute a hold-harmless condition, consistent with the principle of predictability and stability set out above. If sub-national governments experience too dramatic changes in revenues due to historical patterns in the short to medium term, this may make adjustment costs excessive. Similarly vested interests may capture the process of formula based allocations, for example, to avoid adjustments in existing staffing.

The motivations for the differences between actual and alternative distributions will depend largely on the context. Hence, it is important to understand the drivers of a particular set of options. A pure formula based allocation is often considered as the "ideal." However, the present methodology suggests that the formula-based allocation themselves need to be subject technical scrutiny (e.g., are expenditure needs effectively captured?). To illustrate this point more generally, the paper presents a set of actual (i.e., Indonesia's final block grant allocation for 2006) and alternative (all formula or otherwise) allocations using the methodology below to quantify the magnitude of these trade-offs. Greater targeting mis-specifications across different options need to be flagged for additional policy analysis. The approach also serves to structure a complementary qualitative discussion of the incentive effects surrounding one particular set of transfer distribution scenarios, and how these circumstances impact the efficacy of public expenditures.

3. Fiscal Decentralization in Indonesia

Starting in 2001, Indonesia devolved almost a third of public expenditure to sub-national governments, notably its 434 districts (*kabupaten/kota)* and to a lesser degree 32 provinces.[7] Regions depend heavily on central government transfers to finance the gap between limited own-source revenues (OSR) bases and prevailing expenditure levels. Transfers consist of revenue sharing (e.g., from oil & gas (SDA), a derivation share of property taxes and domestic personal income (TAX), a general purpose transfer (DAU), a special autonomy grant for Papua, and a minor special grant facility (DAK).[8]

Disparities in own-source revenues and revenue sharing mean that Indonesia's regions enjoy significantly different levels of fiscal resources on a per capita basis (World Bank 2003). Figure 1 summarizes the per capita fiscal revenues of provinces and their respective districts, highlighting that the DAU is the largest source of revenue for most provinces. The right-most provinces highlight the natural resource wealth of Kalimantan, Papua and Riau.

At the district level, the DAU accounts for on average 64 percent of total revenues in 2004. In 2006, the DAU total Rps. 145,664.2 billion (or USD 14.6 billion). The grant is in principle meant to address disparities between presumed local expenditure needs and local own fiscal potential. The overall size of the DAU (*vertical share* between the central government & regions) is calculated as a share of net national revenues, currently

---

[7] The original 336 localities and 26 provinces in existence at the onset of decentralization have multiplied in number owing to splitting (Fitrani, et al. 2005).
[8] Aceh received additional revenue sharing. However, these transfers are not calculated as part of its fiscal capacity in the fiscal transfer formula. Neither are the special autonomy funds for Papua.

26 percent (net of shared revenues).[9] Districts are allocated 90 percent of these funds.

The remainder is distributed across provinces.[10]

Figure 1: Sub-National Revenues in Indonesia (Aggregated by Province)
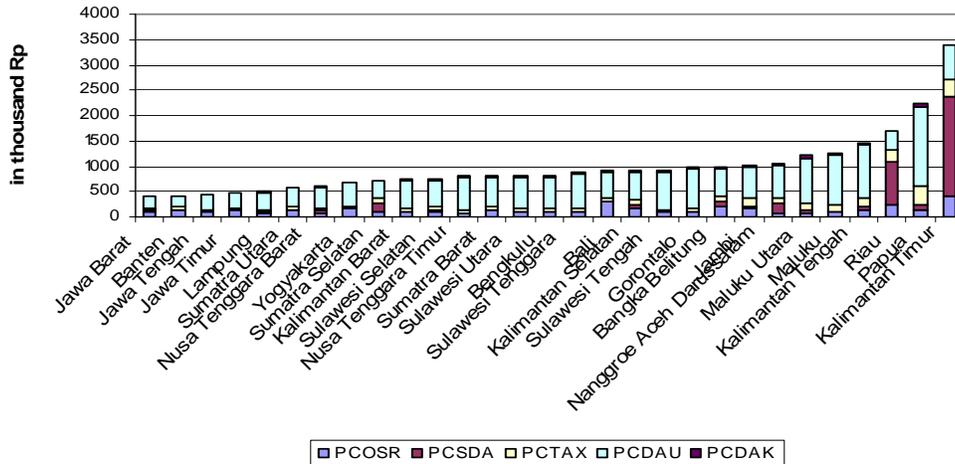
Source: Authors' calculation using MoF 2004 data. The data is aggregated at the Provincial level. DKI Jakarta is omitted from the figure because of it has a different autonomy set up.The 2004 data is based on 2003 definition of provinces (30). The figure does not include special autonomy fund transfer to Papua which accounted for 2% of total DAU pool.

Table 1 summarizes the existing establishments costs, formula-based allocations,

and hold-harmless in the overall allocation of the DAU from 2001-2006. Policymakers

in Indonesia introduced a formula-based intergovernmental transfer system with the

launch of the 2001 Big Bang Decentralization. However, DAU allocations were still

driven largely by existing establishment costs. These estimations were based on the sum

of previous transfers for deconcentrated structures and staff, which were handed over to

local governments, as well as prevailing development transfers to local governments.

Over time, policy makers envisioned increasingly moving to a transparent formula-based

allocation (Lewis 2001;World Bank 2003).

---

[9] Law 33/2004 over Law 22/1999 stipulates that during the transitional period the DAU pool should be at the minimum 25.5 percent of net national income and should be 26 percent in 2008. For the 2006 budget, however, the parliament agreed to allocate 26 percent of net national income for DAU pool.
[10] Currently Mininstry of Home Affairs is drafting implementing regulations of Law 32/2004 to regulate and clarify expenditure assignments between provincial and local governments.

	2001	2002	2003	2004	2005	2006
Existing Establishment Cost[a]						
- SDO/Inpres	80%					
- Proportional Wage Bill		50%	45%	40%	40%	
- 100% Wage Bill						50%
Formula-Based Allocation[a]						
- Lump Sum	1.5%	10%	5%	5%	5%	
- Fiscal Gap Formula	18.5%	40%	50%	55%	55%	50%
Fiscal Capacity Formula	Ave (OSRt + PBBt + BPHTBt) * Ave (IGRDP_SD + IGRDP_nonSDA + IWorking_Age)	OSRi* + STXi + 0.75*SDAi	OSRi* + STXi + 0.75*SDAi	0.5*OSRi* + STXi + SDAi	0.5*OSRi* + STXi + SDAi	OSRi + STX + SDA
Expenditure Needs Formula[b]	(0.25*IPOPi +0.25*IPOVGAPi+0.25*IAREAi+0.25*ICOSTRELi) *Ave_Exp	(0.4*IPOPi +0.1*IPOVGAPi+0.1*IAREAi+0.4*ICOSTRELi) *Ave_Exp	(0.4*IPOPi +0.1*IPOVGAPi+0.1*IAREAi+0.4*ICOSTRELi) *Ave_Exp	(0.4*IPOPi +0.1*IPOVGAPi+0.1*IAREAi+0.4*ICOSTRELi) *Ave_Exp	(0.4*IPOPi +0.1*IPOVGAPi+0.1*IAREAi+0.4*ICOSTRELi) *Ave_Exp	(0.3*IPOPi +0.1*1/HDIi +0.15*IAREAi+0.3*ICOSTRELiCost +0.15*IGRDPPCi)*Ave_Exp
Hold-harmless	Yes	Yes	Yes	Yes	Yes	Yes
- % of districts benefited from HH	[…]	[…]	[…]	[…]	11%	3%
Amount						
- Nominal Amount (in Bln Rp)	[…]	[…]	76,978	83,139	88,766	145,644
- % of Central Expenditures					22%	23%

Note:

[a] = as share of Total DAU Pool (Province & Districts)

[b] = OSR is imputed revenue based on a regression of actual OSR against regional income measured by GRDP

PBB = shared property tax and BPHTB = shared change of property title tax income

STX = Shared Tax Revenue and SDA = Shared Natural Resource Revenue
IPOP = Population Index, IPOVGAP = Poverty Index, IAREA = Area Index, ICOSTREL = Cost Index, HDI = Human Development Index and IGRDPPC = GRDP Per Capita Index

The Subscript t indicates total and the subscript i indicates the respective kab/kota. For more details see Annex 1 and Lewis (2002a)

Source: Ministry of Finance data. See also Arze (2005).

