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The Emergence of Farm Structures in Transition:

A Transaction Cost Approach to Analyse the Redeploying Process of Assets from Socialist Large-Scale Farms in the Czech Republic

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Abstract

The emergence of small-scale farms in the Czech Republic after 1989 primarily depends upon resources that come from former collective farms (CF) and state-owned farms (SF). In this paper the restructuring process of large-scale farms in the Czech Republic due to the transformation of the economy after the velvet revolution is analysed in the framework of Transaction Cost Economics (TCE). The analysis focuses on the choice of the new governance mode of labour in successor large-scale farms after the privatization of SF and transformation of CF. The central argument for the predominant existence of large-scale farming in the Czech Republic concentrates on high transaction costs of leaving the existent farm structure. TCE seem to be an adequate theoretical tool for a deeper understanding of restructuring processes in transition countries. The paper presents preliminary estimations of the farm's governance structure of labour. Moreover, results show that there are differences between the paths of restructuring of former state and collective farms. The number of employees and shareholders characterise the emerged large-scale farms. However, according this analysis family farms emerged more often from collective farms. Data come from a survey in 1999 conducted in both Czech regions North Bohemia and South Bohemia.

Key words: restructuring, governance structure, interest groups, transaction costs, farm structure, Czech Republic.

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1 Introduction

The emergence of small-scale farms in the Czech Republic after 1989 depends primarily upon resources from former collective farms (CF) and state-owned farms (SF). The restructuring process of large-scale farms in the Czech Republic is characterised by large fall in agricultural employment and changes in the organization of labour (governance structure) of successor agricultural enterprises. These processes seem to be dependent on the initial situation of the original farm at the end of socialism and, respectively, at the beginning of transition. In the Czech case, it seems that intra-organizational characteristics of large-scale farms determined whether family farms could emerge from the former socialist farm. I use the term 'family farm' when the same person is residual claimant, worker on that farm, and owner of assets. In contrast to family farms, large-scale farms have more than one residual claimant. Family farming in the Czech Republic contributes to the agricultural sector only with 23.1 percent of agricultural land and the average farm size is 36 ha (DOUCHA and JURICA, 1998). This leads to the question what hinders the emergence of family farms from former state and collective farms. This fuzzies even more because generally in transition direct successors of SF and CF are affected by high budget constraints and the costly redistribution of formal property rights. This redistribution itself creates new interests and interest groups on and at the farm. Solving interest conflicts and satisfying different interests is additionally costly. Moreover, some studies show that family farms seem more efficient in crop farming (Mathjis and Vranken, 1999) than large-scale farms with more than one owner because they face the problem of solving moral hazard (shirking, cheating) (Allen and Lueck, 1998, Schmitt, 1993). Therefore, in spite of all these costs for large-scale farms, it is to ask what causes the dominance of large-scale farming in the Czech Republic, even though the institutional framework for privatization/decollectivization did not determine the new type of farm after its transition.

I will argue that the high transaction costs of redeploying privatized and transformed assets outside the successor farm prevent to exit from the large-scale farming structure and to set up family farms. Moreover, these transaction costs of redeploying assets are dependent on the farm's history which itself determined the institutional framework of establishing individual property rights over assets. Empirical results show that family farms primarily emerged from former state farms while collective farms continued to farm in cooperative forms.

Because of the high relevance of agricultural employment and because of the question how to redeploy human and physical assets, the change in the governance structure of transacting labor, land and assets is the key point in this paper. While the focus on that paper lies on the theoretical discussion, descriptive data analysis and a linear model additionally show possible factors determining ownership structure in large-scale agricultural enterprises[2] in the Czech Republic.

In the second part of the paper, the research question and the theoretical components of Transaction Cost Economics (TCE) are presented. WILLIAMSON'S three level scheme is applied to elaborate the principle aspects of transition: institutions, governance structure, individual. Then, the Transaction Cost Approach is demonstrated. The third part of the paper presents some empirical results of the KATO survey conducted in summer 1999 in the Czech Republic.

[2] Large-scale enterprises in the initial situation are agricultural Collective Farms (CF) and State-Owned Farms (SF) (see STRYJAN and LINHART 1994); the analysis focuses on the successor farms of legal entity.

2 Restructuring in transition: making a choice how to redeploy human assets

2.1. Research Question

The successor large-scale farms of former collective (CF) and state farms (SF)[3] are agricultural cooperatives, joint stock companies, limited liability companies and others, farming on approximately 76 % of agricultural land (AACC 1999; SARRIS, DOUCHA and MATHIJS 1999). During transition, the farms have had to re-govern the farm's inputs labour, capital and land due to the re-establishing of individual property rights over assets and land caused by the institutional change. Several laws ruling restitution, privatization and transformation[4] as creating the institutional environment for firms-in-restructuring enforced the property rights transfer over physical inputs land and capital. It is of importance that both physical and human assets used as input for farming in SF or CF were still valuable at time of restructuring and had certain attributes like asset specificities. Moreover, the owners' access to use the factors was costly (for the discussions of effective property rights problems in transition see HANISCH, M. and A. SCHLÜTER 1999). The question in this paper focuses on the problems how to find a new deployment for privatised/transformed assets with concentration on human assets. How can we characterize the redeployment process of assets and the emergence of different interest groups within the large-scale farm in the process of restructuring? To answer this question, governance structure of assets and their origin has to be understood. In order to clearify this, I present a graphic model of this problem.

2.2. Interests and Interest Groups

The redeploying process of assets in agricultural large-scale farms during transition can be understood by means of analysis in changes of the interests[5], interest groups and the budget constraints or elbow room[6]. The interest groups relevant in agricultural large-scale farms under transition can be characterised as follows (Figure **1**):

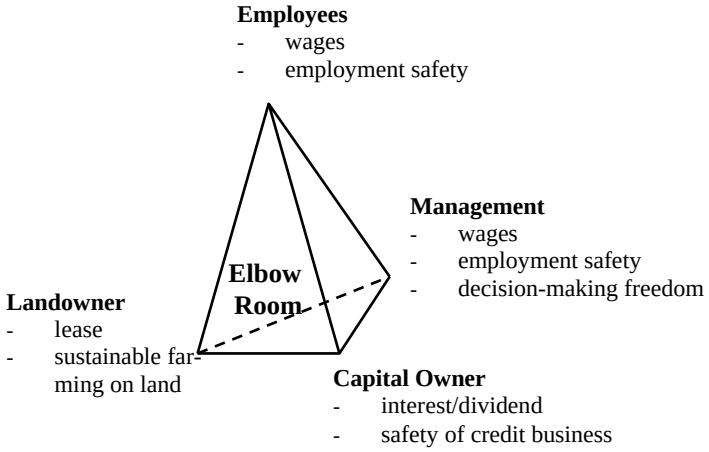
[3] In 1989 CF farmed on 61 % and SF on 38 % of land.

[4] For a detailed discussion of the change in the institutional framework for restructuring, see STRYJAN, 1994, and SCHLUETER, 1998.

[5] Each firm serves interests by coalitions among different owners of resources (BECKMANN 1998, p. 12). The simplest explanation of the business firm is that it arises from contractual agreements among individuals (MOE 1995, p. 121; see also HART 1995, p. 159: the firm as a nexus of contracts).

[6] The elbow room is here defined as the possibilities of the farm to produce and to distribute added value and/or profit and/or losses. For the analysis here, this definition is sufficiently. A more detailled discussion is forthcoming.

Figure 1: Interests, Interest Groups and Elbow Room



Source: based on BECKMANN 1998a, p. 22

The interest groups (management, employees, landowners, and capital owners) presented in Figure **1** emerged from former CF and SF. However, the set and the development of these interest groups are more complex because individuals may have more than one interest. Often, individuals simultaneously supply the firm with labour, land and capital what raises the problem of simultaneous redeploying of the assets. Moreover, a change from low budget constraints to high budget constraints can be observed in the transition process. This change of budget constraints may effect the opportunities and goals of the farm and preferences of individuals related to the farm. This leads to following two decision-making problems:

- First, the reduction of labour not needed in the successor farm (by means of dismissals, split up of agricultural and non-agricultural parts of the farm, break up of social services, etc.). Only these split ups of agricultural parts of the former state or collective farm gave the possibility of access to farming resources for family farms.
- Second, new contracting of labour subject to different levels of transaction costs[7].

