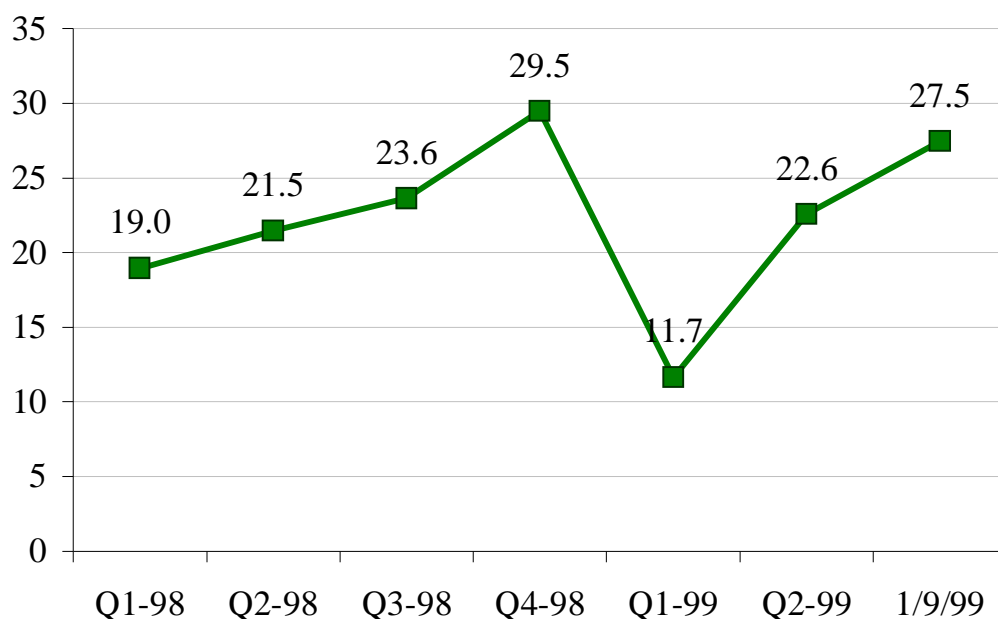


HOW MUCH IS A HRYVNA OF MUTUAL SETTLEMENTS WORTH?

Mutual settlements, representing the payment of tax debts in kind, are a relatively recent phenomenon in Ukraine (Way, 1997). Prior to 1994, the practice of paying taxes with goods and services rather than currency was unheard of. Beginning in late 1994 and 1995 mutual settlements appeared as the government stopped printing money to cover its fiscal deficits and local governments searched for new ways to meet their expenditure plans by converting growing tax arrears into payments in kind. As Graph I indicates, since that period mutual settlements have mushroomed and in 1998 constituted 29.2 per cent of the tax revenues collected by subnational governments. For the first six months of 1999, mutual settlements declined in importance to 26 per cent of total subnational revenues, net of transfers, as the central government moved to restrict their use.¹

GRAPH I
MUTUAL SETTLEMENTS AS PER CENT OF TOTAL REVENUES



¹ Transactions of this type have become so widespread that many of Ukraine's companies now advertise for the relatively new position of "mutual settlements manager".

Responding in part to pressures from the IMF, the Cabinet of Ministers issued a decree in 1998 banning the use of mutual settlements and by the first month of 1999 mutual settlements had fallen to only 20 per cent of total revenues. Since then, however, mutual settlements have bounced back and comprised over forty per cent of total revenues in June of 1999. This rapid expansion in mutual settlements further galvanized the Cabinet of Ministers to cancel the earlier decree and replace it with a new one on Aug. 27, 1999 which will make it more difficult to carry out mutual settlements. According to this new decree, local governments are, as of Sept.1, 1999, prohibited from issuing new veksel, or promissory notes to finance mutual settlements.

It is not clear whether this new effort on the part of the central government to curb the use of mutual settlements will be more successful than previous attempts. Mutual settlements still can be conducted without the medium of veksel. The most likely outcome is that mutual settlements will be around in Ukraine for some time to come and local governments will continue to use them as a way of overcoming cash shortfalls.

