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ABSTRACT

Following formal privatisation of farm land and assets in Central Europe, the change in agricultural production structures has been both more limited and different than was initially expected. In this paper, the theoretical reasons underlying those expectations are reviewed. An alternative theoretical framework is suggested, through which the causes of actual structural changes are analysed. Its premises and hypotheses are compared to primary survey data from the Czech Republic.

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Limitations to De-collectivisation in Central European Agriculture^S

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1. Introduction

One of the distinctive features in the transformation of post-communist agriculture throughout most of Central and Eastern Europe has been the development of a *dual* pattern in production structures. After the privatisation of land and farm assets in 1991-1993, the socialist-era large-scale wage-labour collective and state farms have generally been downsized and some disbanded in the process of property restitution. They were partly replaced by a large number of family, more generally, individually-operated farms, most of them very small by any standard.

Presently both types of agricultural production units between them constitute the dual structure of agricultural sectors in the region. Although the shares in total agricultural land and agricultural output of both farming modes vary widely over countries, individually operated farms have come to work considerable shares in agricultural land (except in Slovakia). At the same time, traditional farms have not generally disappeared (only in Albania and Latvia), nor have they become similar to Western farms either in size or organisation, as was expected by many analysts and policy makers in the early transition years. Thus two clearly distinct types of primary production have come to characterise agricultural production in Central and Eastern Europe. Table one presents sector structures in the region, showing that especially in Central Europe the individualisation of farming has been rather limited.

<table 1>

The aim of this paper is to explore the apparent limitations to de-collectivisation for the case of the Czech Republic. De-collectivisation is here defined as the formation of individually operated (for short: 'individual') farms from the land and property of formerly collective and state farms (here referred to as 'traditional' farms). An important theoretical reason for the central place of property rights reforms in post-socialist agriculture in the early 1990s was that this was seen as implying such individualisation of farming. This, in turn, was expected to lead to improved production efficiency.

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2. Why Expect Individualisation of Farming?

Arguments for the view that privatisation of ownership would lead to de-collectivisation (in the restrictive sense of the replacement of traditional farms by individual farms) are mostly found in an applied transaction costs based theory, as promoted by Schmitt (1993) and others¹. Here it is argued that the *raison d'être* for co-operative primary production is the existence of economies of scale or scope. However, in much of agriculture, technical economies of scale and scope are argued to be inherently limited and in addition outweighed by diseconomies in the *organisation* of production (Ferenczi, 1991:403). The source of these diseconomies is thought to be primarily the rapid increase in transaction costs² with number of employees. The farm size (in number of employees) that is optimal with regard to the production process is not expected to exceed family-farm size. In this mode of farming (here referred to as the individual farm), organisational diseconomies are argued to be largely excluded. Wage labour is not used and shirking or free-riding is supposedly difficult because of the small size, the hierarchical structure and the externally enforced continuation of relations within the household 'labour force' (Deininger, 1995; Hagedorn, 1994).

Based on these considerations and observations, the common perception in the early transformation years was that "the private sector will be more productive than the collective" (Petit and Brooks, 1994:483). Significantly, 'private' was usually equated to 'individually owned' and contrasted to 'collective'. This led to the generally accepted view that "privatization in ... agriculture mainly concerns the breaking up of large units..." (World Bank, 1995:2). Such individualisation was not seen as optional, but as fundamental since "restructuring of large-scale farms (is) in line with the new ownership patterns and the principles of a market-based economy" (Csaki and Lerman, 1994:560). Collective farming had needed constant socialist government support to survive. Once this assistance was removed -as it was in Central Europe- individual farming could be expected to replace collective farming more or less spontaneously. New, or newly effective owners would search for the most efficient and profitable use of their assets, and use them in (or rent them to) individual farms.

3. Complete Privatisation, Partial De-Collectivisation

In line with these theoretical expectations the means – privatisation- was generally implemented speedily and effectively throughout Central and Eastern Europe, leaving only a little farm land and a

¹ Schmitt's paper, originally written in 1990, represented the dominant approach in the early transition years. It was an application to post-communist farming of theoretical work on household production by Pollak (1985) and Binswanger & Rosenzweig (1986). Older precursors are Aereboe *et al.* (1929), Chayanov (1966 ed.) and Mill (1892 ed.). For contemporary expositions of it, see Sarris *et al.* (1999: 315-317) or Mathijs *et al.* (1999:4-8).