Both processes are overlapped. I suggest to discuss the redeploying process in large-scale enterprises separately as

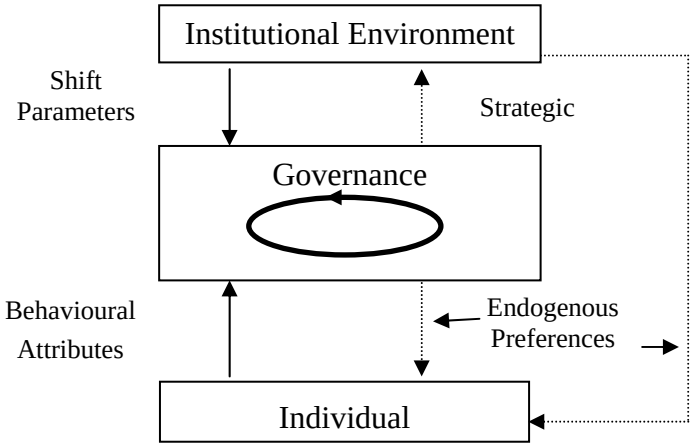
- the collective search for the redeployment strategy of valuable assets, and
- the bilateral negotiation to minimise transaction costs of organising labour.

2.3. Organization of Labour during Transition

A promising tool for a model of restructuring agricultural farms and, therefore, redeploying assets of the farming sector is the Transaction Cost Approach (TCE). Transactions are connected with transaction costs[8] (WILLIAMSON 1997, p. 8). Transferred to the problem how to redeploy labour in an uncertain institutional environment, the transaction costs may be dependent on binding forces between the supplier of labour (e.g. worker) and the buyer of labour (e.g. firm or management). Transaction costs vary with the attributes of (1) the transaction and (2) the institutional arrangement (governance structure) (see WILLIAMSON, e.g. BECKMANN 1998b, pp. 1). WILLIAMSON'S three level scheme (1996, p. 223; 1997, p.8) integrates the governance structure in a complex model with the institutional environment and the individual (Figure 2).

[7] see WILLIAMSON (1985, pp. 240), Williamson (1997, pp. 18).
[8] For detailled presentation of Transaction Cost Economics (TCE), see WILLIAMSON 1985, 1996, 1997.

Figure 2: Three Level Scheme



Source: Williamson 1996, p. 223, and 1997, p. 8.

WILLIAMSON distinguishes three kinds of governance modes: (1) market, (2) hybrid, (3) hierarchy. According to TCE, the choice of any organizational form depends on costs for this transaction. The level of transaction costs is characterised by three major attributes of transactions: (1) uncertainty, (2) asset specificity, and (3) frequency. The focus of TCE lies on (human) asset specificity[9]. The TCE applied to the question of governing and/or redeploying labour concentrates on the bilateral relation between the 'supplier' of labour (individual) and the "buyer" (e.g. management, firm). According to TCE[10], both parties seek for a transaction cost economising organization of labour[11].

As already mentioned, three modes organising labour are suggested by TCE: (1) market, (2) hybrid, and (3) hierarchy. These are determined by transaction costs needed for safeguarding the human asset specificity one has acquired during socialism. Individuals want to economise on transaction costs when they redeploy their human assets. This portrays the choice of the governance mode of labour, namely a transaction costs minimal solution for the use of human assets aquired during socialism. In order to simplify the problem of complementarities in redeploying human assets, land and non-land assets remains for further research. MENARD (1997, p. 41) distinguishes three basic patterns, moulded by characteristics of human assets: (1) weakly specific assets easy to redeploy, (2) an intermediate situation with specific but redeployable human assets, and (3) non-separable (or very weakly separable) human assets and bilateral dependency between employer and employees. This dependency "... develop[s] coalitions allowing *voice* to predominate over *exit*: negotiations on conditions in which these assets will be mobilised should prevail over market regulations" (MENARD 1997, p. 41). These different categories of human assets theoretically correspond with the governance mode of labour (Table 1) where labor can be organized between saisonal spot markets and inside-ownership.

[9] Asset specificity refers to the degree in which an asset can be redeployed to alternative uses or users. Williamson distinguishes at least four kinds of asset specificity: (1) site specificity, (2) physical asset specificity, (3) human asset specificity, and (4) dedicated assets (cf. BECKMANN, 1998b, p. 2).

