Maintaining Utility Services for the Poor

Policies and Practices in Central and Eastern Europe and the Former Soviet Union

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Executive Summary

Until the early 1990s, utility prices were set artificially low for residential consumers in most countries in Central and Eastern Europe and the former Soviet Union. When the cost of these across-the-board price subsidies became unaffordable, one government after another decided to bring residential tariffs closer to supply costs. The resulting price adjustment process, however, turned out to be more painful than originally expected. The required large increase in the prices of utility services coincided with a decrease in household incomes due to the general contraction of economic activity.

Introduction

Furthermore, the decline of real average household income was coupled with increasing income polarization. As a result of these two trends, the share of the poor within the overall population reached alarming proportions in many countries. Paying utility bills became a major challenge for the rapidly growing army of poor households. Some governments simply pressured utility managers to be lenient with households that did not pay their utility bills. By the middle of the 1990s, however, most governments recognized that this does not provide a sustainable solution, and started to experiment with various subsidy schemes aimed at low income households. The main objectives of this paper are (i) to provide a conceptual framework and methodology for the evaluation of utility subsidy mechanisms in order to help decisionmakers choose the mechanism that suits their specific circumstances and priorities best; and (ii) to present the results of applying this methodology to a selected number of countries and utilities relying on currently available information and data.

Utility subsidies can serve many objectives. Sometimes governments want to ensure that all households receive a basic (universal) level of service because of the perceived positive externalities associated with it, or as an attempt to "buy" support from the electorate. A temporary subsidy may be an acceptable "price" to pay for making a large tariff increase politically palatable. Subsidies to certain classes of consumers may facilitate a systematic effort to strengthen payment discipline and reduce the stock of outstanding receivables. Finally, subsidies may enable the poor to receive utility services without having to sacrifice other essential needs. The analysis in this paper is presented from the point of view of this last objective.

Analysis

Households receive several types of utility subsidies in Central and Eastern Europe and the former Soviet Union. In order to simplify the analysis in this paper, we have grouped these subsidies into the following seven categories:

- No disconnection of delinquent residential customers
- Across-the-board household price subsidies
- Life-line tariffs (with two fixed or "floating" blocks, or with three blocks)
- Price discounts provided to certain households selected on the basis of occupation, medical history, age, merit, etc.
- Compensation for the share of utility expenditures that exceeds a notional burden limit set as a given percentage of monthly household income (based on actual utility expenditures or expenditure norms)
- Other earmarked cash transfers helping low income households to pay for utility services
- Non-earmarked cash transfers to poor households.

To evaluate the performance of utility subsidy mech-

anisms, the paper relies on household survey data, augmented with information provided by government ministries and statistical bureaus. Each subsidy mechanism is evaluated against the following criteria (first, at a conceptual level, and then using real-life examples):

- The extent to which the poor are being reached (i.e., coverage)
- The share of the subsidy that goes to the poor (i.e., targeting)
- Predictability of the benefit for the poor (which tends to be inversely related to corruption)
- The extent of pricing distortions and other unintended side effects due to the subsidy
- Administrative simplicity.

In addition, the paper briefly reviews the financial impact of each subsidy mechanism on the budget, other (non-household) consumers, and utilities. The paper covers electricity, gas, heat, water, and sewerage services.

We have found that subsidy mechanisms that perform well according to some of the criteria tend to perform poorly according to others (e.g., high coverage is usually associated with low targeting). Furthermore, not all subsidy mechanisms are applicable or perform equally well across all countries and utility services (the lack of metering in water supply, for example, poses a problem for life-line tariffs). Therefore, it has not been possible to identify one subsidy mechanism that outperforms all other mechanisms irrespective of country circumstances and preferences. It has been possible, however, to identify subsidy mechanisms that, at least from the point of view of the above five criteria, are unlikely to be top performers in any country and sector. These are the mechanisms of no-disconnection, across-the-board price subsidy, earmarked cash transfers, and burden limits.

The table below presents the main results of the evaluation in a numerical format. To find the subsidy mechanism that suits their circumstances best, decisionmakers need to (i) obtain information on the share of the poor connected to each type of utility service (this will help to narrow down the coverage scores of across-the-board subsidies and life-line tariffs); (ii) consider the possibility of metering/billing actual household consumption (this will show whether life-line tariffs are a meaningful option); (iii) determine the weights that they assign to each of the five criteria (if metering/billing of actual consumption is not feasible, zero weight should be assigned to the price distortion criterion); (iv) calculate aggregate scores for each subsidy mechanism and for each type of utility service; and (v) identify the subsidy mechanisms that received the highest aggregate scores for each type of utility service.

To illustrate how this can be done, we included an aggregate score in the table, calculated with double weights

EVALUATION OF SUBSIDY MECHANISMS[a]

Evaluation Criteria	*No Disconnection*	*Across the Board Price Subsidy*	*Life-line with 2 Blocks*	*Life-line with 3 Blocks*	*Life-line with Floating Blocks*	*Price Discount for Privileged Consumers*	*Burden Limit Based on Actual Util. Exp.*	*Burden Limit Based on Util. Exp. Norms*	*Other Ear-marked Cash Transfer*	*Non-ear-marked Cash Transfer*
Coverage	1	1 to 2	1 to 2	1 to 2	1 to 2	1	1	1	1	1
Targeting	1	0	0	2	1	1	0	1	2	2
Predictability	0	2	2	1	2	2	1	1	1	1
Pricing Distortion	-2	-2	-1	-2	-1	-1	-1	0	-1	0
Administration Cost/ Difficulty	0	0	0	0	-1	-1	-2	-2	-2	-2
Aggregate Score[b]	2	2 to 4	3 to 5	5 to 7	4 to 6	4	0	3	4	5

[a] Scoring: 0 – low, 1 – medium, 2 – high (see the last section of Chapter II for more information).
[b] Calculated with double weights to first two criteria.

assigned to the first two criteria. For utilities with high connection ratios among the poor (e.g., electricity and water supply in most countries), the three-block and the "floating"-block life-line tariffs occupy the first and the second place, respectively. For utilities with lower connection ratios among the poor (typically, district heat, gas, and sewerage), the first place is shared between non-earmarked cash transfers and the three-block life-line tariff. When no reliable estimate exists for actual consumption (or the billing system has major deficiencies), life-line tariffs drop out, the criterion of pricing distortions becomes meaningless, and the top score goes to cash transfers/privileged consumer discounts or across-the-board price subsidies, depending on the connection rate of the poor.

In principle, the cost of the household subsidies can be covered by the utilities themselves, non-household consumers, or the budget. The first option, however, rapidly leads to the depletion of the working capital of the utilities, which in turn reduces the reliability of the services they provide, and the resulting and inevitable curtailments (which tend to have an anti-poor bias) reverse the poverty alleviation impact of the subsidy. The second option may also become unsustainable if demand from industrial consumers is highly elastic with respect to price. Even when the short-term price elasticity of industrial demand for a specific utility service is relatively low, the welfare cost of distorting the price of an essential input is likely to be larger in the long run than the deadweight loss associated with additional taxes in the context of a well-functioning tax regime. Cross-subsidies also run counter to the worldwide trend to liberalize the supply of electricity and gas to industrial consumers. In summary, financing of the subsidy from the budget seems to be the best option in most utility sectors and countries.

Overview of Bank Advice and Government Response

Pointing to the need to reduce fiscal deficits, the Bank advocated a rapid phase-out of across-the-board utility subsidies in all countries in the region. In the former Soviet Union, the Bank also argued strongly against the widespread tolerance of non-payment and the continued application of large price discounts to privileged consumers. Responding to government concerns that many households would not be able to pay tariffs that fully cover costs, the Bank generally recommended the use of income-tested subsidies to soften the negative impact of rising utility tariffs on low income households. However, the Bank provided little practical advice on the administration and financing of these income-tested cash transfer mechanisms, and tended to overestimate the coverage of the poor that could be achieved by these mechanisms in real life. In several countries in the former Soviet Union, the Bank endorsed the application of a specific income-tested subsidy mechanism, burden limits, without noticing the low coverage and targeting ratios that this subsidy mechanism produced. A possible explanation for this oversight is the insufficient amount of analytical work that supported and substantiated Bank advice. There were few Bank studies that relied on statistical evidence from household surveys to evaluate the extent to which the applied subsidy mechanisms reached their stated objectives.

Heeding the Bank's message about fiscal prudence, most countries in the region have made significant progress in phasing out budget-funded across-the-board utility subsidies. However, their track record is less positive concerning the phase-out of across-the-board subsidies funded through higher prices paid by industrial and commercial consumers. Also, the countries of the former Soviet Union (with the exception of the Baltic states) have achieved only modest progress in their efforts to strengthen payment discipline and to phase out price discounts to privileged households. As a result, several subsidy mechanisms coexist in many countries in the region today, providing more support to the middle class than to the poor, and having a detrimental impact on the financial health of utilities, on industrial competitiveness, and on local and central government budgets.

In view of these remaining challenges, the Bank should step up its assistance to governments that are willing to move away from particularly ineffective and costly subsidy mechanisms (for example, governments that have decided to sell state-owned electricity and gas distribution companies to strategic investors, since the new owners will more aggressively pursue and ultimately disconnect non-paying households). In each country where the government is searching for a better way to protect the poor, an effort needs to be made to collect data on utility connection ratios, household expenditures, and the impact of the currently applied subsidy mechanisms on the poor and the non-poor. In some countries, the necessary information will be available from previous household surveys, while in other countries, new household surveys will have to be undertaken. The time and money spent on these surveys will enable the Bank to provide higher quality and more convincing advice to its clients.

Introduction

Until the end of the 1980s, major production and investment decisions in Central and Eastern Europe and the former Soviet Union were guided by political considerations, resulting in production patterns and fixed assets that turned out to be uneconomic after these economies were opened to international trade. Commodity prices were divorced from world market prices and set administratively to facilitate the fulfillment of centrally prepared plans. Gas, electricity, and heat prices paid by residential consumers were set particularly low.

Households received a cross-subsidy from large (typically industrial) consumers, who paid higher than average utility tariffs despite lower than average costs,[1] and also enjoyed an across-the-board subsidy provided to all classes of energy consumers (in the form of budgetary transfers financing the capital costs of energy production, transport, and distribution). The same "cross-subsidy on top of an across-the-board subsidy" mechanism operated in water supply and sewerage.

By the mid-1990s, these low household utility tariffs had become unsustainable in most countries in the region. The budget lacked resources to cover the costs of price subsidies, industrial consumers revolted against high tariffs that hurt their international competitiveness (several switched to self-supply), and many of the newly corporatized (in some cases privatized) utilities were reluctant to shoulder indefinitely the losses associated with the low residential tariffs. The resulting price adjustment process, however, turned out to be more painful than originally expected.

The required large increase in the prices of utility services coincided with a decrease in household incomes

TABLE 1. UKRAINE: AVERAGE HOUSEHOLD INCOME AND ENERGY TARIFFS, 1992-98 (1992=100, CPI ADJUSTED)

%	Income [2]	Electricity Tariff	Natural Gas Tariff	District Heat Tariff (Kiev City)
1992	100	100	100	100
1993	65	47	27	69
1994	44	79	46	180
1995	41	376	448	1270
1996	38	578	643	1953
1997	43	617	613	1973
1998	43	594	563	1644

Source: World Bank staff estimates based on data from the State Statistical Committee and the Ministry of Economy.

[1] The transport and distribution of electricity, gas, heat, and water is subject to a positive economy of scale. This economy of scale effect explains the natural monopoly characteristics of basic utility services, justifying the need for economic regulation.

[2] Due to the growing share of the informal economy in Ukraine, official statistics may overstate the decline of income by as much as 20 percentage points.

due to an across-the-board contraction of economic activity in transition countries. In Ukraine, for example, household energy tariffs increased four- to twelve-fold (in real terms) between 1992 and 1995, while the average household income dropped to less than half of its original level (Table 1). Similar, although less dramatic, adjustments took place in most Central and Eastern European countries (Table 2 presents figures for Hungary).

The decline of real average household income was coupled with increasing income polarization in practically all transition countries.

The Gini coefficient[3] of disposable income increased (on average) from 24 to 33 in Central and Eastern Europe and the former Soviet Union during the first six years of transition.[4] Inequality rose particularly fast in the former Soviet Union, with Ginis approaching 50 in Russia and Ukraine, 40 in Central Asia, and 35 in the Baltics by the middle of the 1990s. The share of the poor within the overall population reached alarming proportions in many countries (see Table 3).

In the absence of some kind of subsidy, paying utility bills would have posed a major challenge for the rapidly

TABLE 2. HUNGARY: AVERAGE HOUSEHOLD INCOME AND ENERGY TARIFFS, 1990-98 (1990=100, CPI ADJUSTED)

%	*Income*	*Electricity Tariff*	*Natural Gas Tariff*	*District Heat Tariff (Kiev City)*
1990	100	100	100	100
1991	98.3	112	110	128
1992	94.5	110	111	146
1993	90	109	98	n.a.
1994	92.6	96	83	n.a.
1995	88.1	129	101	n.a.
1996	88.1	129	107	n.a.
1997	89.5	150	122	n.a.
1998	93.0	155	121	150 (estimate)

Source: Central Statistical Bureau and Energy Office.

TABLE 3. INCIDENCE OF ABSOLUTE POVERTY[a]

	Armenia, 1996	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*	*Ukraine, 1996*
Population	40.0%	0.2%	1.3%	55.6%	5.9%	36.2%	21.7%	21.6%
Households	37.0%	0.2%	0.8%	47.8%	5.2%	30.6%	19.0%	19.7%

[a]Based on a $2.15/capita/day absolute poverty line (in 1996 PPP terms).
Source: Bank staff calculations based on household surveys. Only countries with relatively recent household surveys that provide information on utility connections and expenditures are included in the table.

[3]The Gini is an index of inequality that varies between zero and 100, with zero representing perfect equality and 100 perfect inequality.

[4] Source: Branko Milanovic, *Income, Inequality and Poverty during the Transition from Planned to Market Economy*, The World Bank, 1998.

growing army of poor households. For example, just the district heating bill would have exceeded 60% of the (cash plus in-kind) income of a typical family of four in the lowest income quintile living in a small apartment of 40 m^2 in Moldova during the heating season in 1997/98.[5] After the tactic of delaying tariff adjustments was exhausted, some governments simply pressured utility managers to be lenient with households that did not pay their utility bills.[6] By the middle of the 1990s, however, most governments recognized that these practices do not provide a sustainable solution, and started to experiment with various subsidy schemes aimed (according to official statements) at low income households. As a result of these subsidy schemes, the share of expenditures used on utilities remained within tolerable limits for most households in the region, including the poor (see Table 4).

The main objectives of this paper are (i) to provide a conceptual framework and methodology for the evaluation of utility subsidy mechanisms in order to help decisiomakers choose the mechanism that best suits their specific circumstances and priorities; and (ii) to present the results of applying this methodology to a selected number of countries and utilities relying on currently available information and data. The utilities covered are electricity, natural gas, district heat, water, and sewerage. The paper is divided into three chapters. After this first introductory chapter, the second chapter describes the pros and cons of each subsidy mechanism at a conceptual level, and then illustrates these with real-life examples. The third chapter reviews the evolution of Bank advice and government responses in this area, and draws lessons for the future. Supplementing the main text of the report, Annex 1 provides information on household survey data sets and absolute and relative poverty lines that we used in the analysis. Annex 2 describes the assumptions we made when assessing the system of price discounts for privileged consumers. Finally, Annex 3 presents additional tables supporting the main findings of the report.

TABLE 4. SHARE OF UTILITY EXPENDITURES IN TOTAL HOUSEHOLD EXPENDITURE

Poverty Groups (absolute poverty line)	*Armenia, 1996*	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*[a]	*Ukraine, 1996*
Non-poor	11.4%	7.9%	15.4%	7.9%	25.3%	12.8%	7.7%	4.0%
Poor	10.2%	9.0%	12.1%	10.6%	44.8%	12.5%	29.1%	3.5%
All households	11.0%	7.9%	15.3%	9.4%	26.3%	12.7%	12.3%	3.9%

[a]Rent is included in utility expenditure.
Source: Bank staff calculations using household survey data.

[5]Due to the rapid depreciation of the Leu and a decrease in real incomes, the full cost of district heating for the same Moldovan family exceeded the family's income by the end of the 1998/99 heating season. Even for a family of four with the estimated nationwide average per capita income, paying the full cost of district heating would have required about 40% of the total income of the family.

[6]Industrial, agricultural, and budgetary customers also benefited from this political pressure. The stock of receivables in the Ukrainian power industry, for example, ballooned from $650 million to $3.2 billion between early 1995 and end-1996.

Evaluation of Subsidy Mechanisms

Framework for Evaluation

Utility subsidies can serve many objectives. Sometimes governments want to ensure that all households receive a basic (universal) level of service because of the perceived positive externalities associated with it,[7] or as an attempt to "buy" support from the electorate. A temporary subsidy giving households time to adjust may be an acceptable "price" to pay for making a large tariff increase politically palatable. Subsidies to certain classes of consumers may facilitate a systematic effort to strengthen payment discipline and reduce the stock of outstanding receivables. Finally, subsidies may enable the poor to receive utility services without having to sacrifice other essential needs. The analysis in this paper is presented from the point of view of this last objective.

Households receive several types of utility subsidies in Central and Eastern Europe and the former Soviet Union. In order to simplify the analysis in this paper, we have grouped these subsidies into the following seven categories:

- No disconnection of delinquent residential customers
- Across-the-board household price subsidies
- Life-line tariffs (with two fixed or "floating" blocks, or with three blocks)
- Price discounts provided to certain households selected on the basis of occupation, medical history, age, merit, etc.
- Compensation for the share of utility expenditures that exceeds a notional burden limit, set as a given percentage of monthly household income (based on actual utility expenditures, or on utility expenditure norms)
- Other earmarked cash transfers helping low income households to pay for utility services
- Non-earmarked cash transfers to poor households.

The performance of a subsidy mechanism depends on its success in reaching the poor, and on the amount of purchasing power it transfers to them.[8] Since the average support per beneficiary provided by most utility subsidy mechanisms can be adjusted relatively easily (within certain limits), the real challenge is to increase coverage.[9] However, the evaluation of any subsidy mechanism should go beyond the amount of support provided to the poor. First, subsidies have a cost that needs to be financed from somewhere. For a given level of purchasing power to be transferred to the poor, this cost depends on the targeting efficiency of the subsidy mechanism.[10] Second, some subsidy mechanisms allow the poor to count on a level of support with a reasonable certainty, while benefits from other mechanisms are highly unpredictable (which

[7]Water and sewerage utilities provide health benefits that extend beyond the members of a household receiving these services, suggesting that private willingness-to-pay may be somewhat below the socially optimal level. The same consideration, however, does not apply to electricity, gas, and district heat (the frequently cited public benefits of street lighting are independent from the supply of electricity to individual households).

[8]These two factors determine the effectiveness of the subsidy, defined as the percentage of the poverty gap eliminated.

[9]Conceptually, the coverage ratio is equal to (1-e)u, where e is the error of exclusion (the ratio of those who are poor but don't qualify) and u is the rate of subsidy uptake (the ratio of those among the poor who decide to apply).

[10]The targeting ratio or efficiency of a subsidy mechanism is equal to P (1-i) / [P (1-i)+N i], where P is the average benefit provided to the poor, i is the error of inclusion, and N is the average benefit provided to the non-poor. Sometimes i is divided into two parts, formal inclusion error (when the eligibility criteria are designed in a way that they knowingly allow certain non-poor households to receive the subsidy) and infiltration (when some recipients "fake" poverty and qualify due to inadequate eligibility checks).

tends to invite corruption in countries with poor governance). Third, subsidies have unintended side effects due to their interference with price signals and other incentives resulting in the wasteful use of resources. Fourth, certain types of subsidies demand sophisticated institutions or technology to administer them, while others require very little extra administrative effort.