Assuming that the practice of mutual settlements is not about to disappear, it is worthwhile asking whether a Hryvna of mutual settlements is equivalent to a Hryvna which is collected in the form of cash. The question is worth posing because, once a formula based system of transfers is in place in Ukraine, the revenue capacity of different oblasts will be measured by an index of relative fiscal capacity and the presence of mutual settlements could potentially distort this measurement.

In the system of public accounts in Ukraine mutual settlements are treated as the equivalent of cash. Cancellation of a tax debt through a mutual settlement is treated as both a receipt and an equivalently valued expenditure in measuring the fiscal balance of a local government. In other words, what a local government receives in benefits from a mutual settlement is assumed to be equal in value to what the local government would have received if the tax debt had been paid in cash.

There is a suspicion, however, that the true economic value of a mutual settlement may be generally less than its nominally recorded value. If, for example, a local government agrees to receive a barrel of apples having a market value of Hr 100 in exchange for a cancellation of tax liabilities worth Hr 150, the mutual settlement is overvalued by Hr 50. If the tax debt had instead been paid in cash, the local government would have been able to buy apples worth Hr 150. In this example, the use of a mutual transaction has increased the "effective" revenues and purchasing power of the local government by only Hr 100 and not, as it is recorded, by Hr 150. Some

evidence supporting the need to adjust mutual settlements in order to make them equivalent to cash is given below.

I. MICRO-ANALYSIS OF MUTUAL SETTLEMENTS

There are two conceivable approaches to investigating whether, and by how much, a Hryvna of mutual settlements may be worth less than a Hryvna of tax paid in cash. One avenue of investigation would be to examine a sample of individual mutual settlements, calculate the unit value implicit in each settlement, and compare that unit value with a comparable market value for the item in question. The extent to which the unit value calculation exceeded the market value would provide a measure of the “discount” to be applied to the mutual settlement.

While straightforward, this micro approach is nonetheless beset with several difficulties. One is the knotty problem of establishing strict comparability. For example, a unit value calculation for a road repair would have to take into account the quality of the repair and the type of materials used for the repair in addition to ascertaining the market value of a similar repair when different suppliers of these services charge different supply prices. Another problem arises from the need to aggregate a set of discounts in some fashion in order to obtain an average discount which could be applied to the total recorded value of mutual settlements. Since the value of the discounts are likely to vary across different sectors of the economy, there is no unambiguously correct method of aggregation.

One attempt to apply a variant of this micro approach is by O’Connell(1999) who found, in the case of a Vodacanal in Donetsk oblast, that it received gasoline supplies for needed repairs that were worth only about one-half of the value of the write-down in tax liabilities. This case study illustrates that the counterpart of the loss to the local budgetary organization is a nontaxable profit reaped by the private sector supplier and that this potential for profit stimulates the growth of tax arrears. By concealing their cash and racking up tax arrears, firms may be able to use the vehicle of mutual settlements to pay their taxes at a substantial discount.

II. MACRO-ANALYSIS OF MUTUAL SETTLEMENTS

An alternative approach to measuring this discount has more of a macro flavor and tries to infer the extent of any mutual settlement overvaluation from oblast level information on the composition of total receipts between cash and mutual settlements. This approach has its own set

of limitations but is less subject to aggregation problems. The intuition behind this approach is that if we could observe two sets of oblasts, one of which paid its bills exclusively in cash, and another which settled its accounts only by mutual settlements, the latter would have a higher recorded value of total receipts because it effectively paid more for what it received than the cash group did. The basic underlying assumption is that both groups bought essentially the same basket of public services but the mutual settlement group paid more for what it obtained than the cash group was required to pay.