[10] The basic assumptions for the individual in this model are the behavioural attributes 'bounded rationality' and 'opportunism' (WILLIAMSON 1996, 1997, p. 1, 1998, pp. 1). I discuss these assumptions and the institutional environment in my thesis (forthcoming in end of 2000).

[11] In general, transaction costs (TC) are defined as ex ante costs of drafting, negotiating, and safeguarding a transaction, and ex post costs of monitoring, adapting and enforcing the transaction (see BECKMANN 1998b, p. 1). For the problem in how far the institutional and the individual part of the model influence the choice of the governance mode, see WILLIAMSON 1996, 1997, 1998.

Table 1: Governance Mode and Ownership in form of Membership or Shareholding

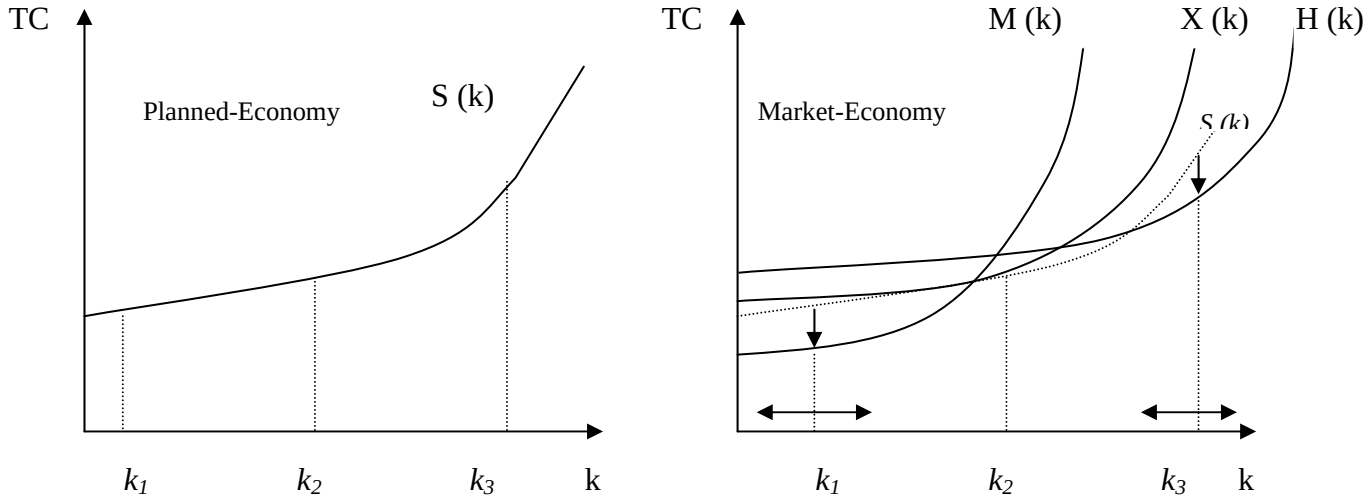
	governance Mode		
characteristics	**Market**	**Hybrid**	**Hierarchy**
contractual form	no or weak contract	long-term contract	Inside-ownership/self-employment
safeguarding activities against opportunism	low	medium	high
example in the Czech agriculture	*worker without employment safeties*	*worker with long-term contract and employment safeties*	*worker with membership/shareholder status or family farmer*

Source: own table, based on WILLIAMSON 1996.

2.4. Human Asset Specificity and Transition

Following TCE, one central hypothesis here is that the higher the human asset specificity, the more the hierarchical mode in organising labour is chosen. This is given by Figure 3 as the tradeoff between the human asset specificity k, transaction costs TC, and the choice of the TC's minimal governance mode M (market), X (hybrid), or H (hierarchy). It is assumed that individuals choose the ownership structure that maximises the expected value of the farm (cp. ALLEN and LUECK, 1998) by economising the TC for the transaction.

Figure 3: Specificity, Transaction Costs and Governance



Source: own figure following WILLIAMSON 1990, p. 23, and MENARD 1997. p. 47.