Based on the above considerations, we use the following five criteria to evaluate the performance of utility subsidy mechanisms:

- The extent to which the poor are being reached (i.e., coverage)
- The share of the subsidy that goes to the poor (i.e., targeting)
- Predictability of the benefit for the poor
- The extent of pricing distortions and other unintended side-effects due to the subsidy
- Administrative simplicity.

The evaluation of each mechanism is divided into two parts: (i) a brief description of the mechanism and a discussion of its performance at a conceptual level, including some of the problems that are likely to be encountered when applying the mechanism in practice; and (ii) illustration of the main conclusions through the analysis of available empirical data.

Not all criteria are of the same level of importance. A government with a chronic shortage of budgetary resources may assign top priority to reducing the leakage of the subsidy to the non-poor. Another government with a limited institutional capacity may value administrative simplicity more highly. Unfortunately, subsidy mechanisms that perform well according to some of the criteria tend to perform poorly according to others (e.g., high coverage is usually associated with low targeting). Furthermore, not all subsidy mechanisms are applicable or perform equally well across the full range of utility services. The lack of metering of water use, for example, may pose a problem for lifeline tariffs.[11] Therefore, it is not possible to rank subsidy mechanisms independently of time, place, and sector. The aim of the paper is to help decisionmakers choose the subsidies that are most likely to suit the specific circumstances in their countries.

For most decisionmakers, it also matters who has to shoulder the cost of the subsidy. In some countries, there is a separate line item in the budget covering this cost. In other countries, the cost is borne by industrial or other non-household consumers through utility tariffs that are set above costs. Sometimes, however, the budget is unable to honor this obligation, or the industrial customer base collapses, and utilities end up absorbing the cost of the subsidy. Although governments have considerable freedom of choice in selecting the source of financing, not all subsidy mechanisms are equally amenable to being financed from the budget or through higher industrial tariffs. The discussion of each subsidy mechanism below includes a brief assessment of its financial impact on the budget, non-household consumers, and utilities.

Since decisions about subsidy mechanisms are made in the context of a single country, we used a relative definition of poverty for the purpose of the evaluation. In each country, we considered as poor those household survey respondents whose per capita consumption was less than two-thirds of the median per capita consumption of all surveyed households (see Annex 1 for details). The share of the (relative) poor in countries with recent household surveys of acceptable quality are presented in Table 5. As expected, the incidence of relative poverty is higher in countries with a higher level of inequality.

TABLE 5. INCIDENCE OF RELATIVE POVERTY

	Armenia, 1996	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*	*Ukraine, 1996*
Population	28.6%	18.2%	18.7%	27.8%	20.5%	23.43%	30.0%	25.0%
Households	29.8%	19.7%	16.7%	23.6%	18.8%	22.6%	30.4%	26.5%

Source: Bank staff calculations using data from household surveys.

[11]There is a solution to this problem in district heating and gas (assuming it is used for space heating)—the heat/gas bill can be calculated using the amount of heated apartment space as a proxy for heat/gas consumption.

TABLE 6. SHARE OF UTILITY EXPENDITURE IN TOTAL HOUSEHOLD EXPENDITURE

	Armenia, 1996	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*[a]	*Ukraine, 1996*
Non-poor	11.4%	7.9%	15.4%	7.9%	25.3%	12.8%	7.7%	4.0%
Poor	10.2%	9.0%	12.1%	10.6%	44.8%	12.5%	29.1%	3.5%
All households	11.0%	7.9%	15.3%	9.4%	26.3%	12.7%	12.3%	3.9%

[a]Rent is included in utility expenditure.
Source: Bank staff calculations using data from household surveys.

Table 6 above presents the average share of utility expenditures within total household expenditures in these countries.[12] The large differences that can be observed between countries seem to be more reflective of differences in the level of cost recovery than in the level of income. Heating, for example, was heavily subsidized in Ukraine in 1996. In addition, non-payment was widespread in Moldova, Russia, and Ukraine when the household surveys were undertaken. The differences between poor and non-poor in the burden utility expenditures placed on household budgets were insignificant in Armenia, Croatia, Hungary, Moldova, and Ukraine. In Russia and Latvia, however, utility expenditures represented a significantly larger share of total household expenditures for poor than non-poor households.

We encountered considerable difficulties during the evaluation of the subsidy mechanisms. First, we found that two (or more) types of subsidies co-exist in the same sector in many countries. In Ukraine, for example, most non-paying households don't get disconnected from the electricity network, the residential electricity tariff is kept below costs, a large number of households receive electricity price discounts of 50 to 100%, and a housing allowance system covers part of the utility bill if it exceeds 15% (more recently, 20%) of household income. In order to keep matters simple, the analysis in the paper is based on relatively "clear-cut" cases, and provides no guidance on the interaction between two or three subsidy mechanisms. Second, we found that several of the household survey data sets were of poor quality (at least from the point of view of this exercise), particularly the ones from the former Soviet Union, and had to be dropped from the study. Data problems included (i) poorly formulated questions; [13] (ii) missing or implausible answers; (iii) data imputed using a doubtful methodology; and (iv) the poor timing of surveys.[14] After eliminating these data sets, we were left with a smaller number of surveys than ideally required to test the robustness of some of the findings. Third, the surveys (understandably) did not provide all the information needed to evaluate the subsidy mechanisms. The necessary additional information (e.g., on eligibility criteria, budgetary outlays, administration costs, etc.) was obtained directly from those government ministries that provided/monitored the subsidies.

The analysis of subsidy mechanisms below leaves open some important issues. As noted above, it does not cover the interaction between various utility subsidy mechanisms (e.g., the combined effect of a life-line tariff and a burden limit), and between utility subsidies and other sector-specific subsidy schemes (e.g., housing and food subsidies). Furthermore, it does not provide practical guidance on how to make the selected subsidy mechanisms perform better, and how to adopt these to changes in utility ownership and regulation. These issues represent an agenda for further research.

[12]The numbers in Table 6 differ slightly from the numbers in Table 4, since the definition of the poor in Table 4 was based on the absolute poverty line.

[13]An example is the question "how much is your monthly payment for utilities?" in a country where district heating is heavily seasonal, delinquent households don't get disconnected, and there is also a housing allowance scheme. Without additional information, it is difficult to tell whether the response is based on (i) the actual payment or the utility bill that in fact did not get paid; (ii) the payment/bill in the survey month or the monthly average during the year; and (iii) the full payment, including the payment from the housing allowance scheme, or the net payment after deducting a part of the bill paid by the housing office.

[14]An example is a survey carried out in Bulgaria over a course of several months that included a period of hyperinflation followed by monetary stabilization.

No Disconnection

In several countries in the region, utilities are pressured by governments not to disconnect households that don't pay their bills. The pressure comes from local as well as central governments, sometimes in the form of executive orders motivated by social and political considerations. A couple of Parliaments in the former Soviet Union even passed a law forbidding the disconnection of those who did not receive their salary or pension on time. Countries in Central Europe have never really caught this habit and the Baltic states have managed to get out of it, but non-payment by residential (and most other) consumers has remained widespread in the Balkans and throughout the rest of the former Soviet Union.[15] Payment discipline has greatly improved in the few cases when utilities were sold to foreign strategic investors (particularly in the electricity sector), but the transfer of ownership to management, workers, and local investors has produced limited results.

The *coverage* of the poor achieved by the policy of no disconnection is significantly less than 100%. First, as presented in Table 7 below, many poor households are simply not connected to district heating, gas, hot water, and sewerage. Second, some poor households may decide to pay their utility bills since they value the risk of disconnection higher. In a household survey carried out in Russia in 1996, 39% of poor families reported that they had unpaid utility bills (see Table A3-1).

The *targeting* of the poor through this mechanism depends on (i) the share of the poor among those who have payment arrears; and (ii) the relative size of the average payment arrears of poor and non-poor households (assuming that the subsidy received by each household is equal to the household's payment arrears). One could expect low income households to be over-represented among households with payment arrears due to (i) the pro-poor bias in official announcements about tolerating non-payments; and (ii) the higher subjective value that non-poor households assign to uninterrupted utility service. On the other hand, it is likely that the average size of the payment arrears is larger in the case of delinquent non-poor house-

TABLE 7. PERCENTAGE OF HOUSEHOLDS CONNECTED TO UTILITIES

Utilities	*Poverty Groups*	*Armenia, 1996*[a]	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*	*Ukraine, 1996*
Electricity	Non-poor	99.0%	99.8%	na	98.8%	99.9%	99.8%	na	99.9%
	Poor	98.2%	99.0%	na	99.2%	98.7%	97.7%	na	99.5%
District Heating	Non-poor	9.0%	33.4%	26.6%	30.0%	69.9%	35.9%	72.7%	31.2%
	Poor	10.4%	7.8%	14.8%	12.5%	49.0%	23.1%	62.5%	36.9%
Network Gas	Non-poor	1.9%	27.1%	82.0%	21.8%	52.9%	30.0%	63.1%	na
	Poor	1.4%	11.0%	56.4%	8.6%	38.4%	21.4%	60.9%	na
Water	Non-poor	88.4%	96.6%	93.4%	76.2%	83.9%	35.0%	79.2%	57.8%
	Poor	87.4%	74.5%	73.4%	68.7%	70.2%	20.0%	68.2%	69.5%
Hot Water	Non-poor	1.2%	42,6%	na	0.7%	59.0%	32.9%	61.4%	24.3%
	Poor	1.0%	20.3%	na	0.1%	39.3%	19.3%	45.3%	24.8%
Sewerage	Non-poor	na	79.6%	92.8%	na	82.1%	35.0%	69.9%	34.1%
	Poor	na	51.2%	71.0%	na	66.4%	20.0%	57.4%	39.8%

[a]Households with connections to non-functioning utility services are not considered connected.
Source: Bank staff calculations using data from household surveys.

[15]That a delinquent customer continues to receive supply for social reasons is not unheard-of in the West. Northern American utilities, for example, frequently postpone the disconnection of poor households in order to avoid creating life-threatening situations in the winter. Unless customers start repaying their arrears in the spring, however, they do get cut off. Uncollected revenues represent less than 1% of billed revenues for most Northern American utilities. In the former Soviet Union, this ratio tends to be 20-30 times higher.

holds, since their monthly utility bills tend to be larger. According to the 1996 Russian survey, 40% of total reported utility arrears were owed by poor households (see Table A3-2), which represented 30% of all households (see Table 5). This indicates that the policy of no disconnection applied in Russia in 1996 achieved a slightly better targeting of the poor than did random selection. Not surprisingly, the leakage of the subsidy was relatively high even to the highest income group.

Since delinquent households *cannot predict* with high certainty that they will not be disconnected (utilities/governments never announce that there is no need for anybody to pay the bills, and even when it is understood that those who cannot afford to pay will not be disconnected, the definition of "cannot afford to pay" is seldom formalized), the service is not completely free from their point of view. The cost of the service is equal to the lower of the following two variables: (i) the price of the service; or (ii) the subjective probability of disconnection multiplied by the cost of inconvenience of not getting service until payment is made and service is restored. Households that consider this cost higher than the payment to the utility—either because they assign a high probability to disconnection or place a high value on uninterrupted service—continue paying their bills, while other households accumulate arrears.[16] Some households adopt a strategy of occasional payments, since they believe that partial payments significantly reduce the probability of disconnection. Others bribe the meter reader/payment collector for the same purpose (demonstrating that low predictability tends to facilitate corruption).[17]

There are also significant *pricing distortions* associated with this scheme, since the effective price of the utility service is below the cost for many consumers even if the notional price is set properly, resulting in inefficient consumption. From the point of view of *administrative simplicity*, the policy of no disconnection gets one of the top scores among subsidy mechanisms (although the administration of this policy is not without challenges when "eligibility" is formally restricted to households that did not receive their wages and pensions on time).

While, in theory, the cost of unpaid utility bills can be covered from the budget, no government in the region has ever planned budgetary outlays for this purpose. Therefore, in practice, the *fiscal impact* of this scheme is modest, at least in the short run. Exceptions are countries where some of the utilities or their upstream suppliers are among the most important taxpayers (Gazprom in Russia is a good example). In these cases, the opportunity cost of lost fiscal revenues can be quite high. Since regulatory systems seldom allow the recovery of uncollected household bills from *other consumers*, the impact of the policy of no disconnection on the f*inancial position of the utilities* tends to be extremely detrimental. It typically leads to the decapitalization of the companies, and reduces the reliability of service to all consumers.[18] Sooner or later, the budget will also pay a high price, either through supporting the rehabilitation of the run-down utilities and assuming responsibility for their accumulated debt, or receiving reduced proceeds from privatization.

Across-the-board Price Subsidy

Keeping utility prices below costs for all residential consumers is another widely used subsidy mechanism. At the beginning of the 1990s, it was commonly believed in all transition countries that real wages would start growing in the near future. Therefore, many governments decided to postpone the realignment of utility prices and costs, hoping to minimize associated social costs (and political repercussions). By now most countries in Central Europe have abandoned across-the-board price subsidies, but this mechanism is still popular with governments in the former Soviet Union (although the difference between residential tariffs and costs has been reduced compared with the early 1990s).

The *coverage* ratio of this subsidy mechanism is equal to the share of connected households among the poor. As

[16]There are exceptions to this rule—some households may decide to pay utility bills out of moral conviction, i.e., because they believe that this is "the right thing to do." Widespread non-payment, however, tends to weaken this conviction.

[17]One can look at the bribes paid to meter readers/payment collectors as additional leakage of the subsidy to middle and higher income classes. The subjective costs associated with the remaining risks of disconnection, however, represent a welfare loss to the society as a whole.

[18]Utility service disruptions (e.g., electricity black-outs, turn-off of district heating, inadequate pressure in gas and water pipes, etc.) affect lower income households disproportionately in the former Soviet Union. When power and district heating plants run out of fuel and/or become unreliable due to the shortage of working capital and lack of maintenance, governments try to protect the services provided to high priority users such as government offices, security establishments, health care providers, etc. These are typically located in the capital and other large cities, where the incidence of poverty tends to be lower. People in large cities are also more vocal politically, and governments respond to this by spreading disruptions unevenly across the country.

presented in Table 7, this share tends to be very high in the case of electricity, somewhat lower for (cold) water, and significantly lower for gas, sewerage, hot water, and district heat. Interestingly, the opposite tends to be true for the size of the price subsidy—district heating, hot water, and sewerage are typically the most subsidized utilities (when the subsidy per unit of consumption is expressed as a percentage of unit costs), followed by water, gas, and electricity. This suggests that most governments in the region maintain across-the-board utility price subsidies for political rather than social reasons.

The *targeting* ratio of across-the-board price subsidies is influenced by two factors: (i) the share of the poor among those households that are connected (see Table 8 below for selected countries); and (ii) the relative consumption levels of poor and non-poor households. Since poor households tend to be under-represented among those who are connected, the first factor suggests a low targeting efficiency. The second factor also favors the non-poor, since the income elasticity of the consumption of utility services is positive (although this could partially be compensated by household size in countries where poor households tend to be larger, such as in Hungary, Latvia, and Moldova).[19] Comparing Table 8 with Table 5, one indeed finds that the targeting achieved through across-the-board price subsidies, even without the impact of the second factor, is worse in most countries than the targeting that random selection would produce.[20]

To illustrate this, let's consider the price subsidy provided to residential consumers of gas in Ukraine in 1996. The budget spent about $500 million on the gas price subsidy in that year and about 21% of this went to the poor,[21] which is below the targeting ratio (26.5%) that would have been achieved by a random selection mechanism. The targeting of the $220 million that the Ukrainian government spent on the district heating subsidy in the same year was slightly better—about 28% of this went to the poor—due to the higher share of the poor among the households connected to district heating, and also to the relatively small difference in the average size of the apartments between connected poor and non-poor households (47.5 m^2 versus 51.3 m^2 – see Table A3-4).

The *predictability of the benefit* received through across-the-board utility price subsidies is fairly high for the poor. However, these subsidies create a *distorted price regime,* resulting in wasteful consumption practices among households.[22] Across-the-board price subsidies are as *simple to administer* as the policy of no disconnection. In

TABLE 8. SHARE OF POOR AMONG HOUSEHOLDS THAT ARE CONNECTED TO UTILITIES

	Armenia, 1996[a]	*Croatia, 1998*	*Hungary, 1997*	*Kyrgyz, 1999*	*Latvia, 1997*	*Moldova, 1998*	*Russia, 1996*	*Ukraine, 1996*
Electricity	29.7%	18.7%	na	23.7%	18.6%	22.3%	na	26.4%
District Heating	33.1%	5.2%	10.1%	11.5%	13.9%	15.9%	27.3%	29.9%
Network Gas	23.5%	8.7%	9.3%	11.0%	14.4%	17.3%	29.7%	24.6%
Water	29.6%	15.3%	13.6%	28.1%	16.2%	14.3%	27.4%	30.3%
Hot Water	24.6%	10.0%	na	na	13.3%	14.6%	24.4%	26.9%
Sewerage	na	13.1%	13.3%	na	15.8%	14.3%	26.4%	29.6%

[a] Households with connections to non-functioning utility services are not considered connected.
Source: Bank staff calculations using data from household surveys.

[19] With the exception of electricity (plus water and gas in Central European countries), utility services tend not to be metered in the region. Most countries, however, use the size of the apartment (for district heat and gas when used for heating) and the number of people in the household (for water and sewerage) as proxies for actual consumption when calculating utility bills (the per capita water consumption "norms" are sometimes adjusted to reflect the amenities apartments have).

[20] There are exceptions to this tendency. For example, the share of district heating connections was higher for poor than non-poor households in Armenia in 1996. The same was true for district heat, water, and sewerage in Ukraine. These exceptions in Armenia and Ukraine are caused by the high incidence of urban poverty in these countries (district heating and sewerage are more widespread in urban than in rural areas).

[21] About half of the $500 million went to the approximately 2 million households that relied on gas to heat their homes, while the other

order to maintain the financial viability of the service providers, a modest administrative effort is needed to calculate and channel to the utilities the annual contribution from the budget (or to set the price for industrial consumers that will compensate for the losses made on the low residential tariff; see below). Of course there are considerable risks—cost and demand projections may prove to be inaccurate and the budget may run out of money—but these are risks that are present in most regulatory environments and budgeting processes.

Across-the-board subsidies can place a heavy *burden on the budget*. Therefore, many governments in the region decided to leave the budget out of the equation, and raised prices for *other (industrial) consumers* to compensate the utilities for the losses on the services provided below cost to households. This of course makes an already distorted price regime even more distorted, leading to wasteful attempts to economize on the utility bill among industrial consumers who have the ability to turn to alternative supply sources. An example for the latter is the increased reliance among industrial companies on heat produced in their own heat-only boilers even though the true economic cost of co-generated heat produced by power plants and distributed by the district heating system might be lower. Those industrial consumers who have no meaningful supply alternative see their costs go up even more, negatively affecting their competitiveness. Either way, what originally was designed as a revenue-neutral subsidy mechanism can become quite detrimental to the *financial position of the utility,* since the volume of sales to over-charged industrial consumers drops and to under-charged residential consumers increases. A number of district heating companies were driven to insolvency this way in the former Soviet Union by the time their governments decided to eliminate the difference between residential and industrial heat prices.[23]

In the case of electricity and water, alternative supplies are more expensive or their access is forbidden (e.g., lack of third party access in electricity supply or restrictions on the use of underground aquifers), so cross-subsidies tend to live longer. An example is the water tariff in Russia, with prices for industrial enterprises and other non-residential consumers several times above residential rates. The total value of the cross-subsidy provided this way to households was about $1.1 billion in 1997. In addition, households received a $275 million across-the-board price subsidy from the water utilities that suffered financial losses since their total revenues fell short of their total expenses.[24] About 74% of these subsidies, however, went to middle and higher income consumers, thereby slightly increasing rather than reducing social inequality (the poor represented 30% of the population in Russia).[25] Another example is the electricity tariff in Croatia, with a residential rate that was 36-41% below the rates for industrial/commercial consumers who were connected at low voltages in 1998. The total value of the cross-subsidy

half of the subsidy went to the approximately 8 million households that used gas for cooking and water heating (since space heating on average requires about four times more gas than cooking/hot water for a year as a whole). Only 23% of households that use gas for space heating were poor; furthermore, the average size of the apartments of these households was 22% smaller than the apartments of the non-poor (see Tables A3-3 and A3-4). As a result, only about 19% of the first $250 million went to the poor. Assuming that the share of the poor among those households that cook (and some also make hot water) with network gas was the same as among the rest of the households in 1996, and that the consumption of gas for cooking and water heating is proportional to the number of people in a household (the consumption of these low volume users is typically not metered), 22% of the second $250 million subsidy went to poor households (since poor households on average were 7% smaller than non-poor households —see Table A3-4). These two ratios combined produce an estimated targeting ratio of 20.5%.

