CHOOSING THE DEGREE OF EQUALIZATION IN UKRAINE'S FORMULA[1]

With the adoption of the new Budget Code the Ministry of Finance will calculate formula based transfers to (or from) 686 local governments in the 2002 budget. The Budget Code describes the methodological approach to be used in these calculations but does not prescribe in detail how this methodology is to be applied. In principle, these transfers should reflect the difference between a local government's estimated expenditure needs and its estimated revenue means, modified by a coefficient of equalization that will determine the degree to which different local budgets are equalized at the planning stage of budget preparation.

The budget code specifies that the coefficient of equalization can vary within the range of .6 to one. In the 2001 budget the transfer calculations made by the Ministry of Finance relied on a value of unity for this coefficient. For the 2002 budget, however, there has been a growing interest in exploring the effects of alternative values for this coefficient. Given the lack of familiarity with a new formula based funding approach for determining transfers, it is not surprising that much of this discussion displays some confusion on certain issues. First, about where the choice of the equalization coefficient fits into the budget process and, secondly, about how different choices will affect different local budgets as well as the State budget.

The purpose of this note is to dispel much of this confusion. It looks at both the macro- and microeconomic consequences of selecting a value for the equalization coefficient other than unity. It further looks at the budgeting problems that arise when the coefficient of equalization is chosen independently of the overall size of local budgets, as well as at the options to resolve these problems. Plausible outcomes of the application of the proposed options are simulated both on a hypothetical simplified case and on real data of local budgets of Ukraine. Finally, it proposes a short analysis of approaches to the application of the coefficient of equalization that are now prepared by the Ministry of Finance and are to be implemented in 2002.

For the remainder of this note, the coefficient of equalization will be referred to as "alpha", that Greek letter that was used to designate it in the 2001 budget.

I. Impact of Different "Alphas" on Different Budgets

Table 1 below shows, in a hypothetical numerical example, how resources will be redistributed between local and State budgets as "alpha" is reduced in size from unity to .8. A value for "alpha" of less than one reduces the size of both positive transfers from, and negative transfers to, the State budget, in this particular case by twenty per cent. However, because positive transfers are larger than the amount of negative transfers, overall funding for local budgets declines and the reduced funding for local budgets is matched by an increase in State budget revenues.

Table 1. Budgetary Redistribution through Alpha
(billions)

Size of Alpha	Local Expenditure	Local Own Revenue	Transfers (to)	Transfers (from)
1	16	10	6	2
.8	15.2	10	4.8	1.6

In this example, positive transfers fall by 1.2 billion and negative transfers by .4 billion. Total budgetary resources available to local governments therefore decline by the difference between these two numbers, or by .8 billion. This revenue loss for local governments is mirrored in a revenue gain to the State budget of the same amount.

[1] By Kateryna Mainziouk and Wayne Thirsk.

How different local governments will be affected by the lower value for "alpha" depends on their initial level of transfer dependence, in the case of transfer recipients, and on the initial level of transfer pay-outs, in the case of transfer donors. Using an example with four local governments, Table 2 indicates how budgetary resources will be redistributed among the group of local budgets when "alpha" is reduced from one to .8. The general result is that the higher the proportion of transfers to total revenue, the larger is the size of either the gain or loss to a local budget.

Table 2. Budgetary Redistribution among Local Budgets

Local Budget	(a)	(b)	(c)	(d)
Transfers relative to Revenues (%)	60	10	-60	-10
Revenue Change (%) with alpha of .8	-12	-2	12	2

The most transfer dependent local budget, budget (a), experiences the largest relative revenue loss while the richest local budget in terms of own revenue availability, budget (c), enjoys the largest revenue gain. It is clear from this example, that a lower value for "alpha" is associated with a redistribution of budgetary resources from the very poorest local budget to the very richest. Lower values of "alpha" allow local governments with the largest tax bases to gain at the expense of local governments with the smallest tax bases.

II. The Problem of Budgetary Overdetermination and a Suggested Solution

As was seen in Table 1, a lower value for "alpha" implies a lower level of spending on the part of all local governments. Suppose, however, that in its budget determination process the Ministry of Finance sets the level of transfers to local governments and the size of local government expenditure independently of its choice of "alpha". This leads to a problem of budgetary over-determination[2] as the decision about "alpha" directly affects the size of local spending and it is inconsistent to ignore this inter-relationship among budgetary variables. It is simply not possible to choose the size of "alpha" and the size of government spending independently. This contradiction has apparently arisen in the course of preparing the 2002 budget and appears to have cast some doubt on the validity of the formula approach itself. Some have alleged, for example, that the formula does not work properly because of this inconsistency and it therefore contains fundamental flaws.

What can be done then to reconcile these inconsistent budgetary decisions? The preferred solution would be a budgetary process that determines the size of local government spending and the size of "alpha" simultaneously and thereby removes the possibility of inconsistent budgetary outcomes. Failing that, the next best option to consider is modifying the formula itself to incorporate the additional constraint on funding that is imposed by an "alpha" of less than one. The remainder of this note discusses how this modification should be made and illustrates the operation of a modified formula with a simple numerical example.