While in planned economies individuals could only choose the governance mode S (k) (i.e. employee with employment safety but no ownership rights) in state or collective farms, in a market economy that governance mode will be selected which minimises transaction costs. It is market (M) in case of low asset specificity k_1, the hybrid mode (X) at the intermediate level k_2, and the hierarchy (H) at the high level k_3. However, not only the changes to the economising transaction cost level with defined asset specificity is possible in transitional economies but also an increase or decrease of asset specificity itself (horizontal arrows).

Applied to the problem of redeploying assets, it can be assumed that the initial situation (planned economy) of the governance mode of labour was as follow (see also BECKMANN, 1998):

- human assets were often highly specific,
- defined contractual relationships and employment safety,
- egalitarian wage structure,
- no effective property rights in physical assets and no complete ones in human assets[12],
- almost no deployment of farming assets besides collective or state farms.

Starting transition has changed this situation of economic conditions. The initial situation has been transformed towards:

- employment and economic uncertainty,
- wage differentiation,
- restitution of property rights,
- decollectivisation or privatization,

In socialism labour contracts are only based on wage payments without effective property rights in both SF and CF. Although the type of management and the right to a say (voice) formally differ between CF and SF, the effective structure is the same. Restructuring ruled by the laws mentioned above allows the supplier (individual) and buyer (represented by the management/firm) of labour to negotiate for the efficient governance mode. Althgough the opening corridor of possible governance solutions were supposed the same, different characteristics of the institutions based on the history of collective and state farms led to different specificities of reestablished assets. As a consequence, the redeployment process of assets underwent different paths depending upon the origin of the assets (state farm or collective farm). According to the model above, the outcome of this bargaining process responds to a certain TC minimum solution for organising labour. This is ownership (hierarchy) for high specific assets, long-term contracts (hybrid) for medium specific assets and short-term contracts (market) for low specific assets.

2.5. Hypothesis

The history of collective farms provides individuals (entitled people for transformation shares) with more specific assets (argued elsewhere, forthcoming paper) and the costs of redeploying individual assets are higher in the case of collective farms. Because of these arguments, I expect that farms emerged from collective farms have a higher portion of members or shareholders working on farm than those emerged from state farms, that is governance type H characterises successors of collective farms. H is measure as portion of members or shareholders working on farm. I argue that the procedure of restitution of expropriated land and non-land assets during socialism as well as the institutional design of the transformation law (collective farms) different to the privatization law (state farms) are responsible for higher transaction costs in redeploying assets[13]. However, as already said, restitution, transformation and privati-

[12] I assume that during socialism other determinants and institutional rules than in market economies gave career opportunities.
[13] In short, the main reasons are (1) the 7-year rule, (2) the fact that the individual's share in re-established property rights (transformation share) on basis of collectivized land and assets is much larger than that on basis of years worked on farm, and (3) the large number of persons entitled by the transformation law to get property rights. All these characteristics of the transformation of collective farms led to higher transaction costs for redeploying assets outside the existing farm.

zation themselves are derived from the socialist history of both types of farms and therefore, created according the history[14] of the farm types. Therefore, comparing successors of collective and state farms, those of collective farms should have

(1) more members/shareholders, employees, managers, and capital (in other words their size is larger than that of SF successors);

(2) higher portions of members working on farm by all employees than successors of privatized state farms;

(3) higher portion of cultivated land owned by members/shareholders;

(4) slower process of downsizing in labor (decrease of the number of employees) because of the higher employee-participation in decisions about the farm's restructuring (hypothesis is not tested here; will be presented on the conference.).

(5) fewer family farms emerged from former collective farms.

Since there were fewer state farms than collective farms and state farms (only) farmed on 38 % of the Republic's agricultural land (FILIP, 1994), the TCE approach above is able to explain the small proportion of family farms emerged during the Czech transition.

3 Empirical Tests and Results

On basis of the international research project KATO on transformation processes[15], a survey was conducted in both regions North and South Bohemia in the Czech Republic. We interviewed large-scale agricultural enterprises of the legal form '*legal entity*' in summer 1999 by means of standardised questionnaires[16]. North Bohemia is characterised by successor farms of former SF while CF and their successors, respectively, dominate the agricultural structure in South Bohemia.