² Transaction costs are here defined as 'costs of defining, protecting and enforcing the property rights to goods' (as in North, 1990:28), notably including costs arising from asymmetrically distributed information (such as monitoring employees) as in Alchian & Demsetz (1972).

few assets in state hands. The end – restructuring of the organisation of production – was attained to a much more limited extent³. The Czech experience provides an illustration.

In the Czech restitution process, the legislation of which was enacted in 1991-1992, ownership titles to land and assets were redistributed; de-collectivisation was envisaged to result from restitution via individuals' choices in the market. Restitution refers to the restoring to private hands of state property acquired by state coercion (either through donation or sale) in the communist era after February 1948. Heirs to Czechoslovak citizens so treated could claim the ownership of these assets until August 1993, and restitution procedures were immediately started. Of all restitution claims made, 90% was resolved by 1998, resulting in the transfer of 29 % of all agricultural land. Another 50 % had always been formally (though not effectively) owned by individuals throughout the communist era and had been used in the collective farming sector⁴ (Csaki et al. 1999:27). These property rights were made explicit after 1992, and owners could subsequently select their preferred use from a set of three options (OECD, 1995:78):

- to remain or become a member of the new co-operative farm (or other legal entity that was the successor of the old co-operative), putting their land and assets at the management's disposal on a rental basis;
- to cancel or refrain from membership, taking out any land and assets (or assets' pecuniary value) *provided* the aim was to take up farming outside the co-operative, either individually or in a new form of co-operation with other starters;
- to choose neither co-operative farm membership nor any other farming status. In this case the individual had the right to take out land and assets only after a seven-year adjustment period (i.e. in 1999), meanwhile entitled to an annual rent from the property.

The original objective of this policy is clear. On the one hand, free reallocation of resources between the co-operative and family farming mode - supposed to be more efficient⁵, - should increase efficiency. On the other hand, the outflow of land and assets should start only after farms have had time to adjust to market conditions and increase efficiency. These twin developments should have ensured optimal resource reallocation initially and prevent excessive outflow afterwards⁶.

This was the design. The outcome differed from it in three respects. First, while the administrative re-definition of ownership of farm land used in traditional farms was completed as early as 1993, only about a quarter of that land had actually been removed from traditional farming use by

³ For an overview of privatisation policies and outcomes in the region, see Csaki and Lerman (1997) or Swinnen *et al* (1997).

⁴ The remaining 20 % of agricultural land is still state owned. Two thirds of it is presently being prepared for privatisation, one third is mostly leased out (Csaki et al., 1999:27).

⁵ Although there are important qualifications. See Hughes (1999), Mathijs et al (1999) , Mathijs and Vranken (1999), and Sarris et al.(1999).

⁶ For detailed accounts of the restitution process, see e.g. Lindemans (1997); Divila and Sokol (1993); Karlík (1993); Kaizrlík (1997); and Swain (1999).

1998. Throughout Central Europe, individual farming has come to be much less dominant than would be possible legally and was expected theoretically, as was shown in table 1. This is due not so much to an insufficient number of individual farms established but rather because of their failure, in general, to expand. Most newly established farms remained of marginal size by any standard, and certainly relative to traditional farms. The overwhelming majority did not reach a commercially viable size and offers a part-time farming income only.

In the case of the Czech Republic, in 1998 91,708 citizens owned agricultural land, of whom 22,971 were registered individual farmers. Their farm sizes averaged 36 hectares, but over half of them worked less than ten hectares and only 6 % used over a hundred hectares. Between them they worked 24 % of agricultural land. The bulk of the remaining land was occupied by 3,464 traditional farms all working over a hundred hectares, except for a minority of about 10 % (Ministry, 1999; Csaki et al, 1999:29).

The second divergence from initial expectations was that the legal reform of co-operatives and state farms had limited effect on governance structures. Although with smaller labour forces, most farms continued to function essentially as before, be it as a 'new' co-operative or under other legal forms. The supposed inefficiency problems that this governance mode entailed did not lead either the management or the factor owners to reject it on a large scale.

Third, within the traditional-farming sector profitable activities tended to become concentrated in the corporate rather than the co-operative farming mode. Often debts and activities with adverse prospects were left in the co-operative farm, while valuable assets, liabilities, and profitable farm activities were transferred to a (newly established) corporate farm. Since bankruptcy procedures are rather easy to avoid or protract, these 'empty shells' typically continue to exist.