The initial challenge for policy makers was to annually increase the prominence of a formula-based allocation relative to legacy allocations for localities, represented by expenditure on civil servant wages and the amount that localities had received in the previous year. Increasing the share of the formula meant that some localities were potentially bound to get less than the previous year. In a series of "hold-harmless" adjustments, those localities which would have received less than the previous year got

transfers from those regions that would have benefited the most relative to the last year's DAU allocations.[11]

The fiscal gap formula distributes the overall pool of resources available to the regions (net of shared revenues) horizontally by assessing the relative expenditure needs and a proxy for fiscal capacity of each district. Until 2005, the central government used population, area, poverty and cost to measure expenditure needs. The poverty indicators are then replaced by the inverse of Human Development Index (HDI) and GRDP per capita in 2006 (see Table 1 and Annex 1).

The 2004 revisions of the decentralization laws were, however, associated with a significant reversal in policy concerning a fiscal equalization formula-based DAU (DJAdPK 2004;Lewis 2004). The new approach would first fully fund the existing wage costs of each locality, by 2006, and only allocate the residual based on the fiscal gap formula. In 2006, the DAU will first cover 100% of each districts salary – including significant recent increases in staff payments and numbers – before allocating the remainder on the basis of a formula (and implementing the hold-harmless adjustments).[12] The hold-harmless clause relative to previous year allocations is to be phased out by 2008.

Changes in the level of the DAU pool leading up to 2006, associated largely with increasing oil prices, at least in the short-term appear to have a more muted impact of the

---

[11] An important development in the second DAU allocation for 2002 was that natural resources had not been included in the fiscal capacity measure of the DAU 2001. Lewis (2002) argues that lack of data can not be an excuse in this case as reasonable estimates of the shared natural resource revenue existed at the time the formula was implemented. Its introduction in 2002 meant that natural resources rich regions would have seen their DAU transfers decrease significantly. Since this was politically untenable, a hold-harmless adjustment was made to guarantee each locality at least the same nominal transfer as the previous year.
[12] These include an anticipated salary increase in 2006 (i.e., basic salary increase, family supports and income tax supports), an anticipated functional and structural supports increase, 2.5 % top up, 13 month salary, and an anticipated incoming local civil servants.

composition of "windows" by which fiscal transfers are allocated. The higher and more realistic assumptions of oil & gas prices in the state budget also mean that the anticipated overall pool of the DAU allocated to the regions will experience a 65 percent increase in nominal terms for 2006.[13] These special revenue circumstances mean that the share of DAU allocated on the basis of wages rather than formula will increase only moderately from 40 to 50 percent. The large increase in the DAU pool also means that the importance of the hold-harmless was somewhat moderated in 2005. Prior to the hold-harmless adjustments, the importance of the formula correspondingly decreases from 60 to 40 percent. Assuming that the size of the overall wage bill outpaces the growth of the overall DAU pool in the coming years, the relative importance of wage-based allocations will increase.[14]

The growing importance of wages in the DAU raised two questions: (a) What will be the incentive effects of matching wages one for one in transfers? (b) How do wage based allocations compare to formula-based benchmarks? A recent World Bank report shows only a few districts took an independent action to right-size their civil servants, while most did not want to decrease their wage bill as it would decrease their DAU (World Bank 2005). Now, by matching wages one for one through the annual DAU, the central government removes any incentive for regions to streamline their organizational structures and salary bills. In turn, regions must now receive central government

---

[13] Based on 2006 Planned Central Government Budget (APBN P) proposed to the Parliament. The movement of oil price during the fiscal year will not affect the DAU pool and DAU allocation approved by the parliament in the beginning of the fiscal year. It will, however, affect the shared natural resource revenue from oil and gas. In the case of the oil price increase more than 130 percent, the excess amount will be distributed by using the DAU formula (Government Regulation PP 55/2005).

[14] Increases in establishment costs for sub-national governments will depend on developments of wages, promotions, and new hires. These will now be subject to a process of monitoring and negotiation between center and decentralized authorities, although it is unclear whether institutional checks will work to restrain wage growth at less or equal than increases in revenues.

approval to hire additional staff. It remains to be seen how effective this re-centralization of the wage bill is, and the extent to which it will ensure that these expenditures match local needs and address any prevailing disparities.

4. Evaluating Transfer Allocation Scenarios

Various trade-offs inherent in different transfer distributions can be quantified by comparing allocation simulations. Formula-based allocations for fiscal transfers have the advantage of being more transparent and predictable. Such allocations help regional governments plan their expenditure better (Bird and Smart 2002). Since they are open to scrutiny they may promote greater accountability. However, formula-based allocations rely on the availability of a timely and reliable sub-national data. Moreover, even if good proxy data for expenditure needs and fiscal capacity are available, the exact design of a formula may be open to question.

A number of considerations may see central governments deviate from a pure formula-based allocation. The policy principles of predictability argue that allocations should be smoothed over time. For example, existing civil servant and establishment costs may be subject to significant rigidities. Hold-harmless arrangements allow for a transition period. Indonesia's decentralization did ensure that localities were at least held harmless relative to previous years as formula based allocations become increasingly pronounced. Another form of hold-harmless may be due to a mix of omission and political wrangling. For example, during the first 2001 DAU allocation natural resource sharing revenues (SDA) were not considered as a part of the fiscal capacity in the formula. When they were introduced in the subsequent year, this would have meant that natural resource rich would have gotten significantly less DAU. Richer regions, in part

13

through effective lobbying through their leadership in the local government associations, saw a hold harmless provision apply to the (partial) introduction of natural resource based fiscal capacity in the formula in 2002 (see Annex 1).[15]

The notion of a national/centralized civil service was given increased status in the recent revisions of the decentralization laws. Under these revisions, the central government in effect committed itself to finance all civil service expenditures. Consequently wages now enjoy a priority claim over the DAU, something which is fully implemented in 2006. Ignoring for now the perverse incentive effects associated with this change, it is clear that giving precedence to wages will impact the distribution of fiscal transfer allocations.

Allocations based on wages and the hold-harmless provision means that final transfer allocations in Indonesia deviate from pure formula-based allocations. Here, a pure formula-based allocation is defined as an allocation scheme that distributes the total pool of DAU solely by a fiscal gap formula.[16] Figure 2 highlights the actual and pure formula-based allocations differ for the Indonesia's 2006 DAU allocation. A ratio of actual to "ideal" formula-based allocations captures the allocation trade-off (ATO) implicit in such a choice.

---

[15] Issues of natural resource revenue sharing raises a number of other issues, including for example whether special considerations needs to be paid to environmental degradation owing to non-renewable resource extraction within sub-national jurisdictions (Bahl and Tumennasan 2004)
[16] In addition, the simulation does not allow minus allocations and therefore converts all minus allocations to zero.

