

OLGA A. PATOKINA AND JAMES W. KOLARI

Joint-Stock Company Glinozem

A Case Study of Privatization and Valuation

Introduction

The joint-stock company "PO Glinozem" was established on the basis of the "Glinozem" group of enterprises. These enterprises were built at a distance of 250 kilometers northeast of St. Petersburg at the end of the 1950s. The main business activity of "Glinozem" includes the production of alumina, cement, roofing slate, and limestone.

The technological process of alumina production is used to make soda, potash, and metallic gallium. Because the enterprise was built in an uninhibited place near a large deposit of limestone, the entire industrial infrastructure was constructed simultaneously and included into its assets. At present the enterprise embraces four main production facilities and fourteen subsidiary production facilities, such as an electric power station, a construction workshop, railway and automobile workshops, a repair shop, and so forth. Many of these subsidiary facilities also provide services for the population and small enterprises of Pikalevo, a new small town that has sprung up around the enterprise.

The enterprise occupies a plot of 2,993 hectares, which is endowed with large limestone deposits. The book value of its fixed assets was about 125 million rubles on January 1, 1992 (where the limestone deposits are not included in fixed assets according to accounting rules). The enterprise possesses various

Olga A. Patokina is an Associate Professor in the School of Management at St. Petersburg State University, St. Petersburg, Russia. James W. Kolari is Texas Commerce Bank Professor of Finance in the College of Business Administration at Texas A&M University. This paper was completed in September 1995. The initial version of the paper was written by Professor Patokina in the course of consulting work for Glinozem. Professor Kolari worked on the editing and interpretation of results.

The authors gratefully acknowledge the international travel grant support from the Center of Russian and Eastern European Studies at the University of Pittsburgh, as well as the Center of International Business Studies and Finance Department at Texas A&M University, without which this collaboration would not have been possible.

nonproductive fixed assets, such as a large sports center with a swimming pool, a nice hotel, numerous residential houses built for employees, and some other buildings. These nonproductive assets were created at the expense of both state monetary resources and enterprise profits.

The basic raw materials for producing alumina are (1) the waste products from processing apatite at a huge enterprise named “Apatite” located on Koli Peninsula not far from Pikalevo; and (2) local limestone, which is also used for the production of construction materials. In the 1950s, Glinozem employed the most advanced technology in Russia.

Alumina is a semifinished product that is used as a raw material for producing aluminum. There exist different technologies for producing alumina. For example, there is another Glinozem enterprise not far from Pikalevo in Boksitogorsk, but it uses a different technology and a different raw material (bauxite). For this reason, there is no competition between these two producers of alumina in the northwest region of Russia, and each of them is a monopolist in its market segment. Pikalevo’s Glinozem supplies two or three aluminum factories with its alumina (e.g., one is in Tajikistan). Notably, they are closely connected with one another—if there is a demand for aluminum, there is demand for alumina, and vice versa.

The number of consumers of the construction materials produced by the enterprise (e.g., cement and roofing slate) is enormous. Formerly these products were in short supply in Russia and were distributed by means of centralized planning. But since 1986 the enterprise has had the right to sell part of these products to any buyer.

The Glinozem enterprise was subordinated to the Ministry of Nonferrous Metallurgy until 1990. This branch of industry had always been considered by the government and by Gosplan (the body of centralized planning) as strategic. As such, there existed a very strong system of centralized planning and control of these enterprises. In 1989 the ministries of nonferrous and ferrous metallurgy were merged. A new ministry had to decide strategic tasks. New voluntary associations of state enterprises were established to coordinate the activities of the separate enterprises. Consequently, Glinozem entered the “Aluminum” Concern.

The average number of employees in Glinozem is about 7,200 persons. Net sales were 6,950 million rubles in 1992 and more than 15,000 million rubles in the first half of 1993 (about \$15 million). Total assets in January 1993 were 12,334 million rubles, net worth was more than 8,500 million rubles, and net working capital was 4,226 million rubles. More detailed accounting data concerning assets, profits, volumes of sales and output, prices, cash flows, and basic financial ratios are presented in this case study. In general, due to its monopoly position and skilled management, the enterprise is relatively large and wealthy compared with many industrial enterprises in Russia.

Privatization Process: Offer and Privatization Conditions

Economic Environment

Beginning in 1986, the enterprise became “self-financing.” The enterprise had to fulfill the required state plan and pay a fixed share of earned profits to the ministry and concern budgets, with the remainder of profits going for investment and overhead expenses. State investments were not provided, but the firm had the right to sell production made in excess of the plan by contract, fixing contract prices higher than state prices. This was very profitable for Glinozem due to unlimited demand for construction materials and high free-market prices.

Attitude of Managers and Legislation

An initiative to privatize Glinozem was put forward by the general manager and was supported by top managers in early 1991. The law “On Privatization of State and Municipal Enterprises in the Russian Federation” had not been adopted at that time, as it was only being discussed. However, there existed “Regulations on Leasing,” which made provision for leasing the fixed assets of state enterprises by their workers and employees with the subsequent purchase of those assets. A meeting of employees was called to approve a resolution on leasing to be presented to the Ministry of Metallurgy.

At first managers were motivated mainly by the desire to escape the guardianship of the ministry and the concern and become free from limitations in their activities. But when the law “On Privatization” was adopted, there emerged a risk that the managers might lose their power within the firm, because the law gave outside investors the opportunity to become real owners. This circumstance prodded the managers and employees to privatize the enterprise.

Attitude of Employees

Privatization was supported by the firm’s employees. The main reason for such an attitude was the fact that Glinozem was the only big enterprise in its small town. An employee purchase of the firm increased the chances of avoiding unemployment. It was reasonable for workers and employees to trust the managers more than outsiders. Over a period of 35 years, the general manager of the firm was the same person, appointed by the ministry. His wife was the head of the economic department, responsible for planning and analytical work. They managed to gather a very efficient team of managers and used all the advantages and shortcomings of the existing economic system to the benefit of the firm. It had always been one of the best performers in its branch, according to economic indices. This position was advantageous both to the managers and to employees.

To provide a more in-depth analysis of the prospect of privatization, a group of experts was invited to value the company and choose an acquisition strategy.

Legislation and the Authorities' Ambitions

Although the law "On Privatization" was adopted in July 1991, there was no real working mechanism for privatizing large state enterprises. Many crucial problems had not been overcome at that time. A list of enterprises exempted from privatization was not published, as directed by the law. There were no official methods of company valuation, but the law required the use of methods recommended by the State Committee for Property Management. It was not known which state body could or must give permission to privatize a specific enterprise (e.g., Glinozem). In this situation the authorities could make privatization decisions. The officials of the Ministry of Metallurgy did not support the idea of leasing or privatizing the enterprise. "The Draft Privatization Program" for 1992 published in December 1991 and a packet of instructions on the privatization process (supplements to a presidential edict) published in February 1992 described the mechanism of privatization, but the Supreme Soviet did not confirm the Draft at the beginning of 1992. There was a fight between old authoritative bodies (ministries) and new ones (property funds and committees for the management of state property) for leadership in the process of privatization. Thus, the preparation process was delayed until the passage of the presidential edict "On the Regulation of the Commercialization of State-Owned Enterprises and Their Transformation into Open Joint-Stock Companies" of July 1992. This edict obligated the managers of all large enterprises (those not exempted from privatization) to transform them into open joint-stock companies. Numerous governmental resolutions, regulations, and instructions followed this edict and defined the structure and the order of presentation of privatization plans, the order of carrying out a closed subscription for shares, share pricing, and so forth.

The real process of privatization began in October 1992, when "The Privatization Plan"—carried out by the firm and presented to the regional body of the State Committee on State Property Management—was adopted.

Preparation Process: Official Company Valuation Model

Company valuation is a required preliminary stage of the privatization process. The order and methods of company valuation are regulated by the following documents at this time:

1. The law "On Privatization of State and Municipal Enterprises in the Russian Federation," paragraph 17; and
2. "Temporary Methods for the Valuation of Privatized Enterprises" (elaborated by the State Committee on State Property Management).

Company valuation is performed by a commission on privatization, which includes representatives of the Committee on Property Management or its local bodies, as well as representatives of the managers and employees of the enterprise being privatized.

The value of a firm is estimated as the net book value of its assets on a fixed date in 1992, the initial data being taken from the balance sheet. The valuation is preceded by conducting an inventory of the fixed assets, which is used to specify their book value. Firm value is calculated according to the formula:

$$V = \text{total assets} - \text{total liabilities} - \text{privatization fund} - \text{special assets}, \quad (1)$$

where the privatization fund equals the net profit earned by the firm that can only be used by the employees for privatization purposes (or for the acquisition of stocks); and special assets are defense-related assets, environmental-protection assets, and assets of social significance. As a rule, although these assets are prohibited from privatization, they are financed at the expense of the firm, and there are no other sources for their financing. This oversight is one of the contradictions of the legislation, which resulted in some serious consequences; for example, many kindergartens and cultural centers were closed, and their property was leased out to commercial firms.

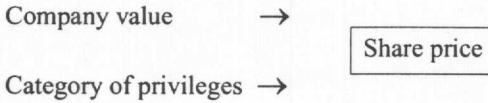
Based on this approach, the value of Glinozem equaled 375,702,000 rubles. This figure was obviously too low for the following reasons: (1) this estimation did not include the value of such important assets as land and natural resources that the enterprise had at its disposal; and (2) the book value of fixed assets was many times lower than their market price.

Upon reestimating the value of fixed assets, which took place at the end of 1992, their book value increased more than 20-fold! Hence, total assets increased 12- to 15-fold, and net worth increased 16- to 18-fold. The new value of Glinozem was 3.5 billion rubles, but the results of this reestimation were not taken into consideration. Instead, the preliminary company value was registered in the Statement on the Enterprise Value, which was added to the Privatization Plan of the enterprise.

We next discuss how the preliminary company value influences the market price of enterprise shares at different stages of the privatization process and under different share issuance conditions.

Sales Process: Closed Subscription

The legislation gives workers and employees of an enterprise a chance to choose the category of privileges (acquisition strategy) in the process of closed subscription for the shares of their enterprise. The preliminary company value and the category of privileges chosen by the employees define the price of the shares distributed through closed subscription. The general model of share pricing in a closed subscription is the following:



Different categories of privileges provide different levels of share prices in a closed subscription:

- First category: Price = $0.7 \times$ book value for the employees' lot of shares;
 Price = $1.0 \times$ book value for the managers' option;
- Second category: Price = $1.7 \times$ book value for the employees' lot of shares;
- Third category: Price = $1.0 \times$ book value for the managers' option;
 Price = $0.7 \times$ book value for the employees.

In the case of Glinozem, the second category of privileges was chosen, which gave the right to buy 51 percent of the voting shares to managers and employees—the most expensive method of privatization. Both management and employees wanted to avoid new owners.

The statutory fund of the joint-stock company had a preliminary valuation of 375,701,000 rubles. According to the "Privatization Plan," 375,701 common stocks were issued with a nominal value of 1,000 rubles each. The employees needed to pay 325,732,760 rubles to acquire 51 percent voting control of their firm (or $1.7 \times 0.51 \times 375,701,000 = 325,732,760$). In accordance with the legislation, this sum was to be paid both with vouchers and with money, where one voucher equals 10,000 rubles. The required share of vouchers is equal to 80 percent for federal property and may be lower for municipal property. Glinozem was not federal property, but the market voucher price was about one-half of its nominal value at the beginning of 1993, so 80 percent of the mentioned sum was paid with vouchers. Figure 1 shows the chosen initial capitalization process.

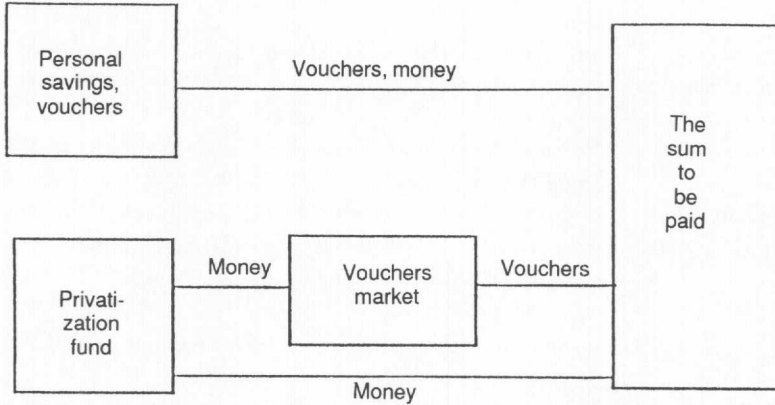
The procedure of stock distribution among the persons who had participated in a closed subscription is not regulated by legislation; instead, it is established by the employees. Usually, this process takes into account a person's position, the duration of his work at the enterprise, and his personal services to the firm.

The closed subscription was completed in November 1992. The remaining 49 percent of common shares was deposited with the regional Committee on Property Management, which was to announce an open sale of part of these shares (or 29 percent of the statutory fund).

Open Sales: Check Auctions

To give all citizens in Russia a chance to participate in the privatization process and to provide demand for shares, 150 million special privatization checks (vouchers) were given to citizens free of charge between September and December

Figure 1. Initial Capitalization Process



1992. In line with legislation, 29 percent of issued shares must be sold through check auctions and paid by vouchers.

Organization of the Check Auction

The shares of Glinozem (108,953 common shares) were opened to check auction in April 1993. It was one of the first check auctions in the St. Petersburg region. The organizer of the auction was the regional body of the State Committee on State Property Management, and the regional Property Fund was the seller. Applications for participating in the check auction and vouchers could be submitted to any department of the Regional Savings Bank. Because the local authorities wished to give some privileges to citizens of the St. Petersburg region, the department of the Regional Savings Bank in St. Petersburg did not receive applications and vouchers. Another reason for such a policy might be an agreement with a large investor who sought to buy a sizable lot of shares, thereby lowering transaction costs.

Information

The auction was preceded by an announcement in a regional newspaper. The information in the announcement was minimal—the official name and legal address, the main activities, the list of workshops and affiliated departments, the plot size of land, the size of the statutory fund, the type, amount, and nominal value of initial shares, and a short-form balance sheet as of January 7, 1992. No information was provided concerning revenues, costs, a business plan, or investment projects.

Results of the Check Auction

A total of 95 percent of check auction shares were sold. The only large investor who took part in the check auction was a nonstate firm participating in the export of aluminum from Russia to Western countries. It acquired 20 percent of the statutory fund. A small portion of shares (3 percent of the statutory fund) was bought by employees at the expense of the privatization fund. Some shares (2 percent) were bought by a commercial bank. Every winner received three shares (1,000 rubles par value) for one voucher (10,000 rubles par value). So the market (auction) price of a share was 3.3 times higher than its nominal value. Actually, the market price of a voucher was 4,500 rubles at that time, so that the true “market” price was 1,500 rubles per share.

The last 4 percent of shares were sold through a money auction, with an initial price fixed at 3,300 rubles per share. These were acquired by small investors.

The Secondary Market

The secondary market for the shares of privatized enterprises is illiquid. On January 1, 1994, the shares of Glinozem were distributed among shareholders as follows:

- 54 percent to managers and employees of the enterprise;
- 20 percent to the large nonstate investor;
- 20 percent to the regional body of the State Property Fund;
- 2 percent to a commercial bank;
- 4 percent to small investors.

Shares that are under the control of the Property Fund are nonvoting. The fund can hold these shares for not more than three years. During this period, officials of the fund are to arrange for large long-term investors to purchase these shares through an investment contest. This is a competition of investment projects, and the price of initial shares is fixed. As soon as these shares are acquired, they will obtain voting power.

The shares are not included in stock-exchange listings. There is no information about sales of large lots of the shares, but separate shares are sold at a price 10 times the nominal value.

Other Approaches to Firm Valuation

Firm Valuation Problems in Russia

The choice of firm valuation methods depends upon the aim of the investor, the nature of the company’s activities, and available information. At the first stage of the “large” privatization process (under closed subscription), managers and employees of privatized enterprises were interested in the lowest company value, because it precisely defined their expenses for acquiring stocks. Property funds, sellers, property management committees, and organizers were also not interested in high firm value. The main task of these bodies was to carry out a mass

closed subscription in a very short period of time—defined by the presidential edict—not to receive large quantities of money. The only way to do this was to simplify the process of firm valuation and to stimulate demand for shares with low prices. The official Methods of Company Valuation ensured the realization of both of these goals.

At the second stage of the privatization process, when shares were printed for open sales at check auctions, the initial company value influenced only the initial lot size. The market (auction) prices of shares were determined by supply and demand. An analysis of the results of check auctions that took place in St. Petersburg in 1993 shows that the MP/NV (market price/nominal value) ratio changed greatly from one firm to another. The minimum value of this ratio was 0.5 and the maximum was 273. Such a gap between the auction price and the nominal value of privatized enterprises' shares reveals that investors had their own company valuation, which differed from the official value. The average level of this ratio was 16.7. It is interesting that the auction results of shares were usually determined by two or three investors and sometimes by just one investor who had bid the largest number of checks.

The demand in the secondary market for shares of privatized enterprises is driven primarily by long-term investors. This demand is mostly for the statutory fund, as opposed to stocks, due to the fact that the former pays high dividends. Hence, a key factor that influences stock prices is their distribution among different kinds of owners. If a firm's shares are evenly distributed among numerous large investors, the price of its shares is high. However, when a large investor gets control of a stock, its price decreases.

Russia is now undergoing the process of redistribution of property and concentration of property rights for enterprises in the hands of a relatively small number of private persons. Of greatest importance for these persons is asset valuation, especially of property and intangible assets, such as the rights for the use of land, natural and water resources, and so forth.

Given uncertain economic conditions and hyperinflation, it is practically impossible to forecast future cash flows and profits. To make matters worse, firms conceal information revealing their profits and dividends. Because of the high inflation rate, the traditional approach to the definition of the cost of capital is so high that it reduces the present value of firms to zero, rendering profit analyses by investors meaningless. Moreover, estimations of P/E (price/earnings) ratios are also impossible due to the absence of a stock exchange for the securities of privatized firms.