Table 3 presents a "base case" situation for five hypothetical local governments. These governments are assumed to have identical expenditure needs but quite different revenue characteristics. The assumption of identical expenditure needs, 200 per capita, allows us to

[2] From the standpoint of formal Mathematics, a system where the number of variables is fewer than the number of restrictions is 'over-determined' and hence is either incompatible or can be reduced to an equivalent system that can be either determined (if the rank is equal to the number of equations) or undetermined (if the rank is lower than the number of equations).

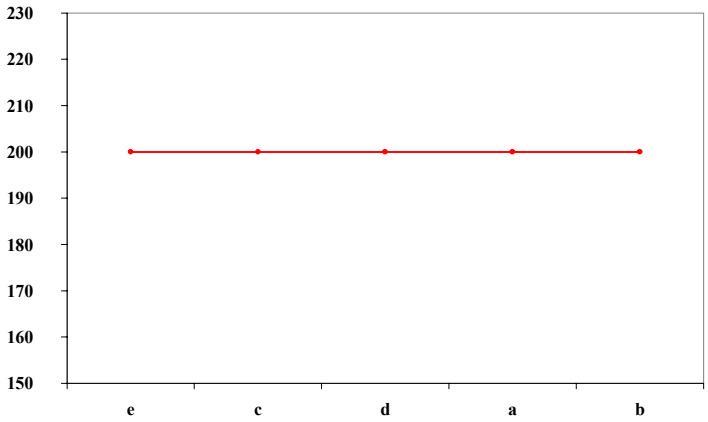
demonstrate more clearly and transparently the way in which the formula resolves the problem of budget over-determination. Further in this note we will consider a more realistic situation where per capita expenditure needs of local governments are calculated on a norm basis and, hence, differ across the territories. We will find that the application of a modified formula is appropriate in this situation as well. In both cases we assume that revenues per capita to vary between 85 and 300 reflecting different sized tax bases.

Table 3. Formula Transfers and Unitary Alpha: an Example

	Population	Relative Expenditure Need	Relative Expenditure Need Percapita	Calculated Revenue Forecast	Calculated GAP	Tranfer = GAP	Resulting Expenditures Percapita	Calculated Revenues Percapita
	1	2	=2/1	3	2 - 3	2 - 3	2 / 1	3 / 1
e	20	4,000	200	1,700	2,300	2,300	200	85
c	15	3,000	200	1,500	1,500	1,500	200	100
d	30	6,000	200	3,000	3,000	3,000	200	100
a	5	1,000	200	800	200	200	200	160
b	10	2,000	200	3,000	- 1,000	- 1,000	200	300
Total	**80**	**16,000**	**200**	**10,000**	**6,000**	**6,000**	**200**	

When “alpha” is set equal to one, the formula provides for complete equalization among the group of local governments. All local governments in this example will either receive, or make, a transfer, calculated from applying the formula that will allow them to achieve the same level of per capita expenditure, 200. The per capita transfer in each case will be the difference between per capita expenditure needs and estimated per capita revenues. As Table 2 shows, only the local government (b) in our example will have per capita revenues surplus to its per capita expenditure needs and it, therefore, will contribute a negative transfer of 100 per capita to the State budget.

Figure 1. Distribution of per Capita Spending in Case of Unitary Alpha



Using the same set of numbers as in Table 3, Table 4 illustrates how the formula can be revised to permit the same level of local government spending when “alpha” is reduced below unity. With a value for “alpha” of less than one, differences in the size of local government's tax base are allowed to influence the level of per capita spending. Per capita spending will be higher than average in communities with the largest per capita revenues and vice-versa. The resulting differences in per capita expenditure, however, are constrained by the revised formula to have the same average value as before when “alpha” had a value of one.

To better understand the nature of the modified formula, some notation is introduced below:

E_i = per capita expenditure needs of the i'th local government;
E^* = average per capita expenditure need of all local governments;
R_i = per capita revenues of the i'th local government in the previous period;
R^* = average per capita revenue for all local governments in the previous period;
P_i = population of the i'th local government area;
P = total population of all local government areas
α = the coefficient of equalization;
R = forecast of average per capita revenue in the current budget period;
IFC_i = index of relative fiscal capacity for the i'th local government;
T_i = formula based transfer for the i'th local government.

Using this notation, the modified formula appears as:

$$T_i = (E^* + (1- \alpha)(R_i - R^*) - IFC_i x R)P_i$$

This formula is almost identical to the regular formula except for the inclusion of the second term on the right hand side of the transfer equation. This term allows per capita spending to diverge from the average amount, E*, according to the size of "alpha" and the extent to which a local government's historical per capita revenues differ from the average amount. If a local government historically has had higher than average per capita revenues, its planned per capita spending will exceed the average amount by a factor that depends on the size of "alpha". Conversely, when a local government has experienced below average per capita revenues, it's per capita expenditure will be less than average to reflect its relatively small tax base. The magnitude of these departures from average spending will depend on the size that is chosen for "alpha". As "alpha" declines in size, the degree of expenditure disparity will increase to reflect the lower level of equalization that has been selected. An important feature of these disparities is that their weighted average is always zero, thus preserving average per capita spending at its original value.[3]

If "alpha" were given a value of one, the regular transfer formula would be reinstated. In the limit, if "alpha" were alternatively assigned a value of zero, indicating no preference for any expenditure equalization, the variation in local government spending would be driven entirely by differences in the size of the local tax base.

Table 4 puts the modified formula through its paces in the context of the five local government example. In this example, the value of "alpha" is set at .6, the lower bound allowed by the budget code. The local government labeled as (e) can be used to illustrate how the modified formula works. Based on its past revenue record, community (e) has the lowest index of relative fiscal capacity, .68. The difference between its past per capita revenue and the average amount is minus 20. The product of this difference and (1-α) is, in this case, equal to minus 8. The average per capita expenditure of 200 minus 8 is 192, the new measure of per capita expenditure need taking into account the below average size of the tax base in this community. Multiplying by the total population of this community, the total expenditure need is 3,840. Given a revenue forecast of 1700 for this community, the revenue gap is 2,140, an amount that the

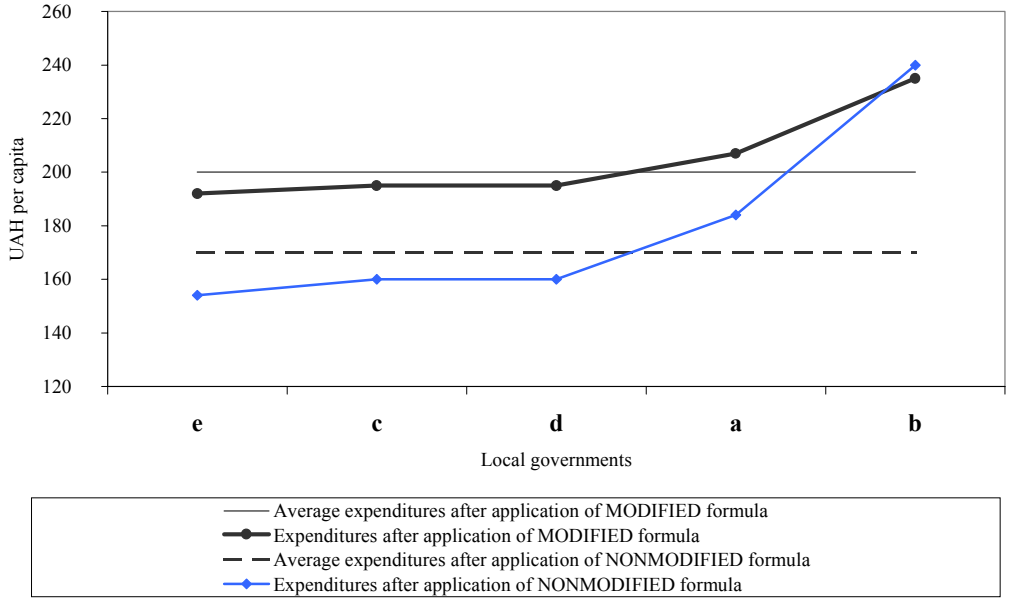
[3] It is easy to show that the sum of the deviations of per capita revenue from the average, weighted by the relative size of a local government's population in total population, is zero. This is why the value of average per capita spending is unaffected by the choice of "alpha".

modified formula would calculate as the necessary transfer needed to balance this community's budget.

Table 4. An Example of the Modified Formula Calculation

		Relative Fiscal Needs			How do we calculate the Revenue Forecast?			The Process of "Correction"			
Local Gov't	Popula-tion	Overall	**Per Capita**	Calculated Revenue Forecast	Actual Revenues last period	Revenue per capita last period	Coefficient of RFC	Deviation from Average Revenue Percapita	**"Corrected" Average Expenditure Percapita**	"Corrected" Relative Expenditure Need	New Calculated GAP = New Transfer
e	20	4,000	**200**	1,700	850	43	0.68	- 20	**192**	3,840	2,140
c	15	3,000	**200**	1,500	750	50	0.80	- 13	**195**	2,925	1,425
d	30	6,000	**200**	3,000	1,500	50	0.80	- 13	**195**	5,850	2,850
a	5	1,000	**200**	800	400	80	1.28	18	**207**	1,035	235
b	10	2,000	**200**	3,000	1,500	150	2.40	88	**235**	2,350	- 650
Total	**80**	**16,000**		**10,000**	**5,000**	**63**	**1.00**	**60**	**200**	**16,000**	**6,000**

Figure 2. Resulting Changes in the Distribution of Per Capita Expenditures



Similar calculations are performed for the other communities in this table. The resulting dispersion in per capita spending is shown in the graph accompanying this table. The community with the largest revenue base, community (b) ends up with per capita expenditure of 235 or a level of spending that is 22.4 per cent higher than that in the lowest spending community. The weighted average of these expenditure differentials is 200, the same level of average spending as in the case when “alpha” was assigned a value of one.

It is clear from this example that the modified formula is capable of reconciling a fixed level of local government expenditure and any value that might be chosen for “alpha”.

III. Application of the Modified Formula without Assuming Identical Average per Capita Needs

Unlike the described example, where estimated per capita expenditure needs were assumed to be identical across different communities, in reality they could be quite different. How would this fact reconcile with the application of the modified formula?

Table 5 and Figure 2 continue the example of the five hypothetical local governments dropping the assumption about identical estimated expenditures. Assume that the estimated per capita expenditure needs of these five sample communities vary between 130 and 260 Hryvnias (these numbers are shown in the fourth column in Table 5 highlighted in bold), but the average remains at the level of UAH 200. Besides, assume a highly possible situation where in some budgets, say in communities (e) and (c), estimated expenditure needs are higher than average (260 and 280 respectively), while the revenue base indicators of those governments are rather weak compared to the remaining three local governments and their average per capita revenues in the last year were UAH 20 and 13 lower than average. Conversely, revenue needs of local government (a) are relatively low, UAH 150, while its per capita revenues in this budget period were higher than average by UAH 11. The modified formula requires that, for poorer governments, estimated expenditure needs in the formula should be decreased with account for "alpha". Since per capita expenditures in the budgets of these two communities used to be higher than average before the introduction of the formula, the modified formula should move them closer to the average level. Respectively, the high revenue position of government (a) will result in an increased index of estimated expenditures of its budget in the formula. Since 'baseline' expenditures of the government (a) were lower than average, the formula in this case will only decrease the deviation of this budget from average.

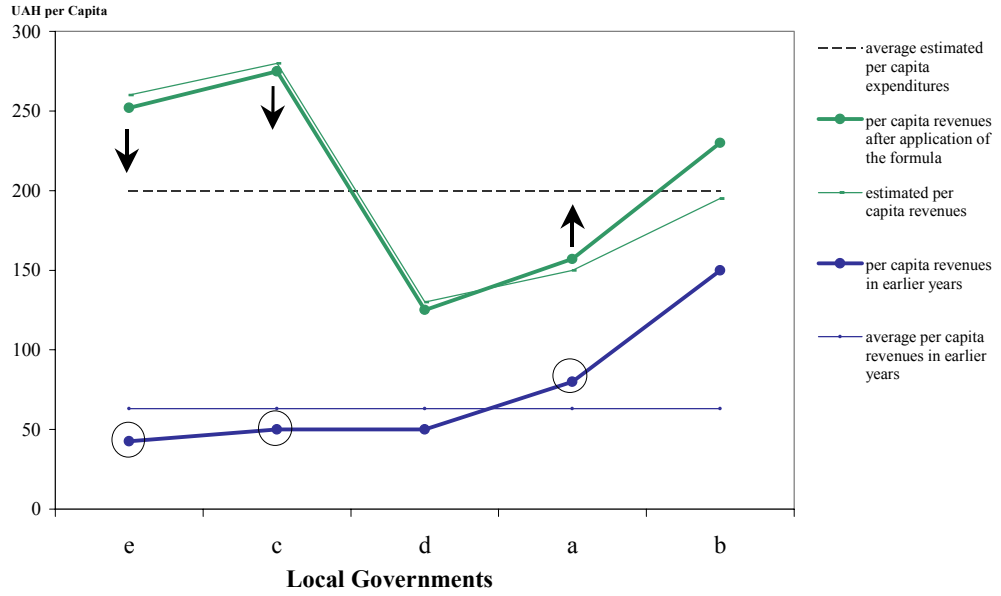
Table 5. Transfer Calculation without Assuming Identical Average per Capita Expenditures
("alpha" = .6)

					How do we calculate the Revenue Forecast?			The Process of "Correction"				
Local Gov't	Popula-tion	Relative Fiscal Needs	**Relative Fiscal Needs Percapita**	Calculated Revenue Forecast	Actual Revenues last period	Revenue per capita last period	Coefficient of RFC	**Deviation from Average Revenue Percapita**	**"Corrected" Average Expenditure Percapita**	"Corrected" Relative Expenditure Need	New Calculated GAP = New Transfer	Resulting Expenditure
e	20	5,200	**260**	1,700	850	43	0.68	- **20**	252	5,040	3,340	5,040
c	15	4,200	**280**	1,500	750	50	0.80	- **13**	275	4,125	2,625	4,125
d	30	3,900	**130**	3,000	1,500	50	0.80	- **13**	125	3,750	750	3,750
a	5	750	**150**	800	400	80	1.28	**18**	157	785	- 15	785
b	10	1,950	**195**	3,000	1,500	150	2.40	**88**	230	2,300	- 700	2,300
Total	80	16,000		10,000	5,000	63	1.00	**60**		16,000	6,000	16,000

In other words, we observe that apart from those local governments for which the modified "alpha" results in an increased deviation from average, there are some governments with an opposite relative budget position in per capita revenue history and estimated expenditure needs. For such governments, the lower-than-unity "alpha" brings a larger budget equalization; and the lower the "alpha", the closer to the average they are. If the overall number of such governments is relatively large, the described effect may outweigh the trend towards higher dispersion which would normally be a typical feature of a smaller "alpha". Such is the situation

simulated in our hypothetical example. When "alpha" equals unity, each government has a baseline level of per capita expenditures with a standard deviation of UAH 66 and a coefficient of variation of .33. When "alpha" is set, for example, at a level of .6 (as in Table 5), the standard deviation of the five governments considered here decreases to UAH 64 and the coefficient of variation goes down to .32.