Figure 2: Actual versus Fiscal Gap Formula-based DAU 2006 Allocations
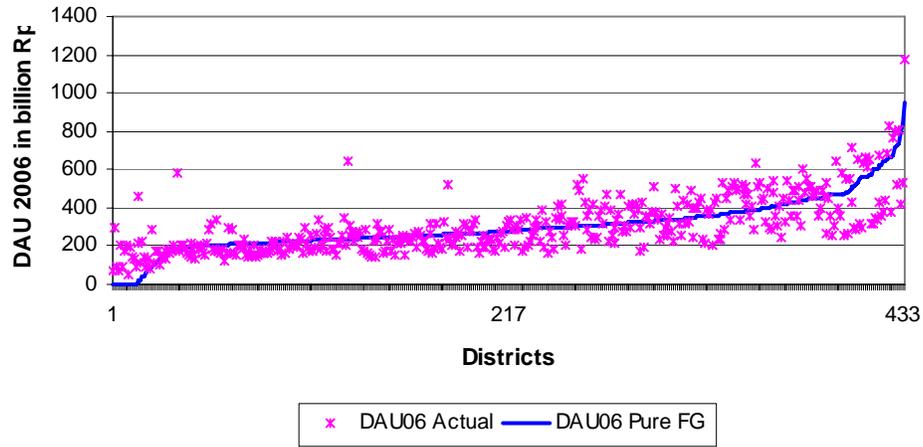
Source: Author's calculation using MoF data

The extent of the trade-off will vary by individual districts. Figure 2 ranks districts DAUs from low to high based on a presumed formula base allocation. For example, some districts on the left would have presumably received no formula-based DAU transfers. Of the 15 districts that would have received no DAU transfers, eleven of them are located in natural resource rich provinces such as Riau and East Kalimantan. What districts received in reality, denoted by the scatted dots, differed quite significantly in many cases from their intended allocations. The advantage of this approach is that it also allows us to pin-point the apparent degree of over and under-financing of a particular locality, potentially allowing for a more systematic follow-up analysis.

Figure 3: **Ratio of Actual to Fiscal Gap Formula DAU 2006 Allocations**
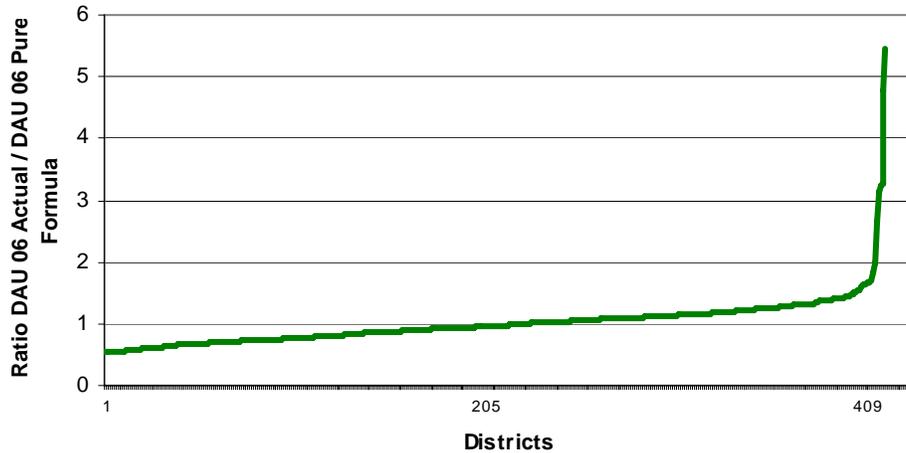
Source: Authors' Calculations. For presentation purposes, ratios of >6 are excluded.

Figure 3 presents the ratio of the actual DAU allocation to the presumed formula ideal.[17] When the ratio is 1 for a given district, the allocation is "ideal" and there is no mis-targeting by this benchmark. Those districts with a ratio of less than one are under-resourced, whereas those with over one are relatively over-resourced. It is important to note that this measure refers to relative rather than absolute resourcing. The absolute transfer amounts received by districts ultimately depend on the overall vertical share (i.e., the total amount of fiscal resources transferred to localities). On the other hand, if the absolute total amount of money being distributed to districts is too low, individual districts will also be receiving too little even if the proxies for relative expenditure needs are appropriately used. Municipalities of Kota Dumai, Kota Surabaya and Kota Samarinda received 18, 20 and 34 times (omitted from the graph from presentational purposed) more than what they would have received if pure-formula based allocation

---

[17] The districts that received zero DAU transfers are omitted from the graph since their ratios are equal to infinity (X / 0=∞)

were applied. Dumai and Samarinda are both located in natural-resource rich region of Riau and East Kalimantan. In turn, localities such as Sarmi and Yahukimo of a lagging province in Papua received only around a half of the "ideal" allocation.

Figure 3 implicitly assumes that the formula-based distribution is correct. However, the design of a formula might be equally open to question. The preference of one formula over another can be based on a range of arguments. The original DAU formula separately measured expenditure needs for population, area, poverty gap, and regional cost levels. For example, Lewis (2002) argued that costs should ideally be used to multiply expenditure needs factor as this actually reflects the spending requirements that need to be adjusted by cost. Others have claimed that poverty should figure more prominently in the distribution of the DAU. The 2006 DAU has dropped the poverty measure in favor of the HDI and per capita GRDP.[18]

Table 2 presents a number of plausible allocation scenarios in the policy debate. Simulation one to four refers to a number of alternatives for expenditure needs formula design. The 2006 formula substituted the Human Development Index (HDI) for the previous poverty gap measures. Simulation three stresses the importance of inter-regional cost differences in financing services by using the cost index to multiply the population, area, and poverty indicators. Simulation four stresses the poverty gap measure as the sole expenditure needs indicator. All simulations used the 2006 fiscal capacity definitions and keep all other variables as defined in Table 1.[19] Simulations five to six refer to political or hold-harmless compromises. Option five would allocate all the

---

[18] The rationale is that HDI measures the state of welfare of the people and GRDP per capita measures economic potential and activity of one region (Warta Keuangan, 2nd Edition 2005).
[19] Simulation two uses poverty indicators from DAU 2005 basic data from MoF.

DAU based on the distribution of existing bureaucrats, implicitly assuming that DAU can be appropriately distributed based on the present salary distribution (since this implies number and seniority/wage levels). Option six applies a pure 2006 formula, but implements a hold-harmless provision relative to 2005. The last simulation uses population as the sole indicator of expenditure needs, essentially targeting on per capita equalization.

Table 2: Alternative Expenditure Needs Calculation for Simulation

Simulation	Expenditure Needs Formula
#1 : Pure Formula 2006	$(0.3*IPOP_i+0.1*1/HDI_i+0.15*IAREA_i+0.3*ICOSTREL_i+0.15*IGRDPPC_i)*Ave\_Exp$
#2 : Pure Formula 2005	$(0.4*IPOP_i +0.1*IPOVGAP_i+0.1*IAREA_i+0.4*ICOSTREL_i)*Ave\_Exp$
#3 : Multiplicative Cost	$*ICOSTREL_i$
#4 : Poverty	$(0.5*IPOP_i +0.5*IPOVGAP_i)*Ave\_Exp$
#5 : Wage Distribution	$WAGE_i/WAGE_t$
#6: Pure Formula 2006 + Hold Harmless	$(0.3*IPOP_i+0.1*1/HDI_i+0.15*IAREA_i+0.3*ICOSTREL_i+0.15*IGRDPPC_i)*Ave\_Exp$
#7: Population	$IPOP_i*Ave\_Exp$

Note: definitions of the variables are the same with Table1 unless stated otherwise

In summary, any evaluation of transfer allocations will need to consider the trade-offs relative to some "ideal" benchmark allocations. At the same time we compare the trade-offs resulting from different methodologies by comparing different formula-based allocations. The practical importance of these trade-offs will be manifested by the size of our trade-off measure. Whereas other characteristics of a transfer will clearly matter for evaluations (e.g., the potential incentive effects of wage based allocations), the magnitude of our disparity measures highlights the degree to which different allocation choice matter in practice.

Table 3: The "Cost" of Alternative DAU 2006 Allocation

	DAU 2006 Actual Allocation	
	% of districts under resourced	% of Total DAU misallocated
#1 : Pure Formula 2006	51%	12%
#2 : Pure Formula 2005	55%	9%
#3 : Multiplicative Cost	31%	22%
#4 : Poverty	48%	16%
#5 : Wage Distribution	47%	4%
#6: Pure Formula 2006 + Hold Harmless	50%	10%
#7: Population	29%	30%

The costs of mis-targeting of intergovernmental transfers can be measured by the extent to which local governments are under-funded relative to those that are over-funded. We can capture the trade-off by moving from one allocation mechanism to the other based on overall level of misallocated transfers (Table 3) and statistics that summarizes the individual discrepancies, notably for the under-resourced (Figure 2 & 3, Table 4).

