Structural Change in Transition: A Role for Organizational Legitimacy? Evidence from Czech Agriculture

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Abstract

Market liberalization in Central and Eastern Europe was targeted at establishing incentives that would improve economic performance. While substantial reorganization of enterprises is observed, firms can also be observed which devote resources towards establishing organizational legitimacy. Motivations for such behavior are considered and empirical evidence of its relationship with technical efficiency using a distance function approach is analyzed for the case of Czech agriculture. Contrary to the expectation that such behavior would be inefficient, we find that firms reap private economic gains from legitimacy efforts through improved access to agricultural land, investment subsidies and firm internal social capital. However, its effect on technical efficiency depends on whether such legitimacy efforts are valued by stakeholders or understood as a norm. Evidence of the trade-off between gains or sustainability from legitimacy and reorganization thus brings a new perspective to the understanding of structural changes in transition.

Keywords

Organizational legitimacy, efficiency, structural change, transition, agriculture

JEL classification

D21, D23, D24

1. Introduction

The processes of price and market liberalization and restoration of property rights in agricultural sectors in post-communist countries of Central and Eastern Europe were expected to result in economic incentives that would stimulate farm restructuring and improve farm-level economic performance. Nonetheless, empirical efficiency analyses have shown that ten or more years after the economic system change, a variety of organizational forms continue to survive despite substantial technical inefficiency (see Thiele and Brodersen, 1999; Mathijs and Swinnen, 2001; Curtiss, 2002; Davidova et al., 2003; Latruffe et al., 2003). Theories as well as the empirical studies have considered organizational forms, scale, and scope though results have been inconclusive concerning which organizational form might be best for agricultural production. Studies of structural change have often attributed observed technical inefficiency to rigidities or constrained reorganization possibly arising from transaction costs or heterogeneity across the institutional conditions (Schlüter 2001; Brem 2001).

In this paper we consider an alternative explanation for these observations. In particular, we consider the role of persistent social norms and values that may continue to support incentives for firms to devote resources and effort toward achieving a state of organizational legitimacy, i.e. a condition for congruence or consistency between societal perception of the firm and social norms and values. Where achievement of such a state pays off for firms, within this generalized context devotion of resources toward that end may be economically efficient. We hypothesize that organizational legitimacy is associated with economic gains which, in the transitional settings, allow legitimacy to be a complement to purely private efficiency as a strategic goal for survival of an organization. In such a case, gains from organizational legitimacy provide incentives to choose effort, activities, or organizational forms that appear inefficient from a purely private good perspective.

As an empirical setting, we consider the case of Czech agriculture. We note that a significant share of farms in transition have continued to provide activities and services that generate on a local basis public benefit. This provision occurs despite associated direct and indirect costs. Given the value structure among rural population, we hypothesize that such behavior is motivated by a strategy for attainment of organizational legitimacy. Within this context, we present a theory and assess empirical evidence to explain how farms that pursue organizational legitimacy goals could survive in a competitive environment. We also consider characteristics of firms that exhibit such behavior. In short, we reconsider effort to secure organizational legitimacy and evaluate its implications for economic efficiency.

2. Theoretical Framework

2.1. Concept of Organizational Legitimacy and Efficiency

The concept of organizational legitimacy has a long history where it has been considered within a wide scope of disciplinary literature, see e.g. early work by Weber (1968) or Parsons (1960). The linkage between legitimacy and organizational behaviour was considered early on by Dowling and Pfeffer (1975) and Pfeffer and Salancik (1978). More recent neoinstitutional literature follows this framework clarifying that in some social, political, and economic contexts the firm may find it feasible to earn proprietary value through application of inputs to activities that do not contribute directly to private good production processes, see e.g. Ruef and Scott (1998) who draw on Meyer and Rowan (1977). We follow the conventional definition here where organization legitimacy is defined as a consistency or congruence between the firm's behavior and social norms, values, or beliefs, see e.g. Suchman (1995). We emphasize two theoretical aspects of the concept by considering (a) how the firm's behavior directed at managing the state of its organizational legitimacy affects economic efficiency and (b) how achievement of legitimacy affects economic efficiency.

2.2. Organizational Legitimacy and Production Possibilities

Define *x* as a vector of variable private good inputs managed by the firm. We assume these inputs are applied to a private good production technology conditioned by flows from a vector of quasi-fixed inputs, θ , to produce a vector of private good outputs, *y* . To introduce the possibility of the firm attempting to manage its organizational legitimacy, we note that the firm may also apply its inputs (*x,* θ) to produce a vector of what we label as organizational legitimacy effort, *z*. Any such production plan is viewed as generating a vector of local or quasi-public goods, *s*, as well as a contribution to organizational legitimacy. The translation of such effort into organizational legitimacy is clearly complex and highly conditioned by the social context. We suppose that at any time a firm can be described as having a particular state of organizational legitimacy, noted by a vector *q*. This level of organizational legitimacy is likely to follow from both current and past effort. The characteristics of the firm that might be included in this vector will vary from one social context to another.

