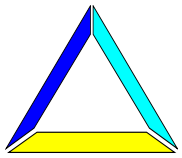
INSTITUTE FOR ECONOMIC RESEARCH AND POLICY CONSULTING IN UKRAINE

GERMAN ADVISORY GROUP ON ECONOMIC REFORM

Reytarska 8/5-A, 01034 Kyiv, Tel. (+38044) 278-6342, 278-6360, Fax 278-6336
E-mail: institute@ier.kiev.ua, http://www.ier.kiev.ua



V15 Technical note

Estimating gas demand for households in Ukraine

Our assessment of household demand for gas in Ukraine is based on a so-called *Engel curve* which shows how gas consumption changes as the level of disposable income changes. A simple linear form of the *Engel curve* can be written as:

$$C_i = a + b * I_i \qquad (1)$$

where C_i and I_i denote gas consumption of a specific household i. To estimate the parameters a and b of equation (1) we use household expenditure data from a Household survey collected by the State Statistical Committee in 2005. There are 3598 observations for urban households and 6772 for rural ones. The data set also contains weights that indicate the number of households with a specific set of characteristics in the total number of households in Ukraine. For our assessment we estimate two weighted regressions for all rural and urban households that consume gas. The regression contains the variables from equation (1) as well as those listed in table 1.

Table 1
Variables included in the regressions

Variable	Description
Gas_cons	Annual consumption of gas of a households, subsidies included, in thousands cubic meters
Ln_income	Logarithm of annual income of a households
C_gas	1 – if there is a central gas supply, 0- otherwise
C_heating	1 – if there is a district heating, 0- otherwise
Sq_meters	Number of square meters in an apartment of a household

Descriptive statistics of the data series used for estimation is presented in table 2. As shown in the table on average rural households consume almost 70% more gas than urban households, even though rural households earn on average 20% less than urban one. In rural areas 17% of households have access to district heating and 60% to the gas grid. Coverage of theses services in urban areas is much higher, i.e. 77% for central heating and 95% for centrally supplied gas.

Table 2
Discriptive statistics the data series used for estimation

	Gas_cons	Income	C_gas	C_heating	Sq_meters
Rural households (5643 observations)					
Mean	1.466381	10195.41	0.600213	0.170477	63.52228
Maximum	22.49730	18944.75	1.000000	1.000000	311.3000
Minimum	0.000000	1198.135	0.000000	0.000000	0.000000
Std. Dev.	1.425480	4166.303	0.489898	0.376084	24.41737
Urban households (3213 observations)					
Mean	0.867436	12884.96	0.952692	0.775910	50.37656
Maximum	20.75676	26892.99	1.000000	1.000000	260.0000
Minimum	0.000000	1269.730	0.000000	0.000000	0.000000
Std. Dev.	1.289998	5991.385	0.212329	0.417046	20.68757

Source: State Statistical Committee, own estimation

The results of our estimation are presented in table 3.

Table 3.
Estimation results, dependent variable is gas consumption in tcm

Variable	Coefficient	t-statistics	Coefficient	t-statistics
Rural households				
W_LN_INCOME	0.220***	57.19	0.217***	45.23
C_GAS	0.000***	37.36		
C_HEATING	-0.000***	-42.56		
SQ_METERS	0.000***	14.34		
C	-0.000***	-21.22	0.000***	-2.849
R-squared	0.537		0.266	
Urban households				
W_LN_INCOME	0.111***	26.77	0.094***	0.00
C_GAS	0.000***	7.34		
C_HEATING	-0.000***	-51.87		
SQ_METERS	0.000***	11.74		
C	0.000***	5.91	0.000	0.22
R-squared	0.555		0.071	

Note: ***significant at 1% level
Source: own estimations

All coefficients are significant at the 1% level and have plausible signs, that is positive for income, gas and the number of square meters per apartment and negative for access to district heating.

Kyiv, December 2006

AC and FP