Table 3 summarizes the share of districts under-resourced and the amount to which they are under-resourced as a share of the overall DAU comparing the actual 2006 DAU to alternative specifications.[20] By definition, the amount that certain districts are under-resourced is the amount that others are over-resourced (given the absolute overall vertical pool). Mis-targeting losses are significant, ranging from nine to 30 percent of the DAU or from USD 1.2 billion to almost 4 billion. For example, if one believes that poverty should be the main indicator for expenditure needs, this implies that poor localities are under-resourced by Rps. 21 trillion (16 % of DAU share for districts or estimated USD two billion) relative to the prevailing DAU allocation for 2006..

---

[20] As similar measure could be constructed for aggregate resourcing of individual districts (i.e., predicted OSR, all revenue sharing, DAU, and other transfers), although our chosen measure purposively focuses on the DAU misallocations.

Table 4: Mis-targeting Between Different Allocation Criteria

|	*Actual DAU 2006*	1. 2006 Fiscal Gap Formula Design	2. 2005 Fiscal Gap Formula Design	3. 2006 FG Formula with Exp Need Multiplied by Costs	4. Poverty Formula	5. Wage-based Distribution	6. 2006 FG Formula with Hold-harmless	7. Population Formula
Actual DAU 2006 Allocation	X							
#1 : Pure Formula 2006	0.03	X						
#2 : Pure Formula 2005	0.02	0.01	X					
#3 : Multiplicative Cost	0.05	0.03	0.04	X				
#4 : Poverty	0.03	0.05	0.02	0.1	X			
#5: Wage Distribution	0.005	0.05	0.06	0.13	0.14	X		
#6: Pure Formula 2006 + Hold Harmless	0.03	0.04	0.06	0.12	0.16	0.01	X	
#7: Population	0.04	0.07	0.05	0.09	0.03	0.05	0.07	X

Source: Authors' calculation

In addition to overall mis-targeting, the analysis of fiscal transfer should be concerned with those individual districts that are under-resourced. The mirror image to under-resourced districts, given an overall vertical pool, is the districts that receive too much transfer. Localities where the problem of too little transfers is most chronic would also be those where public services may not be provided owing to an excessive budget constraint, given prevailing expenditure roles & responsibilities. We draw on the poverty literature, and construct a further measure akin to a Foster, Greer and Thorbecke poverty gap index by summarizing the deviations from ideal allocations (in Figure 3 the ratio is 1) for those below 1 (Deaton 1997):

$$\text{Fiscal Resource Gap*} = 1/N \ \Sigma \ (1 - X_i)^2 \text{ , where } X \leq 1 \qquad (1)$$

With (i) being the district, X the ratio, and N the total number of localities. The squared implies a greater weight for outliers, but can be suitably increased or decreased. Table 4 presents the pair-wise fiscal resource gap measure for all comparisons across the

seven allocation scenarios. Figures 4 compares the actual and the ideal formula based

allocation to alternative allocations based on our two measures, (a) aggregate

misallocation and (b) the fiscal resources gap. [21]

Figure 4: Mis-targeting in Comparative Allocation Scenarios

Measure 1: % of DAU
Measure 2: Fiscal Resource Gap
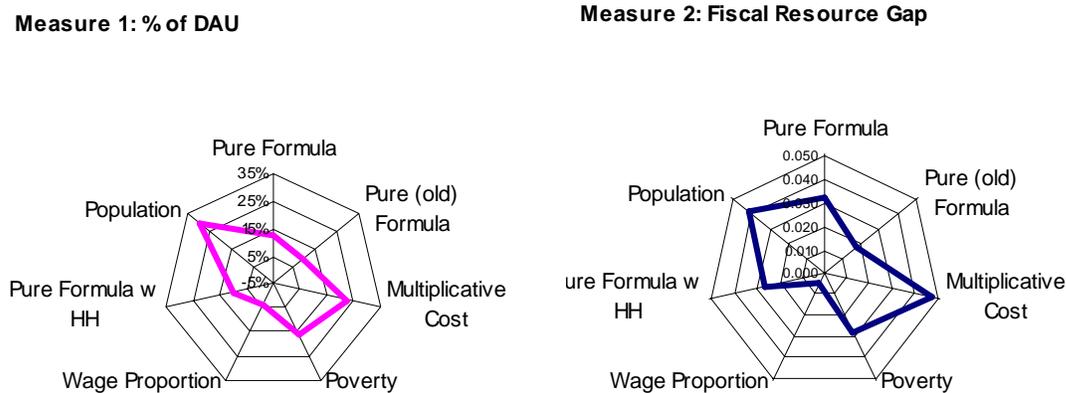
The smallest differentials are evident between the actual and the fiscal gap

formula that uses district wage proportions as the expenditure needs indicator (Table 4,

Figure 4). This highlights that wages are already a significant driver of the overall 2006

DAU allocation. But misallocations become more pronounced when comparing to a pure

formula allocation with hold-harmless or an allocation using the vintage 2005 formula.

Differences are very large if one believes that population, poverty and a multiplicative

cost specifications should be the main drivers for DAU allocations (i.e., the northwest

---

[21] The present measure focuses on the "mis-targeting" of the DAU amount only, although the discussion could also be cast in terms of a district's overall expenditure needs and respective revenues received. The overall resource envelope of a locality can be viewed as presumed own-source revenue capacity (OSR), plus shared revenues (SDA/TAX), plus the DAU. The notional expenditure needs of an individual district (i) can be calculated by allocating the overall pool of revenues available for districts nationally (i.e., OSR+SDA/TAX+DAU) by some relative of expenditure needs. For example, if only population is used, then allocations EN_i for each district would be identical on a per capita basis. The measure of overall under or over-resourcing for a district would then be $(TOTREV_i/EN_i)$, where $TOTREV_i$ are OSR_i+SDA/TAX_i+DAU_i. In the case of OSR_i this assumes the notional own revenue capacity (e.g., from regression analysis), and other transfers include actual derivation and block transfers. For reference, this variation was adopted in previous versions for the 2004 DAU and Arze (2005) for 2005.

and southeast legs of the diagram). This suggests that careful attention needs to be paid to assessing whether these specific expenditure needs are most likely to be reflective of actual needs, for example through more detailed case studies for district levels.

Differences in the degree of misallocation suggested by the aggregate versus under-resourced weighted ATO measure highlights that individual localities may be particularly hard hit by particular transfer distribution scenarios. Figure 4 suggests that the effect of wage allocation is greater than applying a pure hold-harmless or the old formula based on measure 1. However the effects of the hold-harmless and especially wages are more pronounced if measure 2 is used (compared to just the 2005 formula specification), which emphasized the under-resourced tails of the distribution. The "inverse Robin Hood approach" – taking from the needy to give to the less needy – of these political trade-offs is far more costly for the most deserving (relative to the formula benchmark) than overall. Comparing the actual (northernmost ray in Figure 4b) to the ideal formula shows that this effect is especially extreme. The design costs for poverty and a multiplicative costs specification are quite close for both measures.

5.   Conclusion

We have argued that the method presented in this paper is more explicit about the benchmark allocations used to assess equalization relative to prevailing approaches that have focused on the final disparities in per capita revenues or correlations to various measures of expenditure needs and fiscal capacity. It highlights that intergovernmental fiscal transfer analysis should be explicit about the expenditure needs proxies, fiscal capacity proxies, and their functional form in defining "ideal" allocations. However, it also highlights that while prevailing expenditure assignments (e.g., with emphasis on

22

education and poverty) should guide these choices, applied design should be context specific. However, a more explicit approach is more transparent and open to greater scrutiny.

