Why Are Companies Disappearing in Transitional Agriculture? Evidence from Lithuania[♣]

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ABSTRACT

In most transition economies, agricultural reforms have led to the emergence of family farms and household food production and to the decline of corporate farms. This study explores the extent of that trend for the case of Lithuania based on secondary information and primary survey data. The structure of corporate farms and links to the economic environment are explored. Specific hypotheses on the reasons for the profitability crisis in corporate farms are developed and tested. The paper concludes with a critical discussion of current changes in farm structures in the transition economies.

Key words: transition, agriculture, enterprise restructuring, survey data, ordered probit model

JEL: P46, Q12, R20, O12, O18

1. Introduction

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An important aspect of the economic transition in the formerly socialist economies is the change in the structure of enterprises within agricultural sectors. Following the agricultural reforms, such as privatization of farm land and assets, in the early 1990s, traditional socialist farm structures (collective and state farms) have generally been transformed into corporate farms: capitalist enterprises with the legal labels of partnerships, joint-stock companies or limited liability companies. Simultaneously, in all of the transition economies millions of private individual farms - family farms – have emerged, often operating on a very small scale and satisfying much of rural household food consumption (Swinnen and Macours, 2000; Lerman, 2001). Corporate farms, in contrast, have declined in number and, it appears, also in economic viability. Evidence from various countries suggests that corporate farms are suffering from low profitability, high debts, and high liquidation or bankruptcy rates, even in those countries where policies towards the different farm structures are officially non-discriminatory (EBRD, 2003; Lerman et al, 2002). In this paper we will examine the possible reasons for these problems besetting corporate farming in many transition economies, and explore their relevance for corporate farms in Lithuania.

This question is an interesting one for several reasons. Theoretically, the market reforms in agriculture were driven by a distinct view on the inadequacy of corporate enterprise structures in agriculture within a market economy, and the desirability of replacing them with family farms, which were deemed to be inherently more efficient (Schmitt, 1993). To enable this transformation to occur was a major aim of the land privatization programmes in the early 1990s. The common perception of socialist-style farm structures in the early transformation years was that "the evident weakness of this organizational form provides the argument for full scale privatization" (IMF *et al.*, 1991:157-158) and that at "privatization in … agriculture mainly concerns the breaking up of large units…" (World Bank, 1995:2). It would now, more than a decade later, be important to examine how the performance of corporate farms, as they presently operate in the new market economies, is connected to such innate inadequacies, and which other factors could possibly play a role. If there are indeed such other factors, then corporate farms are not doomed by their inherent governance structures, as has been argued, and it would then be possible to explore policies to enhance their performance.

From a policy point of view, the fate of the corporate farming sector is important for agriculture as a whole. Because alternative farm structures, family farms, are typically

small and often market only part of their production, commercial agriculture is still to a large extent dominated by corporate farms. They also work considerable shares of agricultural land in many transition economies. Improving the performance of these enterprises would be relevant to the contribution of the agricultural sector to the national economy (e.g. in terms of incomes, employment, and export potential).

In this paper several hypotheses on the factors affecting corporate farm profitability in a transition economy (section 2) are developed. These will be examined based on both secondary information (section 3) and survey data from Lithuania collected by the authors (section 4). The data provide an opportunity both for an explorative investigation of the structure, environment and performance of corporate farms in Lithuania (section 5) and for an econometric analysis of the validity of the hypotheses (section 6). The paper is concluded with an overview and discussion of the findings (section 7).

2. Hypotheses

In the wider literature on the agricultural sector in transition economies, several reasons have been advanced to account for what has amounted to a crisis in agriculture in general, and in corporate agricultural enterprises in particular (Bezemer, 2002c; Hobbs et al, 1997; Sarris et al, 1999). Since ultimately such factors all translate into low farm profitability, they can be conveniently outlined with reference to a farm profit function of the form

$$\Pi = R - C + B$$

where Π is farm profit, R is revenues from agricultural production, C is total costs connected to agricultural production, and B is any other income, not directly connected to agricultural production (such as net credit, subsidies or income from non-agricultural activities). This can be specified as

$$R = pQ$$
$$Q = Q(K, L)$$
$$C = Lw + Kp_K$$

where p is the output price, Q is agricultural output level, K and L are levels of capital (including land) and labour utilised in agricultural production, w is the agricultural wage, and p_K is the price of capital. In the literature on (corporate) enterprises in transitional agriculture, four factors have been suggested which may depress (corporate) farm profit and endanger farm viability. These may be presented as four hypotheses on the shape of the farm profit function.

Hypothesis 1: $\frac{\partial(\Pi)}{\partial(Q)} \prec 0$

A well-known argument against the corporate governance structure in agricultural production (as distinct from a family farm structure) is that it leads to overly large farms with flawed incentive structures (Deininger, 1995). In most of the socialist economies, farms had a number of workers far exceeding the size of farms on which generalizations about scale and scope economies are based (Pryor, 1992). Corporate farms, as successor organizations to these structures, are still large, recent restructuring notwithstanding. One reason is that corporate farms need to be above a minimum scale in order to justify the overhead costs of management (which are absent in family farming). However, technical economies of scale and scope can be argued to be soon outweighed by diseconomies due to the costs of monitoring employees in team production (Alchian and Demsetz (1972). These costs arise because of the information asymmetry problem between managers and workers with regard to the state of the land, crop, and animals, and the appropriate amount of labor input.

Yet another reason may be that such farms, in the transition setting, are often open to state interference. They may be subject to direct state ownership (sometimes via share ownership by state voucher funds) or through dependence on state resources such as subsidies and credit. They may also depend on state services in the areas of information and expertise. National and local governments can then use these resources and services to allow continued operation of large farms, which provide rural

employment. Thus, farm restructuring decisions (slimming) may become politicized, leading to overly large farm sizes compared to the profit-maximizing optimum.

Hypothesis 2: $\frac{\partial(\Pi)}{\partial(p_K)} \succ 0\,, \qquad \frac{\partial(\Pi)}{\partial(K)} \succ 0$

A second reason for reduced farm profitability may be capital constraints, either because of a high price of capital or because of capital rationing. In the centrally planned economies, relative large investments were made into the agricultural capital stock and plausibly over-investments occurred both in fixed capital - the level of mechanization was high in relation to the costs of labour - and in variable capital, e.g. in the amount of fertiliser applied (Pryor, 1992). Presently, such directly subsidised investments are small or absent. Investments are now predicated on access to outside finance, of which bank credit is the most important option. However, agricultural credit markets are characterised by highly specific risk sources, enterprise capital structures, collateral options, intertemporal lending and repayment schemes, and other idiosyncratic factors (Barry et al, 1995). They require targeted institutional support to develop and function. Several recent studies on credit markets for agriculture in the transition economies suggest that these are often failing, for a variety of reasons (Pederson and Khitarishvili, 1997; Davis *et al*, 1998; Shrieder and Heidhues, 1998; Swinnen and Gow, 1999; Koford and Tschoegl, 1999; OECD, 2001; Bezemer, 2002a,b).

In such situations and in the presence of state interest in the continued operation of farm companies providing rural employment (as explained above), the result may be 'soft budgets', where credit is used as subsidies. Given the aim of preserving employment, such funds will be used to prevent the weaker farms from collapsing, rather than flowing to its most profitable use, which would typically be in the more profitable farms. The result is that "the growing share of support by [credit support funds] is to farms whose performance remains the worst among the various … forms of farming" (Csaki et al,1999:36). This quote is actually from a World Bank study on agricultural credit in the Czech Republic. Indeed, a typical flaw in agricultural credit markets in transition economies in general is that credit goes to the weaker farms in terms of profitability, as opposed to the situation in well-functioning credit markets, where loans are allocated to their most profitable use (Pederson and Kitarishvili, 1997; Rother, 1999).

This mechanism need not be typical for credit only. Any supply of inputs,

services or benefits more generally which is controlled (or susceptible of manipulation) by the state will, in this account, have a tendency to be allocated more towards those farms with weaker financial performances. This may include overt subsidies, specialist advice, and tax advantages (see Bezemer, 2002b, for a detailed studies on such allocation biases). This tendency is connected to hypothesis (1): using credit and other inputs or services as subsidies is one way of keeping farms large and their employment potential high.

Alternatively, without state interference, failing credit markets may take the form of under-supply. Too few or too small banks typically service to agriculture. Those that do operate often perceive the sector as risky due to fluctuating yields and revenues, as insecure since land is no adequate collateral, and as unfamiliar and requiring costly, specialist knowledge. To hedge against these risks banks will tend to set relatively high interest rates and demand large collateral to compensate for low loan volume and high risks. In Lithuania, for instance, agricultural interest rates at the moment of writing are typically 2 to 3 per cent above those for other enterprises, and loans extended often have ceilings of two-thirds of the value of collateral (LIAE, 2003). Such interest rates are typically above the return rates of most agricultural projects, and such conditions difficult and costly to meet. With debt finance unattractive, farm management will prefer to meet investment needs from own farm resources, in line with pecking-order theory (Myers, 1984). Thus, it is only the weaker farms without own resources but with the need to meet at least operational investment needs that borrow, this time not because of rationing but because of a high price for credit. Again, such credit rationing directs credit away from the more successful companies. As with politically motivated loan allocation biases, also this mechanism has been observed in the transition context (Bezemer, 2002a).

We note that these two mechanisms in the credit market may be mutually enforcing. With a high probability of bailout because of soft budgets, management of weakly performing farm companies will have fewer reservations about lending against unsustainably high interest rates.

Hypothesis 3: $$\frac{\partial(\Pi)}{\partial\left(p/w + p_K\right)} \succ 0$$

A third problem for farm companies may be low output price relative to prices of inputs - especially if prices are taken in the broader sense of including transaction costs as well as off-farm agricultural output price. The main reasons for depressed output prices are

international competition and domestic market power. An increase in competition was inevitably implied in market reforms. In the early transition years this led in most transition countries to the operation of price scissors, i.e. an increase of input prices relative to output prices (OECD, 1997).

The main problem presently may well be that restructuring has been widespread in agriculture, with many small-scale family farms and many farm companies of smaller size than previously; but little restructuring in the food industry, where one or a few buyers still dominate regional, and sometimes national markets for a particular agricultural product (Gow and Swinnen, 1998; Gaisford et al, 2001).

Farm operators in transition economies are then facing powerful buyers in downstream markets. Their market power is typically based on high concentration and oligopsony power, where many farms deliver to a single processor or trader (Hobbs et al, 1997). It also derives from product perishability, which deprives sellers from the option to defer delivery while negotiating for better transaction conditions. Market power for the buyer may additionally be based on specific investments made by farmers, which are particularly high in, for instance, the dairy sector. Such investments are specific to the product, and, given high buyer concentration, bind the producer to one buyer or a few buyers. Because of asset specificity, farm operators cannot easily change product. Because of buyer concentration, they cannot easily change buyer.

This puts the processing industry in a strong bargaining position vis-à-vis farmers. They may exploit this position by enforcing transaction condition more favourable to them. This may be lower price per product unit; it may also include introducing new quality requirements or passing packaging and transport costs on to producers. All these effectively depress output prices and farm profit.

Hypothesis 4: $\frac{\partial(\Pi)}{\partial(B)} \succ 0$

A final suggestion for explaining low farm profitability is that farms are overly dependent on income from agricultural activities only. As the transitional economies move towards the market system and develop, the share of agriculture in the economy - in terms of employment, GDP share and consumption share - can be expected to fall. This is a long-term trend in the developed capitalist economies, in line with Engel's Law (e.g. Laitner, 2000). In order to survive, farms would there need to re-orientate towards non-agricultural activities and income. This argument has been made in the context of crisis

in agricultural profitability the Western economies, where non-agricultural income has risen greatly over the past 40 years, and is now typically a considerable share of total farm income - e.g. between a third and half on average in the European Union countries (Eurostat, 1999). Research shows that such pluri-activity is now an important determinant of farm viability (Shucksmith et al, 1989; Evans and Ilbery, 1993; McNally, 2001). The suggestion is that this may be insufficiently occurring in the transition economies, and in particular within farm companies (Greif, 1997; Swain, 1999). Operators of family farms in these countries often derive a considerable share of their income from non-agricultural sources such as wages and non-farm enterprise income - about 40 % in Lithuania, according to recent research by Bezemer et al (2003) -, which effectively cross-subsidises agricultural production. Farm companies in transition countries typically rely for the larger part on agricultural activities for income generation (with the exception of Slovakia). This may be another cause for their vulnerability.

In sum, the main factors possibly relevant to depressed farm profits in Lithuania range from features of farm organization to features of their economic environment. Some are typical for the transition economies or for corporate farms, some are generally relevant to all farms in transition economies or for the sector agriculture as a whole. We note that these are complementary rather than rival hypotheses. Their relevance to the Lithuanian case will be explored and analysed in sections 5 and 6 below.

3. Background and Data[1]

3.1 Agriculture in Lithuania

As in all transition countries, agriculture in Lithuania has been greatly affected by the market reforms. Since this was a heavily collectivised and subsidised sector in the centrally planned economy, deep reforms in ownership patterns, production structures, and price relations have occurred. Combined with the opening of Lithuania to foreign markets and competition, the changes in agriculture have been dramatic.

Starting from an untenable position of subsidisation in 1991, prices have moved against agriculture during transition. Input prices have generally increased faster than output prices in real terms, resulting in the 'price scissors' that were a common phenomenon in agriculture in the early part of the 1990s. In Lithuania, however price

[1] Based on OECD (1997), LIAE (2001,2003), EBRD (2003) and Kricsiunaite & Uzdavineine (2000)

scissors continued to operate in 1995 and 2001, when the ratio of input price increases over output price increases was 1.19 and 1.13, while in the years in between it was often very high (1.0 in 1996, 0.93 in 1997, 0.99 in 1998, and 0.71 in 2000). Profits in Lithuanian agriculture have been, and are still, falling. Output decreased dramatically: the share of agriculture in GDP decreased from 27 % to 9 % in 1989-1996, even though these were years of overall economic contraction in Lithuania. Due to economic hardship, employment in agriculture increased in these years, from 18 % to 25 % of total employment, falling back to an official 16 % in 2001.

3.2 Land Reform and Farm Structures

Simultaneously, the number of people involved in small-scale agricultural production has increased dramatically in Lithuania. During 1991-2000, 688,000 claims for land restitutions were filed, and 478,000 restitution decisions were taken. In 2000, there were 523,000 owners of agricultural land, which is 17.4 % of Lithuania's 3 million adult population. Although the area of land privately owned has increased dramatically (it went up from 800,000 to 2 million hectares in 1995-2001), land reform in Lithuania is still uncompleted. In 2001, only 53 % of agricultural land was privately owned. The official collection of applications for land restitution has ended in 2001, but the process of land restitution is still going on.

Family farms are small: 12.6 hectares on average, with 84 % are smaller than 10 hectares. The number of landowners involved in family farming was 132,000 in 2001, with 67,000 of them officially registered as such[2]. Thus, households working family farms and registered household plots between them totalled 532,000 households. With an average household size of 2.7 persons, this implies that 1.4 million of Lithuania's 3.7 million population directly depend on food production for their livelihoods - not counting those households indirectly dependent through gifts, exchange, and barter, and those dependent on income from the corporate farming sector. These figures suggest that Lithuania has become a more agrarian country during its transition from socialism to capitalism. Yet officially, the share of the working population employed in agriculture was only 16 % in 2001, down from 23 % in 1995. This, incidentally, is still very high compared to less than 5 % in the European Union, which Lithuania is set to join in 2004.

[2] These figures should be taken with caution, since registered numbers are very volatile (the 2002 number was 30,000) and plausibly sensitive to policies stipulating particular obligations or benefits dependent on registration or farm size.