[22]As pointed out earlier, a moderate household price subsidy for water and sewerage may actually reduce a distortion by compensating for the public health benefits associated with these services. It is important to note, however, that only external health benefits count in this respect (i.e., public health benefits on top of those that accrue to the family members receiving the service), so the subsidy would have to be modest.

[23]A truly cost-reflective utility tariff requires more than making the prices for these two consumer classes equal. Due to economy of scale effects and the relative stability of industrial demand within a day and within a year, the cost of providing electricity, gas, heat, and water to industrial consumers is significantly below the cost of supply to households.

[24]Table A3-5 includes data on water consumption and tariffs in the Russian Federation in 1997. The estimated value of the cross-subsidy from non-residential consumers and the shortfall in water utility revenues was derived from that table.

[25]The 74% figure is based on the number of poor and non-poor connected to the water supply system in 1996, weighted by the estimated water consumption per capita of poor and non-poor households, taking into account residential consumption norms for different house/apartment characteristics (see Table A3-6).

provided this way to Croatian households was about $126 million in 1998. However, only 9.6% of this total amount went to the (relative) poor, who represented 19.7% of all households in Croatia in that year.[26]

Life-line Tariff

Restricting the price subsidy to the initial block of consumption (called the basic need level) offers a less costly alternative to across-the-board price subsidies while preserving the politically attractive universal protection feature of the latter. Not surprisingly, many governments in the region introduced life-line tariffs for utility services with metered or relatively easily estimated consumption, i.e., for electricity, gas, and (in some cases) district heat. As the metering of water supply becomes more widespread, a number of countries will have the option of adopting life-line water tariffs.

As is the case with the across-the-board price subsidy, the coverage ratio of this mechanism is equal to the share of connected households among the poor. As can be seen in Table 7, a life-line tariff for electricity or water tends to produce high coverage, while a life-line tariff for gas or district heat tends to "score" relatively low in this respect in Central and Eastern Europe and the former Soviet Union.[27]

The *targeting ratio* of the life-line tariff depends on (i) the share of the poor among households that are connected (see Table 8); and (ii) the relative size of the average subsidy for poor and non-poor households.[28] The latter depends on the size of the initial, subsidized consumption block compared with the consumption levels of poor and non-poor households. Since consumption grows with income, the targeting ratio improves as the size of the initial block decreases, and the best targeting ratio that can be achieved with a two-block tariff is equal to the share of the poor among those who are connected. This ratio is achieved when the share of poor and non-poor households consuming less than this initial block becomes the same.[29] But even in this case, the targeting achieved through a simple life-line tariff tends to be worse than the targeting that a random selection mechanism would produce (since the poor tend to be under-represented among those with utility connections).

Targeting can be improved, however, with the application of a three-block tariff structure, assuming the price for the third block is set above the cost, so it includes a negative subsidy.[30] Hungary, for example, operated such an electricity tariff structure in 1997, with a first block of 0-50 kWh/month/household, a second block of 50-300 kWh/month/household, and a third block of 300 kWh/month/household and more.[31] The price of electricity within the first block was 17% below the price of the second block, while the price of electricity within the third block was 16% above the price of the second block. With this arrangement, poor households received 19.9% of the subsidy distributed (after netting out the impact of the negative subsidy; see Table A3-8), producing a targeting ratio that is slightly better than random selection (16.7%). Without the third block "penalty," a two-block tariff would have produced a targeting ratio of 16.1% (see Table A3-9), while spending 35% more in the process (with most of the extra spending going to the non-poor). For the sake of the analysis, we restricted the size of the second block to 50-150 kWh/month/household. The targeting ratio in this hypothetical case jumped to 196%, since the poor received almost two times more benefit

[26]The 9.6% targeting ratio reflects the large (about 100%) difference between the average monthly electricity consumption of poor and non-poor households in Croatia in 1998, based on information obtained from a household survey (see Table A3-7).

[27]As noted earlier, there are exceptions to these general tendencies. A subsidy through a life-line water tariff would reach only 20% of poor households in Moldova, while a subsidy through a life-line district heat tariff would reach 62% of poor households in Russia.

[28]The subsidy (S) that a household consuming more than the initial block (C>B1) receives is equal to the size of the initial block (B1) multiplied by the difference between the price of the first and the price of the second block (P2-P1), assuming that P2 is equal to the cost of the service. If the household consumes less than the initial block (C<B1), its subsidy is equal to C*(P2-P1).

[29]Unfortunately, reducing the size of the initial consumption block also reduces the amount of money transferred to the poor, but this can be compensated for by increasing the size of the price discount.

[30]With P3>P2, the subsidy (S) that a household consuming more than the second block (C>B2) receives is equal to B1*(P2-P1) – (C-B2)*(P3-P2). Please note that S becomes negative at high consumption levels. This tariff structure may not improve targeting in countries where poverty status is strongly correlated with household size.

[31]It is not clear whether the price for the third block was truly above the cost of supply in Hungary in 1997. We simply assumed that the cost was equal to the price of the middle block. Even if the cost was somewhat above this price, a modest parallel increase in the price of each block would not have altered consumption patterns significantly, so our main finding about the (hypothetical) improvement in targeting that a three-block tariff can produce is not sensitive to the accuracy of this assumption.

than the amount of (net) subsidy transferred to the whole class of residential consumers, due to negative subsidy going to the non-poor (see Table A3-10). However, the average size of the subsidy received by the poor was halved because many poor households used more than 150 kWh/month electricity. As an additional side-effect, the coverage of the subsidy mechanism dropped from 95% to 81%, since some poor households consumed so much electricity that their "penalty" in the third block was higher than their subsidy in the first block. By increasing the size of the price discount and the "penalty" at the same time, the size of the average subsidy can be increased while preserving the favorable targeting ratio. This adjustment, however, will not improve coverage, suggesting that there is a trade-off between coverage and targeting in this case.

If the size of the first block is not fixed but set higher (on average) for the poor than the non-poor, a two-block tariff can also produce a better targeting ratio than the share of the poor among those who are connected. In Moldova, households connected to district heating paid a heavily subsidized price for heating the first 12 m^2/capita of their apartments in the winter of 1998/99. Since poor households tend to have a larger family size than the non-poor in Moldova, the average amount of the district heating subsidy provided to them was slightly higher than the subsidy provided to non-poor households, resulting in a targeting ratio of 16.0%, just above the 15.9% share of the poor among those who were connected to district heating (see Table A3-11).

The same approach can also be applied to electricity and gas tariffs (and also to water tariffs after metering is introduced) in countries where poor households tend to have a larger family size.[32] Defining the first, subsidized block as 20 kWh/capita/month of electricity consumption in Hungary, we recalculated the subsidies provided to the households surveyed in 1997. The result was a targeting ratio of 17.7%, higher than the 16.1% ratio produced by a two-block tariff with the first block fixed at 50 kWh/month (see Table A3-12). While this "floating" life-line tariff does not produce improvements in targeting as dramatic as the three-block tariff, it (partly) compensates for this by preserving the coverage achieved by the "fixed" life-line tariff.

The benefit received through a two-block life-line tariff is *highly predictable*. The predictability of the benefit decreases somewhat with the introduction of the third ("penalized") block, since actual electricity consumption fluctuates and even low income families may get "penalized" occasionally. Even when the price discount is relatively high, the *price distortion* caused by a two-block life-line tariff can be fairly low if the first block is kept sufficiently small so most consumers (including the poor) consume more than the first block (ensuring that the last unit of consumption is priced correctly).[33] In the case of a three-block tariff, however, the "penalty" (assuming it kicks in early enough to improve targeting, i.e., most non-poor households should consume beyond the second block) distorts the marginal price signal, and may force many households to adopt saving measures that are overly costly. So the impressive targeting performance of this tariff comes with a price tag—reduced coverage (see above) and increased price distortion.

In terms of the *administrative burden*, a two-block tariff is only slightly more demanding than the across-the-board price subsidy. However, it requires reliable (tamper-proof) metering or a reasonable proxy (such as apartment size for heating) to estimate consumption, therefore it is not suitable for water and sewerage in countries where residential water use is not metered. Furthermore, it requires disciplined meter readers/controllers who are not tempted easily by households wanting to keep their recorded consumption below the limit for the first block. The same requirements apply to the three-block tariff. The administration of a life-line tariff with "floating" blocks is significantly more demanding, since it requires the matching of (metered/estimated) consumption volume and family size (or other factors correlated with poverty status) in order to calculate the utility bill. Nonetheless, this is unlikely to impose a major burden on utilities in the region.

Depending on the size and the source of the price subsidy, life-line tariffs can place a significant burden on the budget, on the finances of the utility, or on other (industrial) consumers (if the cost is recovered through a higher industrial tariff). This financing burden can be greatly reduced and partly (or wholly) shifted to (mostly) non-poor households when a third block is introduced with a "penal-

[32]More generally, the size of the initial, subsidized block can be tied to any indicator that is well-correlated with poverty. For example, the initial block can be set at 30 kWh/household/month, plus 20 kWh/month for each pensioner (or child) in a country where the incidence of poverty is high among pensioners (or among families with many children).

[33]This assumes that consumers respond to the marginal (as opposed to the average) price signal. The evidence in this respect is mixed, particularly if price differences between blocks are small. With a large (e.g., 100%) price jump between the first and second blocks and an effort to increase consumer awareness, it is likely that most households will recognize that they face the higher tariff for every additional kWh.

ty." In the above example in Hungary, the cost of the life-line tariff dropped to less than 1/10 of its original value when the "penalty" kicked in at 150kWh/month, with the great majority of savings coming from the non-poor.[34]

Price Discount for Privileged Consumers

The former Soviet Union operated a system of merit-based utility price discounts. The purpose of these privileges was not to reduce poverty, but to reward service in certain occupations (police, firemen, judges, etc.), and to compensate for injuries or human suffering as a result of birth defects, hard labor, war, or man-made catastrophes (e.g., Chernobyl). Many of these privileges—price discounts of 25 to 100%—were established in legislative acts, while others were promulgated by government decree. Afraid of popular discontent, few governments/parliaments in the newly independent republics dared to overhaul this system (the Baltic states are the most notable exception), despite complaints from utilities that they lacked the resources to sustain these unfunded mandates. A few parliaments even increased the number of privileged citizens, adding the victims of political persecution and low income pensioners to the list. As a result, some level of privilege is enjoyed by one-third or more of the population in several countries in the former Soviet Union.

Since the primary goal of the system of privileges is not poverty alleviation, it is not surprising that the system fails to reach many of the poor (although some of the late additions to the privileged list were intended to help the lower income groups). In Moldova, for example, 314,329 people benefited from electricity price privileges in 1997, and about 35% of these were poor (see Annex 2). Moldova's total population was about 4 million in that year, and 23.4% of the population was below the (relative) poverty line. On this basis, the *coverage of the poor* achieved by the system of privileges was only 13%. The situation was not much better in Ukraine. Out of 5.4 million privileged electricity consumers in 1999, we estimated that only about 1.3 million were poor, representing about 28% of all poor households (Ukraine had 16.3 million households on January 1, 1999).[35]

The *targeting of the poor* by the system of privileges depends on (i) the size of the price discount provided to the various privileged groups; (ii) their utility connection ratios; (iii) the volume of electricity/gas/heat/water consumption (or the limit placed on their privileged consumption) of those privileged households that are connected; and (iv) the incidence of poverty within each privileged group. In Moldova, we estimated that 33% of the subsidy provided by the system of electricity privileges went to the poor in 1997 (see Annex 2), indicating a targeting ratio that is better than the ratio that random selection would produce (23.4%). In Ukraine, we estimated that 23% of the subsidy provided to privileged electricity consumers went to poor households in 1999 (see Annex 2), which was below the ratio of random selection (26.5%). The better targeting ratio in Moldova was due to the inclusion of low income pensioners in the privileged list. This shows that replacing some of the occupation-based privileges (which tend to support the middle class) with privileges based on income or household characteristics that favor the poor is a natural way to improve the targeting performance of this subsidy mechanism.

The system of privileges provides *highly predictable* benefits. Similarly to the across-the-board price subsidy, privileges can be highly *distortionary*. An extreme case is the 100% electricity price discount provided to certain veterans in Ukraine, resulting in highly wasteful consumption patterns. A cap placed on the volume of privileged consumption can, however, minimize the impact of price distortion, particularly if the cap is set below the typical consumption level.

The *administration* of the system of privileges includes (i) the issuance of certificates recording the privileged status of certain consumers; (ii) noting the privileged status and the corresponding price discount on each consumer's record kept by the utility; and (iii) taking the discount into account when calculating the monthly bill for these consumers. This is clearly more demanding than administering the no-disconnection, across-the-board price subsidy or life-line tariff mechanisms. The administration of this mechanism becomes even more complicated when a cap is placed on the amount of "privileged" consumption and the privilege is tied to the individual rather than the entire household. This suggests that there is a trade-off between administrative simplicity on the one hand, and reduced distortions on the other hand.

[34]In practice, keeping the size of the first (and the second) block small may be quite challenging politically. Also, the cross-subsidy element may disappear if price adjustments don't keep up with changes in supply costs, resulting in two subsidized blocks rather than one (Armenia had such an electricity tariff in 1997). There is a body of evidence from across the world demonstrating that block tariffs tend to be captured by the middle class.

[35]There was an important difference between Moldova and Ukraine with respect to the operation of the system of electricity privileges. While in Ukraine the whole household was entitled to the price discount if one family member was privileged, in Moldova only the privileged person received the discount. This was achieved by placing a cap of 60 kWh/month on the discounted volume of electricity consumption for each privileged person.

Depending on the number of privileged consumers and the size of the price discount, privileges can place a significant burden on the budget (as in Moldova), on the *finances of the utility* (as in Ukraine), or *on industrial consumers* (if the cost is recovered through a higher industrial tariff). A cap placed on the volume of privileged consumption reduces the financial burden, and also makes the financial cost of the subsidy more predictable.

Burden Limit

Starting in 1995, a number of former Soviet states introduced subsidies to limit the burden placed by utility expenditures on household budgets. Typically, governments established networks of offices to administer these subsidies. Housing allowance offices receive their funding from the budget, and make payments to utilities on behalf of households whose combined utility expenditures exceed a certain share of their income. This share—the burden limit—typically varies from 15 to 30%, and its calculation may also include fuel costs (in rural areas) or rental payments on apartments (in cities).

In Ukraine, for example, the housing allowance system covers rent plus all utility services, and also the fuels purchased on an individual basis when a house is not connected to gas or district heating. The burden limit was set at 15% of total family income in February 1995 (when the system was introduced), and it was increased to 20% in July 1998. Actual utility bills are used to determine expenditures for the calculation of the subsidy. [36] Income also has to be proven by presenting official documents from the employer, social security office, tax authority, etc. People without work should be registered with the unemployment office to be eligible (except mothers of young children and the disabled). Utility payment arrears need to be settled in full, or a payment schedule should be agreed with the supplier. According to the Ministry of Economy, 1.2 million households received housing allowances in 1995, 5.7 million in 1996, 8.1 million in 1997, and 6.2 million in 1998 (as noted above, Ukraine has about 16 million households). The average allowance disbursed (for a year as a whole) was $10/household in 1995, $25/household in 1996, $64/household in 1997, and $71/household in 1998.

The c*overage of the poor* by this mechanism depends on (i) the recorded income of the poor; (ii) the size of the utility expenditures of the poor in relation to income; (iii) the stipulated burden limit; and (iv) the ability of the poor to meet additional qualification criteria (if any) to receive the benefits. In a household survey in Ukraine in 1996, 58% of the poor who answered the question on housing allowances reported receiving support through this mechanism. It is likely, however, that the share of households that did not receive the allowance was higher among those who did not answer the question. In the same survey, 28% of those who reported receiving housing allowances were poor. Extrapolating this figure to the total number of recipients, it appears that about 1.6 million poor households received housing allowances in 1996, which implies that the housing allowance system reached about 36% of poor households in the country. The true coverage ratio was probably somewhere between 36% and 58%. The relatively high share of the poor missed by the housing allowance system can be explained by (i) the lack of a strict regime of disconnecting non-payers, thereby reducing the willingness of the poor to apply for a housing allowance; (ii) the high number of poor households whose utility expenditures fall below the burden limit; (iii) the difficulty for poor households to meet other eligibility criteria (such as agreeing on a payment schedule with the utility for overdue bills); and (iv) the heavy administrative burden on the poor associated with the application for a housing allowance (there is anecdotal evidence that this burden poses an obstacle for some of the poor families).

The t*argeting of the poor* by the burden limit mechanism depends on (i) the number of poor and non-poor households with utility bills that exceed the burden limit in relation to recorded income; (ii) the relative ability/willingness of these poor and non-poor households to turn to the housing allowance office and prove their eligibility for the allowance; and (iii) the average allowance provided to poor and non-poor households.[37] In the 1996 household survey in Ukraine, only 28% of the households that reported that they received a housing allowance were below the (relative) poverty line. Their average allowance was slightly (2%) lower than the average allowance provided to

[36] If the apartment size is larger than 21m^2/capita plus 10.5m^2 common space for the household as a whole (a very generous limit that few apartments/houses exceed in Ukraine), only a pro-rated share of total rent and utility expenditures is taken into account in the calculation of the allowance.

[37] The allowance (A) provided by the burden limit scheme is equal to E – bY (or zero, whichever is larger), where E is actual utility expenditure, b is the burden limit (expressed as a percentage of income), and Y is income. E is equal to pC, where p is the price of a "unit" of utility service, and C is the amount of utility service consumed. Since C is a function of income, the nature of the relationship between A and Y depends on the parameters in this function. In particular, it cannot be determined a priority whether A increases or decreases with income.

non-poor households, resulting in a targeting ratio of 28% (see Table A3-13), slightly above the targeting ratio of random selection (26.5%).