The explicit comparison of different transfer distributions provides a useful tool for assessing the relative ramifications of different allocation criteria. The first principle is that a formula-based allocation serves as a preferred starting point owing to its advantages of transparency (Bird and Smart 2002). We identified one type of "mis-allocation" in the distribution of transfers due to differences in allocations from a formula based benchmark. These examples included differences due to existing wage costs of local bureaucracies and hold-harmless clauses. Our results showed that the policy costs of horizontal misallocations can amount to almost three billion US dollars in the case of the Indonesian DAU.

Given the inevitable absence of perfect information concerning the absolute expenditure needs and fiscal capacity of all individual localities, any allocation formula will necessarily only provide an approximation of the appropriate transfer levels. Our simulation showed that the specification of a preferred formula design matters. In many cases, these design choices mattered more than political trade-offs. Hence, evaluations of fiscal decentralization need to consider both deviations from a formula benchmark, as well as an explicit analysis of the distributions generated by different formula benchmarks.

Regrettably, theory does not always provide a clear guidance on which fiscal transfer formulas are superior. The choice of "ideal" formula need to be driven by (a) the prevailing assignment of expenditure responsibilities and revenue basis, (b) incentive

effects inherent in the specification of a particular formula, and (c) available proxy data.[22] The method presented above only provides a means of making the allocational implications of different designs more explicit, at the level of individual localities and overall.

The application of our alternative transfer allocation benchmarking (ATAB) method to Indonesia raised policy implications in three areas: (i) the importance of closer linkages between fiscal and administrative decentralization policies, particular at the level of incentives; (ii) the need to ensure consistency between reforms to general (i.e., DAU) and specific earmarked grant (i.e., DAK) programs, and (iii) the need for improved intergovernmental fiscal reviews on the part of key agencies such as the Ministry of Finance to assess both the vertical (i.e., aggregate) and horizontal (i.e., distributional) allocation of public funds to sub-national governments in Indonesia.

The way in which Indonesia has chosen to organize and finance its civil service potentially has significant drawbacks. Our ATAB simulations showed that growing civil servant salary based allocations in Indonesia lead to growing deviations in actual payments to potential formula based allocations which incorporating expenditure needs and fiscal capacity proxies. Our purely first-order quantitative simulations suggest that misallocations in public resources amount to approximately 2 billion USD (1 percent of projected GDP in 2006).

---

[22] In this paper we have only focused on the potential incentive effects on sub-national revenue mobilization. A broader debate, beyond the scope of this paper, relates to the potential role of fiscal transfers on sub-national economic growth. In some contexts, for example, fiscal equalization may be over-equalizing in that it can have negative incentive effects on economic growth and inter-regional migration more broadly.

Linking fiscal transfers to existing establishment costs will likely be associated with significant incentives towards increasing the cost of the bureaucratic apparatus. Indonesia's regions are currently benefiting from a windfall due to higher oil prices, which translates into a significant increase in fiscal transfers. The current system clearly drives all regions to negotiate with the center in order to increase their staffing while providing few incentives to rationalize staffing costs. At the same time, the center may not have institutional capacity or accountability to adequately manage and control regional staffing levels in accordance with the national principles of efficiency and equity.

The current system also pays little attention to addressing potential disparities in attracting civil servants to remote regions (cf World Bank 2005). Wage levels are also in effect centralized, unless localities choose to pay additional salaries outside the basic DAU allocation. The present fiscal transfer incentives provide little impetus or even penalize more flexible and potentially cost-effective local arrangements such as contracting out of school teachers. Moreover districts are being mis-funded without necessarily improving public service delivery outcomes. Given that existing local wage bills have now emerged as the predominant drivers of transfers, additional work is needed to understand how reflective these are of local needs. To what extent do particular localities remain over or under staffed? Further analysis should attempt to more close monitor increases in local salary bills against initial conditions. Comparisons against benchmark allocations can serve as a useful tool to identify outliers for further assessments.

Even as Indonesia's specific grant program remains small, it must be seen as a complement rather than substitute to the general transfer program. Specific transfers (e.g., earmarked or conditional grants) presents a range of particular challenges, and have often tended to perform poorly (Bird and Smart 2002). There may be an important policy role for specific transfers in Indonesia. Since central ministries continue to control significant sectoral expenditures (e.g., for capital/development expenditures) in devolved sectors such basic education, health, and infrastructure, the DAK channel is often pursued as a potential vehicle to shift these expenditures into the more general intergovernmental fiscal system. Since the regional incidence of deconcentrated sectoral expenditures remains murky, DAKs promise greater transparency and accountability. However, at the same time specific grants instruments such as the DAK cannot serve to fix or offset the problems associated to the general DAU fiscal transfers identified in this analysis. At one level the proliferation of "remedial" DAKs may introduce excessive complexity to the system, while at the same time remaining relative limited in volume vis-à-vis the DAU.

Our analysis is focused on the horizontal distribution of transfers in Indonesia. Policy debates surrounding the adequacy of vertical and horizontal shares are clearly interdependent for whether Indonesia's regions are over or under-resourced. A larger overall pool may off-set particular horizontal misallocations, but may imply a significant degree of public resources being mis-allocated for over-resourced regions. Our analysis underscored the potential for significant loses due to horizontal misallocations of an intergovernmental transfer such as the DAU. Using a sample of districts, however, the approach can inform more in-depth work to assess whether individual districts along the

actual versus formula benchmark distribution receive sufficient absolute levels of fiscal resources given prevailing assignments of roles and expenditure responsibilities. More in-depth sub-national work already suggests that high levels of fiscal resources themselves may fail to ensure better outcomes (World Bank 2005). In this vein, there is a significant outstanding policy agenda in Indonesia for assessing both the quantity and quality of decentralized revenues and expenditures.

Finally, the preceding analysis suggests that a well designed and transparent formula based allocations provide a critical ingredient to enhancing the overall effectiveness of public finance in Indonesia. Concerned agencies such a the Ministry of Finance and Home Affairs can contribute to this process by making regional variations in expenditure needs and fiscal capacity indicators more explicit, while at the same time focusing on their performance over time. The South African model of periodic intergovernmental fiscal reviews (cf National Treasury 2005) provides a valuable example in this regard. The distributional method offered in this paper provides both visually and quantifiably powerful ways of better communicating to policy makers in a variety of international decentralization contexts the trade-offs inherent in the design and implementation of intergovernmental fiscal transfers.

Annex 1: The History of General Grant (DAU) Allocation Criteria

1. Indonesia's 2001-5 general intergovernmental block grants (DAUs) have been allocated on the basis of a number of component parts. After 2001, the allocation shifted away from one dominated by legacy SDO/Inpres allocations (Table 1). A wage/minimum allocation component continued to ensure that the "inherited" civil services could be resourced. Subsequent allocations sought to reduce this legacy allocation in favour of a fiscal gap formula that encompasses both measures of local expenditure needs and fiscal capacity. However, each allocation has been subject to additional contingency payments and/or adjustments either for transitional purposes or to ensure holding harmless relative to the previous year.

Table A1-Local Government DAU Allocation Components

	2001	2002	2003	2004	2005
Routine SDO/Inpres	80 %	-	-	-	-
Wages/Min Allocation		50%	45%	40%	40%
Fiscal Gap Fomula		40%	50%	55%	55%
Lumpsum	20 %	10%	5%	5%	5%
Contingencies/Adjustments	Yes	Yes	Yes	Yes	Yes
N (number of LGs)	336	348	370	410	434

DAU 2001 Allocation

2. The 2001 DAU, totalling 60 trillion Rps or about 6 billion dollars (4.1 % of GDP or 278 thousand Rupiahs per person), was allocated primarily on a "hold harmless" basis relative to legacy SDO and Inpres payments. Final amounts were announced in December 2000 Presidential Instruction (*Kepress)* 181. Ninety percent of the total DAU was distributed to local governments. Only one fifth of the 2001 DAU was allocated by formula that considered actual fiscal capacities and expenditure needs, as well a marginal residual lump sum component (Lewis 2001, Table 1).[23] Even in the limited formula component, fiscal capacity that could be attributed to natural resource sharing (SDA) did not enter into the DAU 2001 allocation, as data was not available at the time the formula was fixed.[24]

3. The 2001 allocation also included a 3 trillion contingency fund.[25] Ultimately this served to address the impact of a retroactive wage hike mandated by the center in the

---

[23] Special allocations were also made for the formation of new local governments. And 34 new local governments received new kabupaten/kota formation in 2001. Another twelve are slated for 2002.

[24] During the first year of decentralization the central government allocated the total DAU transfers to the regions based on budgeted amounts as per Law 35/2001, rather than realized actuals on the basis of 25 percent of revenues net of shared revenues (including the reforestation DAK). Since realized revenues were higher than budgeted (299.9 versus 263.2 trillion), the total DAU allocation based on actuals rather than budgeted would have been higher. Including adjustments for shared revenues – which appear to have been adjusted slightly upwards for realizations – the DAU based on actual rather than budgeted figures would have been 9 trillion more costly for the center.

[25] The original APBN allocation was more than double that at 6.5 trillion, apparently more than sufficient to cover financing short falls. The 2.831 trillion in contingencies were distributed in two batches of 1.1 and 1.7 trillion. Provinces received 1.2 trillion, 0.933 trillion (15) and 0.293 trillion (27). Local governments received 1.6 trillion, 0.173 trillion (15) and 1.431 trillion (219).

Spring of 2001 and unanticipated costs owing to the final regional allocation to civil servants and the new organizations of local governments, and was not allocated on the basis of equalization.[26] Provinces received over a third of the 2001 contingency allocations or about 20 percent of their original DAU allocation, as they often took on "residual" employees that the local governments were unwilling to accept.

DAU 2002 Allocations

4.   The DAU 2002 attempted to improve on the DAU 2001, and drew on extensive domestic and international consultations (cf SBPKPD 2001) as well as political debate. Budgeted allocations were 69.1 trillion (4.1% of GDP or 20% of total central expenditures). Total shared taxes are estimated to add another 24.6 trillion to the regional coffers. The budget also allocated an additional 2.054 Trillion "balancing" fund (*dana penyeimbang)*, which effectively served as a contingency allocation.

5.   Finally, allocations differed in five major respects: (i) did not include legacy center-region INPRES/SDO allocations, but only estimates for actual post-decentralization realized regional wage bills for 2001; (ii) increased the fiscal gap formula component that sought to encompass both fiscal capacity and expenditure needs in fiscal equalization from 20 to 40 percent; (iii) introduced data for shared natural resources taxes (SDA) in the fiscal capacity formula component,[27] (iv) increased the lumpsum component that was equally distributed across regions, (v) the DAU 2002 was ultimately forced to "hold harmless" relative to the DAU 2001 (in part due to the addition to SDA allocations to fiscal capacity), (vi) the DAU was now allocated across more new regions (348 instead of 336) reflecting pressures for regional profusion in the system.

6.   To illustrate how the final DAU 2002 amounts were generated, we draw on the local government example, although the process of provinces is similar.

$$(1). \quad DAU_i = PWBA_i + LS_i + FGA_i$$

7.   The lumpsum (LS) is an identical amount for each region. The proportional wage bill allocation (PWBA) for 2002 is based on the actual annualized realized regional wage bill for 2002 (using September 2001 data). It is proportional in that it does not actually cover each Rupiah of regionally expended wages. The LS and PWBA were collectively referred to as the minimum or basic allocation. The DAU 2002 local government allocations are based 10 % on lumpsum, 50% on proportional wages, and 40% on the formula. The provincial allocation was based on a 20% identical lumpsum allocation across all provinces or local governments, 30% realized wage bill, and 50% formula. The fiscal gap formula amount (FGA) combined measures of expenditure needs and fiscal capacity. The formula used regional population, area, poverty gap, and cost index data as proxies for expenditure needs. Fiscal capacity included expected own tax (PAD)

---

[26] With decentralization, local governments were allowed to determine their own organization structure (e.g., *dinases, badans,* and *kantors*). Depending on size and local preferences, regions chose more expansive organizational structures and numbers of management positions. The number of management positions (*echelons)* had a significant bearing on local governments ensuing wage bill.
[27] Aceh and Papau were not penalized for their additional natural-resource tax "fiscal capacity" under the 2002 DAU balancing formula component.

revenues, shared taxes (including land and building and personal income tax), and (partial) natural resource revenues SDA.

Lumpsum Allocations

8. The sum of *lumpsum allocations* were 6.2 trillion for local government and 1.2 trillion for provinces. Local governments were to receive 18.51 billion per local government (or 31,875 per head). Provinces received 46.1 billion per province or 10,063 Rps per capita. The introduction of a lump sum figure creates incentives for the formation of new regions, especially in the case of smaller provinces (Fitrani, et al. 2005).

(2). $LS_i = (LS\text{-weight} * Total\ DAU) / N$

Proportional Wage Bill Allocation

9. For the *proportional wage allocation,* 31.1 trillion of the local government and 2.1 trillion of the provincial DAU were allocated by the relative percentage share of each local government or province in the total actual wage bill. The DAU 2002 base data suggests that the total annualized wage bill in 2001 was 40.5 trillion for 336 local governments and 6.6 trillion for 30 provinces.

(3). $PWBA_i = (Wage\ Bill_i/Total\ Wage\ Bill) * (Total\ DAU\ PWBA)$

Fiscal Gap Formula Allocation

10. The *fiscal gap formula amount* incorporates measures for fiscal capacity and expenditure needs to arrive at an allocation based on fiscal gap (FG_i).

(4). $FG_i = EN_i - FC_i$

11. Depending on the relationship between the expenditure needs and fiscal capacity indicators, fiscal capacity can be negative. The Indonesian formulation imposed the condition that no region show a negative FG (and hence have STX and SDA transfers reduced).

12. *Fiscal capacity* includes estimated own revenues (PAD_i^*), realized tax shares (SXT_i includes PBB, BPHTB, PPh shares for each region), and 75 % of realized natural resource revenue shares (SDA_i). Own revenues were estimated from a regression of own revenues against region income for manufacturing and services.[28] This formulation seeks to avoid penalizing regions own tax effort that collect more than some average milestone of own revenues (e.g., through varying rates or tax collection effort).

(5). $PAD_i^* = 2.357 + 0.00957*RGDPSI_i$

---

[28] The local government regression was run for annualized estimated FY 2000 PAD receipts per region. Provincial own-revenue estimates (PAD) were calculated as 0.87 percent of provincial manufacturing and services GDP. The constant of the provincial regression was dropped, as it was negative.

13. Shared revenue amounts SXT_i and SDA_i were drawn from actuals for 2001. As indicated by the formula, only seventy five percent of natural resource revenue shares received by each region enter into the fiscal capacity definition.

$$(6). \quad FCi = PADi^* + STXi + (0.75*SDAi)$$

14. The *expenditure needs* term incorporates an index for regional factors such as population, poverty gap, area, and price levels relative to national averages.[29] The indexes are defined as the regional factors (e.g., POP_i) divided by the national average (e.g., total population).

$$(7). \quad IENi = (0.4 * IPOPi) + (0.1 * IPOVGAPi) + (0.1 * IAREAi) + (0.4 * ICOSTRELi)$$

15. The total expenditure needs index is a composite of a localities population, poverty gap, area, and cost level relative to the national average. An above average population would result in a higher expenditure needs indicator. In the 2002 formulation, population and cost were given the largest weight (together 80 percent). In contrast, the 2001 formula gave equal weights to all factors. A region with an expenditures needs index under one (i.e., higher than average population, area, poverty incidence, and cost index) will receive more DAU, relative to its fiscal capacity.