We view the process of producing organizational legitimacy as possibly joint with the production process. For the *ith* firm at time *t*, these notions are summarized in the following production possibilities functions for which we assume typical neoclassical properties:

$$g(y_t, s_t, x_t \mid \theta_t) = 0 \tag{1}$$

where

$$q_t = q_{t-1} + d_t(s_t, x_t, z_t \mid \theta_t) \tag{2}$$

From this specification, it is clear the firm may be motivated to produce organizational legitimacy if its production generates proprietary value for the firm in one of two ways. First, production of the local public good *s* may have proprietary effects conditioning the productivity of the other inputs to render returns collectible through sale of *y*. In the simplest case where the public good is not valued by local society, the firm may place no value on the state of its organizational legitimacy, though may find it optimal to implement a production plan to produce positive *s*. A second case of interest would occur when the firm perceives that it can harvest proprietary value from the state q_t. To consider this, we specify the following valuation processes for the firm's outputs. First, we assume the private goods in the vector y_t can be sold on markets prices in the vector, p_t , while inputs x_t can be purchase at prices r_t.; and inputs z_t for prices w_t. Second, we assume that the firm's state of organizational legitimacy is valued by society. This valuation could take the form of access to rights or privileges, or subsidies in the form of flows or grants of assets or access to assets. In the Czech agricultural setting, this social valuation may follow from access to land, government loans, or higher quality labor. In any event, we define the current proprietary value derived from the firm's organizational legitimacy as:

$$v = v(q_t) \tag{3}$$

We assume this valuation function is strictly concave in q_t though in the economically relevant range considered in this setting, we assume $\partial v / \partial q_t \mid q = 0 > 0$. We note that it is likely that this valuation function varies by social setting, e.g. by locale, though to maintain a simple though sufficient notation, we omit such notation in the current specification.

In a static setting, this specification suggests that a firm managed by purely hedonistic managers may find it optimal to devote private inputs to produce organizational legitimacy. This might occur as a

subsidiary effect of the use of private inputs x_t or as a result of application of dedicated inputs z_t. Importantly, such effort will shift the frontier faced by firm's dedicating effort to organizational legitimacy compared to that faced by firm's that do not apply such effort. Consider the simple case where the firm's objective is to maximize profits defined as:

$$\pi_t \equiv p_t' y_t - r_t' x_t + v(q_t) - w_t' z_t \tag{4}$$

Within this notation, it is of interest to establish conditions under which the firm would devote resources to managing organizational legitimacy. Suppose society places no value on organizational legitimacy, i.e. $v(q_t) = 0 \ \forall \ q_t$. Given that z_t contributes no productivity to y_t, the firm would set $z_t = 0$. By comparison, it is clear that for $v > 0$, dedicated effort in the form of application of inputs z to change the state of organizational legitimacy would depend on the firm's perception of its marginal contribution to current and future payoffs of v relative to its cost. For our purposes, it is sufficient to consider the simple static case where Equation (2) is written:

$$q_t = d_t(s_t, x_t, z_t \mid \theta_t) \tag{5}$$

In this case, the first-order conditions for the firm's choice are (omitting the time subscript):

$$\partial\pi / \partial y = p + \lambda \partial g / \partial y = 0 \tag{6}$$

$$\partial\pi / \partial x = -r + \lambda \partial g / \partial x + (\partial v / \partial q)\partial q / \partial x = 0$$

$$\partial\pi / \partial z = -w + (\partial v / \partial q)\partial q / \partial z = 0$$

Two effects are important to note. From these conditions, it is clear that the firm will simultaneously consider the application of x and z. Importantly, where organizational legitimacy is positively valued and $\partial v / \partial q > 0$, if x contributes to q, i.e. if $\partial q / \partial x > 0$, then application of x will be increased relative to the case where $\partial v / \partial q = 0$. Further, considering the optimal level of z, we see a basis for hypothesizing that within the Czech setting, as local conditions implied positive or zero local social valuation of the organizational legitimacy, two distinct sets of firms could be observed: 1) those that pursue organizational legitimacy and 2) those that do not. Within the first group, it follows that the position of the production frontier will be conditioned by the levels of organizational legitimacy effort applied by each firm. More generally, Equations (6) highlight the conditions under which $z > 0$ will involve consideration of all choices made by the firm and the interaction of the elements of the production plan. In general, the following rule would hold:

$$\begin{aligned} &z > 0 \ if \ \partial\pi / \partial z > 0 \mid z = 0, x^0, y^0 \\ &i.e. \\ &z > 0 \ if \ (\partial v / \partial q)\partial q / \partial z > w \mid z = 0, x^0, y^0 \end{aligned} \tag{7}$$

where x^0, y^0 *solve* $max_{x,y}\ \pi_t \equiv p_t' y_t - r_t' x_t + v(q_t \mid z = 0)$. Thus, we can expect organizational legitimacy effort to be devoted by firms when society-based pay-off is expected, and depending on the productivity of such effort *z* in generating that pay-off. From Equation (7), it is clear that where $\partial^2 q / \partial z \partial x = 0$ the choice of organizational legitimacy effort is independent of the choice of private good inputs and outputs. In variations of this problem, limited managerial time might be added to highlight trade-offs between private good production and organizational legitimacy effort. From another perspective, the productivity of the *x* inputs could be reduced by application of organizational legitimacy effort, *z*. Together, these results motivate the hypothesis that the production frontier for Equation (1) will envelop the frontiers associated with particular levels of organizational legitimacy effort. Thus, for a sample of firms, we would expect that while they face a common frontier such as Equation (1), the levels of their ol effort will imply they will be operating with a integrated private good and social value frontier that falls within that common frontier.

3. Methodology

Agricultural production is generally characterized by a technology which transforms multiple inputs into multiple outputs. This holds in particular for the larger enterprises in Czech agriculture. An appropriate framework, which explicitly takes multi-output production into account, is the modelling on an output distance function (Shephard, 1970), which has been the microeconomic foundation of most of the work in non-parametric production analyses. However, the approach is also applicable in a stochastic frontier analysis approach, which is better suited for agricultural data in our view. The output-oriented distance function can be defined based on the output set *P(**x**)* as $D_O(\mathbf{x},\mathbf{y}) = \inf_{\phi}\left\{\phi > 0 : \mathbf{y}/\phi \in P(\mathbf{x})\right\}$ for all $\mathbf{x} \in \Re_+^K$ (see, e.g., Färe and Primont, 1995, p. 11). $D_O(\mathbf{x},\mathbf{y})$ is a non-decreasing, convex, and linearly homogeneous function in the output vector y, and a non-increasing and quasi-convex function in the input vector x. The value of the output distance function is exactly the inverse of the Farrell measure of output technical efficiency, which explains the large popularity of this dual representation of the production technology in the efficiency literature. The distance function can be conveniently transformed to have the same composed error structure as the standard stochastic production frontier, once linear homogeneity in outputs is imposed. Consider a translog functional form for the distance frontier (i.e., ln $D_O=0$) in K inputs and M outputs:

$$\begin{aligned}\ln D_O = \alpha_0 + \sum_{i=1}^{M}\beta_i \ln y_i + \sum_{i=M+1}^{M+K}\gamma_i \ln x_i + \frac{1}{2}\sum_{i=1}^{M}\sum_{j=1}^{M}\beta_{ij}\ln y_i \ln y_j \\ + \frac{1}{2}\sum_{i=M+1}^{M+K}\sum_{j=M+1}^{M+K}\gamma_{ij}\ln x_i \ln x_j + \sum_{i=1}^{M}\sum_{j=1}^{K}\omega_{ij}\ln y_i \ln x_j\end{aligned} \tag{8}$$

Linear homogeneity can be imposed by arbitrarily choosing one output (e.g., y_M) as a divisor for all remaining outputs. In terms of the natural logarithms in equation (8), after bringing the divisor to the right hand side, we have:

$$\ln D_O - \ln y_M = \beta_0 + \sum_{i=1}^{M-1} \beta_i \ln \frac{y_i}{y_M} + \sum_{i=M}^{M-1+K} \gamma_i \ln x_i + \frac{1}{2} \sum_{i=1}^{M-1} \sum_{j=1}^{M-1} \beta_{ij} \ln \frac{y_i}{y_M} \ln \frac{y_j}{y_M} + \frac{1}{2} \sum_{i=M}^{M-1+K} \sum_{j=M}^{M-1+K} \gamma_{ij} \ln x_i \ln x_j + \sum_{i=1}^{M-1} \sum_{j=1}^{K} \omega_{ij} \ln \frac{y_i}{y_M} \ln x_j \quad (9)$$

Denote the output oriented Farrell efficiency measure TE_O with *exp(u)*, where *u* is a non-negative random variable. This implies that ln $D_O = 1/TE_O = -u$. Multiplication by (-1), rearranging terms and adding an additional random variable *v* to account for unsystematic deviations from the production frontier gives the estimating equation (9), which has the standard stochastic production frontier error structure.

$$\ln y_M = -\left(\beta_0 + \sum_{i=1}^{M-1} \beta_i \ln \frac{y_i}{y_M} + \sum_{i=M}^{M-1+K} \gamma_i \ln x_i + \frac{1}{2} \sum_{i=1}^{M-1} \sum_{j=1}^{M-1} \beta_{ij} \ln \frac{y_i}{y_M} \ln \frac{y_j}{y_M} + \frac{1}{2} \sum_{i=M}^{M-1+K} \sum_{j=M}^{M-1+K} \gamma_{ij} \ln x_i \ln x_j + \sum_{i=1}^{M-1} \sum_{j=1}^{K} \omega_{ij} \ln \frac{y_i}{y_M} \ln x_j \right) - u + v \quad (10)$$

Estimation of (10) by maximum likelihood requires distributional assumptions for both the white noise error *v* and the technical inefficiency error term *u* because only the composed error term $e = v - u$ can be estimated. The variables *v* are assumed to be independent and identically distributed (i.i.d.) normal random variables with a mean of zero and constant variance σ_v^2 independent of the *u*'s. The systematic deviations from the frontier *u* are assumed to be i.i.d. half-normal random variables with a mean of zero and a heteroskedastic (i.e., firm-specific) variance parameter of σ_u^2, independently distributed from the *v*'s. This latter specification was initially proposed by Caudill et al. (1995) as a correction in the presence of heteroskedasticity. Wang and Schmidt (2002) point out that the variables, which explain the heteroskedasticity in the systematic error term can also be interpreted as determinants of technical efficiency. Hence, we use this model to analyze the role of organizational legitimacy effort as a determinant of technical efficiency, so that technical inefficiency effects are explicitly expressed as a function of a vector of firm-specific via the variance parameter σ_u^2:

$$\sigma_{u_i} = \exp(z_i \delta) \quad (11)$$

where z_i denotes the row vector of dimension *p* of firm-specific variables (including an intercept term), which may influence the efficiency of the *i*-th firm, and δ is a p-dimensional column vector of parameters to be estimated. The parameters of the frontier distance function and the heteroskedastic inefficiency model are obtained by the maximization of the relevant likelihood function. The nonlinear maximization is performed in Ox 3.40 (Doornik, 2002).

4. Data and Choice of Variables

The data set analyzed for legitimacy-seeking behavior consists of 166 agricultural enterprises from an extensive survey conducted in 2004 by the Institute for Agricultural Development in Central and Eastern Europe (IAMO) and by the Research Institute for Agricultural Economics in Prague (VUZE) in the Czech Republic. For most of these enterprises farm accountancy data for the years 2001 to 2003, collected by

VUZE, are available. The analysis concentrates on legal entities, which represent larger enterprises, since legitimacy-seeking behavior has, among these enterprises, enjoyed a long tradition and is still more probable and feasible than on family farms. Due to an incomplete panel of data and some missing information in the qualitative survey on public good provision and other legitimacy-gaining efforts, the final sample used includes 326 observations - 106 for 2001, 113 for 2002, and 107 for 2003, respectively.