As shown in Table I, however, the oblast data do not conveniently separate into the two groups needed to directly apply this macro approach. Instead, the data indicate that the relative reliance on mutual settlements varies significantly across oblasts. The data are also limited to observations in 1998 and the first half of 1999. Despite these constraints, it may be possible to test the hypothesis that mutual settlements raise the relative cost of public service provision with a set of properly specified econometric equations.

The first specification tests whether the composition of cash and mutual settlements affects the ability of previous period total revenues to forecast the next period's total revenues, that is whether cash and mutual settlements have different effects on the ability to collect revenue in the nearest future. This specification has the following form:

$$Y_i = a + b_1 X_1^i + b_2 X_2^i + e \quad \text{where}$$

Y_i = total revenues of the i 'th oblast for the first half of 1999;

X_1^i = total cash revenues of the i 'th oblast for 1998;

X_2^i = total value of mutual settlements for the i 'th oblast in 1998;

The variable "e" is a random error term assumed to have a mean of zero and a normal distribution.

Inclusion of a tax arrears variable in the regression analysis was also considered but rejected for the following reason. Intuitively, an oblast with a high stock of tax arrears has more opportunities to carry out mutual settlements than an oblast with a low stock of tax arrears and there is some merit to include the prior stock of tax arrears as a potential explanatory variable. Unfortunately, the set of available data is too short to capture the possible influence of this factor. That is, while the past stock of tax arrears may be important in explaining the amount of future mutual settlements, in our data set these two events are almost contemporaneous and those oblasts

engaging in extensive mutual settlements are likely to exhibit a low, rather than a high, level of tax arrears.

A priori, the expected signs of the regression coefficients are $b_1 > 1$ and $b_2 > 0$. Higher levels of cash should be positively correlated with next year's revenue collections. The size of the coefficient b_2 indicates the numerical impact of this year's level of mutual settlements on next year's total revenues. Under the null hypothesis, if cash and mutual settlements both exerted the same effect on total revenues their regression coefficients should be equal.

Part I of Table II presents the results of the regression analysis. Both regression variables are statistically significant and positive, conforming to prior expectations. However, the regression coefficients are of different size and, to test whether their differences are significant, the regression was repeated using the constraint that $b_1 = b_2$. An F-test comparison of the results suggests that these differences are significant and that cash and mutual settlements therefore have different influences on the ability to generate future revenues.

Mutual settlements clearly exert an independent effect on total revenues and the question is by how much. To answer this question, a different regression specification is required focusing on rates of change in total revenues and the change in the importance of mutual settlements in total revenues. The null hypothesis in this case is that increases in the relative importance of mutual settlements should not have a significant impact on the growth in total revenues. The following specification was chosen to test this hypothesis:

$$Y_i^* = a + b_3 X_i^* + e, \text{ where}$$

Y_i^* = percentage growth of total revenues in the i 'th oblast between 1999 and 1998;

X_i^* = change in the proportion of mutual settlements in total revenue over the period 1999 and 1998.

The results of this regression are also shown in Part II of Table II. The mutual settlements variable is significant and the null hypothesis can be safely rejected. A higher proportion of mutual settlements in total revenue appears to trigger a higher level of total revenue. For every percentage point increase in the revenue share of mutual settlements total revenue increases by .55 per cent. This result provides strong indirect evidence that mutual

settlements contain an element of “water” that should be squeezed out of any calculation of total revenue.

These regression results can be used to simulate the revenue consequences of a policy change which eliminated the practice of mutual settlements. Ignoring the small constant term, if the proportion of mutual settlements fell from its observed level of thirty two per cent in 1998 to zero, the expected impact on total revenues is a revenue reduction of about eighteen per cent ($.55 \times (0 - .32)$). If this revenue decline mirrors the lower expenditure cost of using cash to pay for public services, the appropriate discount to apply to mutual settlements in order to obtain their cash equivalent is also eighteen per cent. That is, compared to cash transactions, transactions involving mutual settlements seem to be overvalued on average by about eighteen per cent and a Hryvna of mutual settlements may be worth less in purchasing power than a Hryvna of tax paid in cash by the same magnitude. For computational purposes below, a slightly higher discount rate of 20 per cent is assumed.

