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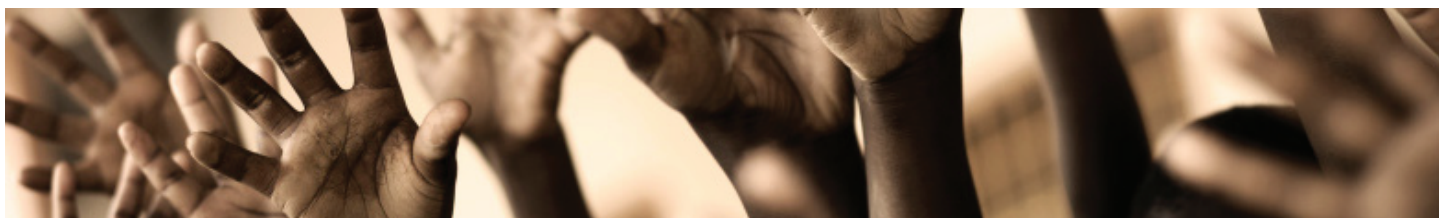
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## **Poverty and social impact analysis of increased natural gas prices and selected social guarantees in Ukraine**

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# Poverty and Social Impact Analysis of Increased Natural Gas Prices and Selected Social Guarantees in Ukraine

## Abstract

To date, prices of gas and other energy used by households in Ukraine have been generously subsidized by the Government. However, suppressed energy prices lead to excessive use of gas and an inefficient level of investment into energy savings. In addition, Ukraine's dependence on imported gas contributes to trade imbalances and growing pressure on the devaluation of the national currency. Thus, the issue of raising gas prices remains critical for the population of Ukraine. In particular, this step was also envisaged in an ambitious reform agenda announced in mid-2010 aimed at restoring stable and high economic growth. However, this policy may have an unprecedented impact on the welfare of population. This paper presents the main findings from the simulation of gas price shocks, provides an overview of social support programs in Ukraine and analyses their efficiency. Based on the analyses, the paper draws two major conclusions. First, increases in gas prices result in welfare losses in all household categories, with a more profound impact on urban households. Second, the current social welfare programs are not very efficient in targeting the poorest households. Reform of the social welfare system is thus required to ensure a safety net for poor households in times of gas price hikes. In order to assist national decision-makers in solving these issues the paper presents general policy recommendations.

**Keywords:** gas price shock simulation, welfare programs, social support programs

**JEL Codes:** I38.

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## EXECUTIVE SUMMARY

To date, prices of gas and other energy used by households in Ukraine have been generously subsidized by the Government. However, suppressed energy prices lead to excessive use of gas and an inefficient level of investment in energy savings. Ukraine is also dependent on imported gas, contributing to trade imbalances and growing devaluation pressures on the national currency. Thus, the issue of raising gas prices faced by the population remains critical in Ukraine. This step was also envisaged in an ambitious reform agenda announced in mid-2010 aimed at restoring stable high growth of the economy.

To evaluate the impact of the increase in gas prices on the welfare of households, we employ a computable general equilibrium model of Ukraine with a microsimulation approach in line with Cockburn, Corong and Cororaton (2010). In particular, information about households' expenditure and income patterns from national household surveys is integrated into the Ukraine CGE model.

According to the results of the medium-term model simulation, the overall welfare losses (measured as equivalent variation) resulting from a 50-percent increase in the price of imported gas is about 5.5 percent of consumption; the impacts of internal price adjustment are more moderate, at an estimated 3.4-percent welfare loss. In the long-term model, which allows for changes in capital endowments over time, the corresponding estimated welfare losses in Ukraine, as measured by consumption, total about 10 percent in the case of the imported gas price hike and 5.7 percent with the internal price increase. The shock would be transmitted through both output/employment and consumption channels.

The simulation of gas price shocks shows that all household categories would experience a welfare loss as a result of higher gas prices. Location seems to be a key factor in differing welfare impacts across households. In the majority of scenarios, urban households tend to experience higher losses than rural households. This can be explained by differences in the structure of their consumption. The CGE simulation suggests that urban poor households should be the focus of social welfare programs for mitigation of a positive gas price shock.

We analyse two current programs which were initially introduced to help poor people. One is low-income family allowances, provided to poor households with income below the guaranteed minimum income (GMI). A second program involves a housing and utility subsidy provided to individuals who spend beyond some threshold on these services.<sup>1</sup>

We arrive at two major conclusions. First, increases in gas prices will result in worse welfare outcomes in every household category, with greater impacts on urban households. Second, the current social welfare programs are not very efficient in targeting the poorest households. Therefore, reform of social welfare system is required to ensure the safety net for poor households in times of gas price hikes.

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<sup>1</sup> Since 2010, households whose cost of housing and utility services exceeds 15 percent of aggregate household income are entitled to a housing and utility subsidy (10 percent for the most vulnerable household categories).

## 1. Introduction

Over the last decade up to the end of 2008, Ukraine experienced robust average real GDP growth of 6.9 percent per year. This growth was based on favourable external demand conditions as well as institutional changes launched and partially implemented through the 1990s and early 2000s. However, stable growth rates undermined incentives for central authorities to conduct necessary economic reforms; many issues remained unresolved. These issues include, *inter alia*, incomplete social system reforms, low energy efficiency, outdated infrastructure, fiscal disequilibrium and an unattractive investment climate. As a result, the recent financial and economic crisis hit Ukraine very hard.

Ineffective economic and social policies hindered the achievement of tangible results in reducing poverty in Ukraine. Although the country has managed to decrease absolute poverty, relative poverty (which reflects inequality) has remained stable at about 27 percent. The economic recession of 2009, which resulted in severe budget constraints, has further complicated the handling of poverty issues and the pursuit of an active social policy to alleviate it.

The Ukrainian social protection system provides a wide range of social benefits, but they are not sufficiently differentiated by recipients' levels of incomes. Moreover, the system is focused on universal protection, which precludes targeting of the most vulnerable groups, in addition to categorical benefit schemes, which generate overlapping beneficiary categories, many of which do not provide support to those who are in need. Fiscal constraints, which became binding during the recession, have once again emphasized the drawbacks of the system.

An ambitious reform agenda announced in mid-2010, required to restore the stable, high growth of the economy, includes changes which inevitably result in adverse social shocks. Increases in gas prices paid by households are among these reforms. Until now, gas and other energy prices faced by households have been generously subsidized by the Government. However, suppressed energy prices lead to excessive use of gas, resulting in inefficient levels of investment in energy savings. Moreover, Ukraine's dependence on imported gas contributes to trade imbalances and growing devaluation pressures on the national currency. Thus, the issue of raising gas prices faced by the population remains critical in Ukraine.

Basic needs such as housing and utility services rely heavily on natural gas through widespread use in heating, cooking, water heating and electricity generation. The minimum standards of living are supposed to be sufficient to cover all the basic needs of a citizen, including basic nutrition and housing expenditures. Thus, the country needs a well-targeted and efficient social protection system to mitigate the negative social shock on the poorest and the most vulnerable groups of society. The question is whether the current social protection system could handle this problem appropriately.

To answer these questions, several issues are tackled. First, the impact of gas price increases on welfare and poverty are simulated to understand the depth of the shock. Second, the existing social protection system is analysed by focusing on two programs: social assistance paid to low-income families and housing and utility subsidies paid to households, to evaluate their efficiency and impact on poverty reduction, and thus to verify their capacity to mitigate rising poverty in cases of adverse social shock. Combining the results of the assessment of the impact of gas price increases on poverty and the evaluation of social program efficiency makes it possible to identify drawbacks and/or gaps in the existing social protection system to develop policy recommendations.

In particular, the simulation of gas price shocks shows that all categories of households would experience a welfare loss due to higher gas prices. However, the impact on urban households would be particularly large, and this category of households should be a focus of social welfare programs for mitigation of increased gas price shocks. Analysis of efficiency of two social welfare programs – social assistance to low-income families and housing and utility subsidies to households – demonstrated that the program of housing and utility subsidies to households helps households in urban areas, which tend to be most impacted by the gas

shock, while the provision of assistance for low-income families does not bring many families out of poverty. Moreover, the efficiency of the housing and utility subsidies program remains low. These results allow us to provide specific policy recommendations regarding reform of the social protection system in Ukraine.

The document is organised as follows. Section 1 describes Ukraine's general economic situation, including the poverty assessment. Section 2 focuses on the research methodology and the data used. In section 3, the welfare of Ukrainian households is analysed with a focus on poverty incidence, income and expenditures patterns. Section 4 discusses the results of simulation of the gas price increase using a computable general equilibrium model of Ukraine, in particular the impact of this shock on poverty. Ukraine's system of social protection is outlined, and the efficiency of two programs – social assistance to low-income families and housing and utility subsidies to households – is evaluated. Conclusions and policy recommendations end the document.