Valuation of Glinozem

In this section of the case study, an attempt is made to use different approaches to company valuation. Tables 1–6 provide the best available accounting and financial information about Glinozem, which is helpful to review prior to reading

Table 1

Assets Structure of Joint-Stock Company Glinozem

	Before revaluation		After revaluation		
	1/1/91	1/1/92	1/1/92	1/1/93	1/7/93
Total assets	100.0	100.0	100.0	100.0	100.0
Noncurrent assets	83.5	73.3	97.7	54.3	36.6
Fixed assets	65.9	54.8	88.1	47.0	28.4
Capital investment	17.3	18.5	9.1	6.6	8.2
Current assets	16.5	26.7	2.3	45.7	63.4
Inventory and expenses	13.0	14.4	0.9	16.2	25.6
—materials	8.9	11.6	0.6	13.7	21.6
—finished goods	1.8	0.7	0.4	0.8	0.9
Cash and settlements	3.5	12.3	1.4	29.5	37.9
—cash	0.8	3.0	0.8	11.8	10.9
—receivables	2.7	6.9	0.6	17.7	27.0

Table 2

Capital Structure of Joint-Stock Company Glinozem

	Before revaluation		After revaluation		
	1/1/91	1/1/92	1/1/92	1/1/93	1/7/93
Equity + liabilities	100.0	100.0	100.0	100.0	100.0
Equity	94.3	85.1	98.4	74.6	70.8
Long-term liabilities	0.0	0.0	0.0	0.0	0.0
Current liabilities	5.7	14.3	1.6	25.4	29.2
Credits	2.3	1.1	0.09	0.0	5.7
Payables	3.4	13.2	1.51	25.4	23.5

Table 3

Financial Ratios of Joint-Stock Company Glinozem

Financial ratios	Before revaluation		After revaluation		
	1/1/91	1/1/92	1/1/92	1/1/93	1/7/93
Liquidity ratios					
Current ratio	2.74	1.85	1.40	1.80	2.17
Quick ratio	0.61	0.84	0.85	1.16	1.30
Receivables/payables	0.63	0.52	—	—	1.08
Debt-management ratios					
Financial leverage	1.06	1.17	1.02	1.34	1.41
Debt to equity ratio	0.06	0.17	0.02	0.37	0.41
Net working capital to equity	0.11	0.14	0.006	0.272	0.48
NWC to inventory	0.83	0.85	0.72	1.25	1.34

Table 4

Financial Ratios of Joint-Stock Company Glinozem

Financial ratios	Before revaluation	After revaluation	
	1991	1992	Mid-1993
Assets turnover	1.72	1.25	1.54
Profitability ratios			
Return on sales	0.20	0.29	0.27
Basic earning power	0.48	0.58	0.65
Return on assets (ROA)	0.30	0.36	0.43
Return on equity	0.35	0.44	0.59
Earning per share (1,000 rubles)	—	5.390	11.586

this section. As we shall see, large differences can exist in the results of different valuation approaches due to the inherent assumptions underlying the models.

Assets Approach

On January 1, 1994, net assets were estimated in two ways. The first estimation (18,954 million rubles) was based on bookkeeping data from January 1993, expected investments, and current assets growth during the year. It was a biased estimation, because the book value of fixed assets reflected their entry value in January 1993 when the reestimation of fixed assets took place. The second estimation (188,640 million rubles) was closer to the true value. The fixed assets book value was reestimated in accordance with the "Order on the Reestimation of Fixed Assets and Investments" adopted by the Ministry of Finance in December 1993. It likely was too high for January 1994 and, therefore, also reflected an expected inflation rate for 1994. Both of these two estimations, however, did not take into account estimations of land value. Unfortunately, there did not exist a central record of land plots, and there was no information about land market price. The only information about an official estimation of a land plot was a contract for privatizing a land plot attached to the privatization plan of an enterprise that was privatized before Glinozem. The official estimation of land was about 5,000 rubles per hectare, which was about the cost of two pounds of meat. According to this absurd appraisal, the net book value of the assets of Glinozem would increase by only 13 million rubles.

Profits Approach

This approach requires the following steps:

- (1) choosing a profit index;
- (2) forecasting future profits;

Table 5a

Balance Sheet: Asset Side

Assets	After reestimation		Before reestimation		
	1/8/93	1/1/93	1/1/92	1/1/92	1/1/91
Noncurrent assets					
Buildings and equipment	3,645	3,483	3,327	125	117
Capital investments	864	486	342	42	30
Long-term financial investments	1	2	5		
Total noncurrent assets	4,510	3,971	3,674	167	144
Current assets					
Cash and securities	1,343	873	33.3	11.8	2.3
Receivables	3,328	1,288	18.7	16	3.8
Inventory	3,153	1,184	33.9	33	22.5
Total current assets	7,824	3,345	85.9	60.8	28.6
Total assets	12,334	7,316	3,760	228	173