16. To arrive at an actual Rupiah amount of expenditure needs, the index was multiplied by as estimated of average expenditure needs (EN^{AV}). It is important to note that this measure does not reflect some actual cost measure, but rather to be reflective of the total resource pool available, in this care total local government spending (APBD) in the previous year. This contrasts with attempts to cost out individual sectoral needs (World Bank 2000).[30]

$$(8). \quad ENi = EN^{AV} * IENi$$

17. Subtracting actual fiscal capacity (FC_i) from expenditure needs (EN_i) for all local governments resulted in a total fiscal gap (FG_i):

$$(9). \quad FGi = ENi - FCi$$

---

[29] The poverty gap measure provides a reflection of the extent of poverty in that it measures the difference between expenditures (cf Deaton 1997:147). The DAU 2002 used an exponent parameter of 1 for the ratio of the difference between the poverty line and individual expenditure divided by the poverty line for the poor.

[30] Lewis (2002) rightly points out that this average amount may be too much or too little. Since we can say little about the appropriateness of this overall resource envelope, we simply accept the EN^{AV} factor as given by political decision. The measure used in 2002 was total local government expenditures in 2000 or 169.62 billion Rupiahs per region -- available divided by the total number of regions. The choice of this measure is somewhat arbitrary, as arguably an inflation adjusted amount could have been used (e.g., projected PAD, STX, SDA, DAU and other transfers such as DAK). As the main use of this coefficient is scaled by the actual DAU available for the formula window (Eq. 9), differences are not that significant. However, one slight shift would be that a choice of higher average expenditure needs indicators would generated fewer zero or non-zero fiscal gap allocations.

18. However, FC_i would have exceeded EN_i for 12 local governments, thus generating a negative fiscal gap (and transfer). To avoid this, these negative fiscal gap local governments were set to zero.[31] The overall local government formula amount (FA_{total}) of 28.4 trillion (40 percent of the local government DAU) was then allocated proportionately based on the share of each local governments fiscal gap. Note that those with a fiscal gap of zero (or previously less) would have received no formula amount under this formulation.

$$(10). \quad FAi = FAtotal * (FGi/FGtotal)$$

Final Modifications: Hold Harmless and New Regions

19. The new DAU 2002 was approved by the Regional Autonomy Advisory Board (DPOD, *Dewan Pertimbangan Autonomy Daerah)* on 30th August 2001 (see DPOD Sekretariat 2001).[32] However, this decision was met by strong protests from the Parliament's budgetary commission (DPR 2001) as a number of most natural resource rich regions noticed that they stood to receive less than in the previous year. Eleven provinces would have received 1.415 trillion and 72 local governments (out of the original 336) received 2.851 trillion less than the previous year (Government of Indonesia 2001).[33]

20. The final DAU 2002 allocation approved by Parliament on 5th December 2001 therefore ensured that no locality received less than in the previous year than the DAU 2001 plus contingency.[34] This no-harm clause meant an effective shortfall of Rp. 4.212 trillion. In contrast, the remaining local governments received 9.2 trillion more. The working team did have a contingency of 2 trillion to work with, but this was clearly not enough, so clearly some changes to the previous allocations had to be made.[35] Hence the surplus rather – rather than an additional "residual" contingency – was proportionally allocated by each regions share of the overall surplus to fill the remaining gap (i.e., this

---

[31] This increased the implicit fiscal need by Rps. 2 trillion to equal to a total of 44.7 trillion in those respective simulations.

[32] Already there was a *request* that the government do its best to ensure that no region received less in 2002 that in the previous year. The simulations were based on the prevailing DAU ceiling, which differed slightly from the amount that Parliament subsequently approved.

[33] The Parliament's objections seemed to contravene Law 22/1999, which prescribes the fiscal balance secretariat to submit a formula to the Regional Autonomy Advisory Board (DPOD), which in turn proposes the distribution of the DAU to the President. The President approves through a Presidential decision (KEPPRES).

[34] Actual simulations and data are available on request as STATA procedures.

[35] The adjustment for the local governments proceeded in three steps: (i) the hypothetical amounts under the no-harm clause were calculated. For the local governments, this inflated the overall DAU amount from 62.2 to 65.1 trillion; (ii) For the surplus regions, the difference made up by reducing their surplus by their share of the surplus times the deficit (i.e., 2.9 trillion); (iii) The surplus regions were then topped up again by a part of the contingency (1.2 trillion for provinces and 0.855 trillion to the local governments). The contingency was allocated in proportion to the reduction of the DAU of the surplus regions in the first stage (i.e., those that had given up the most DAU were also most compensated by the contingency distribution).

meant that the "winners" relative to 2002 also paid the most to make up for the no-harm deficit).[36]

21. Except for a different weights assigned to the fiscal capacity component, the 2003, 2004 and 2005 DAU's were essentially allocated along similar principles, although with increasing formula shares and updated data, especially to reflect the growing number of localities in each round[37]. This new "hold harmless" condition has superseded the 2001 hold harmless condition, which guaranteed that no local government received less that the previous routine (SDO) and development (Inpres) earmarked grants. Simulations were always made using the previous years local governments (i.e., 370 for 2004), and the pro-rated to local governments that experienced a split.

Figure A1-DAU 2004: Hold Harmless Winners
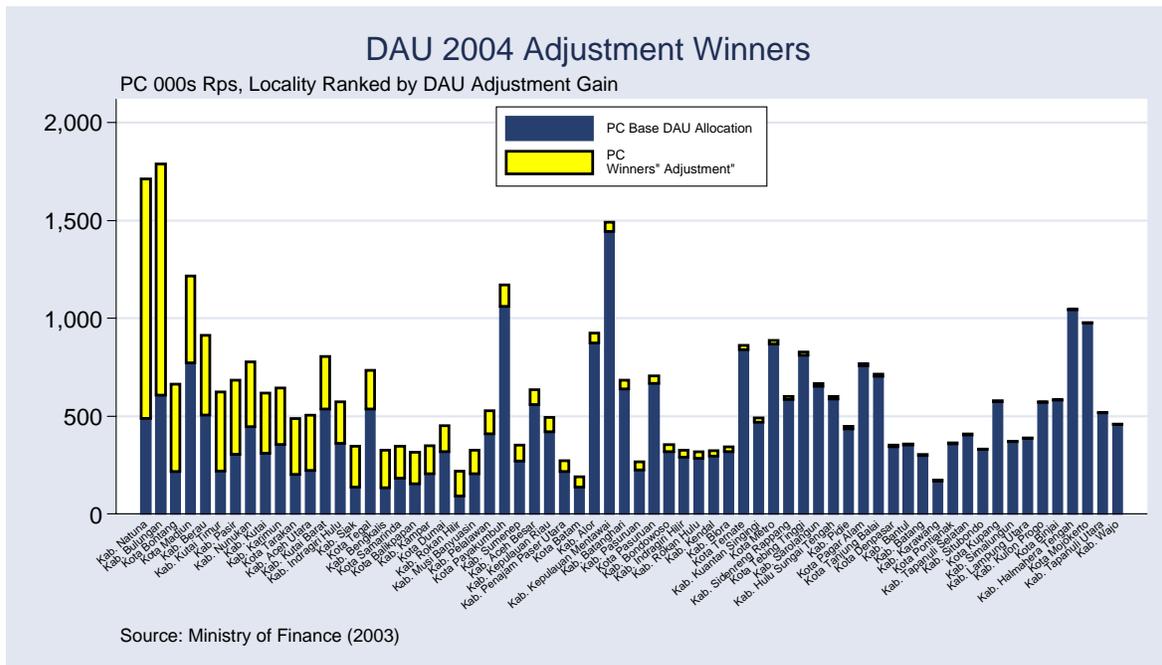
22. Figure 3 shows that the hold harmless adjustment for 2004 will benefit a few select local governments, depicted on the left hand side of this figure. 66 districts gained, led by Kabupaten Natuna in Riau. It received Rps. 1.22 million more DAU per capita than it would have in absence of the adjustment. Less than a fifth (17 percent) of the local governments gained from the adjustment. Not unexpectedly, the winners were wealthier regions. Their estimated total per capita revenues were on average Rps. 1.16 million compared to 720 thousand.