Other farm structures include partnerships and remaining state farms. Both are corporate farm structures in that they have a separation between management and ownership, and between blue-collar and white-collar labour. Farm companies have greatly decreased in number during the second half of the transition. Between 1995 and 2002, the number of farm partnerships went from 2,457 to 923. Such farm companies counted 1,138 (923 partnerships and 215 other structures) in 2000. With an average size of 486 hectares, they worked 553 thousand hectares. Their number appears to be rapidly declining. According to data from the Lithuanian Land Cadastre, in January 2001 there were 697 agricultural companies, working a total land area of 128 thousand hectares; on 1 January 2002 there were 537 agricultural companies working 80 thousand hectares. The best expert estimate at the moment of writing (early 2002) is that there are 485 functioning farm companies, of whom about half are profitable and have a long-term future (LIAE, 2003). This is an extreme example of the generally dire situation of farm companies in Central and Eastern Europe, with the exception of Hungary (Gorton et al, 2003).

With on average 400 companies going bankrupt annually during the transition years, the main cause of their decline was lack of economic viability. One reason may be that the reform policies were flawed. In some cases land rented by corporate farms and owned by private individual could only be restituted after the farm went bankrupt. This would give these individual, the owners of the farm's productive resources, an incentive to bring such failure about. Shares in corporate farms are tradable only within the population of shareowners, which depressed their price and decreased farm equity capital and the value of its debt collateral. Reserve capital, which can be defined with great flexibility especially in the transition context, was exempted from incorporation in share values. Apart from further decreasing share prices, this also gave the management an incentive to increases reserves in order to keep it within the farm. This may not have been the most efficient way of using its capital.

Another comparative disadvantage for corporate farms is taxation. Members of the household working a family farm are not officially hired labour, and hence pay no income tax. Also tax evasion is easier on family farms; often they are not registered, and transparency of accounting is limited since relatively large output volumes are consumed by the family or bartered.

For these and other reason, income per hectare in farm partnerships was between 16 and 53 % lower on average in 1996-1998 than it was in family farms, depending on

production conditions. Still, they are an important component of the agricultural sector. Farm partnerships produced 20 % of gross agricultural output in 2000, with concentrations in sugar beet and meat (both 40 % of the respective totals). Farm companies typically rent their land from individuals or from the state. The Constitution did not allow them to buy land until early 2003; land could be owned only by natural persons. Companies occupy a third of Lithuania's agricultural land, and are mostly located in its most fertile parts, in the centre of the country.

3.3 Domestic Agricultural Policies

Lithuania operates policies designed to support agriculture under the umbrella of the Special Rural Support Programme (SRSP). In 2001, this programme allocated financial support to farms for the purposes of covering debts for near-bankrupt companies, paid part of the interest security on loans to farms (through a separate Rural Credit Guarantee Fund), subsidised fuel, and funded training and consultancy services. The SRSP finances programmes related to preparation for EU membership, extends direct payments and purchases cereals at intervention prices, as in the EU Common Agricultural Policy.

The Rural Credit Guarantee Fund (RCGF) was established in 1998. Together with the Lithuanian Agency for Regulation of Agricultural and Food Product Market (LARAFP), it supports both farms and, since 2000 enterprises in agribusiness through subsidised loans and providing security. The RCGF and LARAFP commit to repay up to 70 % and 100% of loans to farms and agribusiness enterprises, with the bank extending the loan assuming the risk for the remainder. All lenders operating in Lithuania are privately owned, commercial banks, since the state sold its 76 % stake in Agricultural Bank, Lithuania's third-largest bank in asset terms, to NordLB of Germany.

In the 1998-2000 years, the RCGF issued 583 guarantees to farmers and other enterprises, which amounted to 38 million Litai. The majority of farmers, 70 %, used the guaranteed credits for investments in fixed capital, mostly tractors (70 % of loans), also dairy equipment (5 %). In the same period, one third of the credit (13 Million Litai) was repaid. During its existence the LARAFP part-guaranteed loans worth 577 million Litai, extended to banks to food processing businesses. Most (75 %) was used for grain purchases, the rest for trade in other foodstuffs. The budgets of both the RCGF and the LARAFP are required to be approved by the state, who is obliged to meet the liabilities) of both institutions towards banks, which amounted to 15 % of their budgets in 2000.

4. Data

The main empirical basis of this study is a survey research among 53 farm companies in Lithuania, implemented during the summer of 2002. The survey was based on a questionnaire developed in recognition of the main issues relevant to corporate farming in transition economies, as outlined above, and in consultation with staff of the Lithuanian Institute for Agricultural Economics (LIAE). Data were collected through face-to-face interviews by LIAE staff in different parts of Lithuania. In view of the small survey sample, the survey frame was targeted and designed to reflect regional differences rather than aimed to be representative on the regional or national level. It included both farm in areas defined in 2002 by the Lithuanian Ministry of Agriculture (following EU definitions) as being 'favourable to agricultural production' and regions less favourable to it, each comprising of half the sample. This reflects conditions such as soil quality, sunshine, precipitation, relief, and physical infrastructure. A descriptive overview of survey findings is provided in the next section.

5. Farm Structures, Performance, and Economic Environment

5.1. Labour, Land, Livestock

A typical aspect of farm companies, as distinct from family farms, is the presence of a management team separately from the blue-collar labour force. The average management team in this sample consisted of four persons, three men and one woman, with an average age of 47 years. There will typically be a director, a general administrator and human resources person, a farm accountant, and a technical, veterinary or crop specialist. The typical level of education is agricultural college or university, while management have on average 14 years of managerial experience.

With a land area of, on average, 834 hectares, a labour force of 47 workers, and often cattle and/or pig herds of several hundred heads, farm companies in the sample are large by most standards, and also larger than the Lithuanian nationwide average. Companies. Table 2 provides further details on farm production structures in the sample. Corporate farms are shown to have a wide range of land areas, cattle sizes, and labour forces.

Table 2: Agricultural Production Structure in the Sample

	n	minimum	maximum	mean	*s.d.*
			(hectares)		
All land used	51	29	3,356	834	*724*
Crops					
Cereals	51	10	1,620	421	*390*
leguminous plants	15	5	91	33	*26*
Oilseeds	17	18	300	93	*68*
Root crops	32	1	210	60	*65*
vegetables	10	7	33	13	*8*
Fruit	4	3	1,526	73	*64*
other crops	22	2	910	190	*290*
Livestock			(head)		
milk cattle	32	41	669	220	*141*
beef cattle	29	43	1,183	352	*264*
Pigs and hogs	26	87	14,120	1272	*2732*
			(full time equivalents)		
Labour force	53	4	168	47	*40*

Source: survey findings

5.2 Agricultural and Non-Agricultural Activities

Farm companies in the sample were about equally divided over specialised and mixed farm types. A total of 22 farms in the sample derived over 75 % of their total revenues from crop production; 7 farm derived over three quarters of income from livestock production. The remaining 34 farms had significant revenues (over 25 % of the total) from both crops and livestock.

While there is thus, in many farms, diversification within agricultural production, farm companies in the sample are relatively specialised in a broader sense. Presented with a number of non-agricultural activities - among them retail and wholesale trade, food processing, construction, manufacturing, crafts production, tourism, and recreational services - only six respondents reported involvement in such activities. These were in food processing and retail trade (a farm shop), both of which are closely connected to agricultural production itself.

Managers were also asked to report the share of income from agricultural production proper and of various other activities, many of which are more closely intertwined with agricultural production. They reported this for 1990, 1995 and at the moment of surveying in 2002. Table 3 presents the results.

Table 3: Agricultural and Non-agricultural Activities

	Share of income source in total income (%)		2002		
	1990	1995	Share of income source in total income (%)	Incidence in sample (% of total sample)	Labour allocation (fte)
Agricultural production					42
Crop production	29	43	46	81	
Livestock production	62	46	40	64	
Non-agricultural activities					5
Food processing	3	1	2	3	
Transport	0	3	1	17	
Machinery repair, sale and rent	6	7	9	50	
Other	0	1	1	7	
Total	100	100	100	n.a.	47

Source: survey findings

The figures show that income from additional activities outside agricultural sales includes transport as well as machinery repair, sale and rent (agricultural contracting). This accounts for 14 % of income and occupies around 10 % of the labour force on average. The figures also suggest that the relative importance of such activities has slightly increased during transition, but we note that given the imprecision in reporting and the small sample size this is not a statistically significant development. When asked about their expectations with respect to the future development of revenues from non-agricultural activities, managers mostly indicated they expected no changes, while a few foresaw moderate increases in revenues of up to 10 %.

In sum, non-agricultural activities in Lithuanian farm companies are intertwined with agricultural production, and are marginal features of the farm structures in terms of income and labour force. No significant development in their importance has occurred during transition or are expected in the foreseeable future.

5.3 Profit, Investment and Finance

Many farm companies in the sample were in a difficult financial situation, with 20 of reporting losses over the year 2001, ten of which were in excess of 100,000 Litai. Half of the farms (26 cases) were just coping, making either a small profit or a small loss (of up to 10,000 Litai); seven farms made profits in excess of a 100,000 Litai[3]. The average farm reportedly made a small loss in 2001. Almost all (45 out of 51 responding) managers

[3] At the moment of surveying the Litas was pegged to the Euro, at a rate 3.45 Litai per Euro

reported that farm profitability had 'much worsened' or 'worsened' over the preceding five years (i.e. since 1996). Three respondents reported it has remained similar and eight that it had 'improved' or 'improved much'. These findings are in line with the crisis in agricultural companies in the transitional economies, which is particularly severe in Lithuania.

Most (45) farm management had invested in agricultural capital goods in the 1998-2001 years. Many had also invested in land through renting (24 cases), and some additionally in non-agricultural capital goods (ten cases). Respondents also indicated their three most important sources of finance. The most frequent was own farm resources, mentioned by 23 respondents as their primary source of finance; in addition, three mentioned subsidies as the most important or as the secondary source of finance. Agricultural capital goods were also most often (45 cases) financed by own farm resources; in nine cases this was a secondary source, and bank credit or subsidies the primary source. An frequent second source was bank credit (21 cases). Seven farms used subsidies, always as a secondary source, to finance agricultural capital goods. Non-agricultural capital goods were in all cases financed primarily by own resources. In one case bank credit, in another supplier credit were additionally utilised.

5.4 Market environment

Firms in the transitional economies typically operate in challenging market environments, and enterprises in the agricultural sector are no exception. Respondents were asked to rank a number of potential problems relating to market development, the quality of state assistance, and corruption and crime on a scale from 1 to 5, where higher scores indicate a larger problem in transacting. They assigned scores separately to transaction problems in agricultural and non-agricultural activities (where relevant). Nearly all managers (51) responded to this question. The two most important problems were late payment by the output buyer and disputes with the buyer over the price and quality of produce. Both scored an average 3.8 on the 5 point scale. Difficulty to find a buyer or supplier scored slightly lower (3.4). These problems are linked to the large dependence on particurlarly output buyers: over 80 % of agricultural sales, on average, go to the processing industry, which often is a regional monopsony. The remaining sales are about equally divided over sales to retail shops and directly to customers.

A number of other issues were deemed of medium importance (score 2.3-2.5). These included changes in packaging and transport requirements by output buyers, time

spent negotiating with input suppliers or output buyers, lack of wholesale markets in the proximity, bureaucracy, and theft. Of small importance (scores 1.4 - 1.8) were bribes paid to officials, fees for private protection of output and buildings, and a lack of information on government regulations.

Interestingly, these problems were reported in about the same ranked order of importance, but with considerably lower scores for the case of non-agricultural output (reported by 33 managers). Top scores were 'difficulties to find a buyer or supplier' and 'late payment by the output buyer'. Both scored 2.6 on average; all other issues scored less than 2.0. Indeed, the market concentration on the output side of non-agricultural activities as reported by the respondents was considerably lower than in the case of agricultural products. Over 90 % of sales was directly to consumers, the rest equally divided over wholsesale and retail traders.

An extension of this exploration of the economic environment is to examine supporting public and private institutions. Access to, and effective use of, such institutions is typically one of the key bottlenecks in enterprise development in the transitional economies. Table 4 presents qualitative, binary measures for both aspects, both with respect o specialist agricultural services and more general business support.

Table 4: Access To And Use Of Business Services And Institutions

Business services and institutions	Access to services/institutions		Use of services/institutions	
	count	%	count	%
Agricultural services and institutions				
Agricultural extension or technical advice	41	77	24	45
Veterinary services	50	94	38	72
Agricultural marketing co-operative	23	43	5	9
Other agricultural producer association services	46	87	35	66
Farm management training	35	66	15	28
General services and institutions				
Accountancy advice	53	100	51	96
Business advice	31	58	11	21
Information centre on rural development policies	17	32	4	8
Labour exchange/job centre	53	100	19	36
Bank	53	100	43	81
Insurance company	53	100	53	100

Source: Survey findings

Services such as banking, accounting and insurance services, as well as veterinary help, all of which are essential to enterprise operations, are accessed and used by virtually all farms in the sample. Many also have access to an agricultural marketing co-operative or other producer association; but few actually use them. This suggests that, while such associations could play a role in diminishing transaction problems by providing countervailing power, there are factors that hinder their effectiveness in co-ordinating farmer transactions. Information and advice, either from a state agency or from private consultants, is likewise available to many but used by relatively few. Services supportive of rural labour markets are available to all and used by a considerable number of farm managers.

A final aspects of interaction with the market environment is that Lithuanian farm companies were found to be linked, in various ways, to their local, rural economies. Respondents were asked about the geographical characteristics of their employment, input purchases, and output sales. They reported the share of these costs and revenues that came from, or went to, enterprises or households located within their region and outside the cities. On average a fifth of outlays on variable inputs (fodder, fuel, pesticides, veterinary services) was spent on such local, rural enterprises. Of all wages, 70 % were paid to employees from local areas. Just over half (56 %) of all land rent went to private landowners in the local economy. Outlays on non-land real estate (construction, repairs and maintenance of farm buildings), on machinery and on transport spent in the local area accounted for 37 %, 23 %, and 9 %, respectively, of the totals. While the extend of employment and production linkages thus varies over outlay category, the contribution of farm enterprises to local employment and turnover of local upstream industry are considerable. The local links at the output side of the enterprise were generally of smaller importance. Farm managers reported that of all revenues from crop and livestock products, only 11% and 6 % were received from buyers in the local, rural economy.

6. Analysis

The above exploration suggests some inferences on the relevance of the discussion and hypotheses outlined in section 2. Corporate farms in the sample are indeed in many case suffering from low profitability and losses. Their managers report various factors also

suggested by the literature as relevant, notably transaction problems and costs. Diversification seems indeed to be near-absent. We will now examine the relation of such features with farm profitability.

6.1. Testing the Hypotheses

As outlined in section two, the hypotheses suggest that the following factors may depress farm profitability: an overly large labour force; an overly large farm size, in terms of land and livestock, insufficient income from non-agricultural activities; constrained access to credit; and problems with downstream farm produce. These factors are captured by the following variables based on the sample data. Between brackets the sign of their effect on farm profitability under the hypothesis is given.

Hypothesis 1: *Corporate farms are above profit-optimal farm sizes in terms of land and livestock.*
LAND (-), land areas cultivated by the farms in hectares, CATTLE and PIGHERD (-), the size of the milk and beef cattle herd and the number of pigs, and LABOUR, the number of full-time equivalents of the labour force were included as farm size measures were included. These are the most important type of fixed assets (land, accounting for 46 % of all fixed asset value in farm companies in 2000), and the two most common forms of livestock in the sample. Other capital categories such as machinery and buildings were not included because of valuation problems. Size is here measured by input levels, in line with the hypothesis, rather than by output level, as is usual in farm statistics were standard gross margins measures are employed. Measuring farm size by the sum of standard gross margins per product, aggregated over output levels, is also inappropriate here because of its high correlation with profitability.

Hypothesis 2: *Corporate farms face incentives to perform weakly in order to access credit and assistance though soft-budget mechanisms.* CREDIT (-), a binary variable indicating if the farm has taken up credit as a primary source of finance in the 1998-2001 period; and EXTENS (-) a binary variable indicating if the farm has used state-provided extension services were included. Also CONSULT, a binary variable indicating use of business advice, was added. Such consultancy is mostly offered by private firms, in contrast to extension services. Including CONSULT thus provides an opportunity to explore the significance of state involvement in information services.

Hypothesis 3: *Corporate farm profitability is undermined through exploitation by downstream processing industry.* As a measure for dependence on product buyers, a Herfindahl index was constructed for the shares of sales through different market channels (consumers, retail, wholesale, and processor), named CONCENTRATE. The Herfindahl index equals the sum of squared shares sold through each channel, in per cent of total sales. With all sales going through one channel only, the index is equal to one. Its value is smaller as the number of sale channels is larger and as shares are more equal in magnitude.

Farms selling a significant proportion of their output to small-scale buyers such as retail businesses or directly to customers are likely to incur high transaction costsa and thereby depress their profits. To control for this, an dummy variable VOLUME was included, which takes the value 1 if more than 25 % of farm sales are to retail businesses or directly to customers.

It is useful to note that the more direct measure of transaction problems reported earlier (managers' perception of the seriousness of various specific problems) was not included for statistical reasons. Since this variable is restricted to the 1-5 domain, its variability is likewise limited, with for instance a standard deviation of 0.8 on an average of 3.8 for 'late payment'. Another reason for low standard deviations is that these transaction problems were reported as serious by almost all farm managers; only six out of 51 respondents selected scores below 3 for 'late payment'. This implies that statistical association can only be weak (relatively to other variables with higher standard deviations). This was true for all transaction problems values reported in section 4.4 as well as for combinations of them. Regression may then not be the best method for examining the relation of this variable with profitability.

Hypothesis 4: *Corporate farms are insufficiently diversified.* DIVERS (+) was included, which is the share of total farm revenues, in per cent, that is derived from non-agricultural activities.

As control variable FAVOUR, a binary variable indicating if the farm is located in an agriculturally favourable area, as explained in section 3, was also included.

5.2. Regression Analysis

These variables were regressed on farm profitability, reported by the respondents in twelve ranges. Because profit levels are ordered, an ordered probit estimation is

appropriate[4]. Regressions were performed both without variable selection and with stepwise selection based on a 10 % level of statistical significance. In both estimations the variables starred as significant in table 5 were found to be statistically significant related to profitability. The significance, but not the sign, of findings was sensitive to the inclusion of the non-significant findings. In table 5 the full estimation results are presented.

Table 5: Ordered Probit Regression Of Profitability Levels: Estimation Results

Independent variables	Coefficient estimates	(standard errors)	Z statistics
FAVOUR	1.3289***	(0.4868)	2.73
LAND	0.0006	(0.0005)	1.3
LABOUR	0.0037	(0.0068)	0.54
CATTLE	0.0005	(0.0009)	0.55
PIGHERD	0.0002***	(0.0001)	2.66
CREDIT	-2.1129**	(0.8426)	-2.51
EXTENS	-1.0831**	(0.4447)	-2.44
CONSULT	0.9540**	(0.3854)	2.48
CONCENTRATE	-4.0800*	(2.1100)	-1.93
SMALLVOLUMES	-1.5390*	(0.7904)	-1.95
DIVERS	0.0153	(0.0135)	1.13

Regression statistics

Dependent variable:	profit level (1-12)
# observations	46
LR Chi^2 (11)	25.08
Prob > chi^2	0.0089
Pseudo R^2	0.1452
Log likelihood	-73.8280

Notes: Multicollinearity was tested for by regressing independent variables on each other, withy adjusted R^2 levels below 0.70. Covariance and covariation matrices contained small and insignificant values between any pair of variables. One asterisk (*) indicates that the marginal effect is statistically significant for $p<0.10$; two asterisks (**) indicates significance for $p<0.05$; with three asterisks (***) significance also holds at $p<0.01$.

Source: survey findings and authors' calculations

[4] Since profitability is reported within a band between the maximum and minimum ranges, the dependent variable is censored and the Tobit specification may be used. This alternative is inferior to ranked values and ordered probit estimation, since noise is produced by the necessity to assume some value within each profitability band (e.g. the average) as dependent. The Tobit specification produces a poorer model fit (pseudo R2 0.056) significant findings only for variables PIGHERD, CONSULT, FAVOUR, and EXTENS, with identical signs as in the probit case.

Estimation is based on 46 of the 53 farms in the sample, mainly because the data for CONCENTRATE were not reported by all respondents. Model fit is reasonable, given the small sample size and the complexity of the relation under examination. We note that FAVOUR is positive, and the largest and most statistically significant variable. Location and natural conditions are clearly, and unsurprisingly, major determinants of farm performance. The other findings suggest the following inferences on the four hypotheses developed in section 2.

First, there is no evidence that farm size, as measured by land and livestock, would negatively affect profitability (hypothesis 1). Farms with more pork production do significantly better in terms of profit. No significant findings were found on the size of land areas, labour forces, or cattle herds. This is so even though variations in these varibales in the sample are considerable and farms in the sample are on average larger than the Lithuanian nationwide average. Although the sample is too small, and the method inappropriate, to conclusively measure the existence and nature of any scale effects, it is safe to conclude that these findings at least do not support the idea that corporate farms are overly large and therefore loss-making.

Second, there is evidence that take-up of credit and use of extension services is negatively related to farm profit (hypothesis 2). Both of these inputs are allocated by state-controlled (if not always formally publicly owned) institutions, which would be in line with the hypothesis that soft budgets in these allocation systems exist, causing the resources (credit and information, in this case) to be used as subsidies which are allocated to the weaker farms in term of profitability. An interesting finding in this respect is on the use of business consultancy, which is a service very similar in nature to that of extension, but typically offered by private enterprises rather than state-controlled bank and extension services. Use of business advice is positively related to profitability. This may be interpreted to underline the importance of state interference in the allocation of (otherwise very similar) extension services.

Third, CONCENTRATE has a significant and negative association to farm profitability. This provides support for the hypothesis that corporate farm profitability is undermined through exploitation by downstream processing industry (hypothesis 3). The qualification is that the coefficient SMALLVOLUMES is also significantly negative. While a measure of diversified sales

Fourth, the estimation results also show that a larger share of non-agricultural income is related to higher profit levels (hypothesis 4), but not significantly so. It is not

clear, from this analysis, whether this is connected to lack of profitable opportunities outside agriculture or because of sample and data properties. The small number of positive observation on DIVERS may well exclude the possibility of significant findings.

6. Summary, Discussion and Conclusions

This study aimed to provide insight into the causes of the ongoing farm restructuring process in transition economies. The typical trend in this area has been one of a declining number of large, corporate farm companies, and a sharp increase in the number of small-scale family farms and household plot producers. To explore these developments, the study utilises data from Lithuania, where both trends have been particularly strong. The paper provides an overview of trends in Lithuanian agricultural structure, performance and policies in recent years. It identifies the main features of farm companies and of their relations with the economic environment, based on survey data. And it presents and tests for specific hypotheses on the causes for the crisis in profitability and declining numbers of farm companies. Based on the literature it is argued that these trends and hypotheses are interesting beyond the case of Lithuania only. The findings can be summarised as follows.

Companies in the sample are much larger than the Lithuanian average. About half have specialised production structures, mostly in crops. Non-agricultural activities are often connected to food production, and only a marginal feature in terms of farm incomes. Profitability has worsened considerably recently, and most farms are reportedly loss-making. Most farms invested in capital goods, most often financed by internal resources, with credit as the most frequent secondary source of finance. Farm managers report transaction problems in their dealings with the processing industry. Most often these take the form of late payment and disputes over p[rice and quality. The institutional environment support basic farm functions, but especially services in the areas of training and advice are less often available or taken up. Farm companies are found to have important employment and production linkages to the local, rural economy, particularly with the upstream part of the agribusiness chain and with local households.

An econometric analysis suggests that support to farms, which takes the form of subsidies on credit, extension services, and inputs, are biased towards the weaker farm companies, plausibly in order to prevent them from failing. Still, farm companies are fast

disappearing, mainly through bankruptcies. It appears that much of present domestic support resources are wasted, at the cost of restructuring the potentially viable companies.

A second finding is that exploitation by the processing industry may well be another cause for the crisis in profitability. The analysis produces no evidence that large farm size as such is a cause of sub-optimal profit levels, although this issue merits further examination with more appropriate methodologies. Diversification into non-agricultural activities is marginal in this sample, and there is no evidence that it may significantly contribute towards better farm viability.

These results lead to several reflections and policy implications. The most urgent and specific point in the Lithuanian situation appears to be that much of agricultural support is going to agribusinesses rather than farms (although concrete figures were not available). Moreover, what support is allocated to agriculture may well imply the wrong incentives in terms of restructuring, as explained earlier. Both observations would suggest that domestic agricultural policies in the areas of financial and specialist support should be reconsidered. Additionally, the issue of farm profit skimming by the processing industry would also merit further research. Chronic hold-up problems and perpetually changing transaction conditions and disputes are a strong disincentive to increase profitability in farms, since it is not certain the benefits will actually accrue to the farm in the longer term. Solutions may be sought in regulation or re-organization of the processing industry and its transaction practices towards primary producers, or in the more effective build up of countervailing power, such as though the functioning of marketing boards.

Three more general points may finally be suggested. First, the replacement of corporate with individual agriculture, while perhaps beneficial in several respects, is not without costs. Individual agriculture has largely taken the form of small-scale, labour intensive micro-farms or household plots. While this may be a good thing in a time of high unemployment and impoverishment (as argued by Lerman and Schreinemachers, 2002), it may be problematic in view of the longer-term future of commercial agriculture. Where larger-scale, capital-intensive agriculture is not possible in the individual farming sector because of size limitations following from the land reforms, the corporate sector may be necessary to maintain an infrastructure for commercial agriculture. Perhaps this is no longer possible in Lithuania given the rapid decline of corporate agriculture there; but the point may be worth considering in the wider transition context.

Second, the struggle or demise of corporate agriculture, characteristic of most transition countries, is not clearly or exclusively caused by inherent flaws in the governance structures of these enterprises, as is often argued. While these internal factors may play a role, this study has suggested many reasons to do with policies and the institutional environment for the crisis in profitability. Also studies on other countries (Gorton and Davidova, 2001; Mathijs et al, 1999; Mathijs and Swinnen, 2001) have shown that farm efficiency or competitiveness (let alone profitability) is not systematically connected to governance structure (family farms versus corporate farms). The focus in research and policy should shift towards enhancing the institutional and policy environment, rather than banking on the superiority of one farm type and neglecting to provide viable conditions for the alternatives. This is what seems to have happened in the Lithuanian land reforms and subsequent policies.

Third, supporting corporate farms may also be worthwhile from a rural development perspective. The existence of employment and production linkages implies that there are benefits in the local economy to viable rural enterprises beyond their output levels and profitability. While this must never be used to rationalise mistaken support polices which imply perverse incentives, it does serve to rethink the potential of corporate farms in the rural economy of transition economies.

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