Table 5b

Balance Sheet: Liabilities and Equity Side

Liabilities and stockholders' equity	After reestimation		Before reestimation		
	1/7/93	1/1/93	1/1/92	1/1/92	1/1/91
Stockholders' equity	375.7	375.7	189.4	139.6	129.2
Statutory fund	52	—	—	1.2	0.07
Reserve fund	8,044	3,644	3,503	49.3	33.8
Special funds					
Financing for special purposes	71	222	—	—	—
Retained earnings	56.3	1,213	6.7	5.2	0.01
Earnings of current year					
—obtained	6,406	—	—	—	—
—used and distributed among special funds	6,269	—	—	—	—
—nondistributed	137	—	—	—	0.01
Stockholders' equity	8,736	5,455	3,699	195.3	163.1
Long-term liabilities	—	—	—	—	—
Current liabilities					
—bank loans	450	0.1	3.2	2.5	3.9
—accounts payable	3,148	1,861	58.2	30.2	5.9
—other	—	—	—	—	—
Total liabilities	3,598	1,861	61.4	32.7	9.8
Liabilities and stockholders' equity	12,334	7,316	3,760	228	173

(3) estimating the cost of capital; and

(4) combining this information to obtain the firm's valuation.

Since the company has not yet paid dividends, dividends cannot be used as a

Table 6a

Income Statement: Revenues and Costs

	1/1/93-1/7/93		1/1/92-1/1/93		1/1/91-1/1/92	
	Profit	Loss	Profit	Loss	Profit	Loss
Sales revenues	17,702	—	8,901	—	365.5	
Taxes, included in prices	—	2,551	—	—	—	20.9
Costs of goods sold	—	9,156	—	3,724	—	247.3
Sale profits (or losses)	5,995	—	3,226	—	97.3	
Profits or losses from other operations	555	144	55	73	1.1	1.8
Total profits and losses	6,550	144	3,281	73	98.4	1.8
Balance profit (earnings before taxes)	6,406	—	3,208	—	96.6	—

Table 6b

Income Statement: Other Items

	1/7/93	1/1/93	1/1/92
Taxes	2,198	1,183	27.3
Reserve fund	28		
Special funds			
development fund	79.8	309.6	25.4
consumption fund	326.6	499.6	38.9
philanthropic purposes			0.4
other purposes	7.1	2.4	0.07

profit index. For this purpose data on profits and cash-flow dynamics are presented in Table 7. As a starting point for forecasting future profits and cash flows, notice that the profit figures in Table 7 show a stable growth during the period 1991-93, with a rate close to the inflation rate during this period.¹

The following simplified formula was used to calculate cash flows:

$$CF = NP + D - INV - FA, \quad (2)$$

where CF is cash flow, D is accumulated depreciation, INV is inventory growth, and FA is fixed assets and investment growth for the period. The firm had a positive cash flow during the period 1988-92. The cash flow increased in 1992 approximately 20-fold compared with 1991—this rate of growth paralleled the inflation rate in 1992. There was also significant cash-flow growth in the first half of 1993. There are two versions of the cash flow for 1993. The difference

Table 7

Net Profits and Cash Flows in the Period 1988-94

Indices	Actual data (million rubles)										Forecasted data (million rubles)			
	1988	1989	1990	1991	1992	1993 (first half)		1993 ^a	1993 ^b	1994 ^b	1994 ^b			
1	2	3	4	5	6	7	8	9	10	10	10			
Net profits	11.2	27.4	32.8	69.3	2,025.1	4,208.8	13,600.0	13,600.0	13,600.0	34,000.0	34,000.0			
Depreciation	10.4	10.6	10.8	9.2	30.0	113.5	232.8	232.8	232.8	2,000.0	2,000.0			
Increase of inventory	21.3	-0.5	1.8	11.7	1,150.0	1,969.9	4,000.0	4,000.0	4,000.0	8,000.0	8,000.0			
Investments	19.9	23.0	30.1	32.5	301.1	668.5	4,540.0	4,540.0	11,592.0	35,450.0	35,450.0			
Cash flows	-0.62	15.6	11.7	34.3	604.0	1,683.7	5,292.0	5,292.0	-3,593.0	-7,950.0	-7,950.0			

^aExpected investments according to the actual investments made in the first half of 1993.

^bInvestments according to the company's long-term program of development.