First, I descriptively present the structure of the choice of the legal form (Table-A 1 in the Appendix). Then, a crosstab on the number of shareholders[17], employees and deployed assets per hectare gives the structure of inputs land, labor, and capital, as well as the structure of the interest groups. This crosstab analysis is specified into the categories of shareholders working on farm, the portion of land provided by members/hareholders, and assets per shareholder (Table-A 2). Except the variable 'assets per shareholder', the empirical analysis presented in this paper takes farm data from the year of the successor farm's foundation because this time is crucial for the emergence of family farms. The time of foundation was usually between 1992 and 1995. Then, a simple t-test on equality of means is used for the analysis whether successor farms of state and collective farms differ in selected variables (Table-A 3). Afterwards, I estimate a linear regression on the portion of shareholders working on farm as dependent variable. Independet variables are the farm's origin, its number of employees, the portion of land from shareholders, and the number of shareholders. This estimation is to combine the institutional and the intra-organizational setting affected farm's ownership structure. However, this estimation needs better preparation. Results of this estimation seem weak.

[14] The emergence of the institutions ruling restructuring is analyzed in the partial project ‚Privatization' within the KATO Project (see www.kato-projekt.de).
[15] Issues of transition analyzed in the KATO project were liberalization, privatization, and restructuring. KATO means Comparative Analysis of Transition Processes in the Agricultural Sectors of selected Central and Eastern European Countries.
[16] The sample size was 87 large-scale enterprises in agricultural primary production of the legal form 'legal entity'. The sample selection was random on basis of a weighted sample according to agricultural employment density in sub-regions.
[17] The term ‚shareholder' indicates members in cooperatives and shareholders in limited liability companies, joint-stock companies and others. For the analysis here member and shareholder are the same.

3.1. Choice of the legal form and farm differences

The redeploying process of assets from SF and CF in the Czech Republic went along two paths. Collective farms primarily transformed in *cooperatives* (71.4 percent of collective farms in our sample), while state farms primarily changed the legal form after their restitution and privatization processes into one of the company forms (*limited liability company, joint-stock company*) (Table-A 1 in the Appendix)[18]. 70.6 percent of successors of state farms chose the legal form *limited liability company*. While cooperatives have the one-member-one-vote principle, limited liability companies are rather small enterprises run by a few shareholders.

Successor farms differ in many farm characteristics if they emerged from state or collective farms[19]. The structure of interest groups (except the number of managers) is presented in Table-A 2. Basically, there are two types of large-scale farms: farms with a large number of shareholders and employees but a small amount of assets per shareholder (joint-stock companies from collective farms and cooperatives), and farms with a small number of shareholders and employees, but large amount of assets per shareholder (primarily limited liability companies). Table-A 3 in the Appendix shows that these selected farm characteristics differ significantly and this difference holds on even after five to six years of restructuring and farm adaptation towards the market economy[20]. This supports the main idea that leaving an existing structure and setting a different type of structure is encumbered with (too) high transaction costs. Therefore, we observe primarily large-scale farms using the same scale of technology.

3.2. Estimation Results

I also estimate the standardised coefficients of selected predictor variables for the dependent variable SHAREMPL that expresses the portion of members or shareholders working on the farm by all employees. The prediction is that these farm characteristics primarily determine SHAREMPL. Table-A 4 shows the independent variables and the descriptive analysis. Table-A 5 presents the estimation results (both tables in the Appendix).

The hypotheses for the independent variables are as follows:

ORIGIN: the history of the farm matters. I presume that farms with origin *state farms (SF)* have lower SHAREMPL. The predicted sign is negative due to the construction of the variable. The exact argument for this hypothesis is discussed in a paper where the break up of the SF is discussed in detail (forthcoming).

EMPLOY: I expect that farms of my sample (no family farms) with higher employment stocks have also a higher SHAREMPL. The predicted sign should be positive. However, the estimated coefficient is significantly negative. At time of submitting this paper, the reason for this contradiction could not yet be clarified.

LANDSHAR: land and non-land assets of state farms were privatised while those of collective farms were transformed. I expect that the higher the portion of land from shareholders of the same farm (LANDSHAR) is, the higher the SHAREMPL is, too, because shareholders working on farm redeploy their assets in the same farm since this creates lower costs for this transaction.

