



# When is a break-up of Gazprom good for Russia?

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## ARTICLE INFO

### Article history:

Received 27 March 2008

Received in revised form 17 February 2010

Accepted 18 February 2010

Available online 24 February 2010

### JEL classification:

D43

L13

L11

L22

### Keywords:

Russia

Natural gas

Restructuring reform

Market share

National welfare

## ABSTRACT

In the late 1990s, several proposals for a structural reform that would bring competition and market prices to the Russian gas industry were intensely debated. Splitting up Russian gas monopolist Gazprom into several producing companies was a considered option. In this paper, I examine theoretically and numerically how a split-up of Gazprom would affect Russian national welfare. Results show that under the current gas market structures in Europe and Russia, the split-up of Gazprom's monopoly might not be beneficial for Russia. However, analysis in the paper indicates that the market shares that Gazprom has in both Russian domestic and European gas markets are important in determining whether Gazprom's dominance is supported under the national welfare criteria. When Gazprom has small market share in Europe and large market share in Russia, a break-up of Gazprom might plausibly result in increase of Russian national welfare.

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## 1. Introduction

State-owned gas company Gazprom<sup>1</sup> controls most of the Russian gas production and has the sole right to export gas to Europe. Since 1997, a structural reform that would bring competition into the Russian gas industry has been intensely debated, and a split-up of Gazprom into several smaller gas-producing companies was one of the proposed options of the reform (Locatelli, 2003). The debate ended in 2003, when Russian President Vladimir Putin publicly stated that he would not break up Gazprom (Stern, 2005). Since then, Gazprom seems to have enjoyed a strong position in both the European and Russian gas markets.

Until recently, Russian gas pricing policy has, to some extent, justified Gazprom's dominance in the Russian gas industry. Other Russian gas producers, or independent producers as they are known in Russia, are formally free to sell their gas at market prices. However, Gazprom has historically sold its gas at low regulated prices in Russia, aimed at stimulating Russia's economic growth after the collapse of the planned economy. From the beginning of 2000s the Russian economy began to recover and the Russian government gradually started to increase Gazprom's gas prices (Spanjer, 2007). Deregulation of Russian gas prices might be the next step in Russian gas price reform. In 2006 Russia opened a gas exchange, where up to 10 bcm was sold at unregulated prices. There

are further plans to extend gas volumes sold at unregulated price. Price deregulation might stimulate Gazprom to abuse its market power and cause a significant rise in domestic gas prices. Therefore, the question arises as to whether Gazprom's dominance in the Russian gas industry can still be defended when Russian gas prices are deregulated.

Large reserves of natural gas have great importance for Russia. They generate high export profits, provide an inexpensive energy supply to the country and remain an important instrument of Russian foreign policy. This makes the Russian government particularly cautious in making changes in the gas industry that have a potential danger of reducing the economic gains from natural gas. Importantly, in managing relations with its gas trading partners, the Russian government focuses primarily on its own gains.

In this paper, I examine the conditions under which the split-up of Gazprom is economically efficient for Russia. Assuming that Russian national welfare is a main concern of the Russian government, this paper carries out theoretical and numerical analysis to study whether the split-up of Gazprom is beneficial for Russia when Russian domestic gas price is deregulated. In its concern for national welfare, it is assumed that the government ignores the effect of the break-up on foreign firms and consumers, and cares only about the domestic consumer surplus and the profit earned by national firms in domestic and export markets. In the industrial organization literature, national welfare is often used when changes in an industry, which is involved in international trade, are analyzed (e.g., Barros and Cabral, 1994; Zhang and Chen, 2002; Clougherty, 2002).

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<sup>1</sup> In 2005, the Russian government increased its stake in Gazprom from 38% to 51%.

It can be argued, that corruption is a well known and serious problem in the Russian economy, and it is often not without help from Russian politicians Gazprom achieves its economic gains. Therefore, high profits earned by Gazprom might not necessarily contribute to benefit the most of the Russians. But I leave the issue of corruption and the fairness of incomes allocation out of the scope of this paper. In this paper I stick to definition of welfare as the sum of consumer surplus and producers' profit, where producers' profit is only due to incomes from sales less production costs.

I consider a hypothetical long-run equilibrium for the base year of 2005 and compare the *reference case*, which describes the situation where Gazprom is not split up, with the case where Gazprom is split up and new gas-producing companies compete independently with each other in two markets for Russian gas: the domestic gas market and the European gas market. I assume Cournot competition in both the domestic and European gas markets before and after the restructuring of Gazprom. Before and after the restructuring, Gazprom's competitors in the domestic market are Russian independent gas producers, and in the European market, they are importers from other gas-producing countries.