Figure 3. Resulting Changes in the Distribution of Per Capita Expenditures



Thus, the modified formula with a lower-than-average "alpha" exerts a dual effect. On the one hand, "alpha" rewards those local governments that demonstrate a better relative revenue position in earlier years by increasing the amount of their estimated per capita expenditures. On the other hand, as a result of specific characteristics of the baseline distribution of per capita expenditure needs (which frequently does not coincide with the local budget's position in terms of revenues), the effect of "alpha" is to decrease rather than increase the dispersion of per capita revenues.

IV. Simulation of Applying the Modified Formula to Actual Local Budget Numbers

In order to illustrate the possible outcomes of applying the proposed formula to Ukrainian local budgets, this section outlines the results of a simulation conducted on actual data which was used by the Ministry of Finance in preparing the first draft of intergovernmental transfer formulation for 2001. (In the first draft, transfers were calculated between the State budget and the budgets of all the rayons and cities of Ukraine). First, for the sake of a more illuminating demonstration of the idea of a modified formula, all calculations are performed on the assumption that relative per capita expenditure needs in each Ukrainian city or rayon are equal to the national average (UAH 197). Table 6 summarizes the results of these computations for 685 cities and rayons. As one can see from that Table, with an "alpha" reduced from 1.0 to .6, the overall amount of calculated expenditures of local governments remains unchanged and totals UAH 9,182,538 thousand. The national per capita average is also unchanged and amounts to UAH 197. At the same time, with a lower "alpha", the amounts of positive and negative transfers

decrease and, as a result, the variation in ultimate per capita expenditures increases (as Figure 4 graphically demonstrates).

How much would the assumption about the identity of expenditure needs affect real calculations? The results of a simulation that drops this assumption are shown in Table 6 and Figures 5 and 6. Baseline indicators of relative expenditure needs in this simulation correspond to actual data on local governments' per capita expenditures calculated on the basis of a norm-driven approach. As Table 6 shows, with an overall amount of expenditures of cities and rayons being at the level of UAH 9,182,538 thousand and the national per capita average of UAH 197, similarly to the previous example, in this simulation the distribution of expenditures across the 685 local governments is not uniform (the standard deviation equals UAH 34.9, the coefficient of variation – .18).

Figure 4. Simulation of Modified Formula Application to 685 local budgets of Ukraine with the Assumption that Their Baseline per Capita Expenditures Are Equal to the National Average

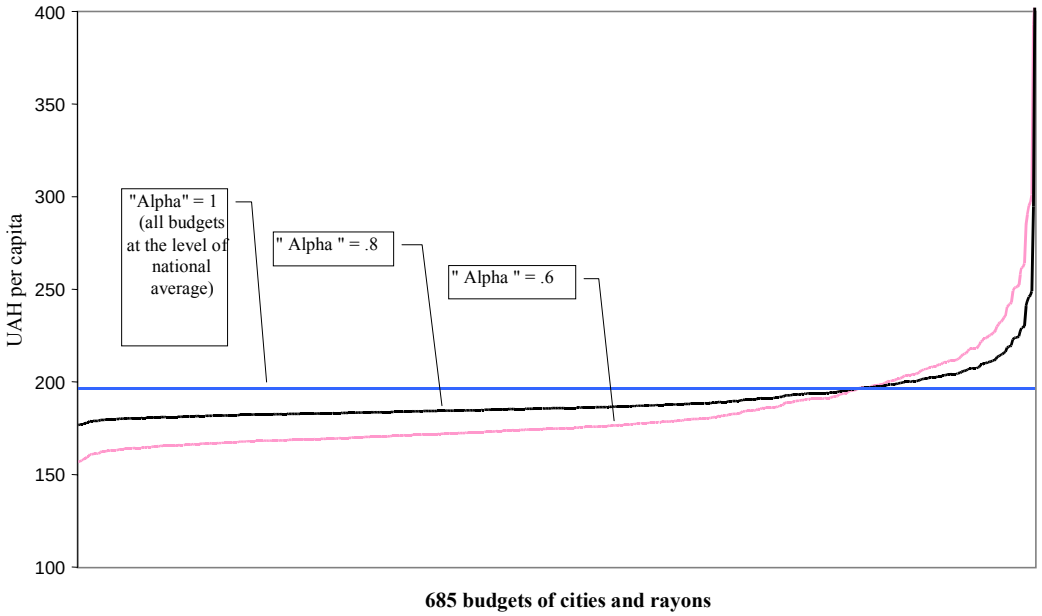


Table 6 suggests that, using actual per capita expenditure numbers, a lower "alpha" results in a smaller rather than higher dispersion. This resembles the situation we considered above for a simplified example of five governments. Obviously, for a large number of cities and rayons of Ukraine, the revenue position of a local government relative to the average is different from its position in terms of expenditure needs. One hundred and ten local governments whose actual per capita revenues in 2001 were higher than national average have lower than average per capita expenditure needs calculated on a norm basis (for example, in Komsomolsk city, per capita revenues in 2000 were almost 2.5 times higher than national average, the estimated level of expenditures being only UAH 146.2, which is considerably lower than average). At the same time, 82 governments featured a radically different situation. They have relatively low per capita revenues and higher-than-average expenditure needs. (For example, actual budget revenues of Nizhyn city in 2000 equaled to .86 of the national average for per capita revenues, while its estimated expenditure needs amounted to UAH 211.9, which is much higher than the national average).