4.3. Accountancy Data – Data for the Stochastic Production Function Specification

Accountancy data for the years 2001-2003 are used to specify the stochastic frontier production model. The firms in the sample are classified as agricultural enterprises with combined crop and animal production. They have various legal forms – Limited Companies, Joint Stock Companies, and Cooperatives. Despite the fact that legal entities are mostly considered large scale farms, they significantly vary in their size. The statistics in Table 3 show that the smallest legal entities, when measured by revenues, comprise only 2% of the largest firms in the sample. The data are aggregated into three output variables (M = 3) defined as total revenue from *Crop*, *Livestock* and *Non-Agricultural Production*, and four input variables (K = 4) – *Labor Expenses* (x_1), *Land* (multiplied by farm averaged paid land rent) (x_2), *Capital* (x_3), and *Intermediate Consumption* (x_4). Mostly cost data is available for production inputs, thus no breakdown between quantity and prices is possible. To keep the indication of output quantity and input equipment comparable over time, the input data expressed in value terms have to be transformed to a constant price basis. Price indices for agricultural output and inputs were used to bring the production (revenue) and expenditure data to constant 2001 terms.

The variable *Crop Production* (y_1) consists of revenues from crop production, including intermediary, store change and loss compensation from insurance. *Livestock Production* (y_2) as the second output variable is defined as revenues from livestock production. The variable *Non-Agricultural Production* (y_3) consists of revenues from non-agricultural production and services and subsidies for countryside maintenance. All input variables are expressed in expenses in constant 2001 prices, although information on total working hours, land use, and animal livestock units is available. In this way, the farms' ability to produce and also to acquire resources (and in the case of output, to market production) is considered. Thus, the variable *Labor Expenses* includes wages as well as social contributions paid for farm employees, *Land* is expressed as total cultivated land multiplied by the average rent price paid by the farm. In this way, quality of land is also partially considered. *Capital* is expressed in asset depreciations, including the depreciation of breeding herds. *Intermediate Consumption* consists of materials for agricultural production such as fertilizers, pesticides, herbicides, energy, services, materials for non-agricultural production, use of own intermediary and others.

Table 1. Descriptive statistics of the distance function model data

Variables in 1,000 CZK		Mean	Std. Dev.	Min	Max
Crop Production	y_1	26,356.6	23,837.1	315.0	161,983.2
Livestock Production	y_2	31,724.0	21,609.3	1,921.0	119,352.0
Non-Agricultural Production	y_3	11,452.0	14,600.1	45.0	101,604.0
Labor expenses	x_1	15,502.7	10,540.2	3,349.3	66,885.0
Land	x_2	974.2	1,334.1	14.0	10,380.0
Capital	x_3	6,423.9	4,505.9	107.0	26,516.0
Intermediate Consumption	x_4	44,695.0	33,241.1	5,562.6	183,979.0

4.1. Organizational Legitimacy Variables

The 2004 survey concerned farms' activities which were assumed to be reactions to various values or norms in their societal environment, which in the case of agriculture is represented by a high share of active shareholders. Thus, these activities mostly comprised the provision of public or semi-public (local) goods of a value not for anonymous individuals, but rather local non-agricultural actors, often holders of the farms' shares[1], employees and other potential workers, land owners, other agricultural actors possibly interested in collective action and policy makers on the regional and state level. The statistics of the data on the provision of public goods and other variables that proxy legitimacy-gaining efforts are summarized in Table 2.

The first variable, "*Social Employment*", should proxy the effort of gaining local support and represents whether the agricultural enterprise employs some workers for social reasons; the data reveals that 60% of enterprises still do so. The variable "*Publicly Beneficial Activities*" represents the enterprise's initiative in providing publicly beneficial activities for the municipality or dwellers, such as maintenance or arrangement of villages and roads or public facilities. Only 23% of the informants do not participate in any publicly beneficial activities for the municipality or local inhabitants. The next variable, "*Social Role of Non-Agricultural Activities*", implies that from 81% of the sampled enterprises active in non-agricultural productions, more than half are active in this sector for mainly or partially social reasons. These activities consist, for example, of catering facilities for workers and elderly people in the community, bus transportation for workers and others, etc. Almost 80% of enterprises organize themselves or participate in the organization of cultural actions. This is captured in the variable "*Cultural Activities*". The variable "*Publicity of Social Concerns*" should indicate the effort of the enterprises to publicize their social and cultural concerns, especially to the most important or powerful actors in the community, thereby achieving higher legitimacy. This is approximated by the question of whether the enterprise invites municipality or town representatives to the company's cultural and social activities.

The next group of variables includes information on the enterprises' efforts to obtain collective and political support through membership in an association or interest group. As the group supplies goods to their members (extension programs, information provision, etc.) and also public goods accessible to non-members (general policies through participating and lobbying in political negotiations), members gain not only legitimate access to the collective goods, but are from the social perspective also eligible to the public goods. Being considered a free-rider among farms can be viewed as a behavior that decreases organizational legitimacy. Membership in the agrarian organization, Agricultural Association, is captured in the variable "*Association Membership*". As the second variable "*Association Initiative*" suggests, almost 40% of all observed enterprises are actively involved in the management and design of this association through regional offices. This position, when compared to regular membership, allows, in addition to better and faster reaction to collective values, participation in shaping new societal values[2]. The variable *"Participation in the Association's Activities*" indicates that half of the members attend association activities such as extension programs, discussions with members and politicians and information meetings with input suppliers more than 6 times a year.

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[1] This is especially due to the privatization process in former collective farms, where former employees became eligible for transformation shares of these farms.

[2] In the case of association activities in transition, active members can, e.g. publicize the importance of agriculture in rural areas to legitimize subsidies, or communicate the perception of importance of large "socialist" style agricultural enterprises and thus influence public perception of the need for organizational change and strong restitution of injustices which occurred during socialist times.

Table 2. Descriptive statistics of the legitimacy data

Variables	*Mean*	*Min*	*Max*	*Description (frequencies)*
Aiming for Local Support				
Social Employment	0.60	0	1	Yes = 1 (60%), No = 0 (40%)
Publicly Beneficial Activities	0.77	0	1	Yes = 1 (77%), No = 0 (23%)
Social Role of Non-Agricultural Activities	0.98	0	2	Non-agricultural activities have: mainly social function = 2 (7%), partially social function = 1 (39%), purely economic function or purely agricultural activities = 0 (54%)
Cultural Activities	0.78	0	1	Provision YES = 1 (78%), never = 0 (22%)
Publicity of Social Concerns	0.40	0	1	Inviting town representatives to company's cultural and social activities: Yes = 1 (40%), No = 0 (60%)
Aiming for Collective (identical interest group) and Political Support				
Association Membership	0.79	0	1	Yes = 1 (79%); No = 0 (21%)
Association Initiative	0.38	0	1	Yes = 1 (38%); No = 0 (62%)
Participation in the Association's Activities	2.18	0	4	More than 10 times a year = 4 (17%), 6-10 times = 3 (23%), 2-5 times = 2 (32%), once a year = 1 (7%), not members = 0 (21%)
Aiming for Workers' support and reputation				
Workers' Wage	14.89	5.26	24.48	Standard deviation = 0.11; in 1,000 CZK
Land Rent Price	563	60	2,000	Standard deviation = 400
EU Standards	0.59	0	1	Fulfillment of technological EU standards: Yes = 1 (58%), No = 0 (42%)
Access to Resources				
Own Land	0.03	0	1	Standard deviation = 0.11
Investment Subsidies	810	0	10,741	Standard deviation = 1,541
Work Ethic	1.12	0	3	No problem = 0 (22%), slight problem = 1 (48%), mid problem = 2 (27%), high problem = 3 (3%)
Workers' Loyalty	1.30	0	3	No problem = 0 (21%), slight problem = 1 (36%), mid problem = 2 (35%), high problem = 3 (8%)
Workers Respect for Management	0.79	0	2	No problem = 0 (35%), slight problem = 1 (51%), mid problem = 2 (14%)
Enterprise and Management Characteristics				
Workers' Evaluation	2.80	1	4	Yes = 4 (7%), rather yes = 3 (69%), rather no = 2 (22%), no = 1 (2%)
Investment Intensity	2.24	1	4	investment did not cover depreciations = 1 (25%), 2 (39%), 3 (22%), highly expending investment = 4 (13%).
Investment Subsidies	810	0	10,741	Standard deviation = 1,541
Size	71,602	5,903	189,487	Standard deviation = 34,934

The third group of variables listed in Table 2 aims to capture the enterprises' concerns with, and reactions to, the workers' values and the enterprises' reputation. Generally high performance and investments into the enterprise and its workers, as well as conformity with regulations, law and societal concerns are valued by the workers. We use three variables with the objective of covering some of the mentioned aspects. These are: "*Workers' Wage*", "*Land Rent Price*", and "*EU Standards*". Generally, the wages paid to agricultural workers are markedly below the national average (around 70% of the national average). The statistics on the categories of gross average monthly wage paid to a worker in the drawn sample (variable "*Workers' Wage*" in Table 1) show that there are significant differences between

enterprises in paying their workers. The average monthly gross is around 15,000 Czech Crowns (CZK) including social contributions, which is slightly less than 500 Euro. The reason for low wages in agriculture is mainly the difficult financial situation of the enterprises due to low market prices, low state support, and low economic performance. Also, *Land Rent Prices* are not given by the land rent market but mostly set by the enterprises themselves (at least within a certain quality interval). Since the average land rent price in the Czech Republic is considered low, enterprises freely offering higher land rent prices show concerns with land owners and thus could benefit from a willingness to negotiate in the case of an intended transaction. The last variable, "*EU Standards*", which represents preliminary investments in EU technological standards, is mostly concerned with animal welfare and ecology and can be understood as partially motivated by the increase of reputation. We hypothesize that all these variables will relate to better shareholder attitudes towards the enterprise – e.g. higher social capital, or consumer preferences for the enterprise's production.

The remaining variables in Table 2 should contribute to the explanation of the efficiency effect of the legitimacy effort variables. The variable "*Own Land*" describes the share of land owned by the enterprise. The survey indicated that enterprises have a high interest in purchasing land. Hence, the low percentage share of own land (3%) indicates low land owners' willingness to sell their land. The following three variables, "*Work ethic*", "*Workers' Loyalty*", and "*Workers Respect to Management*", describe the workers' attitude to the enterprise and should proxy problems of moral hazard or social capital. "*Workers' Evaluation*" indicates the managers' perception of whether wages paid to workers correspond to their work effort/efficiency and qualification. This variable should thus proxy managerial quality. Furthermore, "*Investment Intensity*" is chosen to provide information on farm performance. Lastly, "*Size*" is defined by revenues and should, besides the size of production, also reflect the degree of reorganization, since the largest enterprises mostly retained their pre-transition form.

4.2. Choice of Organizational Legitimacy Effort Variables

We can assume that enterprises seeking legitimacy on the local level will likely be involved in all three of the following activities: social employment, provision of publicly beneficial activities and cultural activities. Therefore, a high correlation among some variables representing legitimacy efforts is expected. We carry out a principal component analysis to explore the latent dimensions and constructs in the original variables. In general, the component factor analysis transforms the correlation matrix through the estimation of a factor model into a factor matrix. Due to the discrete (ordinal) character of most variables, we use non-parametric Kendell's Tau estimates to generate the correlation matrix for the factor analysis. To test the sampling adequacy of individual variables, we use the Anti-Image Correlation Measures of Sampling Adequacy and communalities, which led to the exclusion of two variables from the analysis. These are "*Publicly Beneficial Activities*" and "*Social Employment*". This indicates that these variables do not sample well with other efforts for legitimacy variables and thus can be individually applied in forthcoming analyses. The sampling adequacy of the remaining variables in the component analysis is high, which is indicated by the 0.627 value of the Kaiser-Meyer-Olkin Measure. Using the Latent root criterion (each factor explains at least the variance of one variable), we identified four factors. These are presented in Table 3. In the presented solution, the relative explanatory power of the estimated five factors is 6 variables, which implies that they explain 65.7 % of the total variance of the 9 variables. The index for this solution is thus sufficiently high (min. 60 %) and the variables are in fact highly related to one another. The interpretation of the unrotated factor matrix is, in general, extremely difficult and theoretically less meaningful. Therefore, we proceed to the factor matrix rotation, which simplifies the interpretation. The Varimax solution is chosen for the factor analysis result solution.