Gazprom today is the only Russian company that can export gas to Europe. Splitting up Gazprom into several smaller competitors will affect the export structure of the Russian gas market. In the debate on Gazprom's restructuring, two main variants of the future structure of gas exports were considered. The first is the centralized sale of Russian gas to Europe through one channel. The second is competition among several Russian exporters. I concentrate my analysis on the second variant; that is, I look at the restructuring reform that allows companies detached from Gazprom to compete with each other on the European gas market. Given the ongoing liberalization of the European gas market, focus on the reform that opens competition on the Russian export side is especially important for assessment of the conditions under which Gazprom's split-up is attractive for both Russia and the EU. However, it should be stressed that I assume that after the split-up, only companies detached from Gazprom can export, while independent gas producers still cannot export and sell to the domestic consumers only. While Tsygankova (2007) analyzes how Russian national welfare is affected if independent producers are allowed to compete with Gazprom on the European market, this study concentrates on the split-up of Gazprom.

There are a number of studies that explore the quantitative relation between the Cournot-equilibrium price, the number of producing firms in the market, the profit of the producers, and national welfare. For example, Andersson and Bergman (1995) analyze numerically how a split-up of Swedish electricity-producing company Vattenfall into two separate and independently managed firms will change Swedish national welfare. The numerical model of Golombek et al. (1998) illustrates that a split-up of a single Norwegian gas exporter to the European market into two independent exporters might benefit Norway.

In the theoretical literature, there are a number of articles that look at a Cournot oligopoly where all firms can simultaneously create independent divisions (see Baye et al., 1996; Gonzalez-Maestre, 2000; Corchon and Gonzalez-Maestre, 2000). However, the theoretical literature that analyzes the oligopolistic market where only one firm splits up into independent divisions, with the exception of Polasky (1992), is rare. On the other side, the split-up of a company can be considered as the opposite of a merger of several independent companies. The impact of horizontal mergers on profit and welfare is thoroughly studied in the literature. The literature on horizontal mergers provides a theoretical base for the results of this paper.

Theoretical analysis of horizontal mergers consistently suggests that in the Cournot market, the aggregate market share of the firms involved in the merger is the main determinant of merger profitability (see Salant et al., 1983; Levin, 1990; Cheung, 1992; Fauli-Oller, 1997; Hennessy, 2000). Applying these findings to split-ups, the profit that a

company involved in a split-up earns is more likely to increase after the split-up the higher is the market share of the other companies in the market not involved in the split-up. The intuition here is that the companies not involved in the split-up respond to the split-up by reducing their supply and therefore prevent the market price from falling significantly. Therefore, the market share of non-Russian gas suppliers to Europe might be an important determinant for the decision about Gazprom's restructuring.

Farrell and Shapiro (1990) analyze horizontal mergers in Cournot oligopoly and provide a sufficient condition for profitable mergers to increase welfare in a closed economy. For the case of split-ups, Farrell and Shapiro's result would require that in order for the split-up to be welfare enhancing, the market share of nonsplitting rivals has to be relatively small. Supply of non-Gazprom production to the domestic Russian market is small. Therefore, if the export profits that Russia earns on the European gas market are small, it can be expected that restructuring of Gazprom will increase Russian national welfare.

As split-ups are given far less attention in the theoretical literature than horizontal mergers, I find it to be a useful exercise to set up a theoretical model that focuses on the split-up of a company that is an oligopolistic producer in both the domestic and export markets. In the theoretical literature on mergers and divisionalization, companies in a market are often assumed to have the same marginal costs. This is a strong simplification, especially for the gas market. Costs of different gas producers normally differ because they supply gas from gas fields that vary in size, depth of gas deposits and transportation distance to consumers. Then, in my theoretical analyses, I weaken this assumption, allowing differences in costs between splitting and nonsplitting companies.

The paper is organized as follows. Section 2 develops a theoretical model that is used to examine how profit and welfare are affected if a firm in an oligopolistic industry is split up. Section 3 presents some central data required for the numerical calibration. Section 4 explores the impact of splitting up Gazprom. Section 5 numerically examines the dependence between Gazprom's markets shares and changes in Russian national welfare because of the restructuring reform. Section 6 examines the sensitivity of the numerical result to demand elasticity parameters. Finally, Section 7 concludes the discussion.

## 2. Theoretical model

The focus of the theoretical analysis below is the effect of split-ups on the national welfare of an economy, where the firm involved in the split-up competes with the Cournot-style in both domestic and export markets. The national welfare of such an economy consists of two components: domestic and foreign. The domestic component is domestic welfare, which is the sum of consumer surplus and profits earned on the domestic market. The foreign component is national profits earned on the foreign market.

It is mathematically cumbersome to analyze theoretically the effect of a split-up on national welfare for general demand and cost functions. Therefore, for simplicity, in the theoretical model, I assume linear demand and constant marginal costs. The effects that a split-up has on the domestic component and on the foreign component are independent when the splitting firm has constant marginal costs. I analyze separately the split-up's effect on profit and welfare in a closed economy. At the end of this section, I examine the effects of split-ups on welfare and profit together, and analyze conditions under which the split-up of a firm that both sells domestically and exports can enhance national welfare.

### 2.1. Basic model

Consider a Cournot industry where all firms sell their homogeneous output at the market price,  $P$ . The inverse demand function is  $P(Y) \equiv a - bY$ , where  $Y$  is total industry output. In a set of  $n + 1$  firms,

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