Table 6. Results of Simulation of Formula Application in Case of Identical Baseline Expenditures with Various Values of "Alpha"

"Alpha"	Total Expenditures of Local Governments ('000 UAH)	Positive Transfers ('000 UAH)	Negative Transfers ('000 UAH)	Estimated Expenditures per Capita (UAH)	Standard Deviation	Coefficient of Variation	Share of Governments with Higher-than-average Expenditures, %	Share of Governments with Lower-than-average Expenditures, %
Cities + Rayons								
1	9,182,538	2,633,485	-2,104,059	***197***	***0.0***	***0.00***	*	*
0.9	9,182,538	2,492,834	-1,963,408	***197***	***5.6***	***0.03***	***18%***	***82%***
0.8	9,182,538	2,352,232	-1,822,806	***197***	***11.2***	***0.06***	***18%***	***82%***
0.7	9,182,538	2,211,631	-1,682,205	***197***	***16.8***	***0.09***	***18%***	***82%***
0.6	9,182,538	2,071,069	-1,541,643	***197***	***22.5***	***0.11***	***18%***	***82%***
Cities								
1	4,672,721	197,183	-2,077,876	***197***	***0.0***	***0.00***	*	*
0.9	4,672,721	188,658	-1,939,215	***202***	***7.2***	***0.04***	***23%***	***77%***
0.8	4,672,721	180,182	-1,800,604	***208***	***14.4***	***0.07***	***23%***	***77%***
0.7	4,672,721	171,706	-1,661,993	***213***	***21.7***	***0.10***	***23%***	***77%***
0.6	4,672,721	163,270	-1,523,421	***219***	***28.9***	***0.13***	***23%***	***77%***
Rayons								
1	4,509,817	2,436,302	-26,183	***197***	***0.0***	***0.00***	*	*
0.9	4,509,817	2,304,176	-24,193	***191***	***2.3***	***0.01***	***39%***	***61%***
0.8	4,509,817	2,172,050	-22,202	***185***	***4.6***	***0.02***	***39%***	***61%***
0.7	4,509,817	2,039,925	-20,212	***180***	***6.9***	***0.04***	***39%***	***61%***
0.6	4,509,817	1,907,799	-18,221	***174***	***9.1***	***0.05***	***39%***	***61%***

Application of the modified formula to each of such budgets changes the value of per capita revenues achieved after provision of transfers which take into account their revenue position in the past. For example, for the city of Komsomolsk the application of "alpha" is favorable. In case of full equalization this city would have to make a UAH 296 per capita contribution to the State budget (equal to the difference between UAH 463 of revenues and UAH 168 of estimated expenditures). When the modified formula with a coefficient of equalization of, say .8 is applied the amount of estimated expenditures of Komsomolsk city goes up to UAH 211, and, as a result, the negative transfer decreases to UAH 252 per capita. Due to the fact that Komsomolsk city had lower-than-average revenues the modified formula moves this government closer to the average. Controversially, as Nizhyn city used to have relatively low revenues in the past, the estimated amount of its expenditures would decrease and, therefore, the amount of transfer to this city from the State budget would decrease. But from the standpoint of uniformity of expenditure distribution across Ukraine, the lower estimated expenditures of Nizhyn city would decrease the overall variation, since this city used to have higher-than-average expenditures.

Table 6 shows the values of standard deviation and coefficient of variation after the application of a modified formula with different values of "alpha". As one can see, with "alpha" decreasing from unity to .8 we observe a steady reduction of variation in both cities and rayons. Yet, with "alpha" equal to .7, the coefficient of variation in rayons goes up again and when "alpha" equals .6 it increases in both rayons and cities.

Figure 5. Simulation of Application of the Modified Formula to 685 Local Budgets of Ukraine on the Basis of Actual Data on per Capita Expenditure Needs

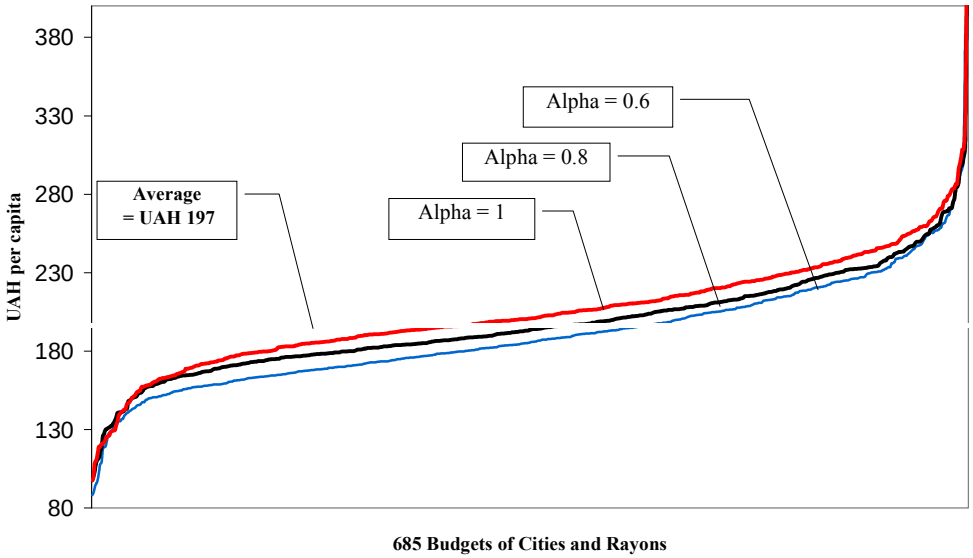
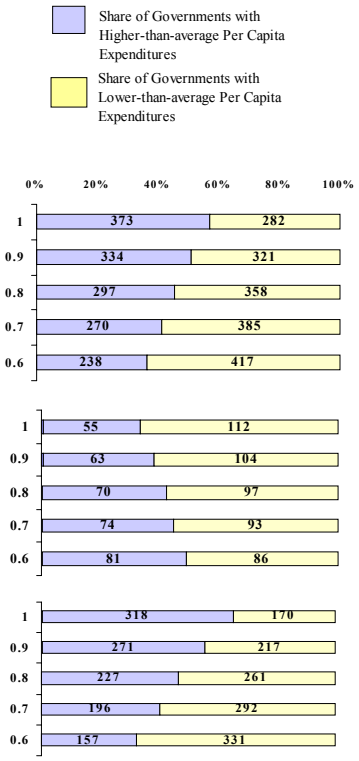


Table 7. Results of Simulation of Formula Application without Assuming Identical Baseline Expenditure Needs with Various Values of "Alpha"

"Alpha"	Total Expenditures of Local Governments ('000 UAH)	Positive Transfers ('000 UAH)	Negative Transfers ('000 UAH)	Estimated Expenditures per Capita (UAH)	Standard Deviation	Coefficient of Variation	Share of Governments with Higher-than-average Expenditures, %	Share of Governments with Lower-than-average Expenditures, %
Cities + Rayons								
1	9,182,538	2,945,797	-2,416,371	***197***	***34.9***	***0.18***	***57%***	***43%***
0.9	9,182,538	2,808,944	-2,279,518	***197***	***33.6***	***0.17***	***51%***	***49%***
0.8	9,182,538	2,672,383	-2,142,957	***197***	***33.3***	***0.17***	***45%***	***55%***
0.7	9,182,538	2,536,040	-2,006,614	***197***	***33.8***	***0.17***	***41%***	***59%***
0.6	9,182,538	2,400,730	-1,871,304	***197***	***35.3***	***0.18***	***36%***	***64%***
Cities								
1	4,349,284	183,447	-2,387,576	***183***	***35.9***	***0.20***	***33%***	***67%***
0.9	4,479,420	178,725	-2,252,719	***189***	***35.2***	***0.19***	***38%***	***62%***
0.8	4,609,555	174,251	-2,118,110	***194***	***36.0***	***0.19***	***42%***	***58%***
0.7	4,739,690	169,995	-1,983,718	***199***	***38.2***	***0.19***	***44%***	***56%***
0.6	4,869,825	166,771	-1,850,360	***205***	***41.6***	***0.20***	***49%***	***51%***
Rayons								
1	4,833,254	2,762,350	-28,795	***211***	***31.9***	***0.15***	***65%***	***35%***
0.9	4,703,118	2,630,219	-26,799	***205***	***31.8***	***0.16***	***56%***	***44%***
0.8	4,572,983	2,498,132	-24,847	***199***	***32.0***	***0.16***	***47%***	***53%***
0.7	4,442,848	2,366,046	-22,896	***194***	***32.2***	***0.17***	***40%***	***60%***
0.6	4,312,713	2,233,959	-20,945	***188***	***32.7***	***0.17***	***32%***	***68%***

Figure 6. Shares of Local Budgets with Per Capita Expenditures Higher and Lower than Average



V. Coefficient of equalization that is being designed in the Ministry of Finance for implementation in the year 2002

Unlike the formula applied in 2001, the draft methodology for transfer calculation that has been developed in the Ministry of Finance for the year 2002 is based on a formula that contains an asymmetric coefficient of equalization "alpha". This coefficient is calculated and used in the following way:

$$T_i = \alpha_i (V_i - D_i),$$

where

$\alpha_i = 1 - ((\sqrt{(Di3 + Li3)/(Di1 + Li1)} - 1) * K_p)$ and varies between .8 and 1 for all donor budgets and

$\alpha_i = 1$ for all recipient territories.

This formula implies that for all donor communities where total revenues collected last year were higher that those collected three years ago the size of negative transfers will be reduced by a lower "alpha", which depends on the rate of such revenue growth but has to be higher that .8. What are the potential positive results that could be expected from this version of the equalization coefficient and what caveats to this approach must be mentioned?

The decision to calculate the level of "alpha" based on the information of the changes in actual revenues through the recent years is inspired by an important goal of creating a stimulus for the local budgets to develop their tax bases in future. Unlike the modified formula described in the previous chapters of this article, which was based on static results of revenue execution in the previous period, the approach advocated by the Ministry of Finance is not concerned with the relative position of a local budget compared to the average but rather with a trend for revenue growth if such is detected. One similarity of this approach with the modified formula from this article is that the growth factor, on which the degree of equalization is based, enters the formula as an exogenous variable whose distribution could differ from the distribution of per capita expenditures and so could also lead to a decrease rather than increase in the level of expenditure variation.