Table 8

Export of Aluminum from Russia in 1992

	Quarter			9 months
	1	2	3	
Thousand tons	192.1	217.0	250.7	659.8
Million dollars	213.6	261.0	343.7	818.7

Table 9

Sales of Main Products Manufactured at Glinozem

Kind of production	Units	1990	1991	1992	Mid-1993
Alumina	thousand tons	266.6	266.6	238.0	148.2
Gallium	tons	11.7	12.0	6.2	1.0
Soda	thousand tons	163.4	159.1	172.8	116.4
Potash	thousand tons	83.8	50.4	46.7	36.5
Cement	thousand tons	2,022.9	2,394.7	1,084.4	1,301.9
Limestone	thousand tons	1,439.7	1,474.5	834.0	581.8
Roofing slate	(special units)	187.7	185.8	146.8	84.8

between these versions is the expected size of investments. The first forecast is based on the size of investments actually made in the first half of 1993. The cash flow is positive, about eight times higher than in 1992—this growth rate is close to the inflation growth rate in 1993. The second forecast for 1993 and the forecast for 1994 presuppose that investments are made per the long-term investment plan developed in 1991 (adjusted for inflation). Here the cash flow is negative. This result suggests that it is impossible to realize the long-term investment plan without borrowing or acquiring external sources of capital. In this case, a more complex model is required to forecast cash flow. Since no information is available for such a model, we followed the first assumption for 1993. As such, the expected operating cash flow for 1993 can be valued as 5,300 million rubles. The growth of the profit and cash-flow increase tends to follow the inflation rate. We believe this pattern will continue in the near future at least, for the following reasons:

1. Production levels and sales for the main kinds of products are stable. Demand for alumina has benefited from the significant increase in aluminum export from Russia in 1992–93 (see Tables 8 and 9).

2. A gap exists between internal and external prices for aluminum (see Table 8), which raises the possibility of future increases in the prices of alumina in line with the inflation rate.

3. The firm has a monopoly position in the northwest region of Russia, where a number of large-scale projects, such as the building of a new seaport at the mouth of the Luga River to be begun in the near future, does much to promote the inflation growth of prices, profits, and cash.

Under this inflation assumption, expected profits for 1993 are estimated at 13,600 million rubles and cash flows at 5,600 million rubles. (The head of the economics department of the enterprise gave a different estimation of net profits: 11,771 million rubles.) Consequently, a model that capitalizes profits and cash flows using a constant growth rate (e) was chosen for company valuation, or

$$V = \frac{P_0(1+e)}{k-i}, \quad (3)$$

where P_0 is the current value of invested capital, k is the cost of capital, and i is the inflation rate.

One of the most difficult problems of valuation in Russia is estimating the cost of capital (or expected rate of return for investments) for discounting cash flows. We suppose there are two main components that might determine the cost of capital in Russia today: (1) a "normal" rate of return for these kinds of firms assuming a stable economy, and (2) the inflation rate. Given that k is the "normal" rate of return, then the expected rate of return for investment or cost of capital is $k^* = k + i + ki$. Assuming that the expected average inflation rate equals the expected average growth rate of profits (cash flows), the model of profits (cash flows) capitalization for company valuation becomes:

$$V = \frac{P_0(1+i)}{k^* - i} = \frac{P_0(1+i)}{k+i+ki-i} = \frac{P_0(1+i)}{k(1+i)} = \frac{P_0}{k}. \quad (4)$$

Thus, under these assumptions, current company value depends only on the obtained current income and "normal" rate of return.

The "normal" average rate of return that was usually used in Russia for the valuation of investment projects before the so-called "normative ratio of the efficiency of capital investments" was $k = 0.15$. Its value varied from 0.08 to 0.22 for different industries. Actually, the return on assets (ROA) for Glinozem was higher during 1991 through mid-1993—namely, $ROA = 0.30$ (1991), $ROA = 0.36$ (1992, after reexamination of assets), and $ROA = 0.43$ (for mid-1993). Consequently, these different values for this ratio were used in the valuation model (see Table 10). For example, given that $k = 0.15$, expected profits for 1993 $P_0 = 11,766$ million rubles, and cash flows = 5,292 million rubles, the company value can be estimated as:

Profit capitalization model: $V = 11,766 / 0.15 = 78,440$ million rubles;

Cash-flow capitalization model: $V = 5,292 / 0.15 = 35,280$ million rubles.

