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Quasi-Fiscal Activity in the Energy Sector in Belarus

Summary

By maintaining administratively set prices in the energy sector at levels below the recovery cost, tolerance to low bill collection rates and excessive operational loses (including theft) the many CIS countries implicitly subsidize domestic energy users. Such indirect subsidy schemes are termed "quasi-fiscal activities" (QFA). This paper aims to produce the estimation of the QFA in the Belarusian energy sector.

The main finding of the paper is that in 2006 QFAs in the energy sector were sizable and reached 3.7–4.7% of GDP, mainly due to mispricing in the electricity sector. Taking into consideration that after the gas price hike in 2007 the cross-subsidization in electricity went up; a further increase in QFAs in 2007 is most likely.

QFAs undermine macroeconomic stability and represent an obstacle for Belarusian energy sector development. While the sector faces problems related to aging industrial capacities, the existing tariff schemes do not ensure proper infrastructure investment incentives. On the other hand, elimination of the QFAs critically depends on a comprehensive energy sector reforms that should be put at the centre of the national reform agenda.

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1. Introduction

The energy sector in Belarus is characterised by slow progress in reforms, domination of vertically integrated state-owned monopolies with weak corporate governance structures and the lack of an independent regulator. By maintaining administratively set prices of natural gas and electricity for some domestic users, i.e. agriculture and households at levels that do not recover full cost, authorities implicitly subsidize them. Such government-sponsored subsidy schemes coupled with tolerating non payment for consumed energy and excessive losses or theft can be described as quasi-fiscal activities (QFA) in the energy sector.

QFA not only cause inefficiencies in the sector but may also undermine macroeconomic stability. Belarus' energy sector faces problems related to aging industrial capacities, while existing tariff schemes do not ensure proper infrastructure investment incentives. Moreover, administrative energy prices are major obstacles for private investment in the energy sector. Furthermore, QFA leads to overconsumption and waste of resources, which result in high energy-intensity of the economy. It hampers efficient resource allocation by supporting loss-making enterprises and taking away public resources from priority needs. QFA is an obstacle on the way of structural changes of the economy as it cuts the incentives to restructure for companies.

The analysis is organised as follows. Section 2 comprises conceptual and methodological issues related to QFA in the energy sector and major mechanisms by which the energy sector fulfils its quasi-fiscal role. Section 3 produces the estimation of QFA in Belarus. Section 4 discusses macroeconomic implications of QFA. Section 5 concludes.

2. Quasi-Fiscal Activity in the Energy Sector: Methodological Issue

The concept of quasi-fiscal activity (QFA) was put forward in the IMF policy papers and refers to operations that "could in principal be duplicated by specific budgetary measures in the form of an explicit tax, subsidy, or other direct expenditure".[1] IMF *Manual on Fiscal Transparency* defines QFA as operations that result in a net transfer of public resources through nonbudget channels.[2]

The most extensively researched QFAs are those conducted by financial institutions, while other activities including those in the energy sector have been less intensively investigated. This is partly due to the unavailability and inaccuracy of the data required for quantitative analysis. However, quasi-fiscal activities in the energy sector are widespread in transition and some developing countries. In Belarus, as in any other CIS country, energy pricing inherited from the soviet past; where prices did not reflect cost but were set to attain certain social goals such as affordability of energy for households or the survival of (often inefficient) companies.[3]

In the energy sector different practices of QFAs can be identified[4]: setting tariffs below cost recovery level, tolerate the build-up of arrears to energy companies as a result of non-payments or payments are not being made in full, excessive losses or theft, non-cash payments and government guaranteed borrowing. The estimation of each of these subcomponents is challenging due to lack of information, reluctance of state-owned energy enterprises to provide the necessary data (insisting that those are commercially sensitive), non-use of generally accepted accounting principles, etc.

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[1] Mackenzie, G.A., Stella, P. (1996). Quasi-Fiscal Operations of Public Financial Institutions. *IMF Occasional Paper* No. 142.

[2] IMF (2001). *Manual on Fiscal Transparency*, Washington: International Monetary Fund.