## **2. Ukraine socioeconomic situation**

### **2.1. Demographic trends**

Ukraine's population has been steadily decreasing over the last two decades. According to the State Statistics Service of Ukraine (SSSU), Ukraine's population in May 2011 was 45.7 million (12.5 percent less than the 1993 peak). The rate of depopulation was highest in the years of structural economic transformation and recession starting in 1994 and peaking in 2001. Since then, the population decrease has slowed down but has not reverted to growth. This is largely attributable to a natural population decrease, due to both low fertility and high mortality rates. The situation was aggravated by negative net migration. Roughly one-quarter of the net reduction of Ukraine's population can be attributed to outward migration. After a short period of net positive migration during the early 1990s, the trend sharply reversed and the net migration remained negative through to 2004. Since 2005, official statistics report positive net migration.

Depopulation is exacerbated by aging of the population. The share of the population over the age of 60 (the official male pension age) will reach 36 percent of by 2050 as compared to 23 percent in 2010, while the share of the population aged between 20 and 59 – the age cohort basically forming the country's labour force – will shrink to 44 percent by 2050 (57 percent in 2010).

Due to depopulation and population aging, the number of economically active persons has declined over the last two decades and sat at 22.0 million at the end of 2010. As a result, the old-age dependency ratio has already increased and its continued growth will exert pressure on the sustainability of current pension system.

### **2.2. Macroeconomic situation**

The situation of a country's economy and its development might play a key role in combating poverty and ensuring its citizens' high living standards. In Ukraine, the difficulties of transitioning from a centrally planned to a market economy have significantly hampered the country's economic performance and its wellbeing relative to neighbouring countries. For instance, in 1990, Ukraine and Poland had similar levels of GNI per capita in PPP terms; by 2009, a threefold gap existed.

Factors explaining Ukraine's lag in economic performance include a lack of domestic knowledge and experience, corruption and a patchy reform path, exacerbated by the ongoing deterioration of physical infrastructure and human capital.

Ukraine has never witnessed a period of stable development based on innovation and investment nor has it completed the transformational reforms launched after independence.



Both international organisations and national experts claim that, unless reforms are facilitated, the economy will continue to grow slowly, well below its potential, and inflation will remain high.

### 2.3. Fiscal policy and the budget

The current systemic problems of Ukraine's fiscal position include a distorted structure of fiscal expenditures, including populist policy spending, high centralisation of public finance, an inadequate model to divide budget powers and an absence of a proper system of public financial control for fiscal expenditures. In recent years, Ukraine's fiscal policy has been marked by short-term and variable planning in revenues and expenditures. It has also been aggravated by various inadequacies in tariff policy at the communal level, by a lack of necessary reforms to the social security system and by the absence of a clear and efficient system of state aid provisions and public procurement.<sup>2</sup>

The new version of the Budget Code<sup>3</sup> passed in 2010 features positive developments, such as increased financial support for local self-government functions by assigning additional revenue sources and increasing the investment component in local budgets. At the same time, the problems of dividing functional powers among the different levels of authority, increasing the efficiency of fiscal funds at the local level and improving the methods of interregional financial equalisation, were not addressed fully in the Code.

Since 2009, there has been a rapid growth in public borrowing on both external and domestic markets and, accordingly, a marked increase in public debt. By the end of April 2011, public debt had reached USD 58 billion or about 35 percent of GDP. Further increases in public debt create risks of larger fiscal pressures, with destabilising effects on the balance of payments, and persistent, chronically high interest rates. These are the key aspects of high fiscal deficits that will create obstacles to the recovery of investment and of the economy's transition towards a sustainable growth path.

### 2.4. Development of living standards of Ukrainians

Economic ups and downs have had harsh impacts on the general welfare of Ukrainians. During the 1990s, real wages sharply declined against a backdrop of economic downturn and high inflation. The labour market adjustment was mainly in the form of declining real wages. Employment remained rather stable due to hidden employment. By the end of the 1990s, wages arrears had risen substantially in both the private and public sectors. As a result, the purchasing power of Ukrainians declined sharply.

In 2000, wages finally started to recover in a context of economic recovery and government policies aimed at improving the welfare of Ukrainians. In particular, the government paid off wage arrears in the public sector. An additional factor contributing to wage growth was the gradual increase in the minimum wage thanks to which real wages almost reached their 1990 levels by the end of 2008. In 2000, the government also paid off pension arrears. During the years of recovery, the income of pensioners grew primarily due to increases in the minimum pension. Higher pensions and wages compensated for the impact of higher inflation on the poor.<sup>4</sup> The average annual rate of consumer price growth was 14.1 percent during that period. Populist policies during the crisis at the end of 2009 resulted in another upwards swing in minimum pensions.

Increased wages and pensions, in addition to increases in other social payments (in particular a large rise in the maternity benefit), contributed to income growth of the population. As a result, absolute poverty measured in terms of a *minimum subsistence* level, declined over these years, from 77.1 percent in 2001 to 17.8 percent in 2009.

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<sup>2</sup> Burakovsky, Movchan (2011).

<sup>3</sup> Law of Ukraine No. 2456 of 8 July 2010.

<sup>4</sup> Burakovsky, Movchan (2011).



## 2.5. Gas market in Ukraine

Over the last decade, the economy of Ukraine has remained heavily dependent on natural gas and coal, which together accounted for 69 percent of total primary energy supply<sup>5</sup> in 2009. These two types of fuels accounted for 69 percent of TPES in 2009. Natural gas occupies first place with 38 percent of all energy consumed in the country. Many years of low gas prices have led to the importance of this fuel in Ukraine's energy balance. The share of gas consumption in Ukraine is higher than in European countries, where the share of gas in primary energy consumption is in the 20-percent range.

Between 2005 and 2009, the structure of primary energy consumption was primarily driven by the continuous growth imported gas prices, which more than doubled over the period. The share of natural gas in total primary energy consumption decreased from 47 percent of consumption in 2005 to 37.5 percent in 2009, while coal's share of this total increased by 4.3 percentage points over the period. Increased use of coal and decreased use of gas in electricity generation led to this change. Measures to promote energy efficiency also helped to reduce gas consumption.

The economic crisis also contributed to further contraction in the share of natural gas in the energy balance in late 2008 and in 2009. The largest industrial gas consumers, primarily large chemical plants and steel mills, rapidly decreased their consumption in the context of collapsing demand and output volumes.

Industrial and residential consumers are the key gas consumers in Ukraine. Due to the different price signals they face, their consumption patterns have diverged over the last five years. Continual and quite dramatic increases in imported gas prices were largely passed on to industrial consumers. The reduction in residential consumption was much smaller, despite major administrative increases in gas prices faced by households in 2006 and 2008.<sup>6</sup>

Less willingness of the population and district heating companies to reduce gas consumption despite the constant growth of imported gas prices and increased domestic gas tariffs paid by households is explained by administrative interference in gas prices. Specifically, these consumers enjoy discounted prices for natural gas, lowering their motivation to decrease consumption. Inadequate prices for gas supplied to residential customers and the obligation of domestic gas producers to sell all gas to this group effectively creates a relative disincentive to invest in energy savings or in the development of domestic gas production. By mid-2010, there was a threefold gap in gas prices paid by residential customers and industry, and district heating companies paid 2½ less than industrial consumers. This gap allowed the Government to lower household heating expenses and helped stabilize utility bills somewhat.

The first steps towards reforming this antagonistic pricing system and abolishing cross-subsidies were made by the Government in 2010 under pressure from the IMF. On 1 August 2010, natural gas tariffs paid by households and district heating companies were increased by 50 percent. This was one of the conditions of IMF approval for a new stand-by agreement.

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<sup>5</sup> Using the definition of total primary energy supply (TPES) provided by the International Energy Agency. Equivalent one that was used in the report is primary energy consumption.

<sup>6</sup> According to the State Statistics Service of Ukraine, gas prices paid by households rose by 80.6% in the 12 months ending December 2006, and by 54.1% in 2008, while no changes were registered in 2007, 2009 and 2010. Despite these upward revisions, prices are still below international levels. The impact of these price changes on the CPI has been huge, explaining more than one third of aggregate CPI growth over the period.

### 3. Methodology: data review and main research methods

#### 3.1. Household survey

An important element of the PSIA methodology consists of reliable information based on data from the Household Budget Survey (HBS) and one-time thematic household surveys. Sample household budget surveys have been conducted by the State Statistics Service of Ukraine (SSSU) on a quarterly basis since 1999 using international standards. Special one-off thematic surveys are performed as needed using questionnaires during a quarterly household budget survey.

The survey is based on universally accepted international standards and generally corresponds to the sociodemographic and economic situation in Ukraine. It is a comprehensive study that objectively displays household incomes and expenditures and the impact of major processes unfolding in Ukraine's socioeconomic development on household living standards.

The HBS covers about 10,500 households quarterly. For example, the initial survey population sample size was 13,023 in 2009. In that year, 10,459 households took part in the survey (81.8 percent of selected addresses after excluding non-residential premises). Complete annual rotation of the household sample mandatorily applies. The territorial sample is valid for five years, built as a probability, stratified and multistage sample using a mechanism of probability-proportional-to-size sampling of territorial units.