The loadings of the variables on the individual factors shown in Table 3 imply that information contained in the variables could be substituted by four uncorrelated variables – factoral scores. Since the analysis mostly deals with discrete variables, it is not possible to use factorial scores to develop new variables representing the detected factors. Hence, we choose surrogate variables representing detected

groups of significantly correlated variables. Variables with the highest factor loadings - *Participation in Association's Activities, Publicity of Social Concerns, EU Standards* and *Workers' Wage* - will be used in the analysis of the efficiency effect of organizational legitimacy.

Table 3. Rotated factor matrix with effort for legitimacy variables

	Component 1	Component 2	Component 3	Component 4
Participation in Association's Activities	**.869**	.028	.018	-.099
Association Membership	**.847**	-.001	.078	.102
Association Initiative	**.605**	.043	.478	.056
Publicity of Social Concerns	-.121	**.804**	.182	-.020
Cultural Activities	.137	**.741**	-.184	-.020
EU Standards	-.063	.162	**-.685**	.108
Social Role of Non-Agricultural Activities	.165	.403	**.652**	.133
Workers' Wage	-.168	-.125	.192	**.806**
Land Rent Price	.222	.107	-.258	**.719**

5. Empirical Results

5.1. Analyzing means of legitimacy effect

In the following, we analyze the relationship of the effort for legitimacy variables to other farm characteristics and access to resources to elaborate the possible efficiency effect of these variables. Table 4 reports these relationships in a form of non-parametric Kendall's Tau correlations. Note that these correlations do not determine any causal directions in the analyzed relationship but should help to formulate hypotheses if, and by which means the chosen effort for legitimacy variables could influence farm efficiency. Most of the correlations are relatively weak, which could partially be the effect of dealing with mostly ordinal variables. Nevertheless, the whole range of the correlations are statistically significant.

Table 4. Kendall's tau correlations between legitimacy effort variables and enterprise characteristics

	Social Employ.	Social Activities	Assoc. Initiative	Land Rent Price	Workers' Wage	EU Standards
Own Land	0.191**	0.162*	0.130	0.147*	0.071	-0.187**
Investment Subsidies	0.098	0.082	0.200**	0.265**	0.086	-0.018
Working Moral	0.154*	0.086	0.000	-0.123	-0.085	-0.182*
Workers' Loyalty	0.057	-0.03	-0.057	-0.079	-0.158*	-0.035
Respect for Management	0.203**	0.143*	-0.018	-0.136*	-0.135	-0.178*
Workers' Evaluation	-0.017	-0.046	0.053	0.048	0.081	0.166*
Investment Intensity	0.036	0.028	-0.026	0.143*	0.160*	0.160*
Size	0.047	0.187*	0.159*	0.322**	0.125	0.018

** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level

The significant correlations imply that enterprises responding to community values by employing workers and carrying out non-agricultural productions and services for social reasons have a significantly higher share of own land than other enterprises. This could imply that they had better access to scarce resources, since there is a high demand for land purchased for agricultural use in the Czech Republic, but low supply on the side of owners of restituted land. This finding, and its suggestion of a lower cost of transactions on local input markets, supports the positive effect of social activities on farm efficiency. However, enterprises which show higher social concerns have larger problems with workers' work ethic

and respect for management, which is generally, and also in this case, a problem of larger enterprises. This would support our hypothesis that enterprises which inherited experience, and likely also equipment for the provision of social and public goods, chose to seek gains from legitimacy rather than to reorganize and eliminate their internal organizational problems.

Furthermore, being active in the management of agricultural associations, as is mostly the case in larger enterprises, brings advantages (likely information advantages); in our case, with respect to access to investment subsidies. Also, enterprises paying higher land rent prices obtain more investment subsidies. In this case, it is less likely to be a result of information advantages (land rent price does not correlate with association activity), but rather a result of the farms' larger scale. However, paying higher land rent prices and wages to the workers seems to have an effect on workers' respect for management and workers' loyalty to the farm. Investment in EU technological standards also relates to more effective workers' evaluation techniques and overall higher investment activity. Also these activities seem to have a positive effect on social capital since they relate to higher workers' effort and respect for management. Nevertheless, investing in technological standards is costly, with limited productive effect, thus its effect on technical efficiency is, despite its possible positive effect on social capital, ambiguous. The positive effect of such preliminary investment could reveal itself once EU technological standards become the norm and hence a liability for all producers.

5.2. Results from Distance Function Application

Results from the estimation of the translog[3] distance function for Czech agricultural producers during 2001-2003 are reported in Table 4. As explained in Section 3, we imposed linear homogeneity on outputs. In addition, we estimated the parameters of the specified model in such a way that the estimated functions satisfy the following properties implied by production theory: monotonicity – non-increasing in inputs and non-decreasing in outputs; and curvature – quasi-convex in inputs and convex in outputs. Furthermore, we normalized all the variables by their respective geometric mean. In this way, the translog form represents the approximation around the geometric mean. Thus, the technological properties are easily interpretable from the first-order parameters. These indicate average partial output elasticities with respect to respective outputs and inputs.

The T-probabilities in Table 4 show that all first-order effects are statistically significant. Given the model specification in equation 10, partial output elasticities with respect to inputs and outputs have the correct sign. The slightly higher elasticity with respect to the share of livestock production rather reflects the higher share of livestock production of total revenues than the share of crop production. Considering the homogeneity constraint in outputs, the share of non-agricultural production is low. The output elasticities with respect to inputs imply that additional input quantities increase the output. The largest proportional contribution to output, while keeping other inputs constant, comes from intermediate consumption. This could relate to the fact that the intensity of using variable inputs such as fertilizers is relatively low, which results from the economizing measures employed during transition due to low farm current resources. Therefore, an additional unit of intermediates (contrary to labor and capital) still has a high production potential. Scale elasticity as the sum of the output elasticities with respect to inputs is not significantly different from the indicated constant returns to scale in the sample mean. However, when

[3] Tests of the model specification rejected the restriction of the translog functional form to a Cobb-Douglas form. We use a likelihood ratio test to examine evidence that supports simplification of the translog to a Cobb-Douglas model. The logarithm value of the likelihood function for the translog model is 232.4, while for the Cobb-Douglas function it is 203.7. The likelihood ratio value is 57.4, which is higher than critical χ^2 value 30.6 for 15 degrees of freedom and a 0.01significance level. This implies that the null hypothesis, $\beta_{jk} = 0$, j = k = 1,..5, can be rejected at the 0.01 significance level. Using the same test procedure, we reject the hypotheses that the stochastic error is symmetric and invariant across observations, and that technical inefficiency varies across enterprises. This supports the use of a frontier model instead of a traditional production function with a normally distributed error term.

tested globally, returns to scale did not prove to be constant in all points of the production frontier.

Estimated technical efficiency is demonstrated in Figure 1. There, observations are sequenced by the score of technical efficiency. Considering the average technical efficiency estimates, over 80% of farms produce with an efficiency higher than 0.9, and are thus relatively close to their production potential. The relatively narrow confidence interval of these estimates indicates their relatively high reliability. These high efficiency values could be given by the high flexibility of the production frontiers in the multiple-output space.

Next, we focus on interpreting the parameterization of the error structure to consider how legitimacy efforts may influence technical efficiency. The negative value of these estimates indicates their negative effect on revenue inefficiency (positive effect on efficiency). The parameter δ_1 in the inefficiency effect model indicates that paying higher wages increases technical efficiency. This indicates that the costs of gaining organizational legitimacy through higher wages are exceeded by the resulting economic gains, in this case, possibly realized through the improvement of social capital. The second parameter in the inefficiency effect model, however, indicates that the effect of high paid wages is lost in highly labor intensive productions[4]. Being active in agricultural associations is also found to reduce technical inefficiency. On the other hand, publicity of social concerns, which also represents a group of variables regarding the farms' social and cultural activities, does not reduce technical inefficiency. Indeed, we find that it significantly increases technical inefficiency. In the context of the analysis in section 5.1., this would suggest that farms which more or less retained their former organizational structure provide this type of public goods to secure their stakeholders' support and their organizational legitimacy without a particular economic gain. In the case of such farms, the provision of public goods could be strongly expected by their stakeholders, who are often simultaneously shareholders. Furthermore, despite its possible effect on reputation, preliminary investment into EU technological standards does not prove to have a positive effect on technical efficiency. This effect could arrive when all farms are obliged to meet these technological standards. In relation to the results in Table 4, which suggest that investment into EU technological standards is realized by more reorganized enterprises, the efficiency results imply that these farms forgo current gains from legitimacy and choose to secure their future competitiveness with efficient managerial practices and technological investments.

[4] Variable labor intensity is measured as a share of labor expenses from the total expenses of total farm production.

Table 5. Estimates of translog stochastic production frontier

Distance function		Parameter	Std.deviation	t-prob
Intercept	α_0	0.057	0.015	0.000
Ln Y_1/Y_3	β_1	0.417	0.018	0.000
Ln Y_2/Y_3	β_2	0.491	0.019	0.000
Ln Labor	γ_1	-0.173	0.040	0.000
Ln Land	γ_2	-0.043	0.012	0.000
Ln Capital	γ_3	-0.063	0.029	0.036
Ln Intermediate Consumption (IC)	γ_4	-0.722	0.039	0.000
$(\text{Ln } Y_1/Y_3)^2$	β_{11}	0.255	0.025	0.000
$(\text{Ln } Y_2/Y_3)^2$	β_{22}	0.251	0.035	0.000
$(\text{Ln } Y_1/Y_3)$ x $(\text{Ln } Y_2/Y_3)$	β_{12}	-0.028	0.138	0.810
$(\text{Ln Labor})^2$	γ_{11}	-0.005	0.005	0.334
$(\text{Ln Land})^2$	γ_{22}	-0.111	0.024	0.002
$(\text{Ln Capital})^2$	γ_{33}	0.054	0.126	0.707
$(\text{Ln IC})^2$	γ_{44}	-0.241	0.029	0.000
(Ln Labor) x (Ln Land)	γ_{12}	0.083	0.049	0.172
(Ln Labor) x (Ln Capital)	γ_{13}	0.015	0.017	0.419
(Ln Labor) x (Ln IC)	γ_{14}	-0.103	0.037	0.137
(Ln Land) x (Ln Capital)	γ_{23}	-0.086	0.043	0.040
(Ln Land) x (Ln IC)	γ_{24}	-0.031	0.053	0.573
(Ln Capital) x (Ln IC)	γ_{34}	-0.013	0.017	0.473
$(\text{Ln } Y_1/Y_3)$ x (Ln Labor)	ω_{11}	0.053	0.044	0.423
$(\text{Ln } Y_1/Y_3)$ x (Ln Land)	ω_{12}	0.090	0.050	0.094
$(\text{Ln } Y_1/Y_3)$ x (Ln Capital)	ω_{13}	-0.006	0.042	0.892
$(\text{Ln } Y_1/Y_3)$ x (Ln IC)	ω_{14}	-0.021	0.071	0.776
$(\text{Ln } Y_2/Y_3)$ x (Ln Labor)	ω_{21}	0.043	0.102	0.585
$(\text{Ln } Y_2/Y_3)$ x (Ln Land)	ω_{22}	0.021	0.025	0.439
$(\text{Ln } Y_2/Y_3)$ x (Ln Capital)	ω_{23}	-0.040	0.041	0.356
$(\text{Ln } Y_2/Y_3)$ x (Ln IC)	ω_{24}	0.095	0.081	0.398
Inefficiency Effect				
Intercept	δ_0	-1.642	0.884	0.079
Workers' Wage	δ_1	-1.830	0.882	0.012
Workers' Wage x Labor Intensity	δ_2	0.323	0.227	0.105
Participation in Association's Activities	δ_3	-0.324	0.094	0.000
EU Standards	δ_4	0.609	0.289	0.090
Publicity of Social Concerns	δ_5	0.248	0.220	0.262
Time dummy 2002	δ_7	0.359	0.247	0.067
Time dummy 2003	δ_8	0.204	0.281	0.484
Ln Y1/Y3	δ_9	0.168	0.175	0.323
Ln Y2/Y3	δ_{10}	1.159	0.280	0.000
Log (likelihood)		**273.296**		