[3] IMF, et al. (1991). *A Study of the Soviet Economy*, Vol. 3, Paris: OECD.

[4] Petri, M., Taube, G., and Tsyvinski, A. (2002). Energy Sector Quasi-Fiscal Activities in the Countries of the Former Soviet Union. I*MF Working Paper*. WP/02/60.

There are two ways to evaluate QFAs in the energy sector[5], the end product and the financial balance approach.

2.1. End-Product Approach

a) Mispricing

If governments in the CIS countries maintain administratively set prices of natural gas or electricity at levels below cost the energy supply companies subsidize the consumers with:

$$QFP = (P - P_A)*V, \tag{1}$$

where QFP is the quasi-fiscal activity on account of mispricing; P – the cost-recovery tariff; P_A – the actual tariff; and V – the output of electricity or gas. (Assuming that the market clearing volume at cost recovering prices is lower (i.e., volumes are price-elastic) and that unit-production cost increase with volume (i.e., increasing marginal cost), the loss of the energy supply companies exceeds QFP.)

b) Arrears

If end-users of gas or electricity do not pay the revenue losses of energy companies equals:

$$QFR = (1 - R)*P_A*V, \tag{2}$$

where R is payment collection ratio, that range from 0 to 1.

c) Excessive losses and theft

Revenue losses due to mispricing and toleration of low bill collection result in inefficiencies on the supply side (poor maintenance, technical problems in transmission and distribution, inadequate metering or billing practices, etc.). Consequently technical energy losses exceed the "normative"[6] level. The extent of **excessive losses** can be estimated by comparing total losses (including normative and excessive) with the loss-factors that would be normally expected, e.g. estimates from countries with competitive energy sectors.

$$QFL = V*((L - L_N)/100) \text{ or}$$
$$QFL = V*((L - L_B)/100) \tag{3}$$

where L denotes total losses L_N is normative losses, L_B – benchmark losses (market economy estimations). Losses are estimated as a percentage of production.

In sum, total quasi-fiscal activity equals:

$$QFA = QFP + QFR + QFL \tag{4}$$

2.2. Financial Balance Approach

If actual revenues of an energy company are insufficient to cover its expenses, and if it does neither obtains explicit subsidies from the state budget nor has sufficient access to the capital market, one alternative might be running arrears.

Payment arrears relate to delayed or incomplete input payments:

$$AQ = (1 - R_Q)*Q \tag{5}$$

where Q is total amount that has to be paid for inputs; R_Q – inputs payment ratio that range from 1 to 0.

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[5] Petri, M., Taube, G., and Tsyvinski, A. (2002). Energy Sector Quasi-Fiscal Activities in the Countries of the Former Soviet Union. *IMF Working Paper*. WP/02/60.
[6] "Normative" losses are technical waste of production due to transformation leakage.

In the case of partial payment of taxes, energy enterprises' *tax arrears* are equal to:

$$AT = (1 - R_T)*T \qquad (6)$$

where T is total amount of taxes that need to be paid, R_T – ratio of tax payment that range from 1 to 0.

Future generation arrears or underinvestment into maintenance and replacement of fixed assets or capacity expansion are as follows:

$$A_I = (1 - R_I)*I \qquad (7)$$

where I denotes necessary amount of investments, R_I – ratio relation between needed and actual investments that that range from 1 to 0.

Mispricing of inputs in the case when such inputs are energy products (e.g. petroleum) is considered by Petri, Taube, and Tsyvinski (2002) as another subcomponent of QFAs, while Tchaidze (2007) does not take it into account :

$$MPI = QEI * (P_{MI} - P_{AI}) \qquad (8)$$

where QEI is quantity of energy used as an input, P_{MI} – the market or cost recovery input price, P_{AI} – the actual input price.

Total quasi-fiscal activity equals:

$$QFA = MPI + A_Q + A_T + A_I. \qquad (9)$$

The unavailability of data on financial accounts of energy enterprises, does not allow us to estimate QFAs in the Belarusian energy sector using financial balance approach, therefore, in calculations we utilizes the methodology that bases on end-product approach.