SHARHOLD: the more shareholders the farm has, the higher the portion SHAREMPL is because it was less costly for them to redeploy their human assets when they had simultaneously to redeploy land and non-land assets. This was not the case to that extent for former state farms.

[18] Data on the emergence of family farms will be presented in the conference.
[19] This will be presented in detail elsewhere and is forthcoming.
[20] I have data for two points of time: the year of foundation the farm after communism, and the year 1998.

With exception of the variable EMPLOY, the estimated coefficients support the hypotheses. However, more research has to be done for the interdependence of the variables and the effect of employment on the dependent variable. As the analysis of restructuring often shows, the causality of variables is not clear at every point of the analysis. The huge variance of the variable EMPLOY (in Table-A2 variable 'employees in 199x') can explain the contradictory results for this variable. The reason for the variance is that in this analysis there are also cases where the farm legally existed in the year of foundation but the farm had no employees.

3.3. The emergence of family farms

Table-A 6 yields the result that more family farms emerged from collective farms than from state farms if we measure by number of farms per hectare and per employee in the socialist farm, while more family farms emerged from state farms if we measure by number of family farms per million Czech Crowns in the socialist farm. Even if the absolute number of emerged family farms was not available at time of writing this paper, these numbers fit to the idea of this paper that we should look more on the redeployed assets than only counting farms. Because usually family farms out of collective farms are very small, we would not get the right understanding of transition/restructuring by only counting farms. Often these emerged family farms are the same household plotting farms as they were during communism. The agricultural statistics just now count those household plots as family farms while during my study in the Czech Republic I found that those family farms in the South Bohemian region often do exist only as gardens or household plots for the family's additional supply. When we searched the officially registered family farms of selected villages, we often found that either the farm does not exist or the farm consist of a garden where some poultry for self sufficiency were kept. On contrast to that, family farms from former state farms are much bigger (data are available upon request and will be presented on the conference). They count less in number but contribute to agricultural market production to a larger degree. Larger family farms are located in North Bohemia where formerly the state farms dominated the agricultural structure of socialism and broke up during the last decade into smaller farms.

4 Conclusion and Further Research Activities

Transaction Cost Economics (TCE) can contribute to the research problem why large scale farms (cooperatives, joint stock companies, limited liability companies) dominate the agricultural sector (and why family farms emerged merely to a small degree) in the Czech case. In this paper, the basic principles of TCE were presented with focus on human asset specificity and the redeployability problem of human assets in the transition process.

This empirical research applied to the dominance of the large-scale sub-sector in the Czech agricultural transition demonstrates that the origin and the internal organizational structure of the farm matter. In contrast to family farms where the owner is also the single residual claimant, the portion of members or shareholders working on farm as an important farm characteristic determine the ownership structure of large-scale farms in the Czech Republic. This portion itself is primarily based on the history of the farm and the number of shareholders. In socialism labour contracts were subject to the political ideology and equal for both types of farms. However, collective farm workers had also a membership basis that was re-vitalised during the process of establishing property rights over assets. The redeployment of land and non-land assets was different between farms emerged from state and collective farms caused by their history. This determined the possibility of the emergence of family farms that primarily arose from state farms. However, because of the general magnitude of transaction costs to redeploy

assets in small-scale farming types, and because state farms only farmed on one third of agricultural land, the large-scale farm type is predominant in the Czech Republic.

To answer the question why small-scale family farms did appear only to a small degree in the Czech case of transition, we have to understand the redeployment process of human and non-human assets in large-scale farms. Almost all resources of the farming sector in the Czech case emerged from former state and collective farms. These resources had to be re-governed (re-organised) during the period of transition. The process of this re-organization is far from being understood by agricultural economists. This paper contributes to that research agenda. Unfortunately, the paper had to be finished right after conducting the survey. Therefore, theoretical and empirical results are preliminary. For example, aspects of moral hazard problems, path dependency, institutional change of formal and informal institutions, and behaviour of individuals wait for further analysis and discussion.

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6 Appendix:

Table-A 1:

Successor farms of state and collective farms (number of observations and percent)

		Legal Form in 1998				
Origin in 1989		Cooperative	Limited liability company	Joint stock company	others	**Total**
Collective sector	Count	50	9	6	5	**70**
	% within row	71.4%	12.9%	8.6%	7.1%	**100.0%**
State sector	Count	2	12	2	1	**17**
	% within row	11.8%	70.6%	11.8%	5.9%	**100.0%**
Total	Count	52	21	8	6	**87**
	% within row	59.8%	24.1%	9.2%	6.9%	**100.0%**

Source: KATO Survey 1999.