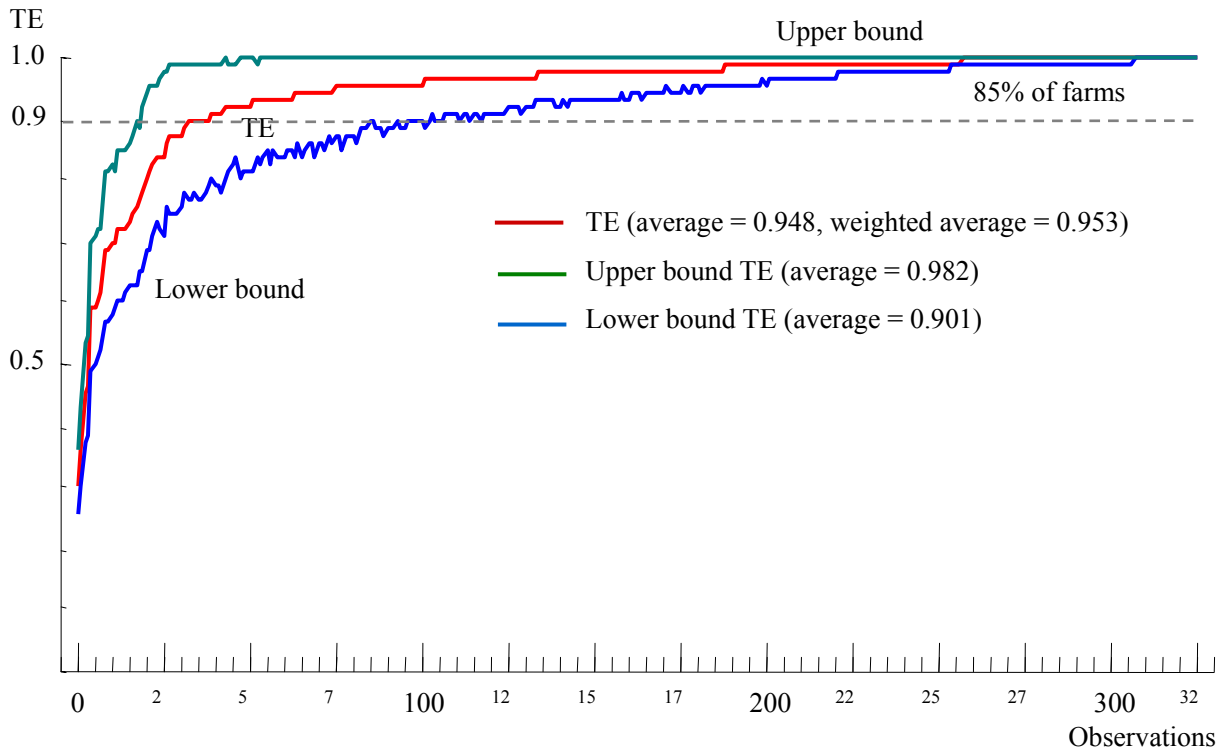

Figure 1. Technical efficiency distribution

6. Conclusions

Structural changes in transition economies have been analyzed from various perspectives. This paper brings into the discussion the role of organizational legitimacy, defined as the congruence between the firm's behavior and social norms, values, or beliefs. The neo-institutional approach in organization theory disputes that firms are motivated to seek legitimacy to secure legitimate access to scarce resources and to enjoy legitimacy-accompanying economic gains. Empirical results from Czech agriculture confirm economic gains from legitimacy efforts in the form of technical efficiency when these efforts respond to societal values but not norms. These gains were found to be related to accessibility to agricultural land, investment subsidies and firm internal social capital, depending on the targeted stakeholders' group. In the case of norms, the provision of public or other societally-valued goods seems to be expected and necessary for generating shareholders support, but has no direct economic gains. This appears to especially concern larger, less reorganized agricultural enterprises which, through gaining stakeholders' support, preserve their organization and possibly prevent their disintegration. More reorganized enterprises which have less experience and facilities for the provision of public goods, forgo the gains from legitimacy and choose to secure their future competitiveness with efficient managerial practices and technological investments. This evidence of the trade-off between gains from reorganization and legitimacy thus brings a new perspective to the understanding of structural changes, particularly regarding the persistence of large agricultural enterprises in transition.

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