This last development appears to be a considerable obstacle in the restitution process, because it is much more difficult for claimants to obtain property in a corporate farm than in a co-operative farm - obviously one of the reasons for the use of such 'skeleton' constructions to start with. Significantly, the conversion of co-operative in corporate farms has accelerated considerably in the last few years before 1999, when property restitution - in kind or money - without proof of the claimant's farming intention was to become possible (Csaki et al., 1999:31,36,28)

As a prelude to an analysis of these developments, a short characterisation of the current properties of the Czech traditional and individual farm modes is helpful at this point. Traditional farms are successor organisations to collective or state farms, and include co-operative farms (*zemedelská druzstva*), joint stock (*akciové společnosti*) and limited liability (*společnosti s.r.o.*) companies. The defining feature is that of the corporate firm, i.e. the separation between farm ownership, control over the production process and implementation of production tasks: there is blue-collar and white-collar labour. Differences between the various forms, in the Czech setting, are that co-operative farms are usually larger in terms of acreage and workers, and also on average less profitable than are farming companies, for reasons described above. The governance structure of the traditional farm is made up

of several hundreds of owners, up to 10 managers, some administrative and technical personnel, and between some tens and a few hundred workers. It typically exhibits large product diversification (especially in crop production), usually including non-farm production as well.

The defining feature of its alternative, the individual farm, is that it is owned, managed, and operated by a limited number of people, usually united in an (extended) family. Its legal form is normally that of a 'physical entity', which is usually the 'physical person' (as distinct from a corporate structure) of the entrepreneur himself. Wage labour is used on a very limited, often part-time or temporary basis if at all. The individual farm is sometimes the successor of a state farm, but typically newly founded as a production entity during the transformation, its owners working land that was acquired through restitution and lease. The production focus is on crop growing, in which there is considerable product specialisation, while activities in animal husbandry are limited and non-farm production usually absent. Also individual farmers are more often supplemental-income farmers.

4. A Conceptual Framework for Individualisation of Farming

In explaining dual sector structures during transition one can approach the organisational alternatives as institutions and assess their performance according to some criterion such as efficiency, profitability, or institutional viability. A comparison of success, in these terms, could explain the observed dominance of one type (as in Hughes, 1999; Rizov *et al.*, 1999). An alternative is to explain it not so much by comparing differences in the final states as by exploring the path that leads from one institution to another. This is the approach taken here. What facilitates the transition from traditional to individual farming, and what hinders it?

This approach derives from the *distributional* explanation of institutional change developed in Knight (1997), Levi (1988) and writings of the later North (see e.g. Knight and North, 1997). It starts from the postulate that actors attempt to change institutions in pursuit of their goals. Actor interests and relative power distributions thus control the institutional outcome. This theory appears better suited to explain short-term institutional change than its alternative, the *efficiency* approach, associated with the early North (e.g. 1990), Libecap (1989) and Barzel (1989), among others, and posed mainly to explain longer-term processes. These theorists assume near-perfect competition of interest groups in the 'production' of new institutions, largely ignoring political mechanisms and power distributions. In consequence, institutional, and in particular property rights change is seen to improve efficiency turn.

A crucial element in the first theory, which underpins the present perspective, is the notion that agents in the process of institutional change have power which they use to induce, curb or hinder it. Power, in this theory, is defined as the ability to influence the alternatives open to others. It can be based on either actor attributes or on features of the change process. Sources of power of the first type include an agent's discretion over resources, superior information, or relevant 'tacit' (i.e. experience-based, non-transferrable) knowledge. Features of the institutional change process that may allow one

party to have power over another include its transaction costs of (the height of which is typically open to manipulation by the powerful agent) and the political constellation governing the change process.

The distribution of agents' power and their goals jointly determine the shape of the evolving formal institution. As agents interact repeatedly in the framework of that new institution, their actions and reactions become increasingly mutually predictable, eventually embodying implicit rules for behaviour: a new informal institution has evolved. Since informal institutions necessarily emerge later and also more slowly than do formal institutions, there typically are initial matching problems between 'old' informal and 'new' formal institutions.

Applying this approach to the evolving formal institution of the individual farm - which, in turn, is predicated on a *set* of more general formal institutions such as individual property rights and contract legislation - , the elements of the above general account can be specified as follows. Management of traditional farms find it, in general, not in their interest to co-operate in the establishing of individual farms. Moreover, they have power over prospective individual farmers deriving, to different degrees, from both features of the restitution process (providing scope for manipulation of the prospective farmer's transaction costs by traditional farm management) and from their position in the traditional, dominant farming system. moreover, existing informal institutions support the traditional rather than the individual farming mode. Thus, in this view the emergence of the individual farm institution is unlikely to occur in the short term.

While the traditional management's aims may seem rather obvious - preservation of the traditional farm-, its power is hard to identify or measure. The focus in the analysis below will therefore be on the sources of that power, particularly the transaction costs, or -more generally- barriers to change that the prospective individual farmers experiences. In order to explore the transition from traditional to individual farming in this vein, consider an individual's incentive structure with regard to the switching decision from present, traditional farm employment to the individual-farming occupation (the relevance of this starting point will be justified empirically below) The first premise then is that individuals compare *ex ante* their well-being, in a broad sense, over both states and decide accordingly. This is a standard component of most approaches to the problem and will remain implicit here.

The second premise is that switching is costly. There are barriers to change quite apart from the levels of well-being in the present and future occupation. Consideration of these costs of change as well as the static comparison of the alternatives is assumed to control the outcome. Since this second assumption is in previous studies usually not explicitly assessed empirically, a description of the nature and importance of such switching costs is the main aim of this paper, in line with its theoretical focus.⁷

⁷ Note that this is complementary to other explanatory models such as Mathijs and Swinnen (1998) who have studied a model in which individual choice only is decisive, testing it with macro-level data. Hughes (1999)

Switching costs are controlled by the institutional arrangements in the economy in general, and by the conditions in the individual's present occupation in particular. Since a considerable share of present individual farmers used to be employed in traditional farms, the features of these organisations are likely particularly important institutions controlling the extent of de-collectivisation. Switching costs can be broken down to costs of leaving the present occupation (exit costs), costs of establishing the new farm (investment costs) and costs of operating the new farm in a given environment (integration costs).

First, *exit* costs may include material components such as a loss in income, but also psychological or political factors, often grounded in informal institutions. Technically, someone with a non-agricultural job or a background in a large traditional farm with a highly specialised labour force is not likely to easily master the array of skills that individual farming requires, and will experience a loss in productivity and income upon switching. Psychologically, a long period of communal life may have installed an emotional appreciation for group membership, a strong sense of loyalty to (perhaps even pride in) the organisation, and a dislike for inequality (Bardhan, 1993:636; Zusman, 1993:24; Kimball, 1988). Politically, various connections with individuals with some power may be both vital to a member's well-being and dependent on traditional farm membership through networks (Carter, 1984). This is especially true in an economic system that inherited a good deal of politicising of economic decisions - see e.g. Ellman (1979:21-23) on this aspect of the former system in general and Csaki et al. (1999: xx) on connection-based fund allocation in Czech agriculture.

Second, *investment* costs are the one-off costs of acquiring farm land and assets in the restitution process or in the market. This is costly not only in terms of money but also time. Third, the existence of *integration* costs implies that success in farming will also depend on the degree to which the new entrepreneur, after establishing the new business, succeeds in using the existing economic institutions or – alternatively - in creating new routines and organisational arrangements serving his particular production and transaction needs.

Integration costs are investments in access to the economic system. They exist because the transaction environment is not an open and atomistic market, but is characterised by network interdependencies between transaction partners imposing a transaction cost premium on new entrants. In a system that is institutionally dominated by the traditional-farming mode, integration costs are largely costs of replacement, in three senses: replacement of access to productive resources, to financial resources, and to market relations. Consider these in turn.

Factors of production in traditional agriculture are typically size-specific and suitable for wage-labour farming. Physical restitution may then create a compatibility problem. Farm land and assets are moreover typically interdependent, and restitution of only part of a complementary set of factors of production implies a loss of productive capacity. Because of these limitations, there will be continuing

considers re-allocation by resource owners, applying that approach to the present data. Rizov et al. (1999) study individual and environmental factors for the Romanian case, using survey data on individual farms only.

integration costs in addition to initial conventional investment costs. The new entrepreneur will have to gain access to productive resources and to funds, which depends on the quality and accessibility of the market for farm land and assets and for external finance. Both types of access are known to be problematic. Land and assets markets hardly exist. Nor do genuine and effective agricultural banks, while subsidy allocation is typically not transparent and biased in favour of established farms⁸. Individual farms have to compete for funds at a disadvantage in the existing system, or bear the costs of setting up their own channels.

The third type of integration costs concerns market relations, which include contracts and personal ties that the traditional farm *as an entity* has with upstream and downstream industries. The costs of replacing them with many separate contracts are typically transaction costs, which the supplier or seller will try to pass on to the individual farm. These costs arise from: (1) acquiring knowledge about the new trading partner, (2) bargaining and formulating new contracts, and (3) adjusting to scale-specific aspects of packaging, processing and transporting. Input suppliers or output purchasers will only trade with individual farms if these can bear these extra costs. If that is not the case, newly established farms are dependent on existing channels that go via the traditional farm and are accessible at a cost only. In either case there is a premium on costs of transacting for the individual farm.

5. The 1998-1999 Survey

The above theoretical framework will be applied to the findings from two mail surveys conducted in 1998-1999 by the author. These surveys were developed on the basis of interview work and a pilot study in Moravia (the eastern part of the Czech Republic) during 1997 and 1998⁹. One survey was addressed to operators of individual farms, the other to managers of traditional farms. The survey to individual farmers was mailed out to members of the Czech Association of Private Farmers (SSZ). The distribution of SSZ members over the administrative districts in the country was taken to be a good approximation of the distribution of all Czech individual farmers and was adopted as the sample frame. Survey questionnaires were sent to farmers in 38 districts; responses came from 31 of these districts. In total 193 responses (18 % of 1081 mailings) were received.

The survey among management of traditional farms in the Czech Republic was conducted in co-operation with regional representatives of the Czech-Moravian Union of Agricultural Co-operatives. This body represent all types of traditional farms in the Agrarian Chamber, the overarching farm interest organisation in the Czech Republic. Here 430 farm managers were addressed, of whom 69 (16 %) responded.

⁸ See on rural or agricultural credit market development in the region Woltz (1996), Pederson and Khitarishvili (1997), Davis and Hare (1997), Gow and Swinnen (1998) and Davis and Gaburici (1999).

⁹ For interview findings, see Bezemer (1999)

The response rates for both surveys were rather low, although it is difficult to decide what the standard for comparison should be. (In similar, previous work, the response rate is typically not reported¹⁰.) In the final analysis, it is the extent to which the sample represents the population that matters (table 2).

<table 2>

A limitation of the comparison is that the official statistics are more detailed on technical and financial information, but lack information on several aspects depicted in the survey (such as experiences in the restitution procedure, human capital, financial operations, and business practices). With this qualification, the data appear to provide a representative picture on comparable aspects. The one caveat to this conclusion is that the survey depicts a group of farms that is larger and in which (for the traditional-farm responses) co-operative farms are over-represented compared to the official figures, both biases obviously being related.

Since detailed technical and financial information could not be collected in the survey, an additional source of information was used. This was the 1996 round of the regular surveys conducted by the Czech Research Institute for Agricultural Economics (VUZE) at. This data set consists of 238 individual and 172 traditional farms and includes information on size of acreage, product specialisation, labour and wages, costs and revenues, production efficiency and regional location. The information from the VUZE data set and the two survey data sets was combined by matching each farm from the survey to a comparable farm from the VUZE data set. In this way, information in the survey was supplemented with technical and financial information taking scale, scope and location influences on efficiency into account¹¹.

6. Assessing the Factors in De-collectivisation

At the outset of this data section it is useful to note two general features of the restitution period which showed up in the survey findings. First, de-collectivisation now appears to be over. Most individual farms in the sample were established in 1990 (27), 1991 (66), 1992 (48), or 1993 (24). In the 182 responses to this question, six farms were started after 1993 and eleven before 1990 – going as far back as 1943. The absence of reported start-ups in 1993-1998 shows that there was no log-like pattern of growth in the number of businesses during transition, as would be natural in the development of new sectors or business modes. Apparently there are indeed presently barriers to the realisation of such a growth path.

¹⁰ See on this Majerová (1997) for Czech agriculture; World Bank (1995) for various CEE countries; Davis and Gaburici (1999) for Romania; Wolz et al. (1998) for Slovakia; Mathijs et al. (1999) for the Czech Republic; and Lerman et al. (1998) for Armenia.

¹¹ Additionally, information in EBRD (1999), Ministry (1994-1999), and OECD (1995) was used to account for developments in productivity and for inflation. A detailed appendix describing the matching procedure is available on request.