P/E-Ratio Approach

This valuation method is based on the market price of shares, the latter being estimated as:

$$MP = E \times P/E, \quad (5)$$

where MP = expected market price of shares, E = expected profits per share, P/E = average P/E ratio for a similar firm or for this firm in the previous period. According to our estimation, expected profits per share for Glinozem in 1993 would equal

$$E = 11,766,000/375,701 \text{ shares} = 31.317 \text{ thousand rubles.}$$

Since there is no secondary market, there is no information on changes in P/E ratios for different issuers. The only opportunity to use a P/E -ratio model for the valuation of this enterprise was to use an average value of this ratio from the Stockholm stock exchange, or $P/E = 10$. Then, the expected share price is

$$MP = 31,317 \times 10 = 313,170 \text{ thousand rubles}$$

and the company value is

$$V = MP \times N = 313,179 \times 375,701 = 117,710 \text{ thousand rubles.}$$

The "Last Sales" Approach

A large lot of Glinozem shares (29 percent of the statutory fund) was sold through a check auction at the beginning of April 1993 at a price of 3,300 rubles per share, with 1,000 rubles par value. It is not correct to consider this price as a market price because check auctions are a very specific market for the following reasons:

- (1) special means of payment, or vouchers, are used;
- (2) the supply is fixed and does not depend on demand or auction prices of shares;
- (3) opportunities for investors to participate in check auctions are restricted in time and space;
- (4) check auctions are a tool for the distribution of primary shares, while market price is a product of the secondary market; nevertheless, the check auction's price is actually a starting point for market prices in the secondary market.

Using this approach, firm value can be estimated as follows:

$$V = MP \times N \times i = 3.3 \times 375,702 \times 3.0 = 3,719,400 \text{ thousand rubles,} \quad (6)$$

where MP = market (auction) price of shares, N = number of shares issued, and i = inflation rate. This estimation is not correct, however. The investor who won the auction and bought 20 percent of the issued shares paid for his control participation and not for separate shares. Nevertheless, the last estimation is too low compared with the preceding ones. Indeed, the auction price for Glinozem (3.3 par value) was considerably lower than the average price of 184 check auctions that took place in St. Petersburg (16.7 par value). It was artificially depressed by the limitation on investors' participation. As a result, we also valued the firm using the average price of check auctions:

$$V = \text{avg}MP \times N \times i = 16.7 \times 375,701 \times 3.0 = 18,785 \text{ thousand rubles.} \quad (7)$$

This estimation is close to that obtained by the net assets approach. This similarity is no accident, however; net worth increased approximately 16- to 18-fold after the reestimation of fixed assets in July 1992.

Summary of Results for Different Valuation Approaches

The valuation results for Glinozem are summarized in Table 10.

Summary and Conclusion

This paper compared the results of different valuation methods for the Russian firm Glinozem. The results provide an opportunity to assess the market valuation of privatized enterprises by comparing estimated prices with those existing in the market. However, one should recognize that the estimates obtained are biased to the extent that the present situation in Russia does not meet the assumptions of the valuation models applied. A major obstacle is the absence of a developed capital market. Therefore, both the assets approach and the profits approach yield rough estimates of firm value. Nevertheless, it is obvious from our analyses that the market price of privatized firms' shares is in all likelihood too low. This observation holds true especially for large industrial firms. In the initial stage of the privatization process, all participants (e.g., buyers, sellers, and organizers) had strong incentives to hold down firm value (and share prices). At the present time, the growth of market prices is substantially restricted by the lack of long-term investors, which can be attributed to political and economic instability in Russia.

As a final comment, at the time of this writing, 54 percent of common voting shares in Glinozem were owned by the employees and managers. For the most part, the company is owned by the managers, as it was before the reforms. Until now, the main goal pursued by the managers was to preserve their power over

Table 10

Summary of Results for Different Valuation Approaches

Valuation method	Company value	Price of 1 share at 1,000 rubles	
	Million rubles on January 1, 1994	Number of issued shares 375,701	Number of issued shares 3,873,398 ^a
1. Net-assets approach on January 1, 1994	18,954	50,451	4,693
on January 1, 1994, with evaluation	188,640	502,101	48,701
2. Profits approach			
$k = 0.15$	78,440	208,783	20,250
$k = 0.20$	58,830	156,587	15,188
$k = 0.25$	47,054	125,269	12,150
3. Cash-flow approach			
$k = 0.15$	35,280	93,904	9,108
4. P/E-ratio approach			
$P/E = 10$	117,713	313,317	30,380
$P/E = 16$	188,253	501,072	48,608
5. "Last sales" approach (with adjustment for inflation)			
5.1 According to the price of check auction for Glinozem's shares	3,719	9,900	960
5.2 According to the average price of check auctions in St. Petersburg	18,785	50,000	4,850

^aThe number of issued shares has increased in accordance with the sum of revaluation.

the company, and, thus, they had never been seriously interested in competing large investors. However, today the firm is in urgent need of capital investments to renovate existing facilities and develop new facilities. Therefore, new stock issues are on the agenda, and the managers are searching for investments from the existing partners.

Note

1. In Tables 6 and 7, in accordance with Russian accounting, "balance profit" = total revenues – total expenses, as assumed in the "Edict on Cost Accounting," and "net profit" = balance profit – taxes. Expenses not assumed by the "Edict on Cost Accounting" are subtracted to get "net profit."