Using data from the same household survey, we tested the hypothesis that increasing the burden limit improves the targeting of the housing allowance (this is the case if the near-poor spend a smaller share of their income on utilities). First, we re-calculated the housing allowance for each household based on their reported income, their rent plus utility bill, and the 15% burden limit, disregarding any other eligibility criteria. While the number of poor and non-poor recipients almost remained the same, the average size of the allowance became larger for non-poor households, resulting in a targeting ratio of 22% (see Table A3-14). Increasing the burden limit to 25% slightly reduced both the number of recipients and the average allowance (reducing total outlays by 29%), and produced a targeting ratio of 22.5% (see Table A3-15). Increasing the burden limit to 35% and 45% raised the targeting ratio to 23% and 24%, respectively, but decreased the coverage of the poor (29% of the poor who received a subsidy under the 15% limit became ineligible when the burden limit was increased to 45%; see Tables A3-16 and A3-17). The persistently low targeting ratio of the burden limit mechanism (below that of random selection) is caused by a weak correlation between per capita household income and the share of utility expenditures (plus rent) within household income in Ukraine.[38]

This phenomenon is not unique to Ukraine. We carried out the same hypothetical exercise using 1997 household survey data from Latvia, and found that the targeting ratio of the burden limit mechanism was below the targeting ratio of random selection, and the targeting ratio changed very little when the burden limit was increased, as in Ukraine.[39] The correlation between per capita household income and the share of utility expenditures (plus rent) within household income was almost as weak in Latvia as in Ukraine.[40] To test whether this phenomenon is caused by a systemic factor that is particular to the former Soviet Union, such as the gross under-reporting of income by middle and upper classes, we selected a Central European country, Hungary, where household expenditure was better correlated with household income.[41] Surprisingly, the correlation between per capita household income and the share of the utility bill in household income proved to be even weaker in Hungary.[42] These results suggest that burden limits are not a suitable mechanism to target the poor in Central and Eastern Europe and the former Soviet Union.[43]

A solution for the problem of low targeting efficiency is the replacement of actual utility expenditures by normative utility expenditures in the formula that is used to calculate the allowance. These can be set on the basis of per capita norms for apartment space (and associated heating requirements), and water and electricity consumption. Since the norms are independent of income, the allowance that a household receives under this modified burden limit mechanism is inversely related to income.[44] It is crucial, however, to set the norms sufficiently low (below the old "sanitary" norms applied in the former Soviet Union) in order to keep the number of beneficiaries limited and the amount of support affordable for the budget.

[38]The R^2 of a regression of the share of utility expenditures (plus rent) in household income using per capita household income as the independent variable was 5.7% in Ukraine (see Table A3-18). The correlation was particularly weak at lower income levels. The correlation remained weak (R^2=0.5%) when we replaced household income with household expenditure on both sides of the regression (see Table A3-19).

[39]The poor received 13.8% of the total (hypothetical) subsidies when the burden limit was set at 15% (see Table A3-20). This figure reached 16.9% when the burden limit was increased to 45% (see Table A3-21), still below the targeting ratio of random selection (18.8%).

[40]The R^2 of a regression of the share of utility expenditures (plus rent) in household income using per capita household income as the independent variable was 8.6% in Latvia (see Table A3-22). The correlation increased somewhat (R^2=14.4%) when we replaced household income with household expenditure on both sides of the regression (see Table A3-23).

[41]The R^2 of a regression of total household expenditure using household income as the independent variable was 50.1% in Hungary (see Table A3-24), 33.9% in Latvia (see Table A3-25), and 23.8% in Ukraine (see Table A3-26).

[42]The R^2 of a regression of the share of utility expenditures in household income using per capita household income as the independent variable was 0.1% in Hungary (see Table A3-27). The correlation remained weak (R^2=1.3%) when we replaced household income with household expenditure on both sides of the regression (see Table A3-28).

[43]A cursory look at household survey data suggests that this conclusion may apply to some of the other regions of the world as well. A possible explanation is that the income elasticity of household energy consumption tends to be close to unity in the low to middle income range. It is worth noting that in the United States, where many states rely on burden limits, the eligibility of a household for the utility subsidy is frequently determined on the basis of an income test, and the burden limit is used only to set the amount of the subsidy. This two-step procedure greatly reduces the leakage of the subsidy to the non-poor.

[44]The allowance (A) is now equal to pcN – bY (or zero, whichever is larger) where p, b, and Y are the same as before,

The Kyrgyz Republic operates a system of housing allowances based on normative utility expenditures in Bishkek, the capital city. To be eligible for the allowance, a household should live in an apartment building and its normative utility expenditures (electricity excluded) should exceed 23% of its income (the burden limit). Normative utility expenditures depend on the number of people in the household and on the level of utility tariffs. About 2,600 families received $22/family (on average) support under this scheme in 1999, implying a coverage ratio of 11% (there are about 23,000 relatively poor households in Bishkek). Using data from a recent household survey, we hypothetically "extended" the coverage of the scheme to the whole Kyrgyz Republic. As expected, the targeting ratio of the scheme—18.7% (see Table A3-29)—was somewhat above the targeting ratio of random selection if only households that live in apartment buildings are considered (the incidence of poverty is 13.1% among those who live in apartments), but still below the targeting ratio of random selection (23.6%) when all households in the Kyrgyz Republic are taken into account. If expenditures for district heat and gas are based on actual expenses when calculating the housing allowance, the targeting ratio decreases to 17.8% (see Table A3-30). If actual electricity expenditures are also included in the calculation, the targeting ratio further decreases to 16.7% (see Table A3-31), demonstrating that the replacement of expenditure norms with actual utility expenditures decreases the targeting efficiency of housing allowances. As in the case of Ukraine (and Latvia), increasing the burden limit improves the targeting ratio only marginally in the Kyrgyz Republic.[45]

Benefits received through burden limits *can be predicted* with a reasonable certainty, although they are not as highly predictable as those derived from life-line tariffs because of the demanding administrative requirements associated with the application. Since the price of an additional unit of electricity/gas/heat/water is effectively zero for a household that reached the burden limit, this is probably one of the most *distortionary* of all utility subsidy mechanisms on the demand side (of course this distortion is unavoidable when consumption is not metered). The distortionary effect, however, is confined to those households that receive support, while the distortions created by an across-the-board subsidy affect every consumer. Placing a cap on per capita or total household consumption of utility services that counts toward the burden limit, or (even better) using consumption norms to fix the level of utility expenditures for the purpose of subsidy calculation (see above) can significantly reduce the distortionary effect.[46] The use of consumption norms (irrespective of actual consumption) has the additional advantage of somewhat reducing the complexity of an *administratively* very demanding subsidy mechanism, making application for the subsidy more simple for the poor. In Ukraine, the administrative cost of the household allowance scheme was $7.6 million, or about 2% of total outlays in 1998. While this is not a very high ratio, it nevertheless represents a substantial cost. As of January 1, 1999, about 7,000 people were employed in 756 offices to administer housing allowances. In Bishkek, one office administers the housing allowance scheme with annual expenses that were equal to 9.5% of the subsidies distributed in 1999.

Burden limits can be quite *costly for the budget*, particularly if the limit is set low. In Ukraine, the cost of the program was $13.5 million in 1995, $140 million in 1996, $517 million in 1997, and $439 million in 1998 (after the burden limit was increased to 20%). Raising the burden limit from 15% to 25%, 35%, and 45% in our hypothetical calculations for Ukraine decreased budgetary outlays by 29%, 48%, and 62%, respectively (see Tables A3-14, A3-15, A3-16, and A3-17). However, the coverage of the poor dropped from 58% (under the 15% burden limit) to 42% (under the 45% burden limit), indicating a trade-off between coverage and cost (see Table A3-33). Also, the unpredictability of the budgetary outlays during the course of a year may pose a serious difficulty for Ministry of Finance officials working on next year's budget. An unanticipated real income shock can lead to a big gap in the budget for the housing allowance system that will likely translate into non-payment, causing *financial problems for the utilities*.

Other Earmarked Cash Transfers

Covering the part of the utility bill that exceeds a given share of income is only one of the utility subsidy

c is the norm for per capita utility consumption, and N is the number of persons in the household. Since pcN does not change with income, the allowance decreases as household income grows.

[45]The targeting ratio of the fully norm-based housing allowance increased to 21.9% when the burden limit was raised to 45% (see Table A3-32).

[46]Burden limits as well as the other income-tested subsidy mechanisms discussed below may also create disincentives to participate in the formal economy, thereby either reducing the overall supply of labor or pushing people toward the informal sector.

mechanisms that provide cash to selected households earmarked to pay part of their utility bills.[47] The City of Riga in Latvia, for example, provided a payment toward the utility bill at a level that ensured that the income of each family who applied for support, after paying the remaining part of the bill for rent and utilities, reached $38/capita/month in the 1997/98 heating season (households above a limit of 18m^2/capita apartment area were not eligible). Most other Latvian municipalities operated social support mechanisms that were broadly similar to the one in Riga.[48] The total number of households in Latvia that received support for utility expenditures through this decentralized social support system was about 330,000 in 1996 and about 263,000 in 1997 (there are about 1 million households in Latvia). The average annual subsidy was $35/household in 1996 and $37/household in 1997.

In Hungary, the government set up an Energy Fund to compensate (partially) low income families for the January 1, 1997, electricity price increase and subsequent additional price increases. In early 1997, the Energy Fund received about $5 million from the budget and about $2.4 million in the form of semi-voluntary contributions from the mostly privately owned electricity generators and distributors. All recipients of regular social assistance were considered automatically eligible for support from the Fund. Other households could also apply for compensation, subject to approval by the local government or any institution providing regular social support. The number of recipients was about 373,000 in 1997, and the support provided ranged from $8 to $60 per household (the average was about $20/household).[49] The Energy Fund was extended to cover gas during its first year of existence. With the purpose of (partially) compensating for gas price increases for selected households who use gas for space heating, the Fund received $3.5 million from the government and $3.0 million from the gas companies. The eligibility criteria were similar to the criteria used for the electricity price compensation. The number of recipients was about 410,000, and the support ranged from $15 to $38 per household. About 100,000 households received compensation for both the electricity and gas price increases.

In Bulgaria, the government operates a Guaranteed Minimum Income (GMI) program that includes an energy benefit component provided monthly to eligible families during the heating season. To be eligible, households should meet a set of asset and employment criteria, and their income from the preceding month should be lower than the GMI. The GMI is set periodically by the Council of Ministers, and is differentiated based on coefficients applied to various family sizes/types. The amount of the energy benefit is equal to the difference between the income of the family on the one hand, and the GMI plus the energy norm on the other hand, but it cannot exceed the energy norm itself. In 1997/98, the central government budget reimbursed the energy companies for the cost of electricity, heat, and fuel supplied to the eligible families. In 1998/99, the families received their energy benefits in cash. The energy norm was set at 430 kWh/month/family, priced at about $14 at that time. The average energy benefit for the 1998/99 heating season was $57/family, and 575,800 families[50] were supported this way. The program was administered by the municipal social assistance offices, which received the funding for the energy benefit from the Ministry of Finance in a special account earmarked for this purpose.[51]

In the absence of reliable survey data, estimates for the *coverage of the poor* achieved by these earmarked cash transfer schemes are highly uncertain. After comparing the reported income and utility expenditures of Latvian households in the 1997 survey, we found that 57% of poor households in the survey were (hypothetically) eligible to receive a subsidy, based on the criteria applied in Riga City (see Table A3-34). This figure, however, should be decreased by the share of those poor who did not apply/qualify for other reasons. In addition, one needs to take into account that many municipalities operated less generous assistance programs than Riga. Therefore, the true coverage ratio of the scheme was most likely below 50%. In Hungary, we estimated that about 480,000 poor households and 200,000 non-poor households benefited

[47]To simplify the administration and monitoring of the use of the subsidy, the cash is typically sent to the bank account of the utility, which then reduces the receivables from the respective household by an equivalent amount.

[48]In Latvia, the administration of income-tested utility subsidies has been decentralized to 600 local governments since 1995. Local governments decide on the criteria for eligibility and on the amount of subsidies disbursed.

[49]The level of support for each household was determined by a complex formula that took into account the income, size, and energy consumption pattern of households and the total amount of money available in the Fund.

[50]The support was provided to families, not households. There is anecdotal evidence that households with two generations of adults submitted more than one application, so the number of households that received support was below 575,800.

[51]The rest of the GMI program was financed from the municipal budgets, and payments to the beneficiaries were frequently delayed due to the lack of funds. This problem did not affect the energy benefits that were disbursed with good regularity.

from the Energy Fund in 1997.[52] Since there were about 600,000 households in (relative) poverty in Hungary in that year, the Energy Fund covered about 80% of the poor. In Bulgaria, the energy benefit program covered about 12% of the population in the 1998/99 heating season. Even assuming that all recipients were poor, the coverage ratio was probably below 50%.[53]

Relying on data from the 1997 household survey for Latvia, and using the criteria applied by Riga City for the country as a whole, we found that 33% of the total (hypothetical) subsidy was provided to poor households (see Table A3-35), indicating that the targeting ratio was significantly above random selection (18.8%).[54] In the case of Hungary, assuming that the same average support (per recipient) was provided by the Energy Fund to poor and non-poor households, we estimated a targeting ratio of 70%. In Bulgaria, there is evidence that the bulk of the energy benefits probably went to the poor, so the *targeting* ratio might have been as high as in Hungary.

The *predictability* of earmarked cash transfers depends on the eligibility criteria and the formula used to calculate benefits. For example, the amount of assistance provided by the Hungarian Energy Fund was difficult to predict for most recipients in 1997 due to the fact that the final approval of the support was far removed from the beneficiaries, and that a non-transparent and fairly complex formula was used to distribute the available funds.[55] The predictability of support from the City of Riga, however, was about the same as the predictability of support from the burden limit mechanism. In Bulgaria, the formula applied to calculate the energy benefit was transparent and simple, but the eligibility criteria were numerous and complex, so the predictability of support was somewhat lower than in Riga.

The scheme used by the City of Riga made the cost of an additional unit of utility consumption zero for eligible households, creating strong incentives for wasteful consumption.[56] Due to its unpredictability, support from the Hungarian Energy Fund was unlikely to create major *distortions* on the consumer side, implying that there is a trade-off between preserving incentives to save energy on the one hand, and increasing the predictability of earmarked benefits on the other hand.[57] The Bulgarian energy benefit scheme of 1998/99 provided to the beneficiaries cash that they could use for any purpose, so it did not distort energy consumption patterns (in fact, the energy benefits in the 1998/99 heating season were similar to a non-earmarked cash transfer mechanism—see the discussion in the next section). The same cannot be said about the in-kind energy benefits provided in the 1997/98 heating season, since as long as the consumption of an eligible household was within the maximum energy benefit, the effective cost of each additional unit of energy/fuel was zero.[58]

The operation of these earmarked, income-tested subsidy mechanisms can be quite *demanding administratively*. In Latvia, 842 people administered the decentralized social assistance system, including housing and utility allowances and all other social benefits, at an estimated cost of about $1.7 million (less than 7% of total benefits provided) in 1998. In Bulgaria, the administrative cost of the social assistance system, including the handling of energy benefits, was about $1.3 million in 1998 (less than 3%

[52]We assumed that the incidence of poverty was 100% among those households who were regular recipients of social support, and 50% among the rest of the households supported by the Hungarian Energy Fund.

[53]We don't have reliable data on the incidence of (relative) poverty in Bulgaria for this period. Since inequality in Bulgaria was probably not lower than it was in Moldova, we assumed that at least 24% of the population was poor.

[54]Since most municipalities applied more restrictive eligibility criteria than Riga, this is a fairly safe statement to make.

[55]The Hungarian earmarked cash transfer scheme seems to be an exception to the rule that low transparency of the allocation formula and low predictability of the amount of subsidy for individual households tend to generate corruption.

[56]In addition, as do most other income-tested subsidy mechanisms, it might have created incentives to shift the activity of potential recipients to the informal sector or to withdraw from the labor market.

[57]A special kind of earmarking—support to poor households to implement energy saving/weatherization measures—gets around this problem rather elegantly. By reducing the amount of energy needed to achieve the same comfort level, this mechanism can provide sustained relief to the beneficiaries. The disadvantages of this scheme are the high costs for the budget (at least in the short term), and the administrative requirements that are of a magnitude larger than the administrative requirements of any other subsidy mechanism discussed in this paper (which may explain why this kind of earmarking has not yet been applied in Central and Eastern Europe and the former Soviet Union).

[58]Someone with a paternalistic attitude may claim that the certainty that the subsidy will be applied to the utility bill rather than spent on other goods compensates for this negative side-effect. Since the positive externality of utility consumption is zero or very low in most cases, we decided not to "reward" earmarked mechanisms for this feature.

of total benefits provided). The Hungarian Energy Fund was administered separately from the general social assistance system. Electricity and gas suppliers were asked to attach to the bill of each consumer a form to be filled out, certified by the municipality or a specialized social assistance entity, and mailed to the Fund. A small number of core staff evaluated the requests, asked for supplemental information when necessary, calculated the support due to each applicant according to a formula, and transferred the money to the bank account of the utility serving the customer. This low cost method (administration costs were equivalent to about $16,000 in 1997) managed to produce a high targeting ratio because it "piggybacked" on the social assistance systems run at the municipal level.

Most earmarked cash transfer schemes are *financed from local and central government budgets*. In Latvia, for example, local governments spent $11.9 million on utility subsidies in 1995, $11.7 million in 1996, and $9.7 million in 1997. In Bulgaria, the central government spent $33 million on the energy benefit scheme in the 1998/99 heating season. Typically, earmarked cash transfers do not place any *financial burden on the utilities*.[59] Hungary was an exception to this rule, since only part of the funding ($8.5 million) for the 1997 energy subsidies came from the central government, while the rest ($5.4 million) was financed by the utilities themselves. The net burden on the utilities, however, was significantly less than the amount they contributed to the scheme, since some of the poor households would probably have been unable to pay their bills otherwise.[60]

Non-earmarked Cash Transfers

All subsidy mechanisms discussed above assume a sector-specific approach to addressing the social impact of utility price adjustments. But is such an approach justified? Typically, governments tried to mitigate the negative social impact of the price liberalization of other essential items such as food through the general social assistance program. Therefore, it is far from obvious that the impact of utility price increases on the poor should be mitigated through sector-specific public interventions. This section discusses the application of non-earmarked cash transfers to support poor households in the region.

A number of countries in Central and Eastern Europe and the former Soviet Union have introduced general cash benefits targeting poor households. These have two main forms: (i) cash benefits provided only on the basis of the poverty status of households, assessed in different ways; and (ii) cash benefits provided on the basis of categorical eligibility (e.g., targeted child allowances) combined with poverty status.[61] These non-earmarked cash transfer mechanisms give complete freedom to households when deciding how to use the money received. While the size of the subsidies is not linked directly to utility expenditures/prices, this may occur indirectly when the level of support is tied explicitly or implicitly to overall consumer price movements. Nonetheless, from a political economy angle, non-earmarked transfers lack the appeal of introducing price and benefit increases simultaneously.

In terms of *coverage of the poor*, non-earmarked cash transfers is the only mechanism among those reviewed that is not subject to the constraint of the share of poor connected to utility services. Coverage depends on the ability and willingness of the poor to meet the eligibility criteria applied by the general social assistance system. In schemes where the eligibility criterion is poverty only (with no categorical "screen"), the most common method is income-testing, based on self-declared income from a full range of sources (at least in theory). Frequently this is supplemented by an asset test of some form (e.g., if the household owns a car, or if there are able-bodied adults in the household who are not registered unemployed and not raising children or students, the household may be ineligible). The asset test in some countries is done on a more discretionary basis, for example, through home visits of social workers and other staff (e.g., in the former Yugoslav republics). At the end of the spectrum is a combined guideline and discretion approach, as implemented through the *mahalla* scheme in Uzbekistan, which combines central government guidelines for eligibility with a final decision in the hands of *mahalla* committees (groups of local elders). The eligibility criteria may also be based on proxy

[59] In fact, earmarked subsidies may be preferable from the point of view of the utilities due to their positive impact on payment collections. This impact, however, is insignificant in countries where utilities do cut off non-payers. Surveys have indicated that households in these countries place a relatively high priority on paying their utility bills (right after paying for food and rent, and before covering medical and other expenses).

[60] This is particularly clear if one takes into account the larger contribution that the government made to the scheme. Apart from the potential financial benefits, the utilities' willingness to participate was also influenced by their desire to project a positive corporate image.

[61] While there is a range of other assistance programs (e.g., birth and death allowances), the discussion here focuses on the fiscally most significant programs aimed at assisting the poor.

means-testing, for example, in Armenia and on a pilot basis in some oblasts of Russia. Proxy means-testing relies on identifying household characteristics that are known to be associated with poverty, and aggregating these on a weighted basis using a formula. Proxy means-testing can also be supplemented by an asset test.

