NATIONAL RESEARCH UNIVERSITY
HIGHER SCHOOL OF ECONOMICS

Vladimir Kossov

PRICE SCISSORS AS A DANGEROUS GAP BETWEEN THE PRICE PROJECTIONS OF SUPPLY AND DEMAND

BASIC RESEARCH PROGRAM
WORKING PAPERS

SERIES: MANAGEMENT
WP BRP 46/MAN/2015

Vladimir Kossov[1]

PRICE SCISSORS AS A DANGEROUS GAP BETWEEN THE PRICE PROJECTIONS OF SUPPLY AND DEMAND.[2]

THE CASE OF FORECAST FOR ELECTRICITY PRICE THROUGH 2020 IN RUSSIA.[3]

The forecast of commodity prices for the upcoming years yields two different prices: one for the producer (seller) and another for the consumer (buyer).

Usually, an imperfect market gap between these two prices is not accidental.

Strong differences between the views of buyers and sellers are analogous to a dialogue between the deaf and the blind. Thus, a third party, such as the government, is required in order to facilitate communication between the two parties

JEL Classification: D4; H2; L5

Keywords: producer and seller price forecast; producer (seller) price – supply side; consumer (buyer) price – demand side

[1] Professor at Higher School of Economics National Research University, Moscow, Russia, e-mail: kossov3@yandex.ru

[2] This Working Paper is an output of a research project implemented at the National Research University Higher School of Economics (HSE). Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE

[3] Author thank professors of HSE I. Gurkov for advice in the preparation of paper and N.Filinov for polishing text

INTRODUCTION

Qualitive differences between two forecasts of prices are a consequence of the market imperfection whereby the state is unopposed to the monopolistic behavior of sellers, such as electricity suppliers. The term “price scissors” is borrowed from Russian history; in 1923, there was a widening gap between industrial and agricultural prices that led peasants to stop selling their produce and revert to subsistence farming. In this article, the “price scissors” refers to preventing future significant gaps between the forecasts of producer and consumer prices. Price scissors refers to an intentional excess in the supply price forecast compared to the demand price forecast. It highlights an incompatibility with regard to electricity price expectations between buyers and sellers. In Figure 1, the open markers designate the forecasted electricity prices of the seller (A0) and the buyer (B0), whereas the solid markers designate three-sigma (3σ) deviations from these forecasts. A1 represents the seller price and B1 the buyer price. In terms of price bounds, A1 can be considered a lower bound for the sellers’ price forecast, and B1 the upper bound for the buyer’s price forecast. An angle between prices A1-O-B1, if it exists, will be called the “price scissors.”

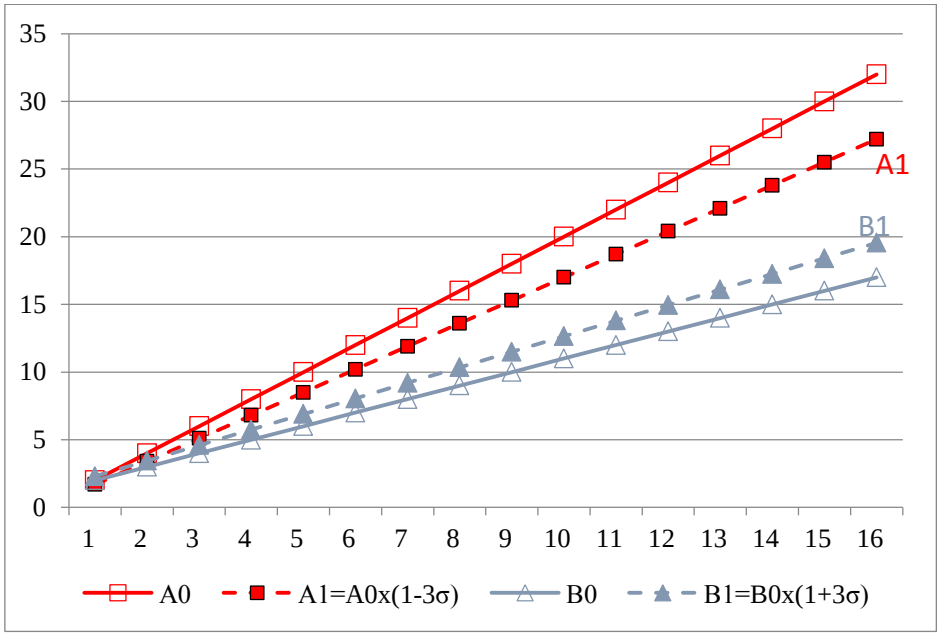

Fig. 1 The price scissors A1-O-B1

In future years, these two price forecasts should form a pair and reflect two different ideas about the prices, given the same assumptions about the state of the economy. At the time of the transaction between the two parties, the prices were equalizing. However, differences persist in predicting prices. In many cases, the market can eliminate the gap between prices. If the price gap is not random, then authorities should intervene to reduce this gap to an acceptable level. After government intervention, the market can return to internally correcting market

irregularities. Focusing on the electricity market, this article aims to identify qualitive gaps between prices of supply and demand.