The PSIA results presented in this report are mainly based on quantitative HBS analysis. This allows both efficient assessment of direct outcomes and forecasting of possible outcomes based on the links established between macro- and micro-level data. Micro-level data from the national sample household budget survey<sup>7</sup> provides additional relevant information. Data obtained from household budget surveys largely meets the PSIA methodology requirements concerning data for quantitative analysis including micro-level data. This means that there is great potential to select and apply the most efficient PSIA approaches such as those using quantitative analysis methods based on a combination of macro- and micro-level data and models.

#### 3.2. Poverty measures

Poverty is commonly defined as the inability of individuals to achieve acceptable standards of living and adequate participation in society. There can be income poverty and human poverty. The latter refers to situations of limited individual possibilities for human development and, thus, is out of scope of research in this paper.

Income poverty is, by definition, connected to income and expenditure needs. In order to measure, compare and assess poverty in an objective manner, various socioeconomic thresholds, referred to as 'poverty lines', are commonly used. Poverty lines try to capture a predefined level of income below which individuals are considered as 'poor' and would qualify for special attention.

When defining poverty lines, researchers and politicians look at two aspects of poverty. These are the absolute and relative components of poverty, and controversy surrounds both definitions. Absolute poverty is defined by comparing individual income to some minimum basket of goods and services. Therefore, the household (an individual) is considered to be in absolute poverty if it cannot afford the basic needs for food, clothing and housing. The minimum consumption basket is defined using basic physiological, social and cultural standards.

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<sup>7</sup> SSCU (2008).

Relative poverty aims to define the economic ability of households to support a typical lifestyle in a given society. I.e., people in relative poverty are those who cannot afford various amenities considered as necessary by most people: adequate housing, food, clothing, health, etc. As a result, relative poverty lines are usually measured in relation to the population's income.

Different countries use either absolute or relative poverty lines, or combinations of various forms of the two, to help define target groups of social welfare programs. A further distinction of severe poverty is also used for targeting in some programs. The analysis of poverty should be made on the basis of both absolute and relative poverty lines, which allow evaluation of:

The poverty incidence and poverty gap when using both the relative and absolute poverty lines and analysis of their differences;

The characteristics of poor households according to selected criteria;

The impact of economic factors and the efficiency of social welfare programs.

### 3.3. Approaches towards evaluating the efficiency of social welfare programs

The major aim of any social welfare program is to help poor individuals by lifting their income to at least the poverty line. However, reductions in the poverty incidence are not always the best measure to evaluate a program's efficiency. In particular, it ignores the differences in well-being between poor households. This means that a static poverty incidence could cover up an increase in the depth of poverty among the poor. Other poverty measures which should be taken into account while evaluating the social welfare programs include the severity of poverty and the poverty gap.<sup>8</sup>

The poverty gap is estimated as the sum of the shortfalls of income of poor individuals from the poverty line and is equivalent to the transfer needed to eliminate poverty at a given poverty line. This measure does not capture changes in the severity of poverty, most typically measured using a squared poverty gap index. This index accounts for inequality among the poor, but is difficult to interpret.

All aforementioned measures belong to the Foster-Greer-Thorbecke (FGT) class. In particular, the formula for their estimation can be represented as:

$$P(\alpha) = (1/n) \sum_{i=1}^q [(z - y_i)/z]^\alpha, (\alpha \geq 0)$$

where  $n$  is the number of households;  $y_i$  measures income of the  $i$ -th household;  $z$  is the poverty line;  $q$  is the number of poor households; and  $\alpha$  is a measure of the sensitivity of the index to poverty.

The type of FGT index depends on the value of  $\alpha$ :

$\alpha = 0$  for estimating the *poverty incidence*, which is the share of households with per capita income below poverty line, and becomes the formula  $P(0) = q/n$ ;

$\alpha = 1$  for estimating the *poverty gap index*;

$\alpha = 2$  for estimating the *severity of poverty index* (SPGI).

The efficiency of social assistance programs varies with their design. Some programs are provided universally through subsidized prices, while others only target the poor. Targeted social assistance aims to achieve more poverty reduction for less state spending. According to the World Bank (2000), universal benefits and subsidies are less efficient and more expensive than targeted assistance. However, it should be noted that efficient targeting carries administrative costs, in particular for antifraud measures.

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<sup>8</sup> See World Bank(b).

According to the World Bank (2000), the efficiency of a social welfare program can be measured against such criteria as:

- Coverage – the extent to which poor individuals are covered by the program;
- Targeting – the share of the subsidy going to the poor;
- Predictability of benefits to the poor, which depends on the level of corruption as well as fraudulent behaviour of beneficiaries;
- Price distortions due to the provision of the assistance or subsidy;
- Administrative simplicity.

These criteria reveal two major errors caused by providing assistance to the poor:<sup>9</sup>

**Undercoverage** – the share of the poor not receiving assistance (an exclusion error);

**Leakage** – the share of non-poor benefiting from the social assistance program (an inclusion error).

Therefore, any social welfare program should ensure that benefits associated with additional reductions in poverty are not lower than the additional costs associated with their provision. It is a very important and difficult task to define the proper parameters of a program.

In this paper, we apply the matching method to estimate the impact of different social assistance programs on poverty.<sup>10</sup> In particular, ex-ante simulations are made. These are possible as the HBS contains precise data on the amount of subsidies, allowances and benefits received by every household. The Distributive Analysis Stata Package (DASP) was used for the non-parametric estimation of the expected share of energy spending in total expenditures.

Our analysis of Ukrainian legislation turned up at least three approaches to defining poverty lines. These are:

- *75 percent of median* of conditional expenditures;
- *Subsistence minimum*;
- Guaranteed minimum income.

These poverty lines are defined at the national level and are used for different purposes. We use two poverty lines in this paper:<sup>11</sup>

Relative poverty line – 75 percent of median per capita conditional expenditures (*75 percent of median*) which is defined in the Order of different Ukrainian ministries<sup>12</sup> and is mainly used for analytical purposes and is not used as an input to guide social welfare policies.

Absolute poverty line – a *subsistence minimum* is defined as the total cost of a predefined basic consumer basket of food items and some minimum set of non-food products and services. The nominal amount of the subsistence minimum is estimated annually for the forthcoming period based on current prices<sup>13</sup> and is defined annually in the State Budget

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<sup>9</sup> Handrich, Betliy (2008).

<sup>10</sup> The number of households lifted out of poverty through participation in the social assistance program was assessed.

<sup>11</sup> The national poverty line is used for the study. Poverty lines are constructed on the basis of expenditures data, which include both consumption and non-consumption spending. Data limitations prevented us from using a spatial price deflator to harmonize the variables across the country.

<sup>12</sup> The Methodology of complex estimation of poverty is approved by the Ministry of Labour and Social Policy of Ukraine, the Ministry of Finance of Ukraine, the Ministry of Economy of Ukraine, etc. (Joint order of the Ministry of Social Policy and Labour, Ministry of Finance, Ministry of Economy, etc. No. 401/6689 from 26 April 2002).

<sup>13</sup> The standards and consumption prices used for calculating the subsistence minimum critically require assessment.

Law for different demographic groups. The composition of the consumption basket has not been updated since 2000.

### 3.4. Computable general equilibrium model

To evaluate the impact of the increase in gas prices on the welfare of households, we employ the computable general equilibrium model of Ukraine. The model used in this study is the single-country CGE model based on the social accounting matrix (SAM) and developed in the framework of the project "Analysis of the Economic Impact of Ukraine's WTO Accession" conducted by Copenhagen Economics, Denmark; Institute for East European Studies Munich, Germany; and Institute for Economic Research and Policy Consulting, Ukraine (2005)<sup>14</sup> and then further developed to meet the needs of this study.

The year 2008 is chosen as the base year.<sup>15</sup> The SAM predominantly relies on information provided by the State Statistics Service of Ukraine, in particular input-output tables in consumer and basic prices, matrices of imports, trade and transportation margins, and of taxes and subsidies. Another source of data is the 2008 Ukraine National Accounts, used to calculate the transfers between institutional agents in the SAM. Information about households has been derived from the Household Budget Survey as discussed above.

The production side of the economy is summarized in 39 sectors, following Ukraine input-output data. On the consumption side, the model specifies public, investment and intermediate consumption as well as final household consumption. Exports and imports are disaggregated by foreign trading partner and modelled with constant elasticity of transformation and substitution. Direct taxes and subsidies are modelled as sector-specific taxes and subsidies on the use of primary input factors. Indirect taxes and subsidies are modelled as a commodity-specific tax on private (household) demand and investment demand. The government receives income from public capital endowments and collects a variety of taxes.

To improve analysis of the income distribution and poverty in the framework of a CGE model, a microsimulation approach is employed in line with Cockburn, Corong and Cororaton (2010). In particular, information about households' expenditure and income patterns from national household surveys is integrated into the Ukraine CGE model.

The model uses two procedures to achieve macroeconomic closure in the model. First, at the macroeconomic level, total investments are equal to the sum of depreciation, public and private savings and the current account balance. Second, government revenues from various direct and indirect taxes rise to compensate for lost revenue in any counterfactual. In other words, government income is held constant. This is achieved by adjusting the level of lump sum transfers to households.

The steady-state formulation of the model developed by Copenhagen Economics et al. (2005) makes it possible to analyse potential long-run gains by allowing the capital stock to adjust to a new steady-state equilibrium. The nature of this adjustment is driven by the assumption that investors demand a fixed rate of return on investment. In the model, the rate of return on investment is defined as the rental rate on capital divided by the cost of producing one unit of the capital good. Results using the comparative steady-state formulation are normally considered as upper bound estimates (if the capital stock increases). The reason is that the steady-state calculation does not account for consumption foregone to obtain the larger capital stock. The elasticities used in the model are from Copenhagen Economics et al. (2005).

The CGE model of Ukraine was programmed using the GAMS/MPSGE software.

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<sup>14</sup> See Copenhagen Economics et al., 2005 for a general description of the methodology. Tables with the results of simulations are available at the request.

<sup>15</sup> The choice of the base year has been determined by data availability at the beginning of the study. At that time, the most recently available input-output tables in basic and consumer prices were for the year 2008.

## 4. Impact of gaz price increase on population

### 4.1. Scenarios

In this paper, we consider several scenarios of the impacts of gas price increases on the population. Formulating different scenarios allows us to capture several dimensions of the impact of a gas price increase: the *time horizon* (medium- versus long-term), the measure of *poverty* (relative versus absolute) and *origin of the shock* (domestic versus external).

We model both medium-term and long-term *time horizons*.<sup>16</sup> The medium-term horizon is modelled with a static model which assumes perfect mobility of production factors (capital and labour), but no changes in production factor endowments. The long-term horizon is modelled with a steady-state model which assumes that production factors are perfectly mobile and that the amount of capital can change to adjust to the new equilibrium.

The second dimension we model is poverty. Several measures of poverty are discussed in this report, and two poverty lines are considered in the CGE model: the relative poverty line (defined as personal income below 75 percent of median) and an absolute poverty line defined as the *subsistence minimum*.

The third dimension is the *origin* of the shock. In a small, open-market economy, the origin of a price shock is external, i.e. global energy prices determine domestic prices. However, domestic production fills roughly a third of (declining) aggregate gas consumption, along with strong government intervention in setting prices of domestically produced gas and of utility services. Prices of domestically produced gas are administratively held below imported gas prices. These features explain the differences in two origins of gas price shocks in our modelling exercise. Specifically, we consider an external price shock when global energy price trends are transmitted to markets in Ukraine through imported Russian gas prices, and an internal price shock when prices of domestically produced gas and utilities are increased regardless of external trends.

These dimensions allow us to form a matrix consisting of eight distinct scenarios (Table1).

**Table 1: Matrix of scenarios**

	External shock		Domestic shock	
	Medium-term	Long-term	Medium-term	Long-term
<b>Relative poverty</b>	Scenario 1A	Scenario 1B	Scenario 3A	Scenario 3B
<b>Absolute poverty</b>	Scenario 2A	Scenario 2B	Scenario 4A	Scenario 4B

These scenarios could be described as follows.

#### Scenario 1:

- **Scenario 1A:** Increased price of imported gas modelled as 50-percent higher price paid for Russian gas. Poor households are defined using the relative poverty measure. Medium-term model horizon is applied.
- **Scenario 1B:** Increased price of imported gas modelled as 50-percent higher price paid for Russian gas. Poor households are defined using relative poverty measure. Long-term model horizon is applied.

<sup>16</sup> We use the term *time horizon* tentatively, rather than referring to static/steady-state models, to simplify understanding of model results.

## Scenario 2:

- **Scenario 2A:** *Increased price of imported gas* modelled as 50-percent higher price paid for Russian gas. Poor households are defined using absolute poverty measure. Medium-term model horizon is applied.
- **Scenario 2B:** *Increased price of imported gas* modelled as 50-percent higher price paid for Russian gas. Poor households are defined using absolute poverty measure. Long-term model horizon is applied.

## Scenario 3:

- **Scenario 3A:** *Increased prices of domestic (residential) gas and utilities* modelled as 50-percent increase in domestic prices. Poor households are defined using relative poverty measure. Medium-term model horizon is applied.
- **Scenario 3B:** *Increased prices of domestic (residential) gas and utilities* modelled as 50-percent increase in domestic prices. Poor households are defined using relative poverty measure. Long-term model horizon is applied.

## Scenario 4:

- **Scenario 4A:** *Increased prices of domestic (residential) gas and utilities* modelled as 50-percent increase in domestic prices. Poor households are defined using the absolute poverty measure. A medium-term model horizon is applied.
- **Scenario 4B:** *Increased prices of domestic (residential) gas and utilities* modelled as 50-percent increase in domestic prices. Poor households are defined using the absolute poverty measure. A long-term model horizon is applied.

## 4.2. Macroeconomic impact

Several general points must be mentioned before presentation of the results of modelling:

- All results present changes in each respective variable relative to the benchmark year of our assessment (2008). Results do not give indications concerning the adjustment path from the benchmark to the new equilibrium.
- Given the purpose of our study, the results presented in this report isolate the economic impacts of increased gas prices from all other events that, in reality, simultaneously affect economic development.
- The model assumes no substitutability between intermediate production factors. However, in reality, substitutes for gas used for energy production, such as coal or wood, potentially mitigate gas price shocks. The modelled results thus represent upper bound estimates.
- Economy-wide results of simulations indicate that the increase in gas prices will negatively impact household welfare regardless of the poverty line considered or the time horizon chosen for estimates.

According to the results of the medium-term model simulation, the overall welfare losses (measured as *equivalent variation*) arising from a 50-percent increase of imported gas prices are about 5.5 percent of consumption, while the impact of internal price adjustment is more moderate, at 3.4 percent of welfare loss. In the long-term model, which allows for changes in capital endowments over time, overall welfare losses from increased prices of gas imports amount to about 10 percent of Ukrainian consumption, while the impact of internal price adjustment is once again more moderate, at a 5.7 percent welfare loss. The choice of



poverty line. representing different clustering of households, had an insignificant impact on macroeconomic results.

There are two channels transmitting this shock to households:

- **Employment/output channel.** Specifically, gas is used as input in several large manufacturing sectors, including in the production of metals production, in the chemicals industry and in utility sectors. Higher gas costs lead to lower output (given unchanged external demands) and, thus, to a lower labour demand. Given an assumption of full employment, reduced labour demand is transmitted to household income in the form of lower wages.
- **Consumption channel.** Households are affected through consumption primarily due to higher prices for residential gas consumption, as well as higher prices paid for utility services that rely on gas as an input, predominantly, heating services.

External and internal price shocks affect aggregate domestic production somewhat differently. In the case of external price shocks, domestic gas prices also rise, and thus gas becomes less affordable. The lack of substitution between intermediate inputs in production results in lower aggregate output for sectors consuming gas, and thus lower labour demand and lower wages. Production of domestic gas is increased somewhat, mitigating the initial output-reducing effect.

In the case of an internal price shock, only domestic, and not external, prices are affected, i.e. there is only an increase in domestic gas prices. Thus, average gas price faced by domestic consumers rise by relatively less than in the case of an external price shock. Moreover, over a medium- to long-term horizon when the economy can fully adjust to new equilibrium, domestic gas and utility services production can benefit from a better economic situation, leading to increased employment and partially mitigating price shocks which are otherwise transmitted to other sectors. Thus, the domestic price shock is not as deep as external price shock, and thus its welfare impact is somewhat smaller.

In all the scenarios considered, the model estimates that wages will decline, and price changes are expected to result in labour adjustments. The impact is much larger in the case of an external gas price shock than when only prices change for gas of domestic origin. It should be emphasised that the results are an estimated upper bound of the impacts of the shock.

#### 4.3. Impacts on poverty

As stated before, a gas price shock has unambiguously negative welfare impacts, and thus social mitigation measures need to be carefully considered by the state. However, the adverse impact of an increase in gas prices varies with household income (poor versus non-poor), urban versus rural residence, having different factor endowments etc.

The impact of gas price shocks on three measure of poverty, the incidence, gap and severity of poverty in Ukraine, varies with the benchmark poverty line used. If the absolute poverty line (exogenous benchmark) is applied, both the incidence and depth of absolute poverty rise, *ceteris paribus*, as a result of a gas price increase. These impacts are larger in the case of an external price shock than in the case of a domestic price adjustment.

However, if the relative poverty line (endogenous benchmark) is applied, the picture changes. When all households become poorer following a shock, incidences and depth of relative poverty actually decline.

In the medium term, external price shocks tend to have a greater impact on poor households, whereas the impact is not statistically different in the long run.

In the case of a domestic price adjustment, there are no statistically significant differences between the reactions of household types in the medium-term, but non-poor households

tend to experience higher welfare losses over a long-term perspective as also reflected by a lower relative poverty incidence. These additional welfare losses of non-poor households could be explained by taken capital losses, as it is assumed that non-poor households own some capital stock and returns to capital decline in long-term.

Location seems to be a key factor explaining differences in the welfare impact by household type. In most scenarios, welfare losses tend to be greater among urban households. This can be explained by differences in the structure of their consumption. The major items of energy-related consumption are centralized gas consumption and district heating in urban areas, while primarily centralized gas consumption dominates in rural areas. High urban heating consumption is very important for determining the welfare impact of a gas price shock.

The welfare impact on skilled and unskilled (labour) households is statistically different. In all scenarios, the impact is larger on skilled households.

To summarize up to here, all household categories experience a welfare loss as a result of higher gas prices. Location and skill level play unambiguous roles in the welfare impacts, while the welfare losses of poor and non-poor households could not be statistically differentiated.

*Ceteris paribus*, households respond by significantly reducing consumption of gas-related services consumption. Thus, it could be expected that the price mechanism adjustment would contribute to increased energy efficiency in the country. However, this reform results in an adverse social shock, as expected. This impact should be mitigated using a social welfare program, as discussed below in section 4.

The CGE simulation suggests that urban households should be the focus of any social welfare program which aims to mitigate an upwards gas price shock. However, bad public finances together with an apparent need to target social welfare programs implies that the focus should be narrowed. Thus, we suggest that the public attention should be on mitigating the impacts of the shock on poor urban households.

## 5. Impacts of selected social welfare programs on poverty in Ukraine

### 5.1. Social support programs in Ukraine: Overview

**Brief overview.** More than 1,000 different benefits can be granted to a person in Ukraine. Procedures relating to assignment and provision of benefits are regulated by in excess of 50 regulatory legal acts (laws of Ukraine, Presidential Decrees, regulations and orders of the Cabinet of Ministers of Ukraine, other ministry- and agency-level acts). The benefits are provided in-kind and include, in particular: housing and utility benefits (exemption from, or reduction of, payment for housing and utility services (including heating) for certain population categories); transport benefits (entitlement to free travel in all modes of public (urban) and suburban transport); telecommunication benefits; health care and rehabilitation benefits (free or privileged purchase of medicines, etc.), industrial benefits, etc.

Overall, more than 40 percent of the country's total population is entitled to benefits. The largest categories include old-age pensioners (over 10 million), war children (over 6 million), labour veterans (over 4 million), war veterans (over 2 million), and victims of the Chernobyl disaster (over 1 million). According to estimates, the total amount of benefits is equal to annual expenditures across all local budgets in Ukraine; hence most benefits are notional rather than functional benefits. Targeting social benefits at the poorest groups of the population remains low because the benefits are provided to various groups based mainly on previous service rather than their income level. Evidence suggests that richer households receive considerably more privileges from these transfer and benefits than poorer ones. Furthermore, not all poor households ultimately receive the benefits to which they are legally

entitled.<sup>17</sup> Therefore, the current social welfare system in Ukraine is complex and expensive to administer.

In addition, the social security system was introduced in 2000-2001, and included four types of compulsory state social insurance: pension insurance, unemployment insurance, insurance against work accidents and insurance in case of temporary loss of ability to work.

In 2009, the Government approved a Strategy to Streamline the Benefit System until 2012. The Strategy does not include any plan to introduce targeted social benefits or to revoke privileges granted on an occupational basis. However, these steps are envisaged in the Program of Economic Reforms developed by the Committee for Economic Reforms under the President of Ukraine in 2010.

In this report, the effectiveness of two programs are assessed in consideration of the main simulation results presented in section 3:

- low-income family allowances: as this is the type of targeted cash payments to poor individuals, who are likely to be more affected by the gas price shock;
- housing and utility subsidies: as this program was specifically designed to protect vulnerable (poor) households in times of rising utility prices.

**Family assistance.** The family assistance program is designed to protect families with children. Family assistance is assigned based on the level of need (except for baby bonuses) and includes five benefit types: (i) a maternity benefit; (ii) a baby bonus; (iii) a children's allowance; (iv) a benefit to care for children under the age of three; and (v) single parent benefit. In addition, there is a program of allowances for low-income families, which gives greater weight to children. The situation with baby bonus has some particularities. It was the most popular subject of political speculation between 2004 and 2008 and became prominent again during the 2010 presidential election campaign. All other types of children's allowances are assigned based on the degree of need and their size is usually linked to the subsistence minimum.

The program of support for low-income families was designed with the specific objective of directing the benefit solely to the worst-off population. Provision of social allowances to low-income families is regulated by Law 250, passed on February 24, 2003, and named "*On social allowances to low-income families*". Low-income family payments are monetary transfers posted on a monthly basis for eligible families. The eligibility criterion for being granted this type of assistance is that families should have per capita income of less than the guaranteed minimum income (GMI).<sup>18</sup> The level of the GMI is defined annually in the State Budget Law. Its size increases for each child in the family. Therefore, the social allowance accorded to low-income families can be referred to as a means-tested social welfare program.

The amount of low-income family assistance is calculated as the difference between the GMI and the family's monthly income, up to a maximum of 75 percent of the GMI. Data on income to estimate the amount of assistance is based on the previous six months, and payment of the assistance is assigned for the next six months.

- ✓ Total income of the family, including low-income families allowances,<sup>19</sup> includes wages and salaries, stipends, pensions, other social assistance payments, entrepreneurial income, etc.<sup>20</sup>

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<sup>17</sup> Handrich, Betliy (2008).

<sup>18</sup> Initially, the Law defined the subsistence minimum as an eligibility criterion for assisting low-income family payments. However, lack of adequate fiscal revenues resulted in the allowance being based on much narrower criteria, namely, the GMI (a direct translation from Ukrainian would be "guaranteed level of the subsistence minimum").

<sup>19</sup> The calculation of income is based on the methodology defined by a special Order of the Ministry of Labour and Social Policy, the Ministry of Economy, the Ministry of Finance, and the State Statistical Committee of Ukraine, No.486/202/524/455/3370, from 15 November 2001.

<sup>20</sup> Except for the lump-sum payment of the first tranche of baby bonuses.

The following families are not eligible to receive the assistance:

- families with members who are able to work, but who are not working, studying or registered as unemployed;
- families whose members made large purchases (more than 10 times the subsistence minimum) during the last 12 months;
- families owning land covering more than 0.6 ha (except for cases when this land does not create an additional source of income);
- families owning another apartment or house if the total size of housing exceeds 21 square metres per family member (plus 10.5 square metres per family) or if the family owns more than one vehicle.

Special local social commissions may also approve the payment of low-income family allowances to the aforementioned families after special consideration of their cases.

Families applying for assistance are subject to possible checks by social inspectors. Their duties include avoiding potential fraud by families. More specifically, they may inspect the living situation of families.

**Housing subsidies and benefits.** Ukraine's housing and utility sector is a major target of benefits and assistance, relative to other economic sectors, through provision of housing and utility services and large-scale price subsidization. In addition to the above-mentioned benefits for housing and utility service payments, granted on the basis of an individual's occupational category and social status, benefits to pay for housing and utility services, based on people's income levels, are also granted (housing subsidies). Benefits for housing and utility services are received by more than 10 million people, whereas 1.5-2 million people receive housing subsidies. More than 2 billion UAH (Ukrainian Hryvnia), or roughly USD 250 million using a National Bank of Ukraine exchange rate of about 8000 UAH per USD, is allocated from the state budget annually to cover the cost of these benefits and subsidies.

Benefits for housing and utility services are a discount system for the payment of services. They are granted to those with a certain social status or occupational category (war veterans, persons with disabilities, persons having special merits, etc.). The level of the discount varies from 25 percent to 100 percent of the nominal payment for housing and utility services. It does not depend on the recipient's income level. Rather, housing subsidies are granted on the basis of one's share of housing and utility bill in income.

Whereas benefits for housing and utility services have existed since Soviet times, housing subsidies were introduced in 1995 to support the most vulnerable groups of the population as energy carrier prices were growing sharply. The program of housing subsidies was implemented under Cabinet of Ministers of Ukraine Resolution No. 89 of 4 February 1995 "*On providing the population with subsidies to reimburse expenses incurred to pay for housing and utility services*" and was further developed through amendments to the Resolution and other legislative initiatives.

The subsidy design contains a component to promote energy savings. In particular, the housing and utility payment is reduced by 2 percent for every 10-percent decline in consumption of these services. As a result, families can reduce the spending threshold on these services to 10 percent of income, while this limit for families with only pensioners or unable to work unable individuals may reduce to 5 percent.

The regulation also contains some anti-fraud measures. In particular, social inspectors can verify living standards of customers. If the subsidy was allocated on the basis of false documents, then the overpaid subsidy is to be refunded by the claimant. However, local social commissions can approve housing and utility subsidies even when eligibility criteria do not.

## 5.2. Evaluation of social allowances to low-income families

**Coverage by the program.** Due to tight eligibility criteria, the coverage of the low-income allowance program remains low. In 2009, only 1.2 million, or 2.6 percent of the entire population, received assistance. Most families receiving the allowance are families with children, as this group tends to be poorer in Ukraine than families with no children. Rural families account for 64 percent of all families receiving the assistance.

At the same time, the level of assistance remains low due to the cap imposed by the program design. Monthly payments totalled UAH 36.9 million in 2009. Overall, in 2009, only UAH 169 million was allocated for the program.

Therefore, the lack of sufficient fiscal revenues along with tight eligibility criteria has resulted in a very limited coverage by the low-income family allowances program. As such, the program is unlikely to have a major impact on poverty alleviation in Ukraine.

**Efficiency of the program.** Low-income family assistance is designed as a targeted social welfare program with means-tested eligibility criteria. As the defined income threshold is rather low, it could be expected that the undercoverage of the poor, defined according to either of the poverty lines used in this paper, would be significant. Low leakage to the non-poor can be expected. To define them, the leakage and undercoverage of this program were estimated using data of the HBS conducted by the State Statistics Service of Ukraine.

The results of the estimates are somewhat surprising given that poor households comprise less than 70 percent of all beneficiaries of low-income family allowance. However, they receive a larger share of the assistance. In particular, poor households, defined using the 'subsistence minimum' poverty, comprised 17.8 percent of all households, but accounted for 63.3 percent of all households receiving the low-income family allowance. These poor households have received 77.1 percent of all funds allocated to this program. It is also worth noting that non-poor households accounted for 36.7 percent of beneficiaries of the program. It is likely that these non-poor families received allowances according to the respective decisions of local social commissions.

Even though there are more rural households in poverty than urban poor households in absolute terms, rural households form a higher percentage of beneficiaries as they are poorer. In particular, rural households comprise 37 percent of the beneficiaries of low-income assistance if poverty is measured using the *subsistence minimum* poverty measure. Poor rural households receive nearly 50 percent of all allocations from the program due to higher poverty in rural areas and the larger number of children in these households.

The analysis of low-income family allowances received by decile of per capita expenditures indicates that the 20 percent poorest households receive 78.0 percent of all program costs, while the richest 10 percent of households do not benefit from such payments. The targeting of the assistance can thus be described as high enough. Also, the average annual amount of benefits received is much higher among the poorest 10 percent of households than among other groups.

Program coverage is very low. Only 0.9 percent of all households participate in the program,<sup>21</sup> and two-thirds of them are defined as poor. This is explained by the low-income eligibility cap for participation in the program. As a result, the undercoverage of poor households (exclusion error) is nearly 97 percent, reflecting the high share of poor households excluded from the program. This is very high for any social assistance program. At the same time, despite tight eligibility criteria, leakage to the non-poor (inclusion error) is also high, at more than 30 percent. This could be explained by provision of the allowance under special

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<sup>21</sup> This indicator is provided for the share of households and, thus, is lower than one shown in Table 4.1, which refers shows that households with more members (in particular, children) are more likely to be poor.

decisions of local social commissions<sup>22</sup> or methodological issues.<sup>23</sup> Either way, program efficiency is a concern.

**Impact of the program on poverty reduction.** Another approach to estimating the efficiency of the program is to look at its impact on poverty reduction by comparing different poverty measures before and after receiving the low-income family assistance. In this case, it is better to use the absolute poverty line (the *subsistence minimum* in our case) because the relative poverty line changes when assistance payments are subtracted from expenditures.

Provision of low-income family assistance only has a marginal 0.1-percentage point contribution to a decline in poverty. This assistance has a greater impact on the severity of poverty, although just a 0.4-percentage point decline.

The very low impact of this type of assistance on poverty can be explained by low coverage of households. Moreover, the low level of assistance is also low, so it merely contributes to improved household income situations. Therefore, even though low-income family assistance is the only targeted program in Ukraine, its impact on poverty remains rather low. The program merely contributes to higher equality among the poor by bringing the poorest closer to the *subsistence minimum* poverty line. Otherwise stated, the program contains design drawbacks which result in its inefficiency if the goal is to bring the most people above the poverty line.

### 5.3. Evaluation of housing and utility subsidies to households

**Program coverage.** The housing and utility subsidy has much higher population coverage than the low-income assistance due to different eligibility criteria. Coverage dropped sharply between 2000 and 2005 for several reasons. The biggest reason was the economic recovery, which stimulated wage growth after 2000. Wage arrears also significantly declined over that period. Rapid increases in social standards, including minimum pensions and minimum wages, have also contributed to the increase in household incomes. Overall, during this period, household income grew faster than the housing and utility tariffs, reducing the share of income spent on these services. The Government also streamlined the legislation on the eligibility criteria for participation in the program. Coverage declined further during the economic crisis of 2008-2009, when eligibility criteria were made even tougher.

In 2010, subsidies to reimburse expenses paid out for housing and utility services were assigned to 1.77 million families, or 78.3 percent of all families applying for a subsidy. Subsidies were assigned to 1.35 million families in urban areas and to 412,800 families in rural areas.

The coverage of the cash subsidy for liquefied gas and fuel is much lower, as it is provided to individuals using these energy resources for heating. In 2010, subsidies for the purchase of liquefied gas and both solid and liquid home heating fuel were assigned to 327,800 families (72.0 percent of those who applied). Almost 80 percent of families receiving this subsidy live in rural areas.

**Efficiency of the program.** The program's coverage of poor households differs with the poverty line applied, most likely because there is no income cut-off for the benefit. If poverty is measured using the 75 percent of median poverty line, poor households account for just 28 percent of households receiving housing and utility subsidies. If defining poverty using the *subsistence minimum* poverty line, the situation is even more troubling, as poor households then account only for 11.8 percent of all households receiving the subsidy. The percentage of the subsidy received by poor households is 32 percent of all program allocations when using a 75 percent of median poverty line, and is 13 percent when the *subsistence minimum* is used. Therefore, even though this type of social welfare program is claimed as being

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<sup>22</sup> Another reason could be attributed to the fact that the allowance is provided to families, whereas data limitations lead the current assessment to be at the household level.

<sup>23</sup> At the same time, there could also be methodological problems when estimating the efficiency of the program. In particular, the survey data are provided for households, while allowances are provided to families. However, this does not contribute to large discrepancies in the estimates.

targeted, *de facto* it is not so. In particular, more than two-thirds of cumulative state spending on the provision of housing and utility subsidies is directed to non-poor households.

Rural poor households were almost totally excluded from the housing and utility subsidies program. This is likely to be explainable by the absence of centralized heating in rural areas. The lack of rural coverage of housing and utility subsidies is partially compensated by access to the cash subsidy to cover gas and solid fuel expenses, mainly provided to rural households. In particular, according to the official HBS, 87 percent of all households receiving compensation for liquefied gas and solid fuel for heating purposes live in rural areas. They receive nearly 90 percent of all compensation provided from the program budget. At the same time, poor households comprise nearly 40 percent of all participants in this program if poverty is measured by the *75 percent of median* relative poverty line, but are just 15 percent when the subsistence minimum is applied.

Housing and utility subsidies perform worse in terms of targeting poor households when compared to the low-income family allowances program, primarily due to an absence of means testing. Notably, the poorest household quintile (the poorest 20 percent) receives nearly 17.5 percent of all utility subsidies received by households, while the richest quintile receives a further 12.1 percent. On average, poorer households tend to receive larger housing and utility subsidies. The third quintile (40<sup>th</sup> through 60<sup>th</sup> percentile of income) receives the most compensation in the form of liquefied gas and fuel subsidies.

Leakage and undercoverage errors are very high for this type of assistance, especially if measured against the absolute poverty line. In particular, nearly 97 percent of households defined as poor when using this poverty line are not included in the program. Meanwhile, 88 percent of non-poor households receive the subsidy.

Total program coverage remains low. This may be explained by several factors, such as:

- the large share of households, especially poor ones, with housing and utility services expenditures below the 15 percent of income eligibility threshold. The expected share of household spending on energy (according to DASP modelling results) was below 15 percent of total expenditures in 2009, and only 6 percent of households in the HBS spent more than 15 percent of income on energy. At the same time, the expected share of energy spending is not surprisingly higher among households already receiving the subsidy.
- limited possibilities to disconnect households from using housing and utility services in cases of payment arrears. As a result, some households decide not to pay for services rather than apply for the subsidy.

The efficiency of the compensation provided for liquefied gas and solid fuel used for heating is higher than that of the housing and utility subsidy, if using exclusion error for the comparison, but is lower if measured as an inclusion error. This might be explained by lower coverage of households by this social assistance program.

The low targeting of the subsidy programs is likely to be explained by the absence of clearly defined means testing in these programs. As there is no income cap on eligibility, leakage to non-poor individuals can be high.

**Impacts of the program on poverty reduction.** The subsidies analysed in this paper have a rather limited impact on poverty. The housing and utility subsidy has higher coverage, leading to a greater impact than either of the low-income assistance or the liquefied gas and fuel subsidy. The state achieves a 0.2-percentage point reduction in the poverty incidence via the housing and utility subsidies program. This type of subsidy reduces poverty in both rural and urban areas. At the same time, subsidies for liquefied gas and fuel naturally result in poverty reduction only among rural households, the primary recipients of this subsidy.



Even though these two social policies help reduce the incidence of poverty, they do not impact the severity of poverty. This is because they are not helping those in extreme poverty. This might be explained by pre-existing low spending by very poor individuals on housing and utility services, rendering them ineligible for assistance. Another reason could be difficulties in applying for subsidies. One more reason could be related to the possibility having accumulated housing and utility services payment arrears.<sup>24</sup>

Matching procedures of poverty structure before and after the social policy implementation could also help indicate the impact of the housing and utility subsidy on poverty. In particular, we study the change (if any) in the poverty status of households before and after the subsidy. The analysis is performed using the *subsistence minimum* absolute poverty line, because the relative poverty line changes with changed attitudes to income and expenditures. The results of the analysis reveal that the poverty incidence is only marginally influenced by the provision of housing and utility subsidies to households: just under one percent of poor households exited poverty as a direct result of this program. This again suggests that both the coverage and size of the program are insufficient. It should also be noted that this program helps households in urban area, who could be most impacted by the gas shock.

Therefore, even though housing and utility subsidies do not result in major changes in measures of poverty, they do help some people to exit poverty. However, the efficiency of the program remains low as it is not means tested.<sup>25</sup> The share of poor household's income spent on housing and utility services is often below, although close to, the income threshold, making them ineligible for the subsidy. Thus, the program could be a more efficient instrument of social welfare policy if its coverage were to be improved and its targeting approach better implemented.

**Possible changes in the provision of housing and utility subsidies.** Currently, the eligibility of households to receive housing and utility subsidies does not directly depend on household income. Expenditure levels may sometimes be taken into account with regard to the absence of large purchases over the last 12 months to determine eligibility. At the same time, low-income family benefits are provided in relation to the claimant's income situation, but at a rather low level of assistance. One could think about possibly combining the two programs, namely the housing and utility subsidy and low-income family allowances, into one.

The following scenario was constructed to describe the potential program:

- households are eligible for this type of assistance if their per capita expenditures net of housing and utility payments are less than 85 percent of the *subsistence minimum*.

If the *subsistence minimum* is considered, but the housing and utility subsidy eligibility threshold is disregarded, nearly 15 percent of households will be eligible for assistance. This program design is more targeted to the poor. Nearly 76.5 percent of poor households would be covered by the program,<sup>26</sup> while leakage to the non-poor would be much lower than under both current programs.

However, higher coverage is costly. Estimates suggest that this form of new program could require the Government to spend nearly UAH 10-15 billion each year for provision of social assistance payments to eligible households. Correspondingly, gradual program adjustments could be made. Moreover, increasing the level of targeting should be accompanied by elimination of expensive in-kind benefits provided to different population groups. At least 50%

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<sup>24</sup> Accumulated housing and utility arrears were nearly UAH 9.9 billion at the end of September 2011.

<sup>25</sup> The efficiency of the program is marginal, as is the case of the low-income family allowances: this program's coverage is higher across the entire population, but coverage of the poor remains similar.

<sup>26</sup> According to the new program, poor households would comprise 13.7 percent of all households eligible for assistance, while poverty incidence is 17.9 percent. As a result, the coverage of poor by the program is assessed at 76.5 percent of poor households.

of the new program expenditures could be financed by reallocating funds from current expensive in-kind benefits towards financing assistance to poor households.

The simulations indicate that this type of new program would be more efficient in helping poor households, although it comes with notable administrative costs. In particular, the government should consider the possibility of introducing proxy means testing (indicator-based targeting) to estimate income and thus determine provisions of household benefits.

## 6. Conclusions and recommendations

Two major answers can be provided in response to the research question underlined in the report. First, increased gas prices result in welfare losses across all household categories, and have a larger impact on urban households. Second, the current social welfare programs are not very efficient at targeting the poorest households. Therefore, reform of the social welfare system is required to ensure the safety net for poor households in times of gas price hikes.

### Conclusions and recommendations regarding the gas market

The losses from below-cost gas sales are accumulated in the state-owned gas company NJSC 'Naftogas'. The company faced increased losses, which were covered by the state.

Thus, the issue of increasing gas prices paid by the general population and by heat generators remains critical in Ukraine. In particular, this step is also envisaged in an ambitious reform agenda announced in mid-2010 aimed at restoring stable high growth of the economy. Such a step, along with the liberalisation of gas market, is likely to positively impact the State Budget through higher VAT revenues on gas consumption and from royalties and taxes from expanded domestic gas production.

Policy recommendations regarding the gas market:

The state should finalize gas market reform based on the EU framework and make it competitive through the vertical unbundling of state gas monopolist NJSC 'Naftogas'.

- The National Electricity Regulatory Commission (NERC) has to become an independent regulator of the energy market, so interference of the Government in gas pricing should be minimized.
- The NERC has to gradually increase gas prices for residential consumers to at least cover costs and eliminate their cross-subsidy by industry.
- The state must implement a program to support installation of individual household gas meters.
- The NERC should specify a methodology for assessing the costs of domestic gas production in line with modern regulatory practices, i.e. with explicit consideration of capital costs.
- The Government would benefit from initiating reforms in the district heat sector, in particular by shifting from compensating gas supplier losses to covering losses of the heat generator. However, subsidies to the heat generators should be phased out over time through gradual increase of the gas tariffs they face.
- The Government should also impose a price formula for setting domestic gas transportation costs on the basis of capital and operational costs (including fuel costs). There should be flexibility to change transportation costs should on some periodic basis (e.g. quarterly).
- The energy needs of residential gas consumers are to be assessed. Appropriate thresholds for essential gas consumption should be specified.

- To mitigate adverse gas price shocks on consumers, housing and utility subsidy programs should be carefully tailored. Greatest attention should be paid to urban consumers.

## **Conclusions and recommendations regarding social protection system**

The CGE simulation conducted within this project shows that the increase in gas prices would be a negative shock for households in Ukraine, causing welfare losses. The reduction in household consumption caused by a 50-percent increase in imported gas price would be about a cumulative 5.5 percent over the medium-term time horizon and about 10 percent over the long-term time horizon. Internal price adjustment in the absence of an external price shock would result in smaller losses amounting to 3.4 percent and 5.7 percent, respectively. Absolute poverty of Ukrainian households would increase as a result of the modelled gas price shock. In the case of the external price shock, the absolute poverty incidence would grow by 8.7 percent over the medium term and by 19.5 percent over the long term, and in the case of internal price adjustments the corresponding figures would be 1.5 percent in the medium term and 4.5 percent in the long term.

Gas price shocks would be absorbed more by the richer segment of the population, as indicated by changes in relative poverty measures. An external price shock would result in a 1.4-percent reduction in the incidence of relative poverty over the medium-term time horizon and a 3.4-percent reduction in the longer run.

Location play a key role in the impacts of the gas price shock on household welfare. In the majority of scenarios, urban households tend to experience higher losses than rural households. This can be explained by differences in their consumption structure. In urban areas, the major items of energy-related consumption are centralized gas consumption and district heating, whereas centralized gas consumption dominates in rural areas. The high level of urban heating consumption is key to determining the welfare impact of a gas price shock.

The modelling exercise thus suggests that social welfare programs to mitigate impacts of an upwards gas price shock should focus on urban households. More specifically, the focus should be on urban poor households given the difficult situation with public finances in the country and necessity to target social welfare programs.

However, the existing social welfare system to protect the poor has notable deficiencies. Our analysis of the means-tested program of low-income family allowances revealed that the program is inefficient at targeting the poor. There is major undercoverage of poor households because the low-income eligibility criteria is so low. Meanwhile, leakage to the non-poor is comparatively high, possibly due to special cases considered by local social offices. The limited program coverage and small total amount of cash payments almost necessarily imply that this program has a negligible impact on reducing the poverty incidence. It does, however, help households in severe poverty.

Policy recommendations regarding the social protection system:

- To improve the social assistance system, the Government should develop and approve a long-term poverty reduction strategy, which should foresee the gradual reform of the current social benefits system, in particular by monetizing at least some untargeted social benefits and through further development of targeted social assistance.
- A monitoring system should be introduced to track the implementation of the strategy for poverty reduction, progress in poverty alleviation and changes in the characteristics of the poor.
- When reforming social assistance, the Government should prioritize targeting of households in severe poverty. This will require radically improving the targeting of the existing low-income benefits program.

- A mixed system based on self-targeting via workfare programs and proxy means testing<sup>27</sup> is recommended to be developed to complement income means testing.
- Taking the aforementioned measures into account, a gradual increase in the income threshold for eligibility of the low-income family allowance is recommended in order to bring it closer to the *subsistence minimum*. At the same time, the local social commissions should have reduced opportunities to include non-eligible families. If local administrations would like to include more families, they should co-finance the program.
- Proxy means testing should be applied to determine eligibility for the housing and utility subsidy. Households should also be targeted by incentives for improved energy savings.
- In the longer run, the Government would benefit from combining the low-income family assistance and the housing and utility subsidy into one type of social welfare program, targeted at the poor.
- As reduced child poverty is officially defined as a policy objective, the Government should devote attention to these issues by ensuring better access to kindergarten and to high quality education at all levels, in addition to a generous baby bonus.

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<sup>27</sup> Proxy means tests, also called indicator-based targeting, proceeds in two steps. In the first step of proxying, the poverty indicator is constructed, and the statistical analysis is performed with the aim of defining determinants and covariates of poverty. The poverty indicator then determines the eligibility of a household for social assistance and the size of benefits on the basis of a score. According to international best practice, variables selected include information on expenditures, employment, education, health, family structure, the location and quality of housing, ownership of durable goods, etc. (Handrich, Betliy).

## BIBLIOGRAPHY

Aslund, A. (2002). Why has economic growth resumed in Ukraine? Scientific materials of IER (2002). Available at:

[http://www.ier.com.ua/ua/publications/working\\_paper/archive\\_2002/?pid=1661](http://www.ier.com.ua/ua/publications/working_paper/archive_2002/?pid=1661).

Betliy, O. (2009). Unemployment in Ukraine: from Assessing Magnitude and Trends to Adequate Policy Response (IER report, 2009,

[http://www.ier.com.ua/files/Projects/Projects\\_2009/2009\\_01\\_Soros/Project%20output/2009\\_01\\_ukr.pdf](http://www.ier.com.ua/files/Projects/Projects_2009/2009_01_Soros/Project%20output/2009_01_ukr.pdf)

Betliy, O. (2010). Stability of National Debt is in Question. (Monthly Economic Monitoring of Ukraine 10 (120), October 2010 (2010). [www.ier.com.ua](http://www.ier.com.ua).

Burakovsky, I. and V. Movchan. 2011. Ukraine: Trade and Human Development. Aid for Trade Needs Assessment. – UNDP, 2011.

Cockburn, J., E. Corong and C. Cororaton. 2010. Integrated Computable General Equilibrium (CGE) Micro-Simulation Approach. *International Journal of Microsimulation*, 3:1, pp. 60-71.

Copenhagen Economics et al. (2005) Analysis of the Economic Impact of Ukraine's WTO Accession. Report prepared for the Ministry of Economy of Ukraine within the framework of the project conducted by Copenhagen Economics, Denmark. Institute for East European Studies Munich, Germany; and Institute for Economic Research and Policy Consulting, Ukraine, World Bank Grant TF 050270.

Dragon Capital. 2011. Ukrainian Economy: Life Without IMF? May 24, 2011. Dragon Capital.

EC/UNDP Blue Ribbon Analytical and Advisory Centre. 2011. Policy Recommendations in Selected Areas, 2011. (Kyiv, 2011, in preparation).

Handrich, L. and O. Betliy. 2008. Principles and Methods of Targeted Social Assistance: Recommendations for Ukraine, IER Policy Paper Series 07, 2008.

IER. 2011. Macroeconomic Forecast Ukraine, May 2011. Available at: [http://www.ier.com.ua/ua/publications/regular\\_products/forecast/?pid=2845](http://www.ier.com.ua/ua/publications/regular_products/forecast/?pid=2845).

Jensen J., T. Rutherford and D. Tarr. 2007. The Impact of Liberalizing Barriers to Foreign Direct Investment in Services: The Case of Russian Accession to the World Trade Organization. *Review of Development Economics*, 11:3, pp. 482-506.

Keuning, S. and W. De Ruijter. 1988. Guidelines to the Construction of a Social Accounting Matrix. Review of Income and Wealth, 1988 - Wiley Online Library. Available at: <http://www.roiw.org/1988/71.pdf>.

Lisenkova, K. 2011. Ukrainian Pension Reform in the Context of Population Ageing: A Dynamic CGE Model Approach. IER Working Paper No.01/2011. Available at: [http://www.ier.com.ua/en/publications/working\\_paper/?pid=2690](http://www.ier.com.ua/en/publications/working_paper/?pid=2690).

Lofgren, H., R. L. Harris and S. Robinson. 2002. A Standard Computable General Equilibrium (CGE) Model in GAMS, IFPRI. *Microcomputers in Policy Research*. Available at: <http://www.ifpri.org/publication/standard-computable-general-equilibrium-cge-model-gams-0>

World Bank. Maintaining Utility Services for the Poor: Policies and Practices in Central and Eastern Europe and the Former Soviet Union. The World Bank, Washington D.C., September 2000.

Ministry of Economic Development and Trade, Ukraine. 2011. Ukraine: Development Prospects. Consensus Forecast. Issue 26, 2011. Available here: [http://www.me.gov.ua/file/link/164206/file/Consensus\\_2011\\_03.pdf](http://www.me.gov.ua/file/link/164206/file/Consensus_2011_03.pdf).

Movchan, B. (Богдан Мовчан). 2002. Economic Recovery of Ukraine: Short Comment Concerning GDP alteration. (Українська економіка після кризи: коротка коментар щодо змін у ВВП). Tendencies of Ukraine's economy. Ukrainian-European Policy and Legal Advice Centre (UEPLAC). March 2002. (Українська економіка після кризи: коротка коментар щодо змін у ВВП). Українсько-європейський центр політичних та юридичних рад (UEPLAC). Березень 2002).

Movchan V., V. Shportyuk. 2010. Non-Tariff Measures and Country Welfare: Analysis with the CGE Model for Ukraine. EERC Research Project R07-1581.

Pugachov B. (Богдан Пугачов). 2010. Impact of prices on citizens' welfare: Methodology and Practical Actions (Вплив цін на добробут громадян: методологія та практичні дії). Kyiv (Київ), 2010.

Reinert, K., D. Roland-Holst. 1997. Social Accounting Matrices. Applied Methods for Trade Policy Analysis. A Handbook (eds. J.Francois and K.Reinert). Cambridge University Press, Cambridge.

Rutherford T., and D. Tarr. 2002. Regional Trading Arrangements for Chile: Do the Results Differ with a Dynamic Model? *Integration and Trade*, 7:18, pp. 117-139.

State Statistics Committee of Ukraine. 2008. Methodological provisions on the preparation of standard reports on quality of results of national sample population (household) surveys. (Методологічні положення щодо підготовки стандартних звітів про якість результатів національних вибіркової (домогосподарської) опитувань). Kyiv, The State Statistics Committee Of Ukraine, 2008, p. 92. (Київ, Державний комітет статистики України, 2008, 92 с.).

State Statistics Committee of Ukraine. 2009. Expenditure and income of Ukrainian households in 2008. A statistical compilation. Part I. (Витрати та доходи українських домогосподарств у 2008 році. Статистичне зведення. Частина I). Kyiv, The State Statistics Committee of Ukraine, 2009, p. 450. (Київ, Державний комітет статистики України, 2009, 450 с.).

World Bank. 2005. Ukraine: Poverty Assessment. Poverty and Inequality in a Growing Economy, May 2005. Available here: [http://siteresources.worldbank.org/INTUKRAINE/Resources/3283351138375819937/Full\\_Report.pdf](http://siteresources.worldbank.org/INTUKRAINE/Resources/3283351138375819937/Full_Report.pdf).

World Bank. 2007. Ukraine: Poverty Update, Report No.39887-UA, Human Development Sector Unit Ukraine, Belarus and Moldova Country Unit, June 20, 2007. Available here: <http://web.worldbank.org/archive/website01022A/WEB/IMAGES/UKRAINEP.PDF>.

World Bank. 2011. Ukraine Economic Update, June 21, 2011. Available here:  
<http://siteresources.worldbank.org/UKRAINE/UKRAINIANEXTN/Resources/455680-1308647514648/MEconomicUpdateJune2011e.pdf>.

World Bank (a), Module 3: Measuring (step 2). Poverty lines.  
[http://info.worldbank.org/etools/docs/library/93518/Hung\\_0603/Hu\\_0603/Module3MeasuringPovertyLines.pdf](http://info.worldbank.org/etools/docs/library/93518/Hung_0603/Hu_0603/Module3MeasuringPovertyLines.pdf).

World Bank (b), Module 4: Measuring (step 3). Poverty measures,  
[http://info.worldbank.org/etools/docs/library/93518/Hung\\_0603/Hu\\_0603/Module4MeasuringPovertyMeasures.pdf](http://info.worldbank.org/etools/docs/library/93518/Hung_0603/Hu_0603/Module4MeasuringPovertyMeasures.pdf).

World Bank (c), Module 5: Measuring (step 3). Inequality measures.  
[http://info.worldbank.org/etools/docs/library/93518/Hung\\_0603/Hu\\_0603/Module5MeasuringInequality.pdf](http://info.worldbank.org/etools/docs/library/93518/Hung_0603/Hu_0603/Module5MeasuringInequality.pdf)