In practice, the coverage of the poor achieved by these programs seldom gets above 60%, as many poor do not receive general social assistance benefits. In some countries, funding constraints lead to conscious efforts to limit coverage to the poorest of the poor.[62] More frequently, however, it is the shortfall of funding during the fiscal year (compared with the plan) that results in leaving many poor applicants "out in the cold." In other cases, onerous administrative requirements make it difficult for the poor to meet the eligibility criteria. Also, some poor families may decide not to apply as a result of the (perceived or real) social stigma associated with being a welfare program recipient.[63] Lack of information and guidance due to the absence of outreach efforts is another factor reducing coverage.

In spite of the efforts to exclude those who are not poor, the *targeting ratio* achieved by non-earmarked cash transfers seldom approaches 100%. In the former Yugoslav Republic of Macedonia, for example, only 60% of the recipients of social assistance can be considered poor according to survey data. When the support provided is subject to additional categorical eligibility requirements (e.g., having a certain number of children, or the presence of elderly in the family), the positive impact on targeting depends on the correlation of the screening characteristic with poverty status. For example, household size is correlated with poverty in several countries in the region (though there are notable exceptions such as Armenia, Russia, and Ukraine). The same is generally true for the elderly living alone. However, these additional categorical eligibility requirements also exclude some of the poor, pointing again to the trade-off between coverage and targeting.

The *predictability* of non-earmarked cash transfers for the poor depends on (i) the eligibility criteria; (ii) the frequency with which these criteria are changed; (iii) the stability of budgetary revenues funding these cash transfers within each fiscal year; and (iv) the predictability of budgets allocated to these schemes from one year to another. Even when continued receipt of support can be reasonably well predicted for the poorest of the households already receiving benefits, the value of the support in terms of units of electricity, heat, or water may remain highly uncertain in countries with frequent price adjustments, as there is no guarantee that the overall fiscal position and utility price movements will be correlated. Therefore, the support provided by this subsidy mechanism tends to be less predictable than the support provided through price discount mechanisms (across-the-board subsidies, price discounts for privileged consumers, and life-line tariffs), but more predictable than the support provided through no-disconnection.

The ability of households to spend non-earmarked cash support as they wish means that this mechanism is the least *distortionary* of the utility subsidy mechanisms reviewed in this paper.[64] In terms of *administration*, non-earmarked cash transfers impose a similarly heavy burden as other income-tested mechanisms (earmarked cash transfers or burden limits). However, mitigating the social impact of utility price increases through this mechanism creates no additional administrative requirements if there is a social assistance system in place already. This approach also avoids the risk that there will be two poverty lines in a country—one for general social assistance eligibility, and another one for utility allowance eligibility—adding confusion to the administration of already complex programs.

[62]The same problem can occur at a smaller scale when the financing of these non-earmarked cash transfers is decentralized. Districts with a high incidence of poverty tend to have smaller tax bases for funding social assistance. Available evidence suggests that the coverage of the poorest of the poor has remained low under most general social assistance systems in the region.

[63]There is anecdotal evidence that some of the "suddenly poor" are more willing to apply for housing/heating allowances than for general poverty benefits in the former Soviet Union.

[64]Non-earmarked cash transfers are not entirely distortion-free. As noted earlier, income-tested social assistance schemes may produce disincentives to participate in the labor market, and there is anecdotal evidence of this in some Central European countries with more generous social assistance benefits. In many countries in the region (particularly in the former Soviet Union), however, the level of benefits is so low that these create minimal disincentives to work. In addition, some countries (e.g., Estonia) counteract this by excluding non-working family members of working age from benefit calculations. The weak ability of many social assistance systems to measure income from informal sector activities further reduces the scope of this undesirable effect. On the other hand, non-earmarked cash transfers and all other income-tested subsidy schemes may encourage potential recipients to shift their activities to the informal sector, producing a different set of distortions.

As do all subsidy schemes funded from general budgetary revenues, non-earmarked cash transfers have a significant fiscal cost (although typically below the cost of across-the-board price subsidies, due to the low targeting efficiency of the latter). On the other hand, non-earmarked cash transfers present no f*inancial burden for utilities or other (non-household) consumers*.

Summary of Findings

Looking at *coverage*, all subsidy mechanisms reach at least one-third of the poor. Only two mechanisms—across-the-board price subsidies and life-line tariffs—reach more than two-thirds of the poor, but even that is limited to electricity and water supply, since at least one-third of the poor don't have access to gas, district heating, and sewerage in most countries in the region.

Across-the-board price subsidies, two-block life-line tariffs and "actual" burden limit (based on actual utility expenditures) produce *targeting ratios* that are below the ratio that can be achieved through random selection. No disconnection, two-block "floating" life-line tariffs and the "normative" burden limit (based on utility expenditure norms) can produce targeting that is somewhat better than random selection. The three-block life-line tariff and income-tested (earmarked or non-earmarked) cash transfers can produce targeting ratios that are at least two times higher than the ratio produced by random selection.

Across-the-board price subsidies, two-block life-line tariffs, and price discounts for privileged consumers provide highly *predictable* support to the poor. Burden limit, most earmarked and non-earmarked cash transfers, and three-block life-line tariffs (with a "penalized" third block) have medium predictability. No-disconnection and certain non-earmarked cash transfers are mechanisms that produce highly unpredictable subsidies to the poor.

No-disconnection and the burden limit based on actual utility expenditures create large *price distortions* for the households that benefit from these mechanisms (by making the effective price of their last unit of consumption zero). Across-the-board price subsidies, and three-block life-line tariffs are mechanisms that create significant price distortions for all (or almost all) households. Two-block and "floating"-block life-line tariffs and privileged discounts create significant price distortions for the minority of households connected. Non-earmarked cash transfers and the "normative" burden limit create no utility price distortions.

No-disconnection, across-the-board price subsidies, and life-line tariffs (with the exception of life-lines with "floating" blocks) are very simple to *administer*. Price discounts for privileged consumers and "floating" life-line tariffs pose significant administrative challenges since the utilities need to match meter readings with certain household characteristics. The administration of burden limits and other income-tested cash transfers exceeds the administrative capacity of utilities, and requires the establishment of a specialized network of local offices. Furthermore, for income-tested subsidy mechanisms to be effective, the authorities should have a good knowledge of the poverty profile of the country.

Table 9 presents the above findings in a numerical format. The scores assigned to each subsidy mechanism were determined the following way:

- A *coverage ratio* below 33% was given a score of zero, between 33% and 66% was given a score of one, and higher than 66% was given a score of two. A number of subsidy mechanisms were given scores of "one to two," since the share of the poor who are connected (and can be reached) varies greatly by utility.
- A *targeting* ratio below the ratio that can be achieved by random selection was given a score of zero, above that ratio was given a score of one, and above two times that ratio was given a score of two.
- For *predictability,* no-disconnection, the most unpredictable mechanism, was given a score of zero. Mechanisms that provide benefits with high certainty (across-the-board price subsidies, two-block and "floating"-block life-line tariffs, and privileged discounts) were given a score of two. The remaining subsidy mechanisms were given a score of one.
- For *pricing distortion*, the two subsidy mechanisms that do not affect the effective price of the last unit of consumption (non-earmarked cash transfer and the burden limit based on utility expenditure norms) were given a score of zero. Mechanisms that distort the effective price for most households (across-the-board price subsidies and three-block life-line tariffs), or greatly distort this price for the beneficiaries (no-disconnection and the burden limit based on actual utility expenditures) were given a score of two. The remaining subsidy mechanisms were given a score of one.
- For administration cost/difficulty, subsidy mechanisms that can be administered by the utilities with little extra effort (no-disconnection, across-the-board price subsidies, and two-block and three-

TABLE 9. EVALUATION OF SUBSIDY MECHANISMS

Evaluation Criteria	*No Disconnection*	*Across the Board Price Subsidy*	*Life-line with 2 Blocks*	*Life-line with 3 Blocks*	*Life-line with Floating Blocks*	*Price Discount for Privileged Consumers*	*Burden Limit Based on Actual Util. Exp.*	*Burden Limit Based on Util. Exp. Norms*	*Other Ear-marked Cash Transfer*	*Non-ear-marked Cash Transfer*
Coverage	1	1 to 2	1 to 2	1 to 2	1 to 2	1	1	1	1	1
Targeting	1	0	0	2	1	1	0	1	2	2
Predictability	0	2	2	1	2	2	1	1	1	1
Pricing Distortion	-2	-2	-1	-2	-1	-1	-1	0	-1	0
Administration Cost/ Difficulty	0	0	0	0	-1	-1	-2	-2	-2	-2
Aggregate Score[a]	2	2 to 4	3 to 5	5 to 7	4 to 6	4	0	3	4	5

[a]Calculated with double weights to first two criteria.

block life-line tariffs) were given a score of zero. Mechanisms that require extra effort from the utilities ("floating" life-line tariffs and privileged discounts) were given a score of one. Subsidy mechanisms that require the establishment of a network of offices to administer the income tests were given a score of two.

- Scores for the last two criteria were given a negative sign to facilitate the calculation of aggregate scores.

To find the subsidy mechanism that best suits their circumstances, decisionmakers need to (i) obtain information on the share of the poor connected to each type of utility service (this will help to narrow down the coverage scores of across-the-board subsidies and life-line tariffs); (ii) take into account the possibilities that exist for reliable estimation and billing of actual household consumption (this will show whether life-line tariffs can be meaningfully considered); (iii) determine the weights that they assign to each of the five criteria (if metering/approximation of actual consumption is not feasible, zero weight should be assigned to the price distortion criterion); (iv) calculate the aggregate scores for each subsidy mechanism and for each type of utility service; and (v) identify the mechanisms with the highest aggregate scores for each type of utility service.

To illustrate how this can be done, we included in Table 9 aggregate scores calculated with double weights assigned to the first two (typically most important) evaluation criteria. For utilities with high connection ratios among the poor (e.g., electricity and water supply), the three-block and "floating"-block life-line tariffs occupy the first and the second place. For utilities with lower connection ratios among the poor (e.g., district heat, gas, and sewerage), the first place is shared between non-earmarked cash transfers and the three-block life-line tariff. When no reliable estimate exists for actual consumption (or the billing system suffers from major deficiencies), life-line tariffs drop out, the criterion of pricing distortions becomes meaningless, and the top score goes to cash transfers/privileged consumer discounts or across-the-board price subsidies, depending on the connection rate of the poor.[65]

Relying on individual scores in the above table, aggregate scores can easily be re-calculated using any set of weights. Hypothetically, depending on the weights assigned to the evaluation criteria, the subsidy mechanism with the highest aggregate score can be non-earmarked cash transfers, any of the life-line tariffs, or even across-the-board price subsidies and privileged consumer discounts (in the case of non-metered water supply). There is no set of weights, however, that makes no-disconnection,

[65] This finding may explain the particularly slow phase-out of across-the-board water price subsidies in the former Soviet Union. The first best solution is to install water meters, establish a reliable meter reading and billing mechanism, and replace the across-the-board subsidy with a life-line tariff.

earmarked cash transfer, or burden limit the top scoring subsidy mechanism.

In principle, the cost of the subsidies can be covered by the utilities themselves (i.e., through decapitalization), non-household consumers (i.e., by setting the prices they pay above cost), or the budget (i.e., from general taxation). The first option, however, should be used as a short-term buffer only, because it rapidly leads to the depletion of the working capital of the utilities, which in turn reduces the reliability of the services they provide, and the resulting and inevitable curtailments (which tend to have an anti-poor bias) reverse the poverty alleviation impact of the subsidy. The second option may also become unsustainable if demand from industrial consumers is highly elastic with respect to price (e.g., in the district heating sector). In that case, the drop in sales to over-charged industrial consumers creates a need for additional surcharges on industry to recover the cost of the household subsidy, which then prompts a further drop in industrial demand, ultimately leading to a major loss of the customer base that was expected to shoulder the cost of the subsidy. Even when the short-term price elasticity of industrial demand for a specific utility service is relatively low (as in the case of electricity), the welfare cost of distorting the price of an essential input is likely to be larger in the long run than the deadweight loss associated with additional taxes in the context of a well-functioning tax regime.[66] Cross-subsidies also run counter to the worldwide trend to liberalize the supply of electricity and gas to industrial consumers.[67] In summary, financing of the subsidy from the budget seems to be the best option in most utility sectors and countries.

Concerning the financing burden placed on the budget, the higher the targeting efficiency of the subsidy mechanism, the lower this burden is going to be. Specifically, for a given amount of purchasing power to be transferred to the poor, the three-block life-line tariff and the income-tested cash transfer schemes require the least amount of funding. In fact, the three-block life-line tariff can be designed in such a way that the "penalty" at the high consumption level (in the third block) fully covers the subsidy at the low consumption level (in the first block). At the other end of the scale, across-the-board subsidies place such a large burden on the budget that most governments have phased these out by now. While at first sight the mechanism of no-disconnection appears to have no impact on the budget, in reality it tends to be so costly for utilities that the budget not only receives lower revenues from corporate taxes, but over time has to finance maintenance and rehabilitation costs and assume responsibility for the accumulated debt in order to prevent the complete collapse of utility services. A number of governments in the region that were lacking in fiscal resources decided to sell their electricity and gas utilities in order to avoid total system collapse (e.g., in Armenia, Georgia, Kazakhstan, and Moldova). The low proceeds from the privatization of these utilities compared with the proceeds in countries where non-payers are regularly disconnected (e.g., Hungary) represented another manifestation of the negative impact of the no-disconnection policy on the budget.

[66] In addition, budgetary outlays on the subsidy do not necessarily represent a net increase in the expenditure side of the budget, i.e., the need to fund the subsidy may crowd out other, low priority budgetary outlays.

[67] A few developed countries have recently introduced competition in the supply of electricity and gas to both industrial and residential consumers. When this trend reaches Central and Eastern Europe and the former Soviet Union, cross-subsidies between households (e.g., a three-block life-line tariff that channels subsidies from households with high energy consumption to households with low energy consumption) will also become unsustainable.

World Bank Advice and Government Response

In this chapter we briefly review the evolution of (i) Bank advice concerning the need for subsidies to mitigate the impact of utility price increases on the poor; (ii) recommended subsidy mechanisms; and (iii) government responses during the past ten years. We selected the cases of Poland and Russia to illustrate the challenges governments and Bank staff faced in Central and Eastern Europe and the former Soviet Union. Both of these countries received substantial assistance from the Bank that included lending as well as policy advice, and Bank assistance was fairly continuous during the examined period. In addition, the two countries received substantial technical assistance and financial support from other donors, and the case studies below briefly describe these as

Pointing to the need to reduce fiscal deficits, the Bank advocated a rapid phase-out of across-the-board utility subsidies in all countries in the region. In the former Soviet Union, the Bank also argued strongly against the widespread tolerance of non-payment and the continued application of large price discounts to privileged consumers. Responding to government concerns that many households would not be able to pay tariffs that fully cover costs, the Bank generally recommended the use of income-tested subsidies to soften the negative impact of rising utility tariffs on low income households. However, the Bank provided little practical advice on the administration and financing of these income-tested cash transfer mechanisms, and tended to overestimate the coverage of the poor that could be achieved by these mechanisms in real life. In a number of countries in the former Soviet Union, the Bank endorsed the application of a specific income-tested subsidy mechanism, burden limits, without noticing the low coverage and targeting ratios that this subsidy mechanism produced. A possible explanation for this oversight is the insufficient amount of analytical work that supported and substantiated the Bank's advice. For example, in the two country cases that are presented in some detail below, only three Bank studies relied on statistical evidence from household surveys to evaluate the extent to which the applied subsidy mechanisms reached their stated objectives.[68]

Heeding the Bank's message about fiscal prudence, most countries in the region have made significant progress in phasing out budget-funded across-the-board utility subsidies. However, their track record is less positive concerning the phase-out of across-the-board subsidies funded through higher prices paid by industrial and commercial consumers. In addition, the countries of the former Soviet Union (with the exception of the Baltic states) have achieved only modest progress in their efforts to strengthen payment discipline and to phase out price discounts to privileged households. As a result, several subsidy mechanisms coexist in many countries in the region today, providing more support to the middle class than to the poor, and having a detrimental impact on the financial health of the utilities, on industrial competitiveness, and on local and central government budgets.

In view of these remaining challenges, the Bank should step up its assistance to governments that are willing to move away from particularly ineffective and costly subsidy mechanisms (for example, governments that have decided to sell state-owned electricity and gas distribution companies to strategic investors, since the new owners will more aggressively pursue and ultimately disconnect non-paying households). In each country where the government is searching for a better way to protect the poor, an effort needs to be made to collect data on utility connection ratios, household expenditures, and the impact of the currently applied subsidy mechanisms on the poor and the non-poor. In some countries, the necessary information will be available from previous household surveys, while in other countries, new household surveys will have to be

[68]These three studies are: (i) Caroline Freund and Christine Wallich, *Raising Household Energy Prices in Poland: Who Gains? Who Loses?,* World Bank Policy Research Working Paper No. 1495, 1995; (ii) *Poverty in Russia: An Assessment*, World Bank, Report No. 14110, June 1995; and (iii) *Russia: Affordability of Cost Recovery—Housing and Communal Services*, World Bank, 1999 (mimeo).

undertaken. The time and money spent on these surveys will enable the Bank to provide higher quality and more convincing advice to its clients.

The Case of Poland

Poland rejoined the World Bank in June 1986 after a hiatus of 38 years. Between 1986 and 1989, the Bank carried out comprehensive reviews of the Polish economy but postponed lending until 1990. Throughout the 1990s, the Bank provided extensive financial and technical support to the Government's economic transformation efforts, including the radical economic reforms that were introduced in January 1990. Thus, the Bank's involvement in Poland encompassed the distinct economic periods of pre-transition, the "big bang" transition, the post-transition contraction, and finally, the period of Poland's sustained growth and aspirations to accede to the European Union.

As the table below shows, Poland, as did other countries in the region, started the 1990s with utility tariffs that were a fraction of economic costs. The evolution of incomes in Poland, however, differed from the evolution of incomes in most countries in Eastern Europe and the former Soviet Union due to the steady growth of Poland's GDP since 1992 (although basing the index on the year of 1990 masks the 15% decline of household incomes in that year relative to 1989).

Bank advice and financial support in Poland were offered both in the sector-specific contexts of energy and social protection studies and operations, and in the broader context of the Bank's support of Poland's sweeping reforms through country assistance strategies and economic memoranda, and related lending operations. Energy sector work generally focused on remedying the distortions of the centrally planned economy and dealing with the critical issues of sector restructuring, while advice in the area of social protection covered income support, the social safety net, and the evolution of poverty during transition. Relatively little Bank advice focused explicitly on the intersection of the utility sector and social issues.

A characteristic feature of Poland's centrally planned economy that remained in place up to the end of the 1980s was the pervasive subsidization of consumer goods and services. The price structure reflected the belief that the state should satisfy the basic needs of the population at below-cost (or "social") prices. The cost to the budget of these subsidies was estimated at 11% of GDP in 1987. A Bank study issued in 1989 examined the degree to which various categories of subsidies succeeded at reducing income-inequality.[69] Across-the-board utility price subsidies were found to be relative income equalizers, although higher income households received more subsidies in absolute terms. The study noted that energy and housing subsidies were considerably less efficient (on a unit of budgetary outlay basis) than some other subsidies in reducing income-inequality, and recommended that the government focus its efforts on providing direct cash trans-

TABLE 10. POLAND: HOUSEHOLD INCOMES AND ENERGY TARIFFS, 1990-98 (1990=100, CPI ADJUSTED)

	Income	*Electricity*	*Natural Gas*	*District Heat*
1990	100	100	100	100
1991	106	147	323	176
1992	105	151	474	352
1993	104	161	483	488
1994	108	170	487	597
1995	114	152	467	480
1996	119	143	437	479
1997	127	145	450	475
1998	132	148	464	505

Source: Bank staff calculations based on official statistical data.

[69] *Poland: Subsidies and Income Distribution*, World Bank Report No. 7776-POL, November 14, 1989.

fers to the most needy, since these could achieve the same degree of income equalization as the prevailing system of subsidies at a cost that would have been 80-90% lower.

On January 1, 1990, the government freed many prices from control, and sharply reduced subsidies. Most utility tariffs were increased dramatically, although they remained significantly below full cost recovery levels. The government recognized that across-the-board price subsidies to households that consumed network fuels were the source of significant distortions in the pricing system, and decided to gradually phase these out. The Bank's advice (supported by the Bank's first Structural Adjustment Loan[70]) was that the government should liberalize coal prices and regulate other energy prices in a way that ensured that the relative prices of oil, gas, electricity, and district heat would not get out of line with the relative prices of these goods on foreign markets.[71] A follow-up energy sector adjustment operation provided additional support to the energy sector reform and price adjustment process.[72] Residential and industrial prices of electricity and gas reached parity by mid-1991. District heat tariff adjustments followed a more gradual schedule, and district heat tariff subsidies continued to impose a considerable drain on the budget during 1992.

The Country Economic Memorandum (CEM) published by the Bank in 1992 pointed to mushrooming increases in housing subsidies (which were expected to require more than US$1.2 billion in 1992 alone), and urged a further reduction in district heating subsidies.[73] On the social protection front, the CEM noted that the government had introduced a multifaceted safety net comprisinglabor market policies, income support, and provision of health services, but also that Poland was overspending on income maintenance programs that did not add much value to human capital. The themes that dominated the Bank's advice on social assistance in the 1980s—that assistance should be targeted at the most needy groups and universal entitlements should be phased out— were again underscored in the 1992 CEM.

Using 1993 household survey data, a policy research working paper[74] concluded that across-the-board household energy price subsidies, while providing assistance to some poorer households in the form of cheaper energy, provided more benefit to wealthier households because they consumed more energy in absolute as well as in relative terms. On this basis, the paper rejected the common social welfare argument for delaying energy price increases, and noted that better targeting of the poor could be achieved through the general social assistance program. If some utility-specific mechanism for subsidizing services to the poor was deemed expedient for non-economic reasons, the study recommended the use of a life-line electricity tariff with the caveat that the initial subsidized block should be kept small.

The 1994 CEM noted that most fuel prices were still below the economic cost of production and recommended further price adjustments, including the phasing out of the across-the-board subsidy for district heating.[75] The CEM also recommended the adoption of measures to safeguard the ability of the most vulnerable to consume utility services after adjustments to the level and structure of energy prices. Specific subsidy mechanisms mentioned included life-line tariffs, price discounts for the poor, and fuel coupons, but there was no discussion of the pros and cons of any of these. As an alternative to continued gradual energy price adjustments, the CEM mentioned the possibility of implementing a one-time, "big bang" increase in energy prices with significant compensation for most of the population, since this approach would ensure that households face the right price signals, and would also avoid the lengthy debates that occur every time energy prices are increased.

By 1997, the Bank's primary role in Poland had shifted back from lending to analytical and technical support, with an emphasis on supporting the country's aspirations to accede to the European Union. The 1997 CEM discussed the energy sector strictly in that context, including achievements in the areas of regulation, competition

[70] *Poland: Structural Adjustment Loan*, President's Report No. P-5294-POL, July 10, 1990.

[71] *oland: Energy Market Development*, World Bank Report No. 8224-POL, February 8, 1991; Poland: Energy Sector Restructuring Program, ESMAP Report No. 153/93.

[72] *Poland—Heat Supply Restructuring and Conservation Project*, President's Report No. P-5418-POL, June 12, 1991. The project included investment loans to five district heating enterprises and a commercial bank, and a sector adjustment loan to the Republic of Poland.

[73] *Poland: Economic Transformation at a Crossroads*, World Bank Report No. 10305-POL, May 29, 1992.

[74] Caroline Freund and Christine Wallich, *Raising Household Energy Prices in Poland: Who Gains? Who Loses?*, World Bank Policy Research Working Paper No. 1495, 1995.

[75] *Poland: Growth with Equity—Policies for the 1990s*, World Bank Report No. 13039-POL, September 28, 1994.

policy, pricing, and restrictions on state aid. It did not address the social protection issues associated with utility services.

Among all donors, USAID was the most active in financing policy research on the social aspects of housing reforms in Poland and other countries in the region. Studies carried out by the Urban Institute on behalf of USAID throughout the 1990s advocated the introduction of housing allowances (burden limits) based on utility expenditure norms as a mechanism to improve the targeting of subsidies to protect the most vulnerable and to improve the financial position of municipal governments.[76] In Poland, housing allowances were introduced by the Law on Rents and Housing Allowances that became effective in January 1995. However, due to the limited rent increases and complex eligibility criteria introduced at the municipal level, a significantly smaller share of the households participated in the housing allowance programs than was originally expected. Despite subsequent increases in rent and utility tariffs, the participation rate remained low (about 6% of households in September 1997), and this was attributed to inadequate outreach effort, among other things.[77] Actual expenditures rather than norms were used for the calculation of the subsidy, which probably reduced the targeting efficiency of the scheme (see Burden Limit section of Chapter II).

Several other donors financed studies as well as investment projects in energy efficiency and district heating, but they typically did not provide specific policy advice on utility subsidy mechanisms. The involvement of the European Bank for Reconstruction and Development (EBRD) in the energy sector in Poland, for example, focused on the financing of energy service companies (ESCOs) through joint ventures. PHARE, the main channel of technical assistance provided by the European Union, helped Poland with its pre-accession strategy. In particular, it assisted with the harmonization of energy policies, restructuring of the energy sector, and the development of inter-regional cooperation.

The Case of Russia

Since the Russian Federation joined the World Bank in 1992, the Bank has approved more than US$11 billion in loans for 43 operations, making Russia by far the largest borrower in the region. A number of Bank investment and adjustment operations have addressed reforms in the areas of energy pricing and the housing sector, including aspects of social protection during the transition. In addition, through economic and sector work, the Bank has sponsored a major investment in the knowledge base of the Russian economy, which has helped provide the necessary inputs for project design and policy advice.

As in other countries in the region, energy prices were far below international prices in Russia at the beginning of the transition period. Rent and household utility tariffs were subsidized to the point of being provided practically free-of-charge. Price reform was a central element of all major economic reform proposals put forward in the early 1990s, although the scope and pace of price liberalization were highly controversial issues. The Bank advocated rapid, economy-wide price adjustments, including moving progressively toward full cost-recovery for housing and utility services with targeted assistance provided to the most vulnerable. The reform of housing and utility tariffs was seen as essential not only to relieve the unsustainable burden of subsidies on the budget and to reduce energy losses and waste, but also to revitalize the country's housing stock, the inefficient allocation and poor maintenance of which was a major barrier to the development of housing and labor markets in Russia.

While the government liberalized prices for many goods in the early 1990s, price controls were maintained on basic food stuff, housing and utility services, and other energy items. The Country Economic Memorandum (CEM) issued by the Bank in 1992 noted that escalating housing and utility subsidies threatened the fiscal position of local governments, with actual expenditures far in excess of housing maintenance budgets.[78] At the beginning of 1993, the cost recovery ratio of housing and utility services was still below 10%.[79] During 1993, utility tariffs for industrial consumers saw their first major increase. Residential tariffs were also increased in 1993, but less dramatically due to concerns over the anticipated social impact. While further increases of residential tariffs have occurred since then, Russian households continue to pay prices that are significantly below supply costs for all

[76] *Toward a Market-Oriented Housing Sector in Eastern Europe*, 1990, pp. 238-240, and *Economic Restructuring of the Former Soviet Bloc: the Case of Housing*, 1996, pp. 49-51, The Urban Institute.

[77] *Local Government Rent Policy and Best Practice in Poland: The Need for Rent Reform and an Improved Housing Allowance Program*, November 1998, The Urban Institute.

[78] *Russian Economic Reform: Crossing the Threshold of Structural Change*, World Bank, 1992.

[79] *Russian Federation: Housing and Utility Services: Policy Priorities for the Next Stage of Reforms*, World Bank Report No. 17483-RU, February 1998.

utility services. The difference between residential tariffs and costs is covered partly from the budget, and partly from surcharges on industrial consumers. The subsidies provided through low utility tariffs are augmented by the tolerance of non-payment that emerged in the second half of the 1990s. As a result, the average cost recovery ratio of residential utility services has remained very low.[80]

The implementation of utility tariff adjustments and the parallel introduction of targeted social protection programs were made more difficult by the rapid fiscal decentralization that began in 1992. The federal government shifted to lower levels of government practically all expenditure responsibilities in the social sphere. In addition, the mass privatization program of 1992-94 transferred the social assets of many enterprises to the municipalities, doubling the housing stock on their balance sheet. These large increases in municipal responsibilities occurred at the same time that industrial production that traditionally provided an important revenue base for local governments collapsed. Managerial and administrative capacity on the local level also proved to be inadequate to cope with the multitude of problems that were suddenly "localized." The seriousness of the situation was highlighted in the CEM issued by the Bank in 1996, which argued for "aggressive action … by the local authorities to increase cost recovery from households, improve energy efficiency, develop competitive housing maintenance markets, clarify property rights, and implement targeted housing subsidies for vulnerable groups."[81]

As regions and municipalities grappled with their new problems in the course of the 1990s, they began to acquire experience with the various mechanisms designed to mitigate the social impact of utility price increases. A decision of the Council of Ministers in late 1993 introduced a system of housing allowances to begin in January 1994, with considerable leeway given to regional and local authorities to determine most parameters of the housing allowance program. By 1995, most municipalities had developed housing allowance programs, using 10% as the burden limit (i.e., households that spent more than 10% of their income on their utility bill were eligible for assistance). A Bank study of poverty in Russia issued in 1995, however, found that the coverage of these recently introduced programs was rather poor (only 5-10% of eligible households were participating).[82] The study proposed a number of options to mitigate the adverse effects of utility price increases on households, including: (i) life-line tariffs; (ii) preferential tariffs, earmarked cash transfers, or vouchers for the certified poor (based on social worker evaluation); and (iii) increases in the minimum cash benefit rates for pensioners, general unemployment benefits, and other non-earmarked cash transfers to the poor. The study gave preference to the third option in order to avoid the proliferation of different kinds of social assistance administered by different agencies. However, the study added that it might not be realistic to expect that adequate compensation could be provided for utility price increases through general social assistance in the short term, and, therefore the adoption of option (i) or (ii) as a transitory mechanism might be advisable for a limited period.

Similar recommendations were made by the team that prepared the Bank's second adjustment loan to Russia in 1997 (by this time, the burden limit was increased by most municipalities to 15%). The report supporting the loan noted that the objective of poverty-reduction could, in principle, be best served through targeted general cash transfers as part of the overall social assistance program.[83] The report, however, acknowledged the need for sector-specific support mechanisms such as life-line tariffs when the coverage of general cash transfers was inadequate due to administrative and other constraints.

A Bank study of housing and utility services issued in 1998 noted that the fiscal position of municipal governments continued to worsen as wholesale energy prices were liberalized and the final stages of enterprise housing divestiture were underway.[84] Housing and utility subsidies were increasingly unpaid, resulting in a growing stock of

[80]In late 1997, for example, the average cost-recovery ratio across all housing and utility services was only 30-35%. Source: *Russian Federation: Housing and Utility Services: Policy Priorities for the Next Stage of Reforms*, World Bank Report No. 17483-RU, February 1998.

[81]*Russian Federation: Toward Medium-Term Viability*, World Bank Country Economic Memorandum, 1996.

[82]*Poverty in Russia: An Assessment*, World Bank Report No. 14110, June 1995.

[83]*Report and Recommendation of the President of the International Bank for Reconstruction and Development to the Executive Directors on a Proposed Second Structural Adjustment Loan in the Amount of US$800 Million to the Russian Federation*, Report No. P-7200-RU, November 28, 1997.

[84]*Russian Federation: Housing and Utility Services: Policy Priorities for the Next Stage of Reforms*, World Bank Report No. 17483-RU, February 1998.

overdue payables to utility companies and the rapid deterioration of the housing stock due to insufficient maintenance. The study argued for an immediate increase of cost recovery up to 50-60%. It was expected that this tariff increase would set in motion serious saving efforts on the consumer side, and would also help the local authorities to pinpoint the real demand for social support. The study emphasized the urgency of improving the targeting of social assistance to needy households and the phase-out of counter-equalizing price discounts provided to privileged consumers.

A Bank analysis completed in 1999 that relied on 1996 household survey and price data found that raising tariffs to full-cost recovery levels would have increased the share of households with medium to high housing-utility burdens (defined as 20% or more of total household expenditures) from 12% to 54%.[85] After taking into account the cost of subsidies to bring the burden of all these families down to 20%, the net effect on municipal budgets would have been a saving of more than 50% of the actual cost of across-the-board subsidies. The study also provided a brief overview of the advantages and disadvantages of sector-specific mechanisms to help the poor to cope with increased housing and utility costs (life-line tariffs, vouchers, and earmarked and non-earmarked cash transfers). The study recommended the application of earmarked cash transfers, such as the existing housing allowance program, with the caveat of significant improvements in the selection procedure. To improve the coverage and targeting of the poor, the study proposed the use of the following proxies for poverty status: (i) the number of children and elderly in a household; (ii) whether a household is female-headed; (iii) the lack of ownership of a private plot of land or other assets and durable goods; (iv) the location of the household's residence; and (v) unemployment of household members.

USAID, through its Russian Federation Housing Sector Reform Project, sponsored a number of studies carried out by the Urban Institute in the 1990s.[86] These studies were devoted to implementing the housing allowance program in Russia, and provided the theoretical and analytical background for the program as well as practical advice for implementation. The studies argued that housing allowances served several policy objectives: (i) protecting the poor during the transition period; (ii) providing an alternative to across-the-board subsidies that imposed a smaller burden on municipal budgets; (iii) contributing to the development of an efficient housing market by encouraging the free movement of families between the private and state housing sectors as a result of better services and lower rents; (iv) promoting the use of a market pricing mechanism for the allocation and reallocation of housing; and (v) facilitating the establishment of an independent and efficient system of housing maintenance. While the Urban Institute recommended that the calculation of the subsidy be based on normative utility expenditures (in order to ensure that the allowance received was inversely related to income), most municipalities decided to implement a burden limit scheme based on actual utility expenditures. As in Poland, this modification reduced the targeting efficiency of the housing allowance program considerably. Assessments of the coverage achieved by the housing allowances found that the initial forecasts were overly optimistic. A low level of awareness coupled with the low level of benefits was highlighted as the main reason behind the worse-than-expected result in Russia.[87]

Although a number of other multi- and bilateral donors financed studies on selected utility services (e.g., on district heating), these were typically engineering assessments of rehabilitation requirements or demand-side management options, and seldom addressed the social impact of increased cost recovery. In addition, the TACIS program, the main instrument of the European Union to channel technical assistance to the former Soviet Union, financed the establishment of energy information centers in a number of Russian cities, and EBRD financed water/municipal services projects with some associated technical assistance for municipal capacity-building. It appears that none of these donors engaged the government in a discussion of the pros and cons of various subsidy mechanisms to maintain utility services to the poor.

[85] *Russia: Affordability of Cost Recovery—Housing and Communal Services*, World Bank, 1999 (mimeo).

[86] *Implementing Housing Allowances in Russia* (1993); *Economic Restructuring of the Former Soviet Bloc: the Case of Housing* (1996); *Restructuring Russia's Housing Sector: 1991-1997* (1997), edited by Raymond Struyk, et. al., The Urban Institute.

[87] *An Assessment of Administrative Practices in Russia's Housing Allowance Program*, prepared by R. Struyk, et. al., The Urban Institute, September 1998.

Annex 1 - Household Survey Data and Poverty Lines

Data

The main data sources for the study were household budget surveys conducted in ECA countries between 1996 and 1999. The survey instruments were designed for poverty assessment purposes and hence have very detailed data on household income and consumption as well as on basic demographic and labor market characteristics (the instruments were based on or similar to the Living Standard Measurement Survey, a standardized tool developed by the World Bank for poverty assessment).

TABLE A1-1. HOUSEHOLD SURVEYS USED FOR THE ANALYSIS

	Name of the Survey	*Agency Conducting the Survey*	*Sample Size: Number of Households*
Russia, 1996	Longitudinal Monitoring Survey	Research Triangle Institute (North Carolina) Institute of Sociology (Moscow)	3,750
Hungary, 1997	Household Budget Survey	Central Statistics Office	7,560
Kyrgyz Republic, 1999	Household Energy Survey	London Economics and National Statistics Committee	3,006
Ukraine, 1996	"Ukraina-96" Project	Kiev International Institute of Sociology	2,322
Latvia, 1997	Household Budget Survey	Central Statistical Bureau	7,707
Moldova, 1997	Household Budget Survey	Department of Statistics	1,584
Croatia, 1998	Household Budget Survey	Central Bureau of Statistics	3,123
Armenia, 1996	Living Standards Survey	State Department of Statistics	4,920

The surveys typically combine a household expenditure diary and questionnaires for all family members. The diary is used to keep track of everyday household expenditures and provide basic data for measuring household consumption. The questionnaires are used to obtain information on income, investment, and certain types of consumption that are different from those that are recorded in the diary.

The samples are representative, based on the method of stratified sampling. For some of the surveys (when the sample could not be fully stratified at the time of the interviews), we used the sampling weights provided by the survey teams (Ukraine, Moldova, Hungary, and Latvia).

All the surveys that we used include a section on utilities. Unfortunately, because the questionnaires were designed for poverty assessment purposes and not for subsidy estimation, these sections sometimes contain incomplete data.

Methodology

a) Main definitions

Poverty is the status of a person who falls short of a level of economic welfare deemed to constitute a reasonable minimum, either in some absolute sense or relative to the standards of a specific society. The general concepts of (i) measuring the well-being (using income or consumption), (ii) choosing the unit of analysis (individuals or households), and (iii) setting the poverty line (defining the level of income or consumption below which the household is considered poor) are briefly discussed below.

b) Measuring well-being

The main issue in measuring well-being is to select an appropriate household welfare indicator. Typical measures of well-being are income and consumption. We used as an indicator of household living standard a comprehensive measure of current consumption.

The current consumption indicator for measuring living standards and poverty based on household data includes:

- monetary non-business and non-investment expenditures
- gifts, earnings, and transfers in-kind
- consumption from stock-piled goods (when the information is available)
- consumption from own production

The current consumption aggregate does not include imputed rent for owner-occupied housing and does not reflect the market value of subsidized goods, leading to the underestimation of consumption and overestimation of absolute poverty incidence. Since we rely on relative poverty lines, these problems probably did not have a significant impact on the quality of the analysis.

c) Unit of analysis and poverty line

The analysis in this paper focuses on poverty among households; if a household is deemed to be poor, all its members are counted as poor. The implicit assumption here is that all individual members of a household benefit equally (or in a constant proportion, depending on their age and gender, called equivalence scale) from the household's expenditure or income.

Although we use relative poverty lines for the analysis in the paper, absolute poverty lines are also mentioned for illustration purposes. Absolute poverty lines produce poverty estimates that make international comparison possible, but are less relevant for country-specific policy analysis. The absolute poverty line was calculated as the cost in local currency of the basket of goods that is equivalent to US$2.15 per day per capita (in 1996 PPP terms).

We set the relative poverty line for each country at two-thirds of the monthly median expenditure per equivalent adult. Households with monthly consumption (divided by their effective size) that is less than the corresponding relative poverty line are called relatively poor.

There are some economies of scale in consumption; therefore, the per capita cost of reaching a certain welfare level is lower in large households than in small ones. The parameter θ was used to measure such economies of scale. We assumed that the effective number of household members who share a certain welfare should be adjusted using this economies of scale parameter, that is, welfare per member (w) in a household with N members equals total household welfare (W) divided by N to the power of θ, i.e.,

$$w = \frac{W}{N^{\theta}}$$

In countries where joint multigenerational families are not rare, taking into account the economies of scale is crucial. For the purpose of this study, following the methodology adopted in *Making Transition Work for Everyone: Poverty and Inequality in Europe and Central Asia, World Bank, 2000*, we set the value of θ at 0.75.

The following summarizes the approaches used to measure poverty:

	Welfare Aggregate	*Welfare Measure per Household Member*	*Poverty Line*
Relative Poverty	Current consumption	Household consumption/$N^{0.75}$	2/3 of the national consumption per equivalent adult
Absolute Poverty	Current consumption	Household consumption/N	$2.15 per day (in 1996 PPP terms)

Annex 2 - Privileges and Poverty Status in Moldova and Ukraine

In order to evaluate the system of utility price discounts for privileged consumers that is in effect in many former Soviet Union countries, we estimated the coverage and targeting ratios of the poor achieved through this subsidy mechanism in the electricity sector in Moldova and Ukraine. The calculations were based on data received from Ukrainian and Moldovan government agencies overseeing the electricity sector, and also on data obtained from household surveys (see Annex 1 for general information on household surveys).

The data provided by the authorities included the number of beneficiaries, their estimated electricity consumption, electricity tariffs, and the percentage of price reduction for these privileged groups. The incidence of poverty among the privileged groups was estimated using household survey data, as described below.

Household surveys provided detailed information on the social and economic status of respondents. Using this information, we constructed sub-samples of respondents representative of privileged groups (i.e., the groups that receive electricity price discounts in Ukraine and Moldova), and calculated the incidence of poverty within these sub-samples. In cases when the questionnaire contained a question on the respondent's affiliation with a certain privileged group, the sub-sample was constructed using responses to this question. For example, to construct a sub-sample of disabled people from the Ukraine data set, the question "Did you receive disability or sickness pension during the last 30 days?" was used. In other cases, when such a question was not asked in the survey, we constructed sub-samples based on proxies, i.e., we selected groups from the survey that we assumed had characteristics similar to the characteristics of privileged groups. Tables A2-1 and A2-2 list the groups from the surveys that were used that way. The data received from the authorities and the calculation of coverage and targeting ratios are presented in Tables A2-3 and A2-4.

TABLE A2-1. UKRAINE: REPRESENTATIVE/PROXY GROUPS FOR PRIVILEGED HOUSEHOLDS HOUSEHOLD SURVEY, 1996

Privileged Groups	*Groups from the Survey Used as Representative/proxy for Privileged Groups*
Militia workers and military officers	Military servicemen
Veterans of military service and war veterans	Receive elderly age pension on privileged terms
Veterinarians (health care + rural)	Work in health care, or physical culture, or social security and 'live in rural area'
Disabled	Receive disability or sickness pension
Victims of Chernobyl catastrophe	Receive compensation for Chernobyl accident
Firemen	Employees of municipal utilities and municipal services

TABLE A2-2. MOLDOVA: REPRESENTATIVE/PROXY GROUPS FOR PRIVILEGED HOUSEHOLDS HOUSEHOLD SURVEY, 1997

Privileged Categories	*Groups from the Survey Used as Representative/proxy for Privileged Groups*
Invalids	Invalids
Second World War participants, fascist camp victims, victims of Leningrad blockade, victims of political repressions	Invalids, age 65 and above
Families with an invalid, families of Chernobyl victims, families of Transnistria victims, children of the military deceased while on duty	Families that receive compensation
Afganistan war participants, Transnistria events participants	Military servants
Public workers	Employees of education, health care, and social service institutions
Police personnel, military police, firemen, judges, security staff	Employees of defense and military services, state security management

TABLE A2-3. MOLDOVA: ELECTRICITY PRIVILEGES, DISTRIBUTION BETWEEN POOR AND NON-POOR *

	Catagories of Beneficiaries	*Benefits, % of Tariff*	*Number of Beneficiaries*	*Average Monthly Consumption, kWh*	*Tariff, lei/kWh*		*Annual Price of Electricity Provided to Beneficiaries (lei)*		*Annual Sum of Benefits (lei)*	*Below Poverty Line, % of People in the Group*	*Annual Subsidies Received by the Poor, lei*
					Full Tariff	*Amount Billed*	*Price at Full Tariff*	*Amount Billed*			
1	Invalids										
	I Group										
	Families consisting of disabled people with minor children	100	2,166	60	0.42	0	654,998	0	654,998		
	Labor invalids	50	17,124	60	0.42	0.21	5,178,298	2,589,149	2,589,149		
	Invalids who were disabled since childhood	50	3,602	60	0.42	0.21	1,089,245	544,622	544,622		
	Army invalids	50	98	60	0.42	0.21	29,635	14,818	14,818		
	Second World War invalids	50	530	60	0.42	0.21	160,272	80,136	80,136		
	Transnistria invalids	50	19	60	0.42	0.21	5,746	2,873	2,873		
	Chernobyl invalids	50	1,300	60	0.42	0.21	393,120	196,560	196,560		
	Afganistan invalids	50	12	60	0.42	0.21	3,629	1,814	1,814		
	Subtotal		24,851						4,084,970	30	1,227,848
	II Group										
	Labor invalids	25	83,008	60	0.42	0.315	25,101,619	18,826,214	6,275,405		
	Invalids who were disabled since childhood	25	12,404	60	0.42	0.315	3,750,970	2,813,227	937,742		
	Army invalids	50	807	60	0.42	0.21	244,037	122,018	122,018		
	Second World War invalids	50	4,679	60	0.42	0.21	1,414,930	707,465	707,465		
	Transnistria invalids	50	145	60	0.42	0.21	43,848	21,924	21,924		
	Members of the high risk subdivisions who were rendered sick of diseases or became invalids	50	250	60	0.42	0.21	75,600	37,800	37,800		
	Afganistan invalids	50	138	60	0.42	0.21	41,731	20,866	20,866		
	Subtotal		101,431						8,123,220	28	2,242,627

TABLE A2-3. MOLDOVA: ELECTRICITY PRIVILEGES, DISTRIBUTION BETWEEN POOR AND NON-POOR *continued

	Catagories of Beneficiaries	Benefits, % of Tariff	Number of Beneficiaries	Average Monthly Consumption, kWh	Tariff lei/kWh		Annual Price of Electricity; Provided to Beneficiares (lei)		Annual Sum of Benefits (lei)	Below Poverty Line, % of People in the Group	Annual Subsidies Received by the Poor, lei
					Full Tariff	Amount Billed	Price at Full Tariff	Amount Billed			
	III Group										
	Labor invalids	25	83,008	60	0.42	0.315	25,101,619	18,826,214	6,275,405		
	Army invalids	50	337	60	0.42	0.21	101,909	50,954	50,954		
	Second World War invalids	50	333	60	0.42	0.21	100,699	50,350	50,350		
	Transnistria invalids	50	24	60	0.42	0.21	7,258	3,629	3,629		
	Members of the high risk subdivisions, who were rendered sick of diseases or became invalids	50	8,071	60	0.42	0.21	2,440,670	1,220,335	1,220,335		
	Afganistan invalids	50	39	60	0.42	0.21	11,794	5,897	5,897		
	Subtotal		91,812						1,331,165	18	240,013
2	Police personnel	50	17,512	60	0.42	0.21	5,295,629	2,647,814	2,647,814	8	218,325
3	Carabineers (military polic	50	1,488	60	0.42	0.21	449,971	224,986	224,986	8	18,551
4	Firemen	50	1,900	60	0.42	0.21	574,560	287,280	287,280	8	23,688
5	Judges	50	291	60	0.42	0.21	87,998	43,999	43,999	8	3,628
6	Penitentiary system staff	50	1,900	60	0.42	0.21	574,560	287,280	287,280	26	74,865
7	Public workers	50	10,000	60	0.42	0.21	3,024,000	1,512,000	1,512,000	16	236,976
8	Second World War participants	50	23,879	60	0.42	0.21	7,221,010	3,610,505	3,610,505	29	1,043,620
9	Families that have one Group I invalid or a child invalid	50	10,000	60	0.42	0.21	3,024,000	1,512,000	1,512,000	24	360,687
10	Participants to the Transnistria events	50	25,000	60	0.42	0.21	7,560,000	3,780,000	3,780,000	20	746,963
11	Afganistan war participants	50	8,071	60	0.42	0.21	2,440,670	1,220,335	1,220,335	20	241,150
12	Fascism camp victims	50	1,074	60	0.42	0.21	324,778	162,389	162,389	29	46,939
13	Families of deceased Second World War invalids	50	5,546	60	0.42	0.21	1,677,110	838,555	838,555	26	218,527
14	Families of deceased Transnistria events individuals	50	234	60	0.42	0.21	70,762	35,381	35,381	24	8,440

TABLE A2-3. MOLDOVA: ELECTRICITY PRIVILEGES, DISTRIBUTION BETWEEN POOR AND NON-POOR *continued

	Catagories of Beneficiaries	Benefits, % of Tariff	Number of Beneficiaries	Average Monthly Consumption, kWh	Tariff lei/kWh		Annual Price of Electricity; Provided to Beneficiares (lei)		Annual Sum of Benefits (lei)	Below Poverty Line, % of People in the Group	Annual Subsidies Received by the Poor, lei
					Full Tariff	Amount Billed	Price at Full Tariff	Amount Billed			
15	Children of the military deceased during the Second World War or while on military duty, who became invalids before coming of age	50	800	60	0.42	0.21	241,920	120,960	120,960	24	28,855
16	Families of those who died during the Chernobyl catastrophe and who died as a result of the actinic disease	50	39	60	0.42	0.21	11,794	5,897	5,897	24	1,407
17	Victims of Leningrad blockade	50	200	60	0.42	0.21	60,480	30,240	30,240	29	8,741
18	Participants to the liquidation of the Chernobyl catastrophe	50	1,050	60	0.42	0.21	317,520	158,760	158,760	24	37,872
19	Victims of the political repressions of the communist regime (pensioners and invalids)	50	10,440	60	0.42	0.21	3,157,056	1,578,528	1,578,528	29	456,275
20	Security staff	50	950	60	0.42	0.21	287,280	143,640	143,640	8	11,844
21	Low income pensioners	30	45,327	60	0.42	0.294	13,706,885	9,594,819	4,112,065	100	4,112,065
TOTAL				383,795					35,851,969	35	11,609,906

Data on number of beneficiaries, consumption, tariffs, and percentage of price reduction for privileged groups were provided by staff of Moldova Redsident mission. Data on poverty incidence for privileged groups was calculated for this paper using household survey data.

TABLE A2-4. UKRAINE: ELECTRICITY PRIVILEGES, DISTRIBUTION BETWEEN POOR AND NON-POOR*

	Privileged Categories	*Number of Beneficiaries*	*Average Monthly Consumption, kWh*	*Average Tariff UAH/kWh*	*Benefits, % of Tariff*	*Monthly Sum of Benefits, UAH*	*Months of Tariff Usage*	*Annual Sum of Benefits, UAH*	*Below Poverty Line, % of People in the Group*	*Annual Subsidies Received by the Poor, UAH*
1	Militia workers	207,196	135	0.1252	50	1,751,013	12	21,012,161	34	7,163,23
2	Veterans of military service	71,430	90	0.1252	50	402,437	12	4,829,239	23%****	1,114,440
3	Judges	3,312	135	0.1252	50	27,990	12	335,877	0**	0
4	Investigators and prosecutors	5,440	135	0.1252	50	45,973	12	551,681	0**	0
5	Military officers	209,288	90	0.1252	50	1,179,129	12	14,149,543	34***	4,823,708
6	Veterinary workers	7,044	135	0.1252	100	119,058	12	1,428,692	4	57,148
7	Firemen	30,344	135	0.1252	50	256,437	12	3,077,246	26	800,084
8	War Veterans	4,344,087	90	0.1252	58	28,412,992	12	340,955,905	23****	78,682,132
	War/labor heroes	6,877	135	0.1252	100	116,235	12	1,394,821		
	100% privileges	385,667	90	0.1252	100	4,345,696	12	52,148,349		
	75% privileges	676,549	90	0.1252	75	5,717,516	12	68,610,187		
	50% privileges	3,274,994	90	0.1252	50	18,451,316	12	221,415,794		
9	Disabled (as per Crimea's VR order)	36,339	135	0.1252	50	307,101	12	3,685,211	34	1,256,322
10	Victims of political repressions of the communist regime	51,891	90	0.1252	50	292,354	12	3,508,247	25	877,062
11	Chernobyl victims	246,319	135	0.1252	50	2,081,642	12	24,979,702	14	3,497,158
12	Chernobyl 30-km zone residents	225,974	135	0.1252	25	954,853	12	11,458,238	14	1,604,153
13	Employees of protection 'plants (Chernobyl)'				100				na	
Total privileged consumers		5,438,664				35,830,978		429,971,741	23	99,875,443

* Data on number of beneficiaries, consumption, tariffs, and percentage of price reduction for privileged groups were provided by the staff of Moldova Resident Mission (original source – Minenergo). Data on poverty incidence for privileged groups was calculated for this paper using household survey data.

** assumption.

*** categories 1 and 5 are grouped together.

**** categories 2 and 8 are grouped together.

Annex 3 - Additional Tables

TABLE A3-1. RUSSIA: ANSWERS TO THE QUESTION "DOES YOUR FAMILY HAVE UNPAID BILLS FOR HOUSING?"

Poverty Groups	*Have Unpaid Bills*	*Do Not Have Unpaid Bills*	*Total*
Non-poor	26.4%	73.6%	100.0%
Poor	38.7%	61.3%	100.0%
Total	30.1%	69.9%	100.0%

Source: Household Survey, 1996.

TABLE A3-2. RUSSIA: ANSWERS TO THE QUESTION "DOES YOUR FAMILY HAVE UNPAID BILLS FOR HOUSING?"

Poverty Groups	*Mean Arrears*	*Number of Households*	*Distribution of Arrears*
Non-poor	242,888	479	60%
Poor	261,782	302	40%
Total	250,194	781	100%

Source: Household Survey, 1996.
Only households that reported the amount of their arrears.

TABLE A3-3. UKRAINE: USE OF GAS FOR SPACE HEATING BY POVERTY GROUPS

Households	*Number of Households*	*% of these Households Represented in Each Poverty Group*	*% of Poor and Non-poor Among these Households*
Non-poor	565.0	33.6	77.0
Poor	169.0	27.7	23.0
Total	734.0	32.0	100.0

Source: Household Survey, 1996.

TABLE A3-4. UKRAINE: APARTMENT AND FAMILY SIZE BY POVERTY GROUPS

	Mean Apartment Size (total area (m^2)		
Households	*Households Using Gas for Heating*	*Households Connected to District Heating*	*Mean Family Size*
Non-poor	65.8	51.3	3.2
Poor	51.6	47.5	2.9

Source: Household Survey, 1996.

TABLE A3-5. RUSSIA: WATER AND WASTEWATER TARIFFS AND CONSUMPTION, 1997

Indices	*Units*	*Values*
Consumption - total	t hs.m^3	17,434,500.40
Of which: household	t hs.m^3	10,129,526.80
Of which: enterprises	t hs.m^3	4,890,672.40
Revenues - total	mln.rub.	22,839,017.20
Of which: main activity	mln.rub.	20,599,125.60
Of which: from households	mln.rub.	4,956,115.20
Of which: from enterprises	mln.rub.	9,631,462.40
Revenues from other activities	mln.rub.	2,239,891.60
Expenditures - total	mln.rub.	25,173,092.80
Of which: expenditures from main activity	mln.rub.	22,191,088.40
Of which: materials expenditures	mln.rub.	10,530,388.80
Average tariff for households	rub/m^3	489
Average tariff for enterprises	rub/m^3	1969

Source: State Statistics Committee.

TABLE A3-6. RUSSIA: RESIDENTIAL WATER SUBSIDIES, 1996

	Residential Customers, Consumer Classes							
	No Connection to Water Supply	*Single House with Water, No Gas*	*Single House with Water and Gas*	*Apartment with Water and Sewerage, No Gas*	*Apartment with Water, Gas, Sewerage*	*Apartment with Water, Gas, Sewerage, Central Heating*	*Total*	*Total %*
I. Poverty Groups[a]								
Non-poor	1,128	265	403	1,004	384	2,606	5,790	70.2
Poor	775	150	204	245	268	819	2,461	29.8
Total	1,903	415	607	1,249	652	3,425	8,251	100.0
II. Residential Consumption Norms (liters/capita/day)[b]	35.0	45.0	70.0	117.5	148.3	260.0	na	na
III. Residential Subsidy (rubles per cubic meter)[c]	554.0	554.0	554.0	554.0	554.0	554.0	554.0	na
IV. Residential Subsidy (rubles per capita per day)	19.4	24.9	38.8	65.1	82.2	144.0	na	na
V. Distribution of Subsidy between Poverty Groups[a]								
Amount of Subsidy that Goes to Non-poor	21,871.92	6,606.45	15,628.34	65,355.38	31,555.84	375,368.24	516,386.17	73.9
Amount of Subsidy that Goes to Poor	15,027.25	3,739.50	7,911.12	15,948.28	22,023.35	117,968.76	182,618.25	26.1

[a] Source: Household Survey, 1996.
[b] Source: PADCO, Inc., 1996, Technical Assistance for Local Level, *Communal Services Pricing in Russia*, p.13.
[c] Subsidy is calculated as difference between budget organizations' tariff, which is set at cost recovery level, and residential tariff. As of January 1996, tariffs for residential customers were 370 rubles/m^3, for budget organizations - 924 rubles/cu meter, and for industrial customers - 2,691 rubles/cu meter. Source: PADCO, Inc., 1996, Technical Assistance for Local Level, *Communal Services Pricing in Russia*, p.10.

TABLE A3-7. CROATIA: ELECTRICITY SUBSIDIES BY POVERTY GROUPS (FOR ALL SURVEYED HOUSEHOLDS)[a]

Households	*Mean Household Income*	*Mean Monthly Electricty Bill*	*Mean Meonthly Consumption of Electricity (kWh)*	*Mean Electricity Subsidy*	*Number of Households*	*Total Electricity Subsidy for Surveyed Households HRK* (kunas)	%
Non-poor	7,174.4	160.1	485.1	48.5	2,441.6	118,432.2	90.4
Poor	2,718.7	102.8	227.2	22.7	553.9	12,584.4	9.6
Total	6,350.5	149.5	437.4	43.7	2,995.5	131,016.5	100.0

[a] Consumption of electricity for households that did not report consumption is imputed. Imputations are based on reported household electricity bill (same survey) and price of electricity.
Source: Household Survey, 1998.

TABLE A3-8. HUNGARY: MONTHLY ELECTRICITY SUBSIDIES BY POVERTY GROUPS [a]

Poverty Groups	*Mean Subsidy (HUF)*	*Number of Cases*	*Total Subsidy (HUF)*	*Share of Total Subsidy*	*Number of Households Receiving Negative or Zero Subsidy*	*Share of Households Receiving Negative or Zero Subsidy*
Non-poor	82	6,295	515,942	80.1%	476	7.6%
Poor	101	1,265	128,395	19.9%	67	5.3%
Total	85	7,560	644,337	100.0%	543	7.2%

[a] Full cost recovery at the second block's price. Energy usage limit for the first tariff block is 50 kWh and for the second block is 300 kWh.
Source: Household Budget Survey, 1997.