Note that this paper uses certain words interchangeably to refer to the price of goods. “Producer” and “seller” are used to refer to the supply side, and “consumer” and “buyer” are used to refer to the demand side.

2. Price forecasts

2.1 Price forecast for the seller

The seller prices for electricity forecasted to 2020 are taken from the website of the CJSC «Energy Forecasting Agency» (EFA). The EFA is owned by Federal Grid Company, a natural monopoly. Moreover, the EFA has published two seller price forecasts - a basic forecast in 2009 and an adjusted forecast in 2011-as well as the conditions under which these prices were calculated. In 2009, the estimated electricity price for 2020 was 15.8 U.S. cents per kWh. In the 2011 forecast, this price was lowered to 12.0 US cents per kWh. It should be emphasized that for forecasts of demand price to the 2020 were used macroeconomic conditions and assumptions about oil prices made in the year 2009 (EFA 2012). For the remainder of the document, Prod refers to the forecasted producer price, which can be specific to the forecast year (e.g., Prod 2009 and Prod 2011).

2.2 Price forecast for the buyer

The forecast for the buyer price is based on a theory set out in Kossov (2005). This theory breaks down the price of goods into two parts: international and national. The international part defines “the normal price.” Normal prices accounts according to the same rules for all countries. The second (national) part defines prices based on the peculiarities of individual countries. For every country national part is the difference between actual and normal prices. For instance, Kazakhstan, Russia (until 2008), and the United States (between 1997 to 2010) are examples of countries with power plants operating on national (i.e., not imported) fuel that have seen their buyer prices fall below the normal price. On the other hand, countries that import fuel, such as Italy and Turkey, typically see prices in excess of the international component.

The forecasting of the demand price through 2020 is described in Kossov (2016). It described an improved algorithm for justification of projected demand prices, first presented in Kossov (2014). The price of electricity demand in Russia through 2020, obtained using this algorithm, used to demonstrate the price scissors. As a forecast for the 2010–2020 period, it utilized only the values of the international component of the price of electricity in Russia. In this paper, the forecasted seller price is referred to as Sel. This balances Prod.

2.2 Forced assumptions

Buyer price forecasts are bound to the original data of the seller price forecasts in order to force parties to share information sources and to ensure the comparability of the forecasts. However, if these predictions are created at different times with different information, as in our case, there are doubts about the justification behind this approach. The drastic difference between the forecasted and actual value can be attributed to changes in the exchange rate between the ruble and the U.S. dollar. The EFA forecasted its values in 2014 at 31.5 rubles to the dollar. Dezember 7^{th}, 2015 the US dollar was worth 67.67 rubles.

For this study, we calculate the boundaries of the price forecasts on the assumption the standart error of demand prices prediction will be 0.046. This value has been estimated on the panel of 25 countries with 1997–2010. It is accepted as σ (sigma) and is used to determine the boundaries of price forecasts. Both boundaries are defined as the positive and negative 3σ (standard deviations). The electricity price for the industry in 25 countries are the independent variable of the panel.

3. THE RESULTS

The results of the forecast of electricity prices for industry are presented in Table 1. It also shows the history of these prices. From these data, Figure 2 is built.

Table 1

The price of 1 kWh of electricity for industry in Russia, US cents

	Price	Trend 2008-2020	Prod 2009	A1. Prod 2009-3σ	Prod 2011	Buy	B.1 Buy+3σ
0	*1*	*2*	*3*	*4*	*5*	***6***	*7*
1998	2,44						
1999	1,16						
2000	1,46						
2001	1,79						
2002	2,27						
2003	2,47						
2004	2,92						
2005	3,21						
2006	3,71						
2007	3,92						
2008	5,13	4,90					
2009	4,86	5,07	5,4	4,65		**4,79**	5,45
2010	5,20	5,23	6,6	5,69	6,64	**4,87**	5,54
2011	5,16	5,40	7,6	6,55	7,99	**5,27**	5,99
2012	5,81	5,57	8,6	7,41	8,57	**5,36**	6,10