Table-A 2:

Farm characteristics in the year of foundation of restructured farms by type of legal form in 1989 (state or collective) and 1998 (survey was in 1999)

Legal form in 1989	Legal form in 1999	Shareholders per farm	Employees per farm	assets per hectare (1000) [1)]	SHAR EMPL [2)]	LAND-SHAR [3)]	Assets per shareholder (1000) [1)]
collective farms:	Cooperatives	253	151	27	.70	.56	102
	Limited liability company	11	26	22	.58	.12	709
	Joint-stock company	252	124	52	.75	.34	77
State farms:	Cooperative	8	80	38	.19	.07	53
	Limited liability company	3	27	35	.09	.12	1,520
	Joint-stock company	N/A	178	19	.60	N/A	1,075

Source: KATO Survey 1999 and own calculations.

[1)] data available only for the year 1998; data are in 1000 Czech Crowns (US $ 1 equals approximately to 34 Czech Crowns).

[2)] Farm's portion shareholders working on farm by all employees.

[3)] Farm's portion of land provided by its shareholders.

Table-A 3:

Test for equality in means between successor farms from state and collective farms (t-test) of selected variables

	199x (year of foundation)		1998	
Variables	**Equal variances assumed [1)]**	**Equal variances not assumed [1)]**	**Equal variances assumed [1)]**	**Equal variances not assumed [1)]**
employees	3.560	3.585	3.94	4.442
Farm's shareholders working on farm	4.119	8.612	4.29	8.959
total farmed land	5.491	7.429	3.720	4.263
Pfarm's prtion of shareholders working on farm by all employees in 199x	6.026	10.187	5.224	7.840
Farm's portion land from shareholders in 199x	4.003	4.451	4.913	5.685

Source: KATO Survey 1999 and own calculations.

[1)] all test are significant (5 % level).

Table-A 4:

Definition of selected variables and descriptive statistics for the regression estimation [1)]

Dependent variable	**Variable name**	**Mean**	**Std. Deviation**	**N**	
Farm's portion of shareholders working on farm by all employees	SHAREMPL	.55	.37	68	
Independent Variables					**Predicted sign**
origin of the farm (1 = collective farm, 2 = state farm)	ORIGIN	1.2	.38	68	-
number of employees per farm	EMPLOY	116.44	92.76	68	+
portion land from shareholders by total farmed land of the farm	LANDSHAR	.42	.34	68	+
number of shareholders per farm	SHARHOLD	177.81	179.43	68	+

Source: own calculations.

[1)] data of continuous variables are of the year of foundation.

Table-A 5:

Linear regression: dependent variable SHAREMPL [1)]

	Standardized Coefficients	Std. Error	t
Constant	--	.15	4.445**
ORIGIN	-.28	.10	-2.826*
EMPLOY	-.44	.00	-2.242*
LANDSHAR	.24	.11	2.351*
SHARHOLD	.77	.00	3.805**
R^2	.55	-	-

Source: own calculation.

[1)] the farm's portion of shareholders working on farm by all employees in the year of foundation of the new farm.

Table-A 6:

Emergence of family farms [1)] from socialist large-scale farms in the Czech Republic

		Number of emerged family farms per ...		
Legal form in 1989	**Legal form in 1999**	**per 100 ha**	**per million Czech Crowns**	**per 100 employees**
		… from the socialist farm in 1989		
collective farms:	Cooperatives	.58	.61	5.78
	Limited liability company	.42	.27	2.58
	Joint-stock company	1.53	.64	13.6
	Total	**.66**	**.58**	**6.07**
State farms:	Cooperative	N/A	6.47	N/A
	Limited liability company	.41	1.88	1.89
	Joint-stock company	.67	.47	2.29
	Total	**.39**	**.72**	**1.67**

Source: own calculation.

[1)] each family farm is counted by 1; however, usually family farms emerged from state farms are larger than those from collective farms (for this, see forthcoming papers of Marketa Johnova, KATO project).