TABLE II
THE IMPACT OF MUTUAL SETTLEMENTS ON LOCAL SPENDING

REGRESSION TERM	COEFFICIENT	t-VALUE	
PART I			
a	47861.1	4.19	
b ₁	.376	15.4	Adjusted R ² =.946
b ₂	.275	4.52	
PART II			
a	-.48	-25.2	
b ₃	.55	2.88	Adjusted R ² =.22

III. POLICY IMPLICATIONS OF THE RESULTS

For policy purposes, the practical implication of this regression analysis is that comparisons of the revenue capacity of different local governments should make explicit adjustments for differences in the mix of cash and mutual settlements in total revenues. For example, if two oblasts have the same amount of total revenue of 100 Hr but one of them has mutual settlements worth 40 Hr and the other has zero, the effective total revenue of the oblast with mutual settlements is approximately 92 Hr ($60 + 40 \times 0.8$) and not the recorded amount of 100 Hr.

Adjustments of the type indicated in this example will be important in refining the measure of relative fiscal capacity that is a central part of a formula based transfer system. Under a formula based approach to determining intergovernmental transfers, an oblast's transfer entitlement is calculated as the difference between its estimated expenditure needs and the product of its index of relative fiscal capacity and the projected amount of per capita revenues from own sources of revenue. Making adjustments to the index of relative fiscal capacity for the relative importance of mutual settlements along the lines suggested by the regression analysis will raise the value of the index for cash rich oblasts and lower the value of the index for oblasts having a relatively high proportion of mutual settlements.

Table III offers a comparison across oblasts of the fiscal capacity index for 1998 and an adjusted index using a 20 per cent discount rate for mutual settlements. As can be seen, the impact of these adjustments is relatively modest. As expected, the value of the index drops for oblasts such as Poltavska, Kharkivska, and Mykolaiivska who make more extensive use of mutual settlements, but never by more than five per cent. Conversely, the index rises for oblasts such as the city of Kiev which rely much less heavily on mutual settlements but the increase in this case is only 4.5 per cent.

These adjustments would redirect the flow of intergovernmental transfers to some extent in favor of those oblasts that rely more heavily on mutual settlements to finance their expenditure plans. While there is a clear-cut equity rationale for making this type of adjustment, in the context of designing a satisfactory formula based transfer program these adjustments must be treated cautiously. It is a cardinal principle of any formula based system of transfers that the formula itself should be devoid of any elements that local governments can use to influence the size of their transfer entitlement. A formula based system will not work well if, with ease, local governments can increase the amount of their transfer by simply altering either their expenditure or revenue behavior.