2013		5,73	9,5	8,19	9,32	**5,43**	6,18
2014		5,90	10,5	9,05	10,00	**5,45**	6,20
2015		6,07	11,7	10,09	9,91	**5,47**	6,23
2016		6,23	12,4	10,69	10,25	**5,47**	6,23
2017		6,40	13	11,21	10,56	**5,47**	6,23
2018		6,57	13,9	11,98	9,90	**5,47**	6,22
2019		6,73	14,8	12,76	11,00	**5,46**	6,22
2020		6,90	15,8	13,62	11,99	**5,46**	6,22

1. Source: Federal State Statistical Service. The actual prices per mWh were converted into prices in US cents per kWh at the market rate of the dollar for the respective year.
2. Estimation of the parameters of the trend on the price of 2008-2012, column 1.
3. Source: Energy Forecasting Agency (EFA, 2012) - projected supply prices 2009.
4. [4] = [3] – 3 x σ. The calculation of the value σ is given in Kossov (2016).
5. Source: Energy Forecasting Agency (EFA,2012) - projected supply prices 2011.
6. Authors' calculations, Kossov (2016).
7. [7] = [6] + 3 x σ. The calculation of the value σ is given in Kossov (2016).

Figure 2 shows the seller and industrial buyer price forecasts for electricity in Russia through 2020 in U.S. cents per kWh; the dotted line represents the price trend from 2008 to 2012.

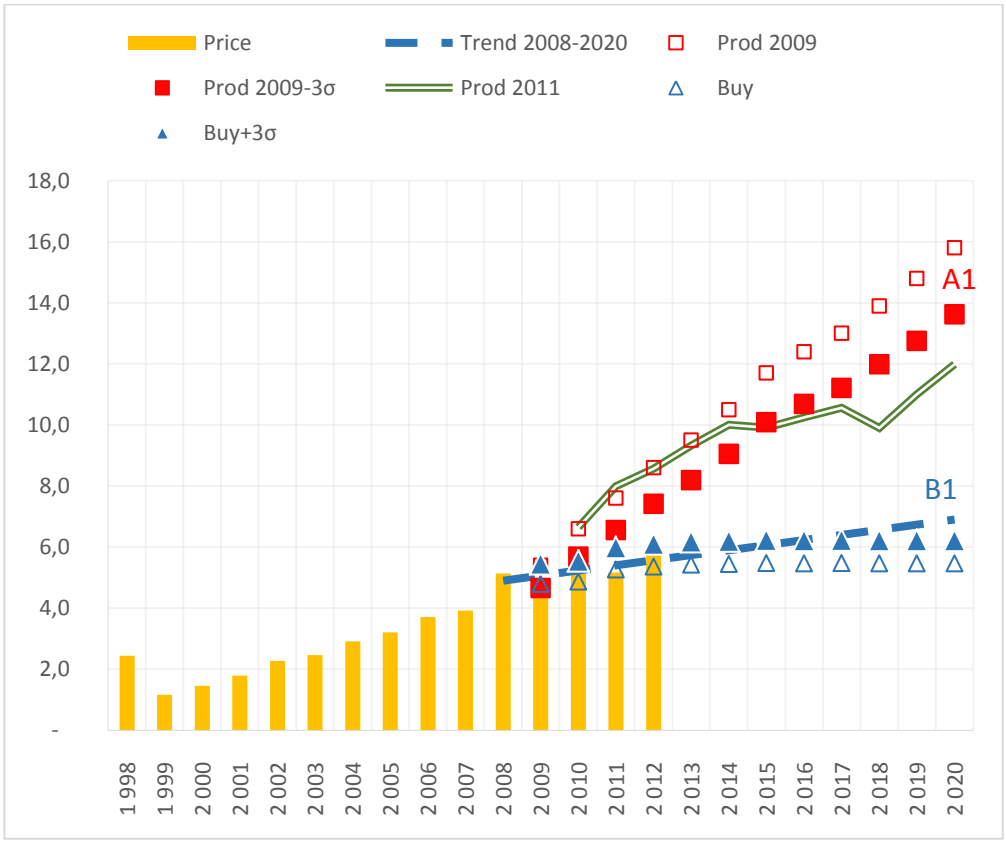

Fig. 2. Russia. Electricity prices for Industry, US cents per kWh

As in Figure 1, the solid markers in Figure 2 indicate price scissors. It is noteworthy that the distance between "the blades" (A1-B1) of the scissors significantly exceeds 3σ. This means that the industrial buyer and seller price forecasts for the Russian electricity industry are fundamentally different. The market not be able to eliminate a contradiction between such different expectation of the demand and supply prices. Thus, the state may need to adjust the tariff for electricity transmission over networks. Figure 2 shows that the upper boundary of the industrial buyer price is almost identical to the trend in 2008–2012 electricity prices for industry. It can be assumed that the price scissors provide the authorities a reason to limit the appetite of a natural monopoly-like network.