It should be noted that the quasi-fiscal activity concept differs from the quasi-fiscal deficit (QDF). The later is the losses incurred by quasi-fiscal activities.[7] For example, in the case of cross subsidization QFA may be larger than QDF or they can offset each other. The quasi-fiscal deficit will be equal to zero, if in the country electricity or gas are sold to households at prices below cost-recovery level, while prices for industrial consumers exceed this level, and are sufficiently high to cover the difference between the hypothetical value of domestically sold energy products for households valued at the cost recovery prices and the actually collected revenue. However, it would be QFAs amount to implicit quasi-fiscal subsidy to population. There also might be a situation when quasi-fiscal subsidy to households is equal to QDF, or quasi-fiscal deficit is smaller than QFAs.[8] For reasons of data availability this paper limits its scope to the assessment of QFA rather than QFD.

3. Estimation of the Quasi-Fiscal Activity in the Energy Sector in Belarus

In general, the energy sector includes the electricity, gas, oil, coal and parts of the utilities (e.g. district heating) sector. For reasons of data availability this paper limits its scope to the electricity, the gas and the heating sector.

This section estimates the QFAs based on the end-product approach and taking into account that there are no reliable estimations on cost recovery prices and non-payment rates in the heating sector.

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[7]Le Houerou, P., Sierra, H. (1993). Estimating Quasi-Fiscal Deficit in a Consistency Framework: The Case of Madagascar. WB Working Paper. WP 1105
[8] Petri, M., Taube, G., and Tsyvinski, A. (2002). Energy Sector Quasi-Fiscal Activities in the Countries of the Former Soviet Union. IMF Working Paper. WP/02/60.

3.1. Electricity sector Quasi-Fiscal Activity

Mispricing

The assessment of mispricing critically depends on estimating reliable cost recovery prices. Petri, Taube, and Tsyvinski (2002) pointed out that "in the case of natural gas and electricity, estimating mispricing is necessarily subject to great uncertainty and judgment, as any quantitative analysis is based on hypothetical benchmark prices. The results of such analyses tend to be quite sensitive to change in these bench- marks". For example, the Belarusian Ministry of Energy and the Ministry of Economy made different estimations of the level of cost coverage for households in the energy sector. According to Belarusian Ministry of Economy assessments, in January 2007 the cost coverage ratio for natural gas was 157%, whereas the Ministry of Energy consid- ered that it was 115%. Such discrepancy was observed in evaluations of energy tariffs for electricity as well. The Ministry of Energy assessed the tariffs for households 7% below the cost recovery level, while the Ministry of Economy estimated the level of coverage at 115%.

In the case of electricity we use the cost recovery level provided by the Ministry of Energy for all users (Table 1). Yet, it should be noted that cost recovery levels for consumer groups differ, e.g. transmission and distribution cost for industrial users that are often connected to the high-voltage grid are significantly lower than those for households connected to low voltage distribution grids. However such detailed cost recovery estimations for different Belarusian groups of electricity users are not avail- able. In addition, cost recovery level used in the assessment of QFA does not include the reproduction of capital. Therefore, the estimates of the prices necessary to re- cover electricity supply cost are systematically below long-run marginal cost (LRMC).

**Table 1: Electricity production costs and prices
for different groups of consumers (US cents per kWh)**

	As of Jan 2003	As of Jan 2004	As of Jan 2005	As of Jan 2006	Since Jan 2007	Since July 2007
Costs	2.32	3.21	3.50	4.40	5.86	n/a
Prices for:						
State financed organizations	3.00	4.02	4.02	4.90	7.15	10.2
Industry	4.41	6.02	6.02	6.70	9.21	8.91[9] (weighted average)
Households	2.39	3.32	3.45	4.09	5.23	5.23
Agriculture	2.44	2.66	2.66	2.90	4.32	5.18
Other enterprises	4.41	6.02	6.02	6.70	9.21	--

Source: The Ministry of Energy.

We compare the actual price paid by different consumer groups with the cost recovery level estimated by the Ministry of Energy. Table 1 show that the residential tariff and the tariff for agricultural producers were cross-subsidized by higher industrial tariff. However, according to the WB estimations and current practice of several OECD coun- tries, where prices reflect the relative costs of supply, average residential electricity prices should be about twice the level paid by industrial consumers (Table 2).