TABLE III
Fiscal Capacity and Discounting Mutual Settlements

<i>Oblast</i>	<i>Estimated per capita revenues 1998</i>	<i>Fiscal capacity index 1998</i>	<i>Estimated per capita revenues 1998 (adjusted for mutual settlements with a 20% discount)</i>	<i>Fiscal capacity index 1998 (adjusted for mutual settlements with a 20% discount)</i>	<i>Difference</i>
CRIMEAN REPUBLIC	155.4	0.72	147.0	0.73	-0.006
VINNYTSKA	99.0	0.46	94.2	0.46	-0.006
VOLYNska	89.4	0.41	86.0	0.42	-0.011
DNIPROPETROVSKA	214.6	0.99	203.3	1.00	-0.009
DONETSKA	256.0	1.19	241.0	1.19	-0.004
ZHYTOMYRSKA	111.2	0.51	103.6	0.51	0.003
ZAKARPATSKA	96.2	0.45	92.3	0.46	-0.010
ZAPORIZKA	245.3	1.14	233.6	1.15	-0.017
IVANO-FRANKIVSKA	163.7	0.76	145.9	0.72	0.038
KYIVSKA	164.3	0.76	156.2	0.77	-0.010
KIROVOHRADSKA	89.5	0.41	84.6	0.42	-0.003
LUHANSKA	159.9	0.74	148.8	0.73	0.006
LVIVSKA	175.7	0.81	167.5	0.83	-0.013
MYKOLAYIVSKA	251.2	1.16	223.3	1.10	0.061
ODESKA	188.0	0.87	183.7	0.91	-0.036
POLTAVSKA	428.1	1.98	383.6	1.89	0.089
RIVNENSKA	150.6	0.70	135.1	0.67	0.031
SUMSKA	186.5	0.86	172.7	0.85	0.011
TERNOPILSKA	74.5	0.34	70.1	0.35	-0.001
KHARKIVSKA	323.5	1.50	287.3	1.42	0.080
KHERSONSKA	114.2	0.53	101.9	0.50	0.026
KHMELNYTSKA	126.0	0.58	114.7	0.57	0.017
CHERKASKA	165.3	0.77	151.2	0.75	0.019
CHERNIVETSKA	108.9	0.50	98.4	0.49	0.019
CHERNIHIVSKA	129.6	0.60	123.4	0.61	-0.009
KYIV	710.1	3.29	696.5	3.44	-0.149
SEVASTOPOL	181.2	0.84	176.3	0.87	-0.031
Average	216.0		202.7	1.00	0.000

In the matter at hand, any adjustment in the measurement of revenue capacity for the relative importance of mutual settlements contravenes this basic principle. Therefore, it is essential that the formula be designed to deny any opportunity for an oblast to enhance its transfer by engaging in a more intensive pattern of mutual settlements. One way of avoiding such an adverse incentive would be to make an initial adjustment to the measurement of relative fiscal capacity when a formula is introduced but to ignore, for an extended period of time, any increase in the relative use of mutual settlements once the formula is in force.

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Way, Lucan, "The Barterization of Regional Finances", World Bank, mimeo, 1997.

TABLE 3
Fiscal Capacity and Discounting Mutual Settlements

<i>Oblast</i>	<i>Estimated per capita revenues 1998</i>	<i>Fiscal capacity index 1998</i>	<i>Estimated per capita revenues 1998 (adjusted for mutual settlements with a 20% discount)</i>	<i>Fiscal capacity index 1998 (adjusted for mutual settlements with a 20% discount)</i>	<i>Difference</i>
CRIMEAN REPUBLIC	155.4	0.72	147.0	0.73	-0.006
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ZHYTOMYRSKA	111.2	0.51	103.6	0.51	0.003
ZAKARPATSKA	96.2	0.45	92.3	0.46	-0.010
ZAPORIZKA	245.3	1.14	233.6	1.15	-0.017
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KYIVSKA	164.3	0.76	156.2	0.77	-0.010
KIROVOHRADSKA	89.5	0.41	84.6	0.42	-0.003
LUHANSKA	159.9	0.74	148.8	0.73	0.006
LVIVSKA	175.7	0.81	167.5	0.83	-0.013
MYKOLAYIVSKA	251.2	1.16	223.3	1.10	0.061
ODESKA	188.0	0.87	183.7	0.91	-0.036
POLTAVSKA	428.1	1.98	383.6	1.89	0.089
RIVNENSKA	150.6	0.70	135.1	0.67	0.031
SUMSKA	186.5	0.86	172.7	0.85	0.011
TERNOPILSKA	74.5	0.34	70.1	0.35	-0.001
KHARKIVSKA	323.5	1.50	287.3	1.42	0.080
KHERSONSKA	114.2	0.53	101.9	0.50	0.026
KHMELNYTSKA	126.0	0.58	114.7	0.57	0.017
CHERKASKA	165.3	0.77	151.2	0.75	0.019
CHERNIVETSKA	108.9	0.50	98.4	0.49	0.019
CHERNIHIVSKA	129.6	0.60	123.4	0.61	-0.009
KYIV	710.1	3.29	696.5	3.44	-0.149
SEVASTOPOL	181.2	0.84	176.3	0.87	-0.031
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