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**LARGE FARMS IN POLAND FOUNDED ON THE BASIS OF
THE PROPERTY OF FORMER STATE - OWNED FARMS (PGRs)**

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Agricultural Economics and Transition:

**„What was expected, what we observed,
the lessons learned.”**

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Key words: Economic efficiency, shareholder companies of the State Treasury, farms purchased, farms on lease, Poland

ABSTRACT: This paper presents economic results of three groups of large farms, in the years 2000-2005, which were founded on the basis of the property of former state – owned farms in Poland. They were divided according their legal and organisational form into: farms purchased, farms on lease and shareholder companies of the State Treasury. On the basis of the results of the analysis it was concluded that all three groups are economically effective, however, farms purchased, as a legal and organisational form, are protected against the production and market risk in the highest degree. Hence, the final direction of privatisation in Poland at the present stage of restructuring should be the purchase of farms. It does not mean, however, that there is a need to liquidate shareholder companies of the State Treasury which due to their specificity play a significant role in implementing biological progress in agriculture.

Introduction

Post socialist countries, when they began the changes of the system in the 1990s, faced the challenge connected with the need of transformation and choice of the way of changing the agricultural sector. In Poland, with the law of 1991, the radical variant of the reform was chosen, which consisted in one-time complete liquidation of state – owned farms (PGRs) as a legal form and privatisation of their property. To this end the Agricultural Property Agency of State Treasury was founded (from 2003 the Agricultural Property Agency - ANR), which has taken over and manages the land and buildings which belonged to state - owned farms (Runowski, Ziętara 2002).

The aim of final privatisation was to be the sales of lands in order to enlarge existing small family farms and create new units based on the own work of their owners. However, due to the lack of capital necessary to purchase the property, and often little interest on the part of farmers themselves, lease became more popular. Leasing was to be a temporary form of privatisation, but it appeared the most popular as well as a permanent way of farmland and buildings development. The introduction of leasing allowed for, among other things, founding of companies – in the initial phase with the proprietary share of employees of former state – owned farms – based on hired labour (Dzun 2005).

In the process of privatisation also a temporary variant was chosen (commercialisation) consisting in excluding, and then transferring, a part of the property to companies with the State Treasury share, with an option to move the shares later. Shareholder companies of the State Treasury were created mainly on the basis of Państwowe Ośrodki Hodowli Zarodowej and Stacje Hodowli Roślin (National Brood Breeding Centres and Plant Growing Stations), and well functioning and profitable former state - owned farms possessing enormous property, which at the same time was difficult to divide (Runowski 2002)

Despite the fact that the process of restructuring consisting in privatisation, liquidation and combining into larger units was in progress, the state still is the sole owner in a part of the companies. This concerns mainly units with a strategic importance

for Polish agriculture as far as the introduction of biological progress in crop and animal production is concerned (Dzun 2002).

From the perspective of a dozen or so years of privatisation in Poland the question arises concerning its effects, from the angle of economic effectiveness of economic activity conducted by new farms.

According to the author, the numerous publications to date concerning this subject do not exhaust the subject of the study, especially as restructuring and adjusting processes are of permanent character (Baum 2005, Jarka 2004, Guzewicz et al. 1997, Osuch 1999).

The aim of this study is then finding the answer to the question which legal and organisational form turned out to be successful in changeable market conditions (purchase, lease, or a shareholder company of the State Treasury form) i.e. was more economically effective.

Study material and the method of analysis

The analysis uses empirical materials from the years 2000-2005, collected through surveys, within the framework of many years of studies on large farms conducted by the Institute of Agricultural and Food Economics (IERiGŻ). The sample studied was representative for particular legal and organisational forms (Guzewicz et al. 2003, 2005). However, due to the fact that the process of privatisation is of a continuous character, from the original sample were excluded units in the phase of restructuring which lead to significant changes in the structure of their organisation, e.g. the division of a farm, and the criterion deciding about exclusion was the lack of continuity of production (table 1).

Table 1

The number of analysed large farms in 2000-2005

Year	Farms purchased	Farms on lease	Shareholder companies of the State Treasury	Total
2000	30	86	24	140
2001	34	90	20	144
2002	40	90	17	147
2003	43	88	17	148
2004	46	87	17	150
2005	51	88	17	156

Source: own study

The subject of the study were large farms, which according to the methodology of IERiGŻ are units conducting agricultural activity in the land area not smaller than 100 ha, or those dealing with specialised agricultural production (e.g. greenhouse cultivation, mushroom-growing, poultry farming). However, the condition of considering units from the last group as large ones was not the surface area of arable lands, but the size of activity. It was assumed that specialised farms should achieve the equivalent of commercial production of the value exceeding 0,5 million PLN per farm (Guzewicz et al. 2006). The number of

specialised farms founded on the basis of the property of former state – owned farms was small (in the analysed samples only three farms), therefore the article uses the term large farm and not large production farm .

Within the framework of the analysis private units which conducted agricultural activity on lands the majority of which was leased from the Agricultural Property Agency were included in the group of farms on lease. In these farms often also buildings and equipment were subject to leasing (Guzewicz et al. 2003)

Farms purchased, in comparison with farms on lease, conducted agricultural activity on lands the most of which was their property. These units owned also outbuildings. This resulted from the conditions of purchase of land of former state – owned farms, according to which ANR, among other things, imposed the obligation of purchasing a utility/farm building.

The analysed shareholder companies of the State Treasury leased all of the land from the Agricultural Property Agency, although they were totally owned by the state. The land they used did not constitute these units' property, which made them resemble farms on lease.

The assessment of the economic effectiveness of farms was conducted according to a classical method of financial analysis with the usage of four basic ratios, the choice of which was suggested by Kulawik (2007):

1. Return on sales

$$ROS = \frac{\text{Sales income and equalled income}}{\text{Basic operating costs}} \times 100$$

2. Total profitability:

$$TPR = \frac{\text{Total income}}{\text{Total costs}} \times 100$$

3. Value added ratio

$$VAR = \frac{\text{Value added}}{\text{Total costs}} \times 100$$

4. Return on equity

$$ROE = \frac{\text{Net profit/Net loss}}{\text{Average state of equity}} \times 100$$

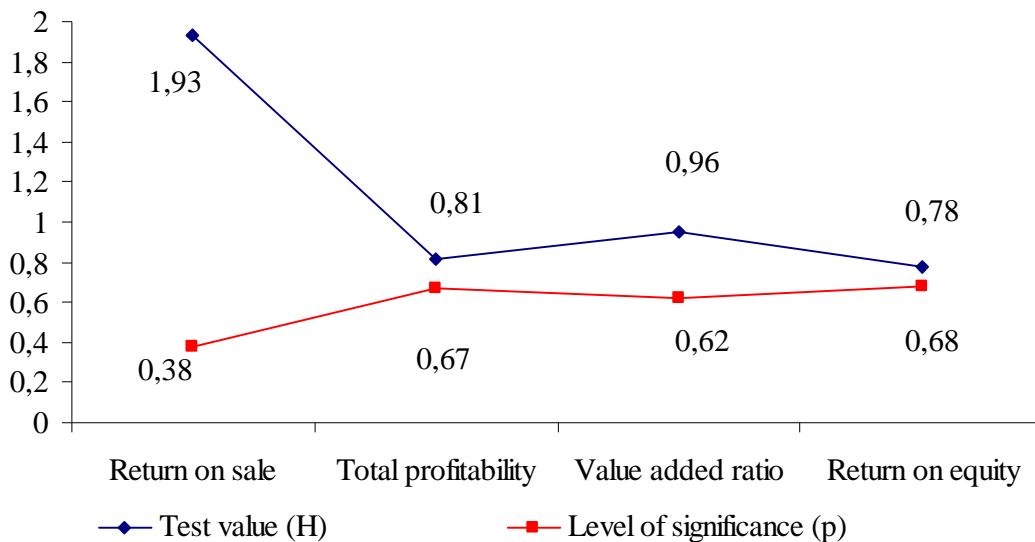
Classical statistical measures (mean, median, standard deviation) were used as ratios comparing particular groups of farms (forms). It was also tested if the distribution of ratios in particular years and forms is a normal distribution or a distribution close to normal. To this end the Shapiro-Wilk normality test was used. The results of the tests conditioned the choice of a statistical method of testing of statistical significance of differences in effectiveness in particular groups. Due to the fact that the null hypothesis of normality of distribution of most of the ratios within a given form was rejected, Kruskal-Wallis Rank Test was used for analysis of differences. The method based on ranking of traits allowed to analyse with a high level of accuracy if distribution of particular ratios of all three forms of farms varies statistically between them. In order to find out which forms

have the distribution of ratios (total profitability and return on equity) that varies statistically, the Kruskal-Wallis test was supplemented with the Median test.

The results of the studies

The comparison of ratios by way of classical statistical measures in the years 2000-2005 allows to conclude that large farms of particular legal and organisational forms achieved different economical effectiveness (Annex table 1,2). Only the year 2000 constitutes an exception, when economic effectiveness ratios showed the lowest diversity. The results of the Kruskal –Wallis test show, however, that this differences were statistically insignificant (graph 1). The analysis of market and weather conditions in 2000, as well as the results of studies concerning previous years, allow to consider this phenomenon incidental (Guzewicz et al. 1997)

Graph 1. The value of Kruskal – Wallis rank sum test for economic effectiveness ratios in 2000



Source: own study

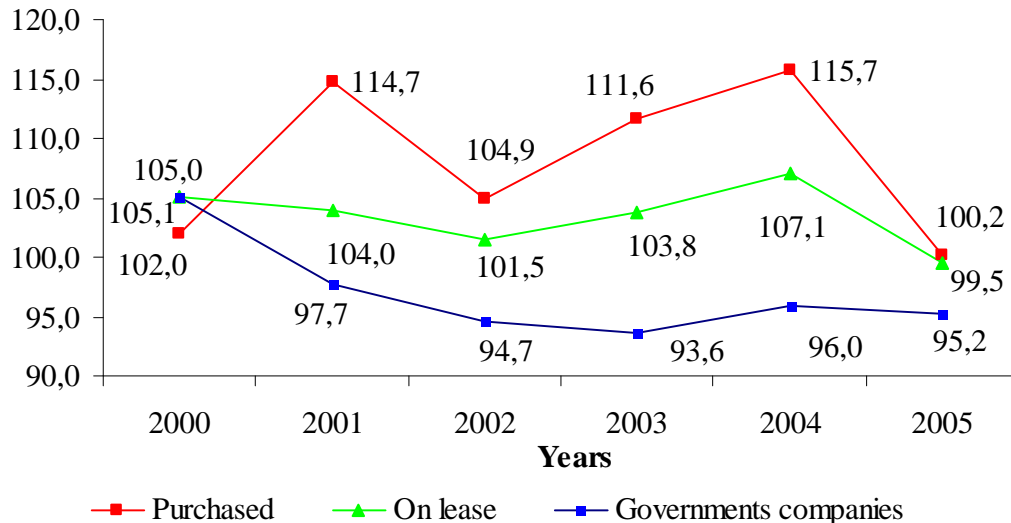
Return on sales ratio – which measures covering basic operating costs (costs connected with production activity) with income from the sales of agricultural products and equalled income i.e. income from the sales, among others, corrected by the difference of levels of ready products stores – indicates the advantage of farms purchased over farms on lease and shareholder companies of the State Treasury (graph 2).

According to the result of the Kruskal – Wallis test, this difference indicates the lack of statistical significance in the aforementioned year 2000, but also in 2005 (Annex table 3).

Return on sales ratio did not reflect technical effectiveness. Shareholder companies of the State Treasury constituted a group which in the studied period achieved the highest efficiency both in crop and animal production, since average crops in companies in the years 2000-2005 amounted to 61 quintals per hectare (including 64 q/ha of wheat) and were higher in relation to farms purchased on

average by 20,6% (including wheat higher by 10,7%) and farms on lease by 20,4% (including wheat by 17,7%). Differences in productivity were also visible in other crops and were the highest in sugar beets yielding, where average crops in the companies of the State Treasury (597,5 q/ha) constituted 132,5% of productivity in farms purchased and 127,5 % in farms on lease.

Graph 2. Return on sales ratio in the years 2000-2005 (median value)



Source: own study

Yielding crops was varied in spite of using a similar level of mineral NPK fertilisation, i.e. nitrogen, phosphorus and potassic fertilization per pure component (on average 240 kg per hectare of arable land). Which means it resulted from differences in the level of soil fertility and production technology used and biological progress.

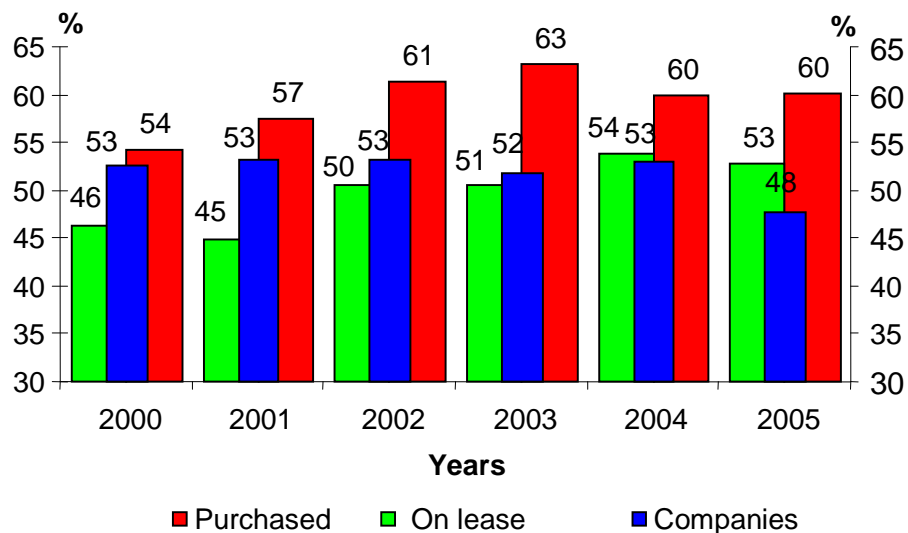
Animal production efficiencies between the analysed groups were less varied. In the companies, production of cow's milk was on average higher only by 3% (on average in the years 2000-2003) than in the group of farms purchased. However, from 2003 higher increase of profitability in the group of the companies was noticed, which caused widening of the difference in profitability (in 2005 it amounted to 15%). Farms on lease showed cow's milk profitability decrease by 10% in relation to the companies, however, in the whole analysed period the distance between the groups stayed at the similar level.

Shareholder companies of the State Treasury did not show, however, any advantage in efficiency of pig production. The amount of meat in porkers in all three forms was at the similar level, however, production in the companies was characterised by a slightly longer fattening period, as well as higher feedstuff usage per kilogramme of livestock growth (higher by 3% than in farms on lease and at least by 20% than in farms purchased). Pigs played a small role both in the structure of the headage of animals as well as in end production of the companies.

The value of the return on sales ratio was then conditioned mainly by a chosen direction of agricultural production (production structure) and the level of work remuneration and its substitution with capital or with simplification of agricultural activity, and not with productivity.

In farms purchased, as in the only group, there were no factors limiting free shaping of work resources (especially reducing the number of hired employees). Flexible shaping of employment was not fully possible in shareholder companies of the State Treasury as well as in a part of farms on lease, especially those functioning as companies with employees share. Farms purchased used this possibility as well as the fact of owning a significant part of production property. Conducting agricultural activity of the smallest size (on average 115,5 ESU) they chose the type of activity in the most flexible way, taking into account current price relations, i.e. they chose the most profitable production directions, substituting work with capital at the same time (the highest index of technical equipment for work). In the structure of agricultural goods production of this group crop production dominated clearly (graph 3). Contrary to farms on lease, they achieved as much as one third of income from the sales of fruit and vegetables. Hence, fruit and vegetable prices decided to a significant degree about the shape of return on sales ratio. Animal production in farms purchased played a significant role in a lower number of units mainly keeping one animal species. Farms dealing with animal production specialised to an equal degree in pig, poultry and cattle breeding.

Graph 3 The share of crop production in the structure of goods production in the years 2000-2005



Source: own study

In farms on lease agricultural activity was larger (on average 180 ESU) than in farms purchased. Within this form, in the group of farms specialised in crop production the phenomenon of crops limitation to plants for which sowing, fertilizing, nurturing, and most importantly, harvesting could be conducted with the usage of the same set of machines (traditional grains, corn for seeds, colza) was observed. This lead, on the one

hand, to a relative lowering of capital needed to mechanise production, simplification of crop rotation, and on the other hand, to limited demand for work.

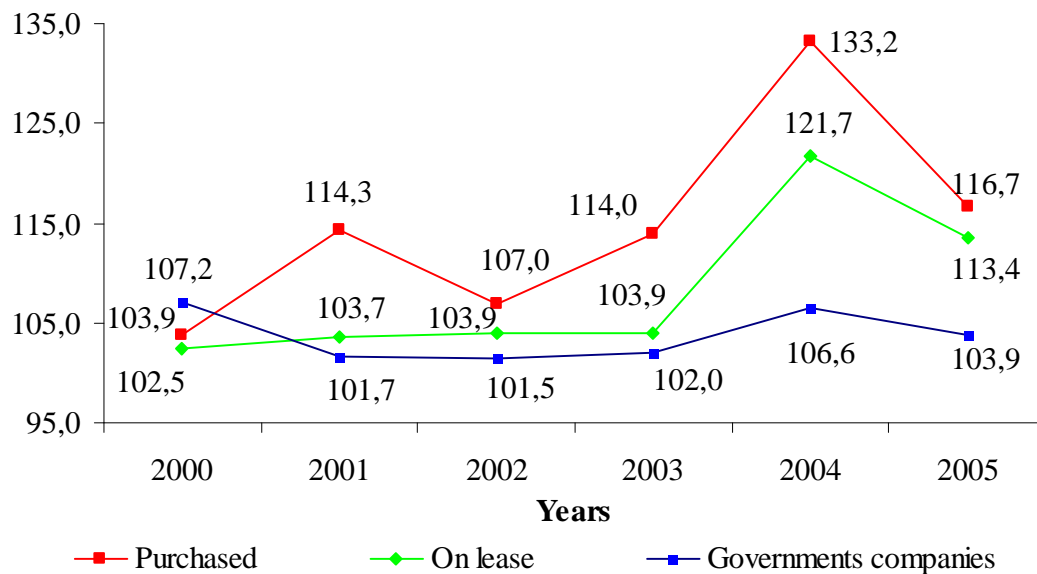
As far as animal production is concerned, farms of this form were more oriented at milk cattle (48% of income from sales of animal production) in a degree similar to the one in which farms purchased were oriented at pigs (38%), but in lower degree at poultry (14% - of income from animal production sales).

Despite much better production indexes, shareholder companies of the State Treasury had the poorest results of sales and as the only group in the years 2001-2005 noted a loss in their basic operational activity (return on sales was much lower than 100). Negative return on sales was not, however, connected with dramatically worse economic efficiency of these units, but with conducted by most of them works for biological progress and the accepted long-term development strategy. This group included the units conducting the largest agricultural activity (on average 376 ESU), but as the only one was not oriented at current price relations (profit maximisation), but at realisation of definite production goals. Works for biological progress stiffened the structure of production, in a way similar to the development strategy of animal breeding companies oriented at milk production development. In this group, milk and beef cattle, as a side activity, constituted almost 90% of income from animal production sales. Achieving a high limit of milk production (milk sales in the reference period, i.e. from April 2002 to March 2003) accompanied by unfavourable price relations in the years 2001-2003, lead to the decrease of return on sales ratio. Achieving production quota guaranteed, however, stable functioning and development conditions for shareholder companies of the State Treasury after joining the European Union. This was manifested in the growth of return on sales ratio for the companies in the years 2004-2005 and achieving the same level in the last year of the analysis, as the other forms.

Total profitability is more important in the hierarchy of economic effectiveness ratios. This ratio, except for return on sales, includes also the result of other business activities (in case of agriculture mainly budget subsidies) and the result of financial activity. In the analysed population the financial activity result was negative nearly in all cases, which was connected with the fact that farms were charged with interest payment: of working, investment credits, for property purchase. This ratio (contrary to return on sales) favoured to a lower degree farms purchased which did not have to pay land rent for land lease. Lease payment charged basic operational activity, while land purchase, usually connected with a credit, indirectly lowered the result of the whole business activity.

The lowest total profitability ratio in the years 2001-2005 was noted by shareholder companies of the State Treasury (graph 4). However, despite negative result of sales (losses), in the whole studied period, total business activity of the companies of the State Treasury was profitable (it brought profit). Works conducted in the field of creative and conservative production to a higher degree generated costs charging basic operational activity. Increased costs were, however, partly compensated by licence fees (breeding) and budget subsidies (so called other operational income), but it was reflected only at the level of total profitability ratio. By 2004 breeding fees and subsidies for implementation of biological progress constituted, indeed only 4% of total income, but still played a significant role in shaping profit.

Graph 4. Total profitability ratio in the years 2000-2005 (median value)



Source: own study

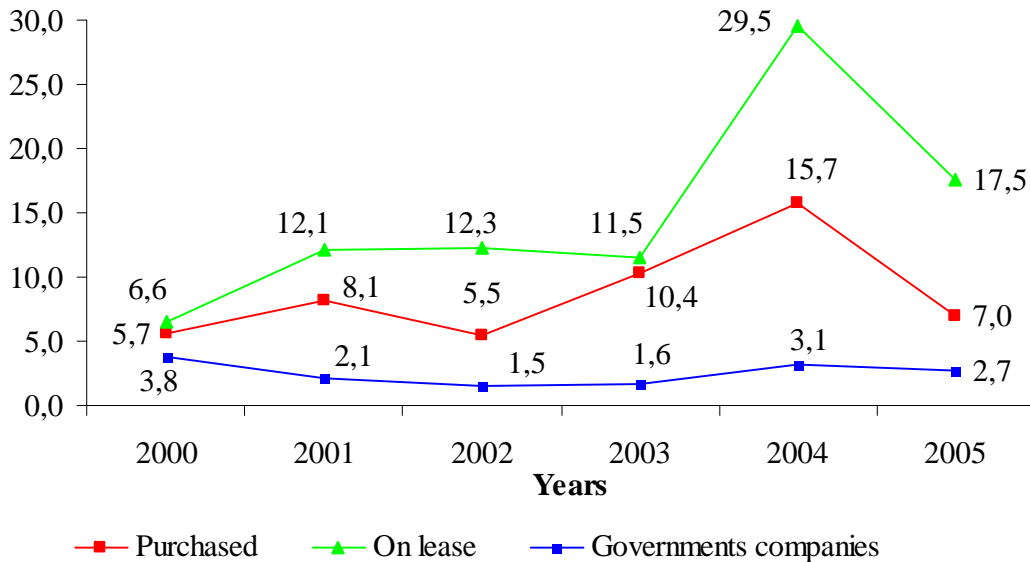
Decrease of income was also noted, mainly in companies specialising in crop production due to the fact that farmers (especially small scale) sought savings in expenditure on purchase of qualified seeds. They introduced progress in varieties, and partly in generations, by way of: barter exchange with neighbours, multiplying small parts of purchased reproductive material in their own farms, and even in the result of qualified material purchase from illegal sources. This had a negative effect on the results of the whole population of companies of the State Treasury studied.

Comparing the distribution of total profitability ratio in particular forms of farms, a statistically significant difference was noted in the years 2001 – 2003 between farms purchased and other legal and organisational forms (Annex table 3,4). Introducing new forms of aid after joining the EU (from 2004) and subjecting in a high degree economic effectiveness to the ability of obtaining different types of subsidies changed these relations. Both farms purchased and on lease showed larger abilities of obtaining EU funds constituting the aid, connected directly or indirectly with agricultural production, as well as subsidies lowering investment costs. This resulted mainly from smaller agricultural production of these farms. The importance of budget subsidies indicates the fact that their value decided about the difference of distribution of total profitability ratio between farms on lease and the companies in 2004, and then about increased similarity of the group of farms on lease to farms purchased in 2005 (Annex table 3,4).

Value addend ratio was the only one whose difference in distribution in forms and years (except from 2003) was statistically insignificant. Social efficiency of all groups of farms was then similar, although they showed differences in other economic effectiveness ratios. This resulted from the differences in payment for production materials used, both own and external.

Farms on purchase engaging relatively lower equity capital in the process of production, despite much lower return on sales than in farms purchased, had higher return on equity ratio (Graph 5).

Graph 5. Return on equity ratio in the years 2000-2005 (median value)



Source: own study

Higher payment for using equity in production resulted from the phenomenon of financial lever. Return on production capital (own and external) used in this group was higher than the cost of credit handling as well as instalments for property lease.

A low level of equity allowed, with favourable natural and market conditions, to obtain significant financial means, however with decreased profitability of production and unfavourable conditions it pose a threat of loss of financial liquidity. The level of standard deviation, the value of which in the group of farms on lease exceeded many times an average as well as median value (Annex table 2), indicated the occurrence of both positive and negative effects of this strategy.

In Poland from 2003 successive growth of prices of farmland has been observed, which is unfavourable for farms which lease this production element. Due to the long-term character of lease agreements, this did not influence directly the value of rents in the analysed period, and at the same time financial results of farms. Attractiveness of investing in land may in the future cause pressure on different allocation of current lands on lease, e.g. selling land to smallholders and lease rent increase for current dependant holders (leaseholders).

Summary and conclusion

The analysis shows that the assessment of economic effectiveness of particular legal and organisational forms of farms constitutes a difficult task. Each group of farms had different functions, and at the same time all forms were economically effective. It was then concluded that all three ways of restructuring of property of former state – owned farms were appropriate.

Research shows, however, that farms purchased appeared to be the most resistant to threats resulting from the production and market risk. They showed the highest ratio of return on sales and profitability of the whole economic activity thanks to flexible shaping of production and directions of agricultural activity. The purchase of a farm should be then a target form of privatisation in Poland.

Purchase of farms on lease with too low own funds may lead, however, to financial tensions, which may consequently influence production and effectiveness of such units. On the other hand, it protects against land prices growth (now in Poland farmland is a great investment), and at the same time lease rents growth.

The merit of leasing was the possibility to start agricultural activity with relatively low start capital, and at the same time it was a chance to work out means necessary for gradual purchasing of used property. It was indicated by return on capital ratio which was the highest in the analysed group of farms. Leasing was useful at the first stage of privatisation, and in the long-term perspective it does not allow for full freedom of farming. Leasing as the direction of restructuring property of former state – owned farms was also connected with a significant financial risk.

Shareholder companies of the State Treasury showed the weakest economic results, which resulted, however, from inadequate valuation of goods of public character supplied by these units, i.e. introduction of biological progress. Farms from this group have, however, taken up actions oriented at increasing effectiveness in the future, which allows to forecast their competitiveness growth in relation to other forms of farms.

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Annex

Table 1

Ratios: Return on sales and total profitability in the years 2000-2005

Years	Legal form	Return on sales			Total profitability		
		average	median	Standard deviation	average	median	Standard deviation
2000	Purchased	100,5	102,0	23,4	101,7	103,9	15,5
	On lease	107,1	105,0	22,7	105,1	102,5	20,9
	Companies	108,4	105,1	11,5	75,0	107,2	53,1
2001	Purchased	115,3	114,7	26,3	114,8	114,3	22,7
	On lease	102,8	104,0	17,9	101,6	103,7	17,7
	Companies	90,0	97,7	23,3	96,4	101,7	20,0
2002	Purchased	104,1	104,9	15,1	109,0	107,0	14,3
	On lease	102,2	101,5	18,7	105,0	103,9	20,0
	Companies	94,6	94,7	7,9	100,9	101,5	7,5
2003	Purchased	114,6	111,6	18,0	118,3	114,0	18,6
	On lease	107,5	103,8	20,2	108,8	103,9	19,6
	Companies	92,1	93,6	10,3	100,3	102,0	6,6
2004	Purchased	119,0	115,7	25,6	137,2	133,2	27,8
	On lease	111,5	107,1	24,7	126,1	121,7	26,8
	Companies	96,6	96,0	13,8	110,6	106,6	16,7
2005	Purchased	101,2	100,2	27,6	119,5	116,7	25,0
	On lease	100,8	99,5	21,9	118,0	113,4	20,4
	Companies	92,7	95,2	21,4	102,2	103,9	14,4

In case of fulfilling the condition of normality of distribution, the data were marked red (Shapiro-Wilk test) for $\alpha=0,05$

Source: own study

Table 2

Ratios: Value added and return on equity in the years 2000-2005

Years	Legal form	Value added ratio			Return on equity		
		average	median	Standard deviation	average	median	Standard deviation
2000	Purchased	41,1	36,9	21,1	-2,6	5,7	52,4
	On lease	41,8	44,3	15,3	0,2	6,6	196,3
	Companies	42,5	43,7	12,9	76,0	3,8	329,6
2001	Purchased	41,9	40,9	15,6	9,6	8,1	12,3
	On lease	35,3	36,2	18,9	163,9	12,1	1053,2
	Companies	34,3	42,0	40,1	-4,8	2,1	70,2
2002	Purchased	40,3	37,8	13,5	7,0	5,5	9,3
	On lease	36,1	36,6	17,5	29,9	12,3	74,9
	Companies	42,9	41,8	8,0	-0,8	1,5	12,3
2003	Purchased	44,3	42,0	12,9	10,1	10,4	10,1
	On lease	37,0	37,3	16,4	23,0	11,5	37,4
	Companies	42,7	42,2	11,0	0,0	1,6	6,1
2004	Purchased	48,5	50,4	13,2	20,6	15,7	16,2
	On lease	44,2	44,5	13,9	37,0	29,5	107,5
	Companies	46,6	44,8	9,8	6,7	3,1	9,6
2005	Purchased	41,0	41,0	15,5	9,8	7,0	12,2
	On lease	40,5	39,9	11,5	32,3	17,5	125,8
	Companies	42,5	43,2	10,5	1,2	2,7	12,9

In case of fulfilling the condition of normality of distribution, the data were marked red (Shapiro-Wilk test) for $\alpha=0,05$

Source: own study

Table3

The value of Kruskal – Wallis rank sum test (H) for economic effectiveness ratios in the years 2000-2005

Lata	Wskaźniki efektywności			
	Return on sales	Total profitability	Value added ratio	Return on equity
2000	1,93 (p =0,3804)	0,81 (p =0,6655)	0,96 (p =0,6202)	0,78 (p =0,6782)
2001	19,80 (p =,0001)	14,74 (p =,0006)	4,12 (p =0,1273)	14,86 (p =0,0006)
2002	11,30 (p =,0035)	10,45 (p =,0054)	3,68 (p =0,1591)	25,86 (p =,0000)
2003	26,76 (p =,0000)	19,33 (p =,0001)	7,26 (p =0,0265)	20,02 (p =,0000)
2004	15,02 (p =,0005)	17,06 (p =,0002)	3,25 (p =0,1966)	30,47 (p =,0000)
2005	2,47 (p =0,2909)	11,03 (p =,0040)	1,62 (p =0,4438)	31,28 (p =,0000)

* The values in brackets present the level of probability of assuming the hypothesis of lack of distribution differences of economic effectiveness ratios of all legal and organisational forms

Source: own study

Table 4

Types of legal and organisational forms for which economic effectiveness ratios in the years 2001-2005 was statistically different (on the basis of Median test)*

Lata	Total profitability			Return on equity		
	Purchased (kod 0)	On lease (kod 1)	Companies kod (2)	Purchased (kod 0)	On lease (kod 1)	Companies kod (2)
2001	1,2	0	0	2	2	0,1
2002	1,2	0	0	1,2	0,2	0,1
2003	1,2	0	0	2	2	0,1
2004	1,2	2,0	0,1	1,2	0,2	0,1
2005	2	2	0,1	1,2	0,2	0,1

* The code of a form in each column means that a statistically significant difference was found between the groups of farms

Source: own study