---

[36] The second set of adjustments was to account for the twelve new cities for 2002. A series of steps "fudges" then followed to arrive at the final allocations. The final allocation lumpsum allocation was dropped to 17.87 billion per local government to reflect the new total of 348 local governments. Wage allocation for the twelve new cities was split from their old regions. The revised fiscal gap FG allocations were based on the post-surplus (pre-contingency) redistribution amounts for the unchanged local governments minus the original minimum allocations (LS+PWBA). For the split local governments and their new cities the FG allocations were distributed according to population and area criteria.

[37] The new fiscal capacity formula used is $FCi = (O.5\ PADi^{*}) + STXi + SDAi$

DAU 2006: Any Innovations?

23. Effective in 2006, the minimum allocation will now cover the total wage bill instead of proportional wage bill (PWBA) and lump sum (LS). In practice, the allocation for wage will be done first and then the rest of the DAU pool will be distributed based on the fiscal gap formula.

24. The Fiscal Gap formula has undergone some major innovations as well. First the components of fiscal capacity will now be fully weighted;

$$(11). \quad FCi = PADi^* + STXi + SDAi$$

Second, the poverty gap indicator is substituted by an inverse of Human Development Index (HDI) and Gross Regional Domestic Product per capita

$$(12). \quad IEN = (0.3*IPOPi + 0.1*1/HDIi + 0.15*IAREAi + 0.3*ICOSTRELi + 0.15*IPCGRDPi)*EN^{AV}$$

The rest of the process remains the same with previous years, including the hold harmless provision.[38]

25. Third, is the removal of hold harmless condition by fiscal year 2008. Folloring the formula final DAU allocation will be

$$(13). \quad DAUi = BAi + FGi$$

The basic allocation (BA) equals to 100 percent of wage bill. The final adjustments will be as follows:

(i) If a region has fiscal gap equal to zero, it shall receive DAU in the amount of the basic allocation (BA). (FG=0; DAU = BA).
(ii) If a region has a negative fiscal gap that is lower than the basic allocation, it shall receive DAU in the amount of the basic allocation less the value of the fiscal gap. (if CF<0, [CF]<AD; DAU < AD).
(iii) If a region has a negative fiscal gap equal to or bigger than the basic allocation, it shall receive zero allocation of DAU. (if CF<0, [CF] >= AD; DAU = 0)

---

[38] Please note that if a region has a minus or zero fiscal gap, its DAU 2006 before hold harmless will be equal to its total wage bill. If the amount is bigger than the previous year DAU, the final DAU allocation after the hold harmless adjustment will ultimately be less than the 100 percent of total wage bill. In 2006, for example, regions such as Kabupaten Badung (Bali), Kabupaten Penajem Paser Utara (East Kalimantan) and DKI Jakarta receive DAU less than their total wage bills.

References

Arze, Javier. 2005. "Fiscal Equalization Impact of Changes to the DAU Allocation Mechanism." World Bank Office: Washington, DC.

Bahl, Roy and Bayar Tumennasan. 2004. "How Should Revenues from Natural Resources be Shared in Indonesia?" in *Reforming Intergovernmental Fiscal Relations and the Rebuilding of Indonesia: The 'Big Bang' Program and its Economic Consequences*. Cheltenham, UK & Northhampton, MA, USA: Edward Elgar, pp. 199-233.

Bird, Richard M. and Micheal Smart. 2002. "Intergovernmental Fiscal Transfers: Some Lessons from International Experience." *World Development*, 30:6, pp. 899-912.

Deaton, Angus. 1997. *The Analysis of Household Suveys: A Microeconometric Approach to Development Policy*. Washington: World Bank.

DJAdPK. 2004. "Desentralisasi Fiskal Pasca UU No. 33 Tahun 2004". Warta Anggaran." Direktorat Jenderal Anggaran dan Perimbangan Keuangan, Departemen Keuangan/Ministry of Finance, Repubic of Indonesia (2nd edition): Jakarta.

DPOD Sekretariat. 2001. "Hasil Simulasi Setelah Penyempurnaan." 29. Regional Autonomy Advisory Board (DPOD) Sekretatiat: Jakarta.

DPR. 2001. "Kesimpulan Rapat Kerja Panita Anggaran DPR_RI Dengan Menteri Keuangan Selaku Wakil Pemerintah Dalam Rangka Pembicaraan Tinkgkat III/Pembasahan Rancangan Undang-Undang Tentang Anggaran Pendapatan Dan Belanja Negara (APBN) Tahun Anggaran, Tanggal 1.23 Oktober 2001." 13. Dewan Perwakilan Rakyat: Jakarta.

Fitrani, Fitria, Bert Hofman, and Kai Kaiser. 2005. "Unity in Diversity? The Creation of New Regions in a Decentralizing Indonesia." *Bulletin of Indonesia Economic Studies*, 41:1, pp. 57-79.

Government of Indonesia. 2001. "Penjelasan Perhitungan DAU TA 2002 Berdasarkan Usulan Pemerintah dan Penyesuaian Formula Hasil Kesepakatan Panja Dana Perimbangan." 3. Ministry/Agency to be confirmed? Jakarta.

Hofman, Bert and Kai Kaiser. 2004. "The making of the big bang and its aftermath: a political economy perspective." 14-46. Edward Elgar Press: Cheltenham, UK/Northhampton, UK.

---. 2006. "Decentralization, Democratic Transition, and Local Governance in Indonesia," in *Decentralization and Local Governance in Developing Countries: A Comparative Perspective*. Pranab Bardhan and Dilip Mookherjee eds. Cambridge, MA: MIT Press (forthcoming).

Kaiser, Kai. 2005. "Intergovernmental Fiscal Relations in Pakistan: Structural Challenges for the 2001 Devolution." World Bank (mimeo): Washington, DC.

Lewis, Blane. 2001. "The New Indonesian Equalization Transfer." *Bulletin for Indonesian Economic Studies*, 37:3, pp. 325-43.

---. 2002. "Dana Alokasi Umum FY 2001: Description, Empirical Analysis, and Recommendations for Revision," in *Indonesia's Sustainable Development in Decentralization*. Budy P. Resosudarmo ed. Jakarta: Indonesian Regional Science Association.

---. 2002. "Revenue-Sharing and Grant-Making in Indonesia: The First Two Years in Fiscal Decentralization," in *Intergovernmental Transfers in Asia*. Paul Smoke ed. Manila: Asian Development Bank (forthcoming).

---. 2004. "Review of Law 32/2004 and Law 33/2004." 17. World Bank (processed, presentation): Jakarta, Indonesia.

National Treasury. 2005. "Intergovernmental Fiscal Review: TRENDS IN INTERGOVERNMENTAL FINANCES: 2000/01 - 2006/07." National Treasury of the Republic of South Africa (www.treasury.gov.za): Pretoria.

SBPKPD. 2001. "Laporan: Formulasi Dana Alokasi Umum Tahun 2002." 59. Sekretariat Bidang Perimbangan Keuangan Pusat Dan Daerah: Jakarta.

World Bank. 2000. "Health Strategy in a Post-Crisis, Decentralizing Indonesia." 65. World Bank, Human Development Sector Unit: Washington, DC.

---. 2003. "Decentralizing Indonesia: A Regional Public Expenditure Overview Report." World Bank East Asia Poverty Reduction and Economic Management Unit: Washington.

---. 2003. "Estimating Financing Needs for Local Services in Madagascar." 4. Poverty Reducation and Economic Management (PREM): Washington, DC.

---. 2005. "Civil Service Reforms at the Regional Level: Opportunities and Constraints." World Bank Jakarta: Jakarta.

---. 2005. "Examples of effective incentives and mechanisms to attract and retain personnel in disadvantaged areas." Public Sector Group (mimeo): Washington, DC.

---. 2005. "Papua Public Expenditure Analysis: Regional Finance and Service Delivery in Indonesia's Most Remote Region." World Bank, Provincial Govt. Papua, Support Office for Eastern Indonesia (SOfEI): Jakarta/Makassar.

Zhuravskaya, Ekaterina V. 2000. "Incentives to provide local public goods: fiscal federalism, Russia style." *Journal of Public Economics*, 76, pp. 337-68.