TABLE A3-9. HUNGARY: MONTHLY ELECTRICITY SUBSIDIES BY POVERTY GROUPS[a]

Poverty Groups	*Mean Subsidy (HUF)*	*Number of Cases*	*Total Subsidy (HUF)*	*Share of Total Subsidy*	*Mean Total Household Expenditure*	*Share of Total Subsidy in Total Household Expenditure*
Non-poor	116	6,295	728,224	83.9%	51,390	0.23%
Poor	110	1,265	139,771	16.1%	23,027	0.48%
Total	115	7,560	867,995	100.0%	46,644	0.25%

[a] Full cost recovery at the second block's price. No penalty for the third-block customers assumed. Energy usage limit for the first tariff block is 50 kWh.
Source: Household Budget Survey, 1997.

TABLE A3-10. HUNGARY: MONTHLY ELECTRICITY SUBSIDIES BY POVERTY GROUPS[a]

Poverty Groups	*Mean Subsidy (HUF)*	*Number of Cases*	*Total Subsidy (HUF)*	*Share of Total Subsidy*	*Number of Households Receiving Negative or Zero Subsidy*	*Share of Households Receiving Negative or Zero Subsidy*
Non-poor	-6	6,295	-35,073	-96.4%	2,094	33.3%
Poor	56	1,265	71,468	196.4%	243	19.2%
Total	5	7,560	36,395	100.0%	2,337	30.9%

[a] Full cost recovery at the second block's price. Energy usage limit for the first tariff block is 50 kWh and for the second block is 150 kWh.
Source: Household Budget Survey, 1997.

TABLE A3-11. MOLDOVA: DISTRICT HEATING SUBSIDY, LIFELINE = 12M^2 (ONLY HOUSEHOLDS WITH CENTRAL HEAT CONNECTION)

Poverty Groups	*Mean Subsidy*	*Total Household Expenditure*	*Number of Households*	*Subsidy as Share of Total Household Expenditure*	*Distribution of Total Subsidy*
Non-poor	67.72	511.48	343,087	13.2%	84%
Poor	68.12	120.96	64,742	56.3%	16%
Total	67.78	449.49	407,829	15.1%	100%

Source: Household Survey, 1998.

TABLE A3-12. HUNGARY: MONTHLY ELECTRICITY SUBSIDIES BY POVERTY GROUPS [a]

Poverty Groups	*Mean Subsidy (HUF)*	*Number of Cases*	*Total Subsidy (HUF)*	*Share of Total Subsidy*	*Mean Total Household Expenditure*	*Share of Total Subsidy in Total Household Expenditure*
Non-poor	121	6,295	761,786	82.3%	51,390	0.24%
Poor	130	1,265	164,153	17.7%	23,027	0.56%
Total	122	7,560	925,939	100.0%	46,644	0.26%

[a] Full cost recovery at the second block's price. No penalty for the third-block customers assumed. Energy usage limit for the first tariff block is 20 kWh*family size.
Source: Household Budget Survey, 1997.

TABLE A3-13. UKRAINE: REPORTED HOUSING SUBSIDY BY POVERTY GROUPS

Poverty Groups	*Households that Received the Subsidy*	*Mean Subsidy (karb.)*
Non-poor	72%	1993
Poor	28%	1958

Source: Household Survey, 1996.

TABLE A3-14. UKRAINE: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 15% OF HOUSEHOLD INCOME[a]

			Total Rent and Utility Subsidy	
Poverty Groups	*Mean Rent and Utility Subsidy, UAH*	*Number of Households*	*UAH*	*%*
Above poverty line	1,784.5	342	610,289.5	77.6%
Below poverty line	1,268.6	139	176,331.1	22.4%
Total	1,635.4	481	786,620.6	100.0%

[a]Sub-sample of 481 respondents, who gave an answer (either "yes" or "no") to the question "Have you received a housing subsidy?"
Source: Household Survey, 1996.

TABLE A3-15. UKRAINE: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 25% OF HOUSEHOLD INCOME[a]

			Total Rent and Utility Subsidy	
Poverty Groups	*Mean Rent and Utility Subsidy, UAH*	*Number of Households*	*UAH*	*%*
Above poverty line	1,268.1	342	433,681.1	77.5%
Below poverty line	906.2	139	125,968.2	22.5%
Total	1,163.5	481	559,649.3	100.0%

[a]Sub-sample of 481 respondents, who gave an answer (either "yes" or "no") to the question "Have you received a housing subsidy?"
Source: Household Survey, 1996.

TABLE A3-16. UKRAINE: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 35% OF HOUSEHOLD INCOME [a]

Poverty Groups	*Mean Rent and Utility Subsidy, UAH*	*Number of Households*	*Total Rent and Utility Subsidy*	
			UAH	*%*
Above poverty line	919.7	342	314,545.1	77.3%
Below poverty line	666.0	139	192,575.4	22.7%
Total	846.4	481	407,120.5	100.0%

[a]Sub-sample of 481 respondents, who gave an answer (either "yes" or "no") to the question "Have you received a housing subsidy?"
Source: Household Survey, 1996.

TABLE A3-17. UKRAINE: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 45% OF HOUSEHOLD INCOME[a]

Poverty Groups	*Mean Rent and Utility Subsidy, UAH*	*Number of Households*	*Total Rent and Utility Subsidy*	
			UAH	*%*
Above poverty line	668.3	342	228,561.9	76.1%
Below poverty line	516.6	139	71,804.6	23.9%
Total	624.5	481	300,366.5	100.0%

[a]Sub-sample of 481 respondents, who gave an answer (either "yes" or "no") to the question "Have you received a housing subsidy?"
Source: Household Survey, 1996.

TABLE A3-18. UKRAINE. HOUSEHOLD SURVEY 1996
REGRESSION OF SHARE OF RENT AND UTILITY EXPENDITURE IN TOTAL HOUSEHOLD INCOME ON PER EQUIVALENT ADULT INCOME

Summary Output
Regression Statistics

Multiple R	0.239427
R Square	0.057325
Adjusted R	0.055032
Standard E	0.437102
Observation	413

ANOVA	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	1	4.775211	4.775211	24.99351	8.53E-07
Residual	411	78.52487	0.191058		
Total	412	83.30008			

	Coefficient	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.271052	0.029108	9.312029	7.66E-19	0.213834	0.328271
X Variable	-6.21E-06	1.24E-06	-4.999351	8.53E-07	-8.65E-06	-3.77E-06

Source: Bank staff calculations.

TABLE A3-19 UKRAINE. HOUSEHOLD SURVEY 1996
REGRESSION OF SHARE OF RENT AND UTILITY EXPENDITURE IN TOTAL HOUSEHOLD EXPENDITURE ON PER EQUIVALENT ADULT EXPENDITURE

Summary Output
Regression Statistics

Multiple R	0.022307
R Square	0.000498
Adjusted R	-0.001934
Standard E	0.450042
Observation	413

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.041443	0.041443	0.204617	0.651258
Residual	411	83.24308	0.202538		
Total	412	83.28452			

	Coefficient	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.156656	0.042241	3.708632	0.000237	0.073621	0.239692
X Variable	1.38E-06	3.05E-06	0.452346	0.651258	-4.61E-06	7.37E-06

Source: Bank staff calculations.

TABLE A3-20. LATVIA: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 15% OF HOUSEHOLD INCOME

			Total Rent and Utility Subsidy for all Surveyed Households	
Poverty Groups	*Mean Rent and Utility Subsidy, LAT*	*Number of Households*	*LAT*	*%*
Non-poor	22.1	538,198.0	11,869,305.7	86.2
Poor	13.6	140,163.0	1,904,299.4	13.8
Total	20.3	678,361.0	13,773,605.0	100.0

Source: Household Survey, 1997.

TABLE A3-21. LATVIA: RENT AND UTILITY SUBSIDY BY POVERTY GROUPS BURDEN LIMIT EQUALS 45% OF HOUSEHOLD INCOME

			Total Rent and Utility Subsidy for all Surveyed Households	
Poverty Groups	*Mean Rent and Utility Subsidy, LAT*	*Number of Households*	*LAT*	*%*
Non-poor	5.0	538,198.0	2,710,043.3	83.1
Poor	3.9	140,163.0	552,196.8	16.9
Total	4.8	678,361.0	3,262,240.1	100.0

Source: Household Survey, 1997.

TABLE A 3-22. LATVIA: HOUSEHOLD SURVEY 1997 REGRESSION OF SHARE OF UTILITIES IN TOTAL HOUSEHOLD INCOME ON HOUSEHOLD PER EQUIVALENT ADULT INCOME

fit zz_shrui zz_inpea

Source	*SS*	*df*	*MS*		
Model	376.864962	1	376.864962		
Residual	3976.53774	7577	0.524816912		
Total	4353.4027	7578	0.574479111		

Number of obs	=	7579
F (1, 7577)	=	718.09
Prob>F	=	0.0000
R-squared	=	0.0866
Adj. R-squared	=	0.0864
Root MSE	=	.72444

zz_shrui	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interval*]	
zz_inpea	-.0055547	.0002073	-26.797	0.000	-.0059611	-.0051484
_cons	.8001751	.0148165	54.006	0.000	.7711306	.8292195

Source: Bank staff calculations.

TABLE A3-23. LATVIA: HOUSEHOLD SURVEY 1997
REGRESSION OF SHARE OF UTILITIES IN TOTAL HOUSEHOLD EXPENDITURE ON HOUSEHOLD PER EQUIVALENT ADULT EXPENDITURE

fit	*zz_shrue*		*zz_expea*				
Source	*SS*	*df*	*MS*		Number of obs	=	7704
					F (1, 7702)	=	1299.42
Model	28.3191217	1	28.3191217		Prob>F	=	0.0000
Residual	167.855359	7702	.021793737		R-squared	=	0.1444
					Adj. R-squared	=	0.1442
Total	196.174481	7703	.025467283		Root MSE	=	.14763
zz_shrue	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interval*]		
zz_expea	-.0015165	.0000421	-36.047	0.000	-.001599	-.001434	
_cons	.4168721	.003319	125.601	0.000	.4103659	.4233782	

Source: Bank staff calculations.

TABLE A3-24. HUNGARY: REGRESSION OF HOUSEHOLD EXPENDITURE ON HOUSEHOLD INCOME

Source	*SS*	*df*	*MS*		Number of obs	=	7560
					F (1, 7558)	=	7595.22
Model	5.8030e+14	1	5.8030e+14		Prob>F	=	0.0000
Residual	5.7746e+14	7558	7.6403e+10		R-squared	=	0.5012
					Adj. R-squared	=	0.5012
Total	1.1578e+15	7559	1.5316e+11		Root MSE	=	2.8e+05
hh expend	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interval*]		
hh income	.7022839	.0080583	87.151	0.000	.6864875	.7180804	
_cons	148110.1	6351.204	23.320	0.000	135660	160560.2	

Source: Bank staff calculations.

TABLE A3-25. LATVIA: REGRESSION OF HOUSEHOLD EXPENDITURE ON HOUSEHOLD INCOME

Source	*SS*	*df*	*MS*		Number of obs	=	7707
					F (1, 7558)	=	3958.07
Model	24654648.6	1	24654648.6		Prob>F	=	0.0000
Residual	47994139.1	7705	6228.9603		R-squared	=	0.3394
					Adj. R-squared	=	0.3393
Total	72648787.8	7706	9427.56135		Root MSE	=	78.924
x total	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interval*]		
totinc	.5651015	.0089822	62.913	0.000	.5474938	.5827091	
_cons	73.58304	1.434549	51.294	0.000	70.77094	76.39515	

Source: Bank staff calculations.

TABLE A3-26. UKRAINE: REGRESSION FOR HOUSEHOLD EXPENDITURE ON HOUSEHOLD INCOME

HH exp = a+b* HH income

Summary Output

Regression Statistics

Multiple R	0.487721
R Square	0.237872
Adjusted R	0.236018
Standard E	18470.37
Observation	413

ANOVA	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	1	4.38E+10	4.38E+10	128.2795	4.57E-26
Residual	411	1.4E+11	3.41E+08		
Total	412	1.84E+11			

	Coefficient	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	17175.78	1196.007	14.36094	3.45E-38	14824.73	19526.84
X Variable	0.222964	0.019686	11.32606	4.57E-26	0.184266	0.261662

Source: Bank staff calculations.

TABLE A-3-27. HUNGARY: HOUSEHOLD SURVEY 1997
REGRESSION OF SHARE OF UTILITY EXPENDITURE IN TOTAL HOUSEHOLD INCOME
ON HOUSEHOLD PER EQUIVALENT ADULT INCOME

fit zz_shuin zz_inpea

Source	*SS*	*df*	*MS*		
				Number of obs	= 7560
				F (1, 7558)	= 10.47
Model	1.46038194	1	1.46038194	Prob>F	= 0.0012
Residual	1054.35477	7558	.139501822	R-squared	= 0.0014
				Adj. R-squared	= 0.0013
Total	1055.81516	7559	.139676565	Root MSE	= .3735

zz_shuin	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interva1*]	
zz_inpea	-9.20e-08	2.84e-08	-3.236	0.001	-1.48e-07	-3.63e-08
_cons	.0473854	.0105771	4.480	0.000	.0266513	.0681194

Source: Bank staff calculations.

TABLE A3-28. HUNGARY: HOUSEHOLD SURVEY 1997
REGRESSION OF SHARE OF UTILITY EXPENDITURE IN TOTAL HOUSEHOLD EXPENDITURE
ON HOUSEHOLD PER EQUIVALENT ADULT EXPENDITURE

fit zz_shuex zz_w

Source	*SS*	*df*	*MS*		
				Number of obs	= 7560
				F (1, 7558)	= 101.43
Model	.00644649	1	.00644649	Prob>F	= 0.0000
Residual	.480344924	7558	.000063555	R-squared	= 0.0132
				Adj. R-squared	= 0.0131
Total	.486791414	7559	.000064399	Root MSE	= .00797

zz_shuex	*Coef.*	*Std. Err.*	*t*	*P>|t|*	[*95% Conf. Interval*]	
zz_w	-5.88e-08	5.84e-09	-10.071	0.000	-7.02e-08	-4.73e-08
_cons	.0127693	.0001783	71.624	0.000	.0124198	.0131188

Source: Bank staff calculations.

TABLE A3-29. KYRGYZ REPUBLIC: BURDEN LIMIT SCENARIOS BURDEN LIMIT EQUALS 23% OF HOUSEHOLD INCOME. FOR UTILITY BILL CALCULATION THE FORMULA THAT IS UTILIZED BY HOUSING ALLOWANCE PROGRAM IN BISHKEK WAS USED.[a]

			Total Rent and Utility Subsidy for all Surveyed Households	
Poverty Groups	*Mean Rent and Utility Subsidy, som*	*Number of Households*	*som*	*%*
Non-poor	764.0	296,595	226,605,508.5	81.3
Poor	1162.9	44,744	52,031,941.2	18.7
Total	816.3	341,339	278,637,449.7	100.0

[a] Subsidy = utility bill - (burden limit rate x total household income).
Utility bill in this case is calculated using Housing Allowance Program formula and consists of norm-based expenditures on district heat, gas, cold water, hot water, maintenance, and refuse.

TABLE A3-30. KYRGYZ REPUBLIC: BURDEN LIMIT SCENARIOS BURDEN LIMIT EQUALS 23% OF HOUSEHOLD INCOME. FOR UTILITY BILL CALCULATION THE FORMULA THAT IS UTILIZED BY HOUSING ALLOWANCE PROGRAM IN BISHKEK WAS USED WITH MODIFICATIONS[a]

			Total Rent and Utility Subsidy for all Surveyed Households	
Poverty Groups	*Mean Rent and Utility Subsidy, som*	*Number of Households*	*som*	*%*
Non-poor	547.8	296,595	162,488,276.4	82.2
Poor	787.4	44,744	35,232,156.7	17.8
Total	579.2	341,339	197,720,433.1	100.0

Household Energy Survey, 1999.
[a] Subsidy = utility bill - (burden limit rate x total household income).
Utility bill in this case consists of the same list of expenditures as used by Housing Allowance Program for subsidy eligibility formula, but calculated in a different way. The difference is that expenses on district heat and gas are not based on norms. These are actual expenses reported by the household for the survey. Expenditures on cold water, hot water, maintenance, and refuse are calculated using the same norm-based formula that is utilized by Housing Allowance Program.

TABLE A3-31. KYRGYZ REPUBLIC: BURDEN LIMIT SCENARIOS
BURDEN LIMIT EQUALS 23% OF HOUSEHOLD INCOME. FOR UTILITY BILL CALCULATION THE FORMULA THAT IS UTILIZED BY HOUSING ALLOWANCE PROGRAM IN BISHKEK WAS USED WITH MODIFICATIONS. [a]

Poverty Groups	*Mean Rent and Utility Subsidy, som*	*Number of Households*	*Total Rent and Utility Subsidy for all Surveyed Households*	
			som	*%*
Non-poor	767.9	296,595	227,760,878.3	83.3
Poor	1017.9	44,744	45,543,644.7	16.7
Total	800.7	341,339	273,304,523.1	100.0

Household Energy Survey, 1999.
[a] Subsidy = utility bill - (burden limit rate x total household income).
The formula used for utility bill calculation is similar to Housing Allowance Program's subsidy eligibility formula. However, there are two differences: electricity expenditure is added to the list and expenses on electricity, district heat, and gas are not based on norms. These are actual expenses reported by the household for the survey. Expenditures on cold water, hot water, maintenance, and refuse are calculated using the same norm-based formula that is utilized by Housing Allowance Program.

TABLE A3-32. KYRGYZ REPUBLIC: BURDEN LIMIT SCENARIOS
BURDEN LIMIT EQUALS 45% OF HOUSEHOLD INCOME. FOR UTILITY BILL CALCULATION THE FORMULA THAT IS UTILIZED BY HOUSING ALLOWANCE PROGRAM IN BISHKEK WAS USED. [a]

Poverty Groups	*Mean Rent and Utility Subsidy, som*	*Number of Households*	*Total Rent and Utility Subsidy for all Surveyed Households*	
			som	*%*
Non-poor	329.6	296,595	97,765,307.3	78.1
Poor	614.1	44,744	27,477,276.2	21.9
Total	366.9	341,339	125,242,583.5	100.0

Household Energy Survey, 1999.
[a] Subsidy = utility bill – (burden limit rate X total household income).
Utility bill in this case is calculated using Housing Allowance Program formula and consists of norm-based expenditures on district heat, gas, cold water, hot water, maintenance, and refuse.

TABLE A3-33. UKRAINE: COVERAGE OF POPULATION BY RENT AND UTILITY SUBSIDY UNDER DIFFERENT BURDEN LIMIT SCENARIOS, % OF HOUSEHOLDS

	Burden Limit			
Poverty Groups	*15%*	*25%*	*35%*	*45%*
Above poverty line	43%	41%	36%	31%
Below poverty line	58%	55%	47%	42%
Total	47%	45%	40%	34%

Source: Household Survey, 1996.

TABLE A3-34. LATVIA: ELIGIBILITY FOR RENT AND UTILITY SUBSIDIES BY POVERTY GROUPS

Poverty Groups	*Total Number of Households*	*Number of Households Eligible for Subsidies*	*Coverage of Households by Subsidies*
Non-poor	538,198.0	202,248.0	37.6
Poor	140,163.0	80,427.0	57.4
Total	678,361.0	282,675.0	41.7

Source: Household Survey, 1997.

TABLE A3-35. LATVIA: RENT AND UTILITY SUBSIDIES BY POVERTY GROUPS

				Total Rent and Utility Subsidy for all Surveyed Households	
Poverty Groups	*Mean Household Income*	*Mean Rent and Utility Subsidy*	*Number of Households*	*LATS*	*%*
Non-poor	114.3	14.2	538,198.0	7,653,374.7	66.7
Poor	80.0	27.2	140,163.0	3,818,546.1	33.3
Total	107.9	16.9	678.361.0	11,471,925.7	100.0

Source: Household Survey, 1997.

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