Unlike the modified formula suggested in this article the coefficient of equalization proposed by the Ministry of Finance is applied in a "classical" way, that is to modify the size of a (negative) transfer rather than the size of the estimated per capita expenditures. As the previous sections have shown, this approach inevitably leads to a change in the total size of the net transfer as the value of "alpha" is decreasing (and since the Ministry of Finance is proposing to only apply "alpha" to the donor-budgets, the size of the transfer will ultimately increase).

Nevertheless, the formula proposed by the Ministry of Finance is different from the "classical" approach in several important ways. First of all, the value of "alpha" is defined by a formula that has a number of new elements – such as a square root in the calculation of the growth factor, the K_p coefficient (set at the level of .4) and a constraint on "alpha" to vary in the interval from .8 to 1 without any clear instruction for a situation where calculations of "alpha" would lead to a value that goes beyond that range. The text of the proposed methodology does not contain an explanation of these elements and their role remains puzzling.

The most important deviation from a classical approach, however, is the decision of the Ministry of Finance to use "alpha" exclusively for the budgets of donor communities. Apparently,

this decision (together with the idea to calculate "alpha" based on the revenue growth factor) was intended to extend the formula to include some mechanisms that would give relative advantage in transfer distribution to the budgets with a more successful history of tax base development. But unlike the idea of using the growth factor in setting the value of "alpha", this decision to give exclusive treatment of donor budgets will hardly help to achieve this goal and may even be detrimental.

Applying "alpha" exclusively to donor budgets effectively means that out of the total number of local budgets which have demonstrated a tendency for an increase in their revenues the coefficient of equalization will only "reward" a certain portion of all cities and rayons while other "successful" budgets will be discriminated against. If "alpha" is set to unity, estimated per capita expenditures of each budget must be equal to the value defined by the norm-driven approach regardless of whether the budget is a donor or a recipient of the central budget funds. Application of the coefficient of equalization according to the methodology suggested by the Ministry of Finance reduces the size of negative transfer from each of the donor budgets and so increases the ultimate value of estimated per capita expenditures in that community. If, however, the sizes of equalization grants received by the rest of the "successful" budgets remain unchanged, no change would occur in the size of per capita expenditures in these communities. Whether a budget is a donor or a recipient of the central government equalization funds depends on many factors, including regional or demographic specifics of the expenditure needs in each community. Therefore, applying a special approach to donors would practically mean that local budgets with identical record of revenue success and per capita expenditure needs calculated in an identical manner would be left in an unjustifiably different budget situation.

Last but not least, a comment has to be made on a provision in a proposed methodology that requires local budgets to use "all additional funds obtained as a result of the application of the coefficient of equalization" exclusively for those types of expenditures "which are not included into the formula for transfer calculation". This requirement contradicts the nature of the equalization grant which is different from targeted subventions and which is supposed to be included into the general fund of a local budget with respect to a freedom of local communities to make their budget decisions and use their budget's resources based on their autonomous choice.

Conclusions

The methodology for transfer calculation that is being developed by the Ministry of Finance for the year 2002 is making the first conscious attempt to establish fair and transparent mechanisms to encourage local budgets in their efforts to increase the local revenue base. A coefficient of the degree of equalization, which is well-known in the theory of public finance and legally established in Ukraine's Budget Code, could be a possible mechanism to achieve that goal. At the same time, the choice of the value of that coefficient and the choice of approaches to establishing that value are critical to the success in creating the necessary budget motivation and keeping the principles of equality in the budget system. Therefore, all policy decisions regarding these choices deserve further discussion and research.

With the help of a simplified example of transfer distribution among five hypothetical communities, the first two sections of this article have revised the main principles of applying the coefficient of equalization. This example has clearly demonstrated, among other things, that in the classical formula for transfer calculation the coefficient of equalization is a variable closely tied to the total size of the net transfer from the central government to the local budgets. It means

that until the choice of the degree of equalization is made no conclusion could be done as for the ultimate size of the net transfer or the estimated size of the total local budget revenues.

The article has also suggested a modified version of the formula to salvage the situation where the normal sequence of budget decisions was broken and where the choice of the coefficient of equalization has to be made after the total size of the net transfer was fixed. In order to solve this problem the modified formula uses a coefficient of equalization that affects the value of estimated per capita expenditure needs of each local budget depending on the size and the sign of the deviation of this budget from the national average in it's actual per capita revenues collected last period. This approach is intended to encourage local communities to develop their revenue potential and while maintaining average per capita expenditures and the total size of the net transfer at the predetermined level.

It was also shown that applying the modified formula does not necessarily lead to an increase in the overall expenditure variation but could even make this variation smaller. Simulations based on real 2001 numbers from 685 Ukrainian cities and rayons have confirmed that this would have exactly been the case had the modified formula been implemented. The simulations have also suggested that of all possible values of "alpha" the lowest possible expenditure variation could be achieved when "alpha" equals .8.

A brief analysis of the draft formula for 2002 being developed by the Ministry of Finance reveals some serious faults in the way the Ministry is applying the coefficient of the degree of equalization. The flawed elements of this coefficient need investigation and correction in order for the formula to become an adequate tool for creating proper budget motivation for all players in the process of transfer distribution.