In Belarus the ratio of household tariff to industrial tariff in electricity was 58%, while in 2007 the situation even worsen and the household electricity price was 50 percent or less of the industrial average (Table 3). According EBRD estimations, to cover the Long Run Marginal Cost (LRMC) of production, electricity bills would need to increase to 6.6 % of household income. In 2006 the share of utility bills in the overall expendi- tures of Belarusian households was around 6%, and it decreased to 5% in 2007.

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[9] The electricity tariff for industrial consumers that use high voltage grids (above 750kVA) is 8.68 US cents per kWh, while those who use grids below 750kVA is 10.2 US cents per kWh. Therefore, the weighted average tariff in the industry is 8.91 US cents per kWh

Table 2: Retail Energy Prices in Selected Countries (USD/unit)

	Nat Gas for Industry (107 kcal GCV(e))	Nat Gas for Households (107 kcal GCV(e))	Electricity for Industry (kWh)	Electricity for House-holds (kWh)
Austria	--	902.90	0.13	0.20
Czech Republic	366.34	531.09	0.11	0.14
Denmark	--	1270.76	0.08	0.32
Finland	251.56	361.19	0.08	0.14
France	393.69	751.77	0.05	0.15
Germany	--	--	0.08	0.21
Greece	379.06	604.68	0.07	0.11
Hungary	535.60	585.01	0.13	0.17
Ireland	--	863.17	0.15	0.23
Japan	401.53	1245.56	0.12	0.19
Netherlands	227.77	1 015.82	--	0.27
Norway	--	--	0.06	0.12
Poland	337.45	577.20	0.08	0.13
Portugal	425.81	1 022.39	0.12	0.20
Slovak Republic	398.25	618.77	0.13	0.17
Spain	373.18	840.73	0.09	0.16
Switzerland	566.75	850.61	0.08	0.13
United Kingdom	379.48	801.12	0.13	0.22
United States	304.93	464.33	0.06	0.10

Note. Data provided for the 1st quarter 2007.
Source: Key World Energy Statistics, IEA 2007.

Table 3: Ratio of Household Tariff to Industrial Tariff for Electricity and Gas

Sector	2002	2003	2004	2005	2006	2007
Gas	0.51	1.03	0.79	0.80	0.80	0.78
Electricity	0.34	0.76	0.61	0.58	0.58	0.49

Source: World Bank (2006), own estimations.

Hence, in 2006 industrial users, who had a tariff well above cost recovery level, paid implicit tax and cross-subsidized retail users and agriculture. In their turn, according to our estimation households received a quasi-fiscal subsidy equal to 0.9% of GDP, while for agriculture it was 0.6% of GDP. Therefore gross QFA in the electricity sector due to mispricing was 1.5% of GDP. However, according to data from the Ministry of Energy the cost recovery level in electricity was 4.45 US cents in 2006 while average tariff amounted 4.12 US cents. In this case the QFA related to mispricing of electricity was even higher (2.5% of GDP).

Arrears

In Belarus the payment discipline improved over the past years and in 2006 collection rate reached 100.3% (consumers paid back part of the previous year's debts), eliminating QFAs in the electricity sector. However, despite the progress in collection of current bills, the electricity sector faces a problem of past arrears (Table 4) that amounted to 0.6% of GDP in 2006. The main debtors of Belenergo are the companies of the Ministry of Agriculture (accounting for 62% of all debts to Belenergo).

Table 4: Debts for electricity consumption (USD mln)

	As of January 1, 2003	As of January 1, 2004	As of January 1, 2005	As of January 1, 2006	As of January 1, 2007
Total, including	812.60	721.38	331.48	293.92	222.52
Domestic consumers	758.59	692.25	328.62	293.92	222.52
Foreign consumers	54.01	29.13	2.86	--	--

Source: The Ministry of Statistics and Analysis.

Losses, including theft

According to Belenergo's Annual Reports the level of losses in 2006–2007 was around 11.2% mainly due to commercial losses and inappropriate billing practice (weakness in billing coverage), the absence of meters for measuring actual consumption. Since the data for 2006 is not available, we assume the same level of losses, as there was no information indicating that the situation has been considerably improved. The

benchmark level of losses (around 8%[10]) has been taken from OECD countries that have competitive electricity sectors. By comparing the level of losses in Belarus with this benchmark level we estimated the extent of excessive technical and commercial losses and the scope of related QFAs, which appeared to be around 0.24% of GDP.

3.2. Gas sector Quasi-Fiscal Activity

Mispricing

According to data provided by the Ministry of Energy in the gas sector the main source of mispricing was liquefied gas, the price for which was set 30% below cost recovery level. Therefore, we estimated QFAs from gas mispricing at 0.1% of GDP. In addition, some preferential prices at a level of about 50–80% of the official price were kept for some selected enterprises (Belenergo, some state plants of chemistry, peat, light, porcelain and other industries).[11] However, due to the lack of data the scope of such QFAs are difficult to measure.

Arrears

The same as in the electricity sector in 2006 the bill collection in gas sector was 100% and the arrears mainly related to debts accumulated in past periods (table 5). These cumulative arrears were equal to 3.5% of GDP in 2006.

Table 5: Arrears for natural gas (USD mln)

	As of January 1, 2003	As of January 1, 2004	As of January 1, 2005	As of January 1, 2006	As of January 1, 2007
Total, including	874.11	708.16	248.66	186.05	131.03
Arrears of domestic consumers	774.63	594.48	247.51	186.05	131.03
External consumers	99.48	113.68	--	--	--

Source: The Ministry of Statistics and Analysis.

3.3. Heating sector Quasi-Fiscal Activity

Mispricing

For the purpose of this study we use the cost recovery estimates provided by the Ministry of Energy. On average the price for heating was only 72% of cost recovery level and brought about QFA of 1% of GDP.

Losses

Officially declared level of losses in the heating network was around 9.9%, while some experts insisted that it was considerably higher. According to some sources losses in distribution amounted to 15–25% of heat supply, compared with 5% in Western European systems. We use the official level of losses for estimation of QFA, which was 0.3% of GDP in 2006.

The analysis has shown that QFAs in the energy sector was sizable and reached 3.1–4.1% of GDP in 2006[12], mainly caused by mispricing in the electricity sector (Table 6). Taking into consideration that after the gas price hike in 2007 the cross-subsidization in electricity went up, a further increase in QFAs is most likely.

Table 6: Quasi-Fiscal Activity in the Belarusian Energy Sector (% of GDP)

	Mispricing	Arrears	Losses	Total
Electricity	1.5–2.5	--	0.24	1.74–2.74
Gas	0.1	--	n/a	0.1
Heating	1.0	n/a	0.3	1.3
Total QFA	2.6–3.6	--	0.54	**3.14–4.14**

Source: own estimations.

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[10] International Energy Agency.
[11] IPM research Center (2007). *Belarusian Infrastructure Monitoring*, www.research.by.
[12] In 2005 the World Bank estimated QFA in electricity and gas sector at around 0.5% of GDP. See: World Bank (2006). *Belarus: Addressing Challenges Facing the Energy Sector*.

4. Macroeconomic implications of QFAs

Affecting the real and the financial side of economy, QFAs may have significant macroeconomic implications. Inadequate prices on energy products cut the incentives for their efficient use and lead to wasteful consumption. As a result the energy intensity of the Belarusian economy is very high by international standards.[13]

Improper energy prices do not send the correct signals to enterprises undermining their incentives to restructure. Implicit subsidies provided through mispricing support loss-making enterprises and thus take away public resources from priority needs. On the other hand, maintaining administratively set energy prices at the level that does not offset the recovery costs result in underinvestments and depletion of the capital stock in the energy sector.

Cross subsidization, such as setting energy prices below-cost recovery level for households, at the expense of industrial consumers (who pay higher tariffs) distorts the price structure in the whole and erodes competitiveness of enterprises in external markets. In addition, since such quasi-fiscal subsidy to population is untargeted it disguises governments' social policies. Yet, QFAs in the energy sector are quite inefficient instrument of social policy as well-off households, which consume more energy and utility services, receive more benefits from subsidization.[14]

If end-users do not pay for gas and electricity the energy sector enterprises can start to run arrears on their obligations towards their suppliers and budget (tax authorities), and finally get involved into mutual arrears. In that case, the government will have to provide loans or subsidies to the energy enterprises, which may result in high rates of inflation.

Subsidies, that government may have to extend to the energy sector in order to resolve the problem with payment arrears and heavy debt accumulation would typically increase the vulnerability of the budget. Besides, budget revenues and fiscal stance can be negatively affected by tax arrears of the energy sector, e.g. after the import gas price hike in Ukraine, the tax arrears of Naftogaz (which was not allowed to immediately raise consumer prices) amounted to 1 percent of GDP in 2006.[15]

In general, QFAs in the energy sector bring about intransparency and distort the picture of the government's true fiscal position, which may cause inappropriate fiscal policies.

Energy subsidies can be financed by accumulating external state debt, thus worsening the external sustainability position and possibly impeding access to international capital markets. For example, after gas price hike in 2007 Belarusian government approached Russia several times with the request of USD 1.5 bn loan for stabilization purpose.

There are some other adverse effects of QFAs worth to be mentioned, e.g. poor maintenance, technical problems in transmission and distribution are dangerous for environment and may end up with ecological catastrophe; toleration of arrears can result in spreading of nonpayment practice to other areas and can create moral hazard problems, poor quality of the energy and utility system decrease the living standards of population.[16]

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[13] Tochitskaya, I. (2006). The Macroeconomic Impact of Gas Price Increase in Belarus: Quantitative Assessment, PP/10/06, IPM Research Center, www.research.by.

[14] See, Freinkman, L., Gyulumyan, G., and Kyurumyan, A. (2003). Quasi-Fiscal Activities, Hidden Government Subsidies, and Fiscal Agenda in Armenia, *World Bank Working paper*, 16, Washington, DC.

[15] IMF (2007). Ukraine Selected Issues, *IMF Country Report* No. 07/47.

[16] Freinkman, L., Gyulumyan, G., and Kyurumyan, A. (2003). Quasi-Fiscal Activities, Hidden Government Subsidies, and Fiscal Agenda in Armenia, *World Bank Working paper*, 16, Washington, DC.

5. Conclusions

The estimation has shown that QFAs in the energy sector was sizable and reached 3.1–4.1% of GDP in 2006. The significant increases in prices of natural gas sold by Gazprom to Belarus in 2007 posed new challenges to domestic energy market. The reluctance to pass through all the increases to final consumers meant that most likely, Belarus will also face expansion of QFAs mainly on account of mispricing and increase in cross subsidization not only between households and industrial consumers but within industry by formation of the privileged group of enterprises that buy energy or gas at the below-cost recovery prices. In addition, taking into consideration that nowadays the depreciation of capital assets in the energy sector is more than 64%, mispricing will hamper the renovation of fixed assets and inevitably will result in higher excessive losses.

QFAs turned to be a very serious problem on both, macro and micro levels. On macro level it hampered and distorted financial flows and macroeconomic stability, posing an additional burden on the budgets and in some cases leading to rising foreign indebtedness. On the micro level the energy sector in Belarus needs considerable investments, and private sector is not eager to come due to state price regulations. Energy sector deficit was financed primary through direct government' subsidies, default on payables, the depletion of existing energy sector assets, and poor quality of service to customers.

QFAs remain to be an obstacle for the Belarusian energy sector development. On the other hand, limited progress in the energy sector reforms result in the instability of the top-down trend to reduce or eliminate QFAs, which therefore might easily be reversed. As it was shown by the Ukraine experience, an external energy shock in the form of increased gas prices resulted in the expansion of mispricing practice and increasing toleration of arrears that together led to an increase in QFAs. Thus, elimination of the QFAs critically depend on energy sector reforms that should be put at the centre of overall reform agenda.

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