Between 1998 and 2012, the industrial electricity price dynamics had the following features:

1) The ruble has been devalued against the dollar over the last 16 years.

2) Between 1999 and 2008, prices wererising by 15.8 percent per annum and the consumer price index (CPI) by 15.6 percent per annum. Inflation limited increases in electricity prices for industry.

3) Between 2009 and 2012, the growth rate of electricity prices decreased to 8.4 percent per annum, with the CPI increasing annually by 7.6 percent. Rising electricity prices for industry caused inflation to accelerate; electricity prices outstripped the CPI average of 1.2 percentage points per year.

Figure 2 shows that Prod 2009 suggests an acceleration of price growth, and that Prod 2011 is based on the preservation of the current rate of growth in 1999–2008, a trend seen in the forecast for 2018–2020. In contrast to the seller price, the industrial buyer price suggests a significant slowdown in the growth rate.

The price scissors Fig. 2 are indicated by solid triangles for Prod 2009 and by solid circles for industrial buyers. Prices for the seller form an angle with the prices of industrial buyers, showing how far apart the price scissors are. This spread in the scissors is significant, meaning that its effect on the market is too large to be eliminated without significant social upheaval (e.g., shock therapy in the early 1990s). Understandably, this situation has drawn criticism related to inflated prices. This significant gap in the perceptions of prices makes it necessary for the government to develop sufficiently rigid pricing policy that can restrict the exorbitant appetites of electricity suppliers.

3.1 The attitude in Russia toward a policy of high electricity prices

Electricity consumers have negative attitudes toward the policy of price increases, which has manifested into the emergence of "small power," the creation of cogeneration power systems producing up to 5 MW in areas with centralized electricity and heat supply. An example is "Magnet," a retail chain that equipped its distribution centers with cogeneration power from MagnitEnergo (no year).

Critical statements on the Russian power situation can be found in reports authored by the well-known Russian expert G. Kutovoy, particularly in a seminal seminar at the 150th meeting of Russia on Energy on June 24, 2014. He presented a substantially new concept of "electricity as a business" (Kutovoy 2014, pp. 7–8).

4. EVALUATION OF LARGE SCALE INVESTMENT PROJECTS

The literature analyzing implemented investment projects is restricted to providing specific examples to judge the typical problems inherent in these projects. Among other deficiencies of the project the authors did not pay attention to what prices were used to weighed the costs and benefits. Velez-Pareja (1999) showed that for a correct evaluation of the investment project, it is necessary to use the current forecasted prices, and evaluate when constant prices shift the net present value (NPV) up. Therefore, for the evaluation of large scale investment projects, it is advisable to use two set of prices:

(1) the forecasted supply prices to determine costs; and

(2) the forecasted demand prices to determine income.

In this case, the cash flows of the project will consider consumers' willingness to pay, which significantly lowers the risk of the project.

5. CONCLUSION

The price scissors are defined as the substantial gap between price forecasts of supply and demand. It is assumed that the supply price forecasts contribute to the gap more than do the demand price forecasts.

Scissors prices indicate incompatible pricing expectations between buyers and sellers. Government intervention was necessary to eliminate it. Evaluations of large scale investment projects must have two price forecasts: the seller price for calculation of costs and the buyer price for measurement of the income on the project.

References

EFA, 2012. Scenarios for the development of electric power industry for the period up to 2030 (russian).
http://www.e-apbe.ru/5years/pb_2011_2030/scenary_2010_2030.pdf

Kossov, V., 2005. Relative Prices as an Instrument of Medium-Term Forecasting of Wholesale Prices. *StudKies on Russian Economic Development, 16 (* 6) , pp. 603-613.

Kossov, V., 2014. Medium Term Forecasting of Demand Prices on Example of Electricity Prices for Industry. *Studies on Russian Economic Development,* 25(5), p. 456–466.

Kossov, V., 2016. Justification demand price corresponding to the projected price of the seller (the price of electricity for industry in Russia until 2020 as the example) *Studies on Russian Economic Development, 32*(1) in the press.

Kutovoy, G., 2014. On the structure of trade in electricity and suggestions on pricing (russian).
http://www.ecfor.ru/index.php?pid=seminar/energo

MagnitEnergo (no year) Small generation of electrical energy. Experience in the retail network "Magnet" and OOO "MagnitEnergo." http://www.np-ace.ru/media/presentations_documents/03

Velez-Pareja, I., 1999. Project Evaluation in an Inflationary Environment. [Online] http://papers.ssrn.com/sol3/papers.cfm?abstract_id=148410

Vladimir Kossov
Professor at Higher School of Economics National Research University, Moscow, Russia, e-mail: kossov3@yandex.ru

Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE.