Comparative analysis of leasing in the agroindustrial complex

D N Suleymanov, M G Mirgorodskaya, A N Minina, N A Gurevich and A E Kovaleva

1 Russian new university, 22, Radio street, Moscow, 105005, Russian Federation
2 K G Razumovsky Moscow State University of technologies and management (the First Cossack University), 73 Zemlyanoy Val, Moscow, 109004, Russian Federation
3 Smolensk State Agricultural Academy, 10/2 Bol'shaya Sovetskaya street, Smolensk, 214000, Russian Federation

E-mail: 79049755219@ya.ru

Abstract. Today in Russia there is an active development of the theory and practice of using leasing. The problematic of this issue was actively studied by domestic and foreign scientists, including: M. N. Agafonova, A. D. Aleksandrov, A. A. Babukh, O. I. Gavrilyuk and many others. In this regard, the study of measures to improve the organizational and economic mechanism for the development of leasing in agricultural production and the establishment of its effectiveness in a developing market becomes relevant and important national economic importance. The article presents the results of a comparative study of commercial preferential leasing and leasing from a state company. The concept of the study is based on an understanding of the economic and technological nature of leasing, which acts as a kind of investment and entrepreneurial activity, as well as an investment resource, the development of which contributes to the improvement of the technical state of agricultural production and acceleration of technical progress in the agricultural sector of the economy. Based on the research carried out, it has been proved that the use of leasing instruments with the support of the state is an effective tool for the development of agricultural enterprises.

1. Introduction

In the process of market transformations, agricultural enterprises were among the most susceptible to the economic crisis [1-4]. The level of depreciation of agricultural machinery and production assets at the beginning of 2000, the agro-industrial complex reached 60-70 percent and more.

Due to the critical state of the machine and tractor fleet, farms are forced to reduce sown areas, carry out work using simplified technologies, which leads to a decrease in yield and an increase in losses of agricultural products, a deterioration in its quality at all stages of production.

The complexities of the functioning of the agro-industrial complex in market conditions are supplemented and aggravated by the seasonal nature of a significant amount of work, the uneven (seasonal) need for additional financing by the same uneven, cyclical possibilities of returning the funds raised.

Due to its sectoral characteristics, agricultural production, even in a stable economy, cannot function normally without resorting to borrowed funds [5-8]. In the context of limited investment injections into Russian agricultural production, leasing is an investment resource for technical renewal of the industry.
Since the beginning of 2000, a program of federal support for agricultural enterprises through the leasing system has been operating in the Russian Federation, the article presents the results of comparing federal leasing in comparison with commercial in order to determine its effectiveness as a tool for developing the agro-industrial complex [9-15].

The purpose of the study is a comparative analysis of commercial and leasing from a state-owned company (hereinafter referred to as state leasing) on the basis of calculated data carried out on a conventional unit of equipment, taking into account the main economic indicators.

2. Materials and methods
Calculations of the effectiveness of various options for organizational schemes for agro-industrial leasing.

2.1. Commercial (preferential)
Based on the presented scheme, we will calculate the leasing transaction using the example of a tractor lease agreement, the selling price of which is 3,778,000 rubles. VAT included. Based on the available amortization share of the input cost through lease payments, we will calculate the value of the property after leasing. After the end of the lease, the transfer of ownership to the client is envisaged.

The calculation is carried out in two stages: at the first stage, the dates of the transaction are calculated, and the rates applicable to each time period are determined.

2.1.1. Step 1. Determine the boundaries of the rental periods, payment dates, applicable rates (taxes and interest payments).

The initial data are: the date of transfer of the property at 10, the duration of each rental period, the number of rental periods 12 months, a sign of how the date of payment for the lease is located in relation to the paid rental period: a certain day of each month and the number of days, used to locate the due date in relation to the payable rental period.

For each of the 10 rental periods, the start and end of the period are calculated, as well as the date on which the corresponding payment for the rental in the specified period is due.

In addition, for each rental period, the following is determined by the payment date:

- tax rates (VAT, property tax, turnover taxes);
- applicable lease interest rates, which can also vary from period to period (they can be, by definition, variables that depend, for example, on the LIBOR rate, or they can be fixed, but with a revision right based on the terms of the agreement).

An array of dates and rates for the commercial lease analysis is presented in table 1.

| Rental period number | Tax rates | Interest rates |
|----------------------|-----------|----------------|
|                      | VAT       | property tax   | turnover taxes | base rate | margin (percentage of appreciation) | aggregate rate |
| 1                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 2                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 3                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 4                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 5                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 6                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 7                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 8                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 9                    | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
| 10                   | 0         | 2.2            | 0              | 8.25      | 11                        | 19.25         |
2.1.2. Step 2. Calculation of lease payments. Payments will be calculated with the following initial parameters:

- lease debt is paid off evenly;
- the leased asset is recorded on the lessor's balance sheet;
- margin (percentage of appreciation) is calculated as a percentage of the lease debt balance;
- property tax is calculated from the residual value of the property on a monthly basis; interest for financing is calculated as 1/12 of the annual rate;
- advance payment is distributed for the entire leasing period;
- the residual book value is charged at the end of the lease term and is paid proportionally.

2.2. State leasing

2.2.1. Stage 1. Determine the boundaries of the rental periods, payment dates, applicable rates. The initial data are: the date of transfer of the property for lease, the number of lease periods is 10, the duration of each lease period is 12 months, a sign of how the date of payment for the lease is located in relation to the paid lease period: a certain day of each month and the number of days used to locate the due date in relation to the payable rental period.

For each of the 10 rental periods, the start and end of the period are calculated, as well as the date on which the corresponding rental payment for the specified period is due.

An array of dates and rates for budget lease analysis is presented in table 2.

| Rental period number | Tax rates | Interest rates |
|----------------------|-----------|----------------|
|                      | VAT       | property tax   | turnover taxes | base rate | margin (percentage of appreciation) | aggregate rate |
| 1                    | 2.2       | 0              | 8.25           | 4         | 12.25                                |
| 2                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 3                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 4                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 5                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 6                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 7                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 8                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 9                    | 0         | 2.2            | 0              | 8.25      | 4                                    |
| 10                   | 0         | 2.2            | 0              | 8.25      | 4                                    |

In addition, for each rental period, the following is determined by the payment date:

- rates of tax payments and fees;
- applicable lease interest rates, which can also vary from period to period (they can be, by definition, variables that depend, for example, on the LIBOR rate, or they can be fixed, but with a revision right based on the terms of the agreement).

2.2.2. Stage 2. Calculation of lease payments. Payments will be calculated with the following initial parameters:

- lease debt is paid off evenly;
- the leased asset is recorded on the lessor's balance sheet;
- margin (percentage of appreciation) is calculated as a percentage of the lease debt balance;
property tax is calculated from the residual value of the property on a quarterly basis;
interest for financing is calculated on a daily basis with a base of 365 days a year;
advance payment is distributed for the entire leasing period;
The residual book value is charged at the end of the lease term and is paid proportionally.
Payments will not be subject to VAT.
The leased property will be recorded on the balance sheet of the leasing company.

3. Results and discussions
The initial amount of the lease debt is determined as the difference between the "input" value of the property 3,778,000 rubles and the received initial contribution of 3,778,000 rubles. The amount received is adjusted for various important components, such as an additional fee. Thus, the initial amount of the lease debt (after the advance payment) is 3,513,540 rubles.

The methodology for calculating the remaining payments is presented on the example of the second payment. Determine the applicable tax and interest rates: VAT - 0%, property tax - 2.20%, turnover taxes - 0%, interest rate - 19.25%
Funding costs at base rate: 260880.
We calculate the property tax. In this case, the tax rate is used to the maximum established by law: 74804.
Based on the available amount of lease debt, we determine the amount of interest income due to the leasing company for the 2nd period: the amount of lease interest income 607821 is equal to the amount of lease debt 362186 multiplied by the lease income rate 19.25 / 100 / 12 • duration of the period 12.
We receive the total lease income for the given period: 683525.
Finally, we recalculate the remaining lease debt, reducing it by the amount repaid in the current payment - 351354 rubles. The new debt value (included for the 3rd payment) is RUB 2,810,832. A complete calculation of all lease payments is presented in table 3.
In the calculations, the rise in the cost of equipment was taken into account without taking into account the federal budget, that is, without subsidizing the interest rate or additional subsidized financing. The calculation of the net present value is presented in table 3. The discount rate is determined taking into account the level of inflationary processes and the risk of –14%.

| Rental period | Incoming lease debt | Total interest income | Lease income incl. base rate | book value | property tax | Payment amount (payment schedule) |
|---------------|---------------------|-----------------------|-----------------------------|------------|-------------|-----------------------------------|
| 0             | 3778000             | 0                     | 0                           | 0          | 0           | 264460                            |
| 1             | 3513540             | 513525                | 430409                      | 29873      | 3778000     | 83116                             |
| 2             | 3135740             | 458933                | 384128                      | 257990     | 3400200     | 74804                             |
| 3             | 2757940             | 404340                | 337848                      | 22907      | 3022400     | 66493                             |
| 4             | 2380140             | 349748                | 291567                      | 195824     | 2644600     | 58181                             |
| 5             | 2002340             | 295156                | 245287                      | 164740     | 2266800     | 49870                             |
| 6             | 1624540             | 240564                | 199006                      | 133657     | 1890000     | 41558                             |
| 7             | 1246740             | 185972                | 152726                      | 102574     | 1511200     | 33246                             |
| 8             | 868940              | 131380                | 106445                      | 71491      | 1133400     | 24935                             |
| 9             | 491140              | 76788                 | 60165                       | 40408      | 755600      | 16623                             |
| 10            | 113340              | 22196                 | 13884                       | 9325       | 377800      | 8312                              |
| Total         | 0                   | 2678602               | 2221464                     | 1491989    | 20779000    | 457138                            |

At the discount rate r = 14%, the net present value is negative (–1064858 thousand rubles), which does not allow the lessor to make a positive decision on the transaction.
Since the implementation of this leasing transaction will be effective for the lessee and will have a positive effect on the development of the agricultural sector in the economy, it is advisable from the position of the state to participate in financing the leasing transaction at the expense of budget funds.
which will compensate for part of the leasing company's expenses.

Table 4. Calculation of the net present value (NPV), r = 14%.

| Time period (year) | Investments, rub. | Cash receipts, rubles | Discount rate r = 14% | Net present value, RUB | Cumulative net present value, RUB |
|--------------------|-------------------|-----------------------|-----------------------|------------------------|----------------------------------|
| 0                  | 3778000           | 264460                | 1.00                  | 3513540                | 3513540                          |
| 1                  | 1102137           | 947838                | 0.86                  | 2565702                |                                  |
| 2                  | 1064839           | 787555                | 0.74                  | 1778147                |                                  |
| 3                  | 1027540           | 653573                | 0.64                  | 1124574                |                                  |
| 4                  | 990242            | 541671                | 0.55                  | 582904                 |                                  |
| 5                  | 952944            | 448291                | 0.47                  | 134613                 |                                  |
| 6                  | 915646            | 370440                | 0.40                  | -238527                |                                  |
| 7                  | 878347            | 305601                | 0.35                  | -541429                |                                  |
| 8                  | 841049            | 251657                | 0.30                  | -793085                |                                  |
| 9                  | 803751            | 358328                | 0.26                  | -999913                |                                  |
| 10                 | 766452            | 169617                | 0.22                  | -1169530               |                                  |
| Total              | 9607407           | -1169530              |                       |                        |                                  |

Profitability of commercial leasing for the lessor: 39%. For the lessee, this transaction will be justified if, when purchasing a tractor, its profitability is 12%.

In this case, the profit of the lessor under the leasing transaction will be 3,778,000 rubles, and the lessee has a net profit of 1,169,530 rubles. The lease profitability will be 12%.

Determine the amount of debt repayment used for the scheme of equal repayment of the lease debt: 409200.00 How the remaining payments are calculated is explained using the example of the 2nd payment.

Property tax: 87120. Based on the available amount of lease debt, we determine the amount of interest income due to the leasing company for the 2nd period: the amount of lease interest income 384128 is equal to the amount of lease debt 3135740 multiplied by the rate of lease income. is: 1088394.

At the end of the calculation, we recalculate the remaining lease debt, reducing it by the amount repaid in the current payment - 3513540. The new value of the debt (included for the third payment) is 2,757,940 rubles.

Table 5. Analysis of government leasing.

| Rental period | Incoming lease debt | Total interest income | Lease income incl. base rate | book value | property tax | Amount of payment |
|---------------|---------------------|-----------------------|-------------------------------|------------|--------------|-------------------|
| 0             | 3778000             | 0                     | 0                             | 0          | 0            | 264460            |
| 1             | 3513540             | 513525                | 513525                        | 430409     | 430409       | 83116             |
| 2             | 3135740             | 489333                | 489333                        | 384128     | 384128       | 1088394           |
| 3             | 2757940             | 404340                | 404340                        | 337848     | 337848       | 1048999           |
| 4             | 2380140             | 349748                | 349748                        | 291567     | 291567       | 1009605           |
| 5             | 2002340             | 295156                | 295156                        | 245287     | 245287       | 970210            |
| 6             | 1624540             | 240564                | 240564                        | 199006     | 199006       | 930815            |
| 7             | 1246740             | 185972                | 185972                        | 152726     | 152726       | 891421            |
| 8             | 868940              | 131380                | 131380                        | 106445     | 106445       | 852026            |
| 9             | 491140              | 76788                 | 76788                         | 60165      | 60165        | 812631            |
| 10            | 113340              | 22196                 | 22196                         | 13884      | 13884        | 773237            |
| Total         | 0                   | 2678602               | 2221464                       | 1491989    | 1491989      | 9769587           |
The calculation of the net present value is presented in table 24, the discount rate will be determined taking into account the level of inflationary processes and risk - 13%.

Table 6. Calculation of the net present value (NPV), \( r = 14\% \).

| Time period (year) | Investmens rub. | Cash receipts, rubles | Discount rate \( r = 14\% \) | Net present value, RUB | Cumulative net present value, RUB |
|--------------------|----------------|----------------------|-------------------------------|------------------------|-----------------------------------|
| 0                  | 3778000        | 264460               | 1.00                          | 3513540                | 3513540                           |
| 1                  | 1127789        | 1088394              | 0.86                          | 969898                 | 2543642                           |
| 2                  | 1048999        | 1009605              | 0.74                          | 804976                 | 1738665                           |
| 3                  | 970210         | 930815               | 0.64                          | 667222                 | 1071443                           |
| 4                  | 903015         | 891421               | 0.55                          | 552262                 | 519181                            |
| 5                  | 852026         | 812631               | 0.47                          | 456413                 | 62768                             |
| 6                  | 852026         | 773237               | 0.40                          | 376577                 | -313810                           |
| 7                  | 852026         | 773237               | 0.35                          | 310150                 | -623960                           |
| 8                  | 852026         | 773237               | 0.30                          | 254941                 | -878901                           |
| 9                  | 852026         | 773237               | 0.26                          | 209112                 | -1088013                          |
| 10                 | 773237         | 773237               | 0.22                          | 171118                 | -1259132                          |
| Total              | 9769587        |                      |                               | -1259132               |                                   |

Next, we will calculate the profitability of budget leasing for the lessor: 2221464

For the lessee, this transaction will be justified if, when purchasing a tractor, its profitability is at least 12%.

Since the implementation of this leasing transaction will be effective for the lessee, although less than the profitability in a commercial transaction, from the position of the state it is advisable to participate in financing the leasing transaction at the expense of budgetary funds, which will compensate for part of the leasing company’s expenses.

4. Conclusion

As can be seen from the results, the most economically profitable for an entrepreneur is the budget version of the agreement, due to the highest level of return on investment, profit from investment, despite the high cost of leasing. This analysis gives us grounds to assume that the developed platform can become a springboard for a radical increase in the growth rate of economic development of the agro-industrial complex.

Also, within the framework of the agricultural development system 2020, it is possible to use the following mechanisms:

- Creation of tax incentives and vacations for the period of concluding a lease agreement;
- Within the framework of the agreement, interest should be charged after writing off the principal amount of the loan, which will allow the company to take the most stable position in the market, and then fully settle with the lessor;
- A necessary condition is to assign, as the choice of the leasing object, a product of Russian production.
- Reimbursement of part of the interest payments for the leasing contract, upon fulfillment of all conditions and terms, upon concluding a new contract.

These measures should stimulate the lessee to regularly renew their funds and, ultimately, increase the competitiveness of the region’s agro-industrial complex.

Summarizing the results, we come to the following conclusions: when introducing the developed platform, we can reasonably expect an increase in demand for leasing services, which will enable entrepreneurs to update fixed assets on favorable, low-risk terms; to increase the quality and quantity of its products by acquiring new industrial means of labor that meet the most modern norms and standards,
which will bring them to a new competitive level; to reduce their costs for labor remuneration and repair of morally and physically obsolete equipment.

Algorithm for servicing of the maximal number of the requests for repair within the established deadlines was designed in the work. Example of the practical application of the algorithm is provided.

Algorithm for servicing of the optimal sequence of requests for the repair obtained with the account of the least total time of delays during completion of service within the established deadlines was designed as well. Example of the practical application of the algorithm is presented.

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