Second, from these data as well as other survey findings it appears that restitution was not an harmonious process (cf. Majerová, 1997:375). Individual-farm operators, both in interviews and through survey responses, frequently complained about the duration of the process, the quality of assets and land obtained in it, and the difficulties encountered in operating their farm afterwards. In most cases, they attributed these problems partly to the influence and opposition of traditional farm management and partly to governmental incompetence. The traditional-farm managers, in turn, complained about the paperwork and regretted the loss of ‘their’ land and assets; three-quarters of them said they would like to expand their farm if possible, despite the general dismal economic prospects and the still large size of traditional farms. It is relevant to take these facts into account when studying a reform episode that was an administrative rather than a market process, characterised by large discretion of especially traditional farm management in the implementation of restitution procedures (see on this also Ratinger and Rabinowicz, 1997:75; Divila and Sokol, 1993:366).

6.1 A Measure for Success

Given the research question studied in this paper – why is individual farming so limited?- it is important to note that there is, for obvious reasons, no direct information on those who indeed considered individual farming but rejected that option. However, in the individual-farmer sample the conditions that promote or constrain individual farming could be observed. The approach taken here is that from the problems and prospects of the practitioners something can be inferred about the reasons why others failed.

In order to assess the conditions for success, a performance indicator for individual farmers must be selected. During transition, opportunities for expansion to a viable farm size typically proved crucial for survival. With such expansion comes the ability to operate commercially rather than as supplemental-income farmer. In what follows, the various conditions of individual farmers are therefore related size, measured as annual per-farm revenue level¹², and market orientation, as indicated by both the share of income that is derived from farming and the time devoted to it. In the individual-farm survey sample, 74 % of respondents satisfied both the criteria of obtaining more than three-quarter of their income from farming and working over 40 hours weekly in their farm business. These figures are here used as the lower bound for what will be referred to as ‘professional’ farmers, as distinct from hobby, part-time, non-commercial and other types of supplemental-income farmers¹³. There is naturally considerable (but not complete) overlap between the two groups. Of 183 valid

¹² This is total production, inferred from reported crop acreages and herd sizes, and valued at official prices. Importantly, this includes output which was in fact used for barter or own consumption. Given the aim of the size classification, this indicator is preferable to the acreage measure used for traditional farms.

¹³ The large under-representation of the latter group is obviously caused by the SSZ membership sample frame. While the survey thus does not mirror the entire sector, this focus is actually useful when investigating the importance of individual farming as a *commercial* activity.

observations, 126 were considered 'professional' farmers and 117 large-scale individual farmers, while 96 were in both categories.

6.2 Exit costs

For an assessment of exit costs consider first the traditional-farm sample. The central variable of interest here, the extent of de-collectivisation, is measured in two ways: by the amount of land and by the number of people involved. Table 3 presents both types of de-collectivisation measures for subgroups of traditional farms aggregated on the basis of size, farm type, and location.

<table 3>

It is useful to note that in the individual-farm sample, 88 % of farm operators started farming only after filing a claim for their property with a traditional farm. By inference, table 3 indeed largely depicts the experiences of prospective individual farmers as reported by the managers of the traditional farms in which their land and assets were used. In general, the data show that there is a substantial difference between the number of applications and the number of actual exits. The number of people who eventually kept their property rather than offer it for rent to the traditional farm again is still lower. Overall, claimants appeared to learn the difficulties involved in individual farming both during and after restitution procedures, leading between 30 and 40 % of them to cancel their plans.

Since de-collectivisation was measured in land or number of people, farm *size* is here also defined in acreage rather than as revenue level. (Note that farms working more land were generally also larger in terms of members or shareholders, but not necessarily in terms of revenues.) The figures show that de-collectivisation (in hectares of land) was more limited in the smaller farms; in terms of number of leavers it was largest in medium-sized farms but small in the other categories. Higher costs of leaving in the largest farms may well be due to the asset incompatibility or labour specialisation problems noted above. In small farms both the number of claimants and transferrals, and D values are rather low. This suggests a barrier to leaving specifically related to small farms such as psychological constraints due to social pressure or, put positively, social cohesion. This interpretation is further endorsed by the observed frequent re-collectivisation (cases of property return) in the smallest farms: nearly a fourth of all successful claimants eventually reversed the transfer. De-collectivisation in medium-sized farms was likely less subject to any of these exist cost sources; consequently it is higher on average while also people-related de-collectivisation measures vary more over medium-sized farms.

As to farm *types*, the number of applications was considerably larger in co-operative than in corporate farms. In the latter mode also more people relinquished their claims or returned their property and loss of acreage was consequently smaller. These findings can partly be explained by the 'empty shell' strategies described above, in part by legal differences that facilitate exit more in co-

operative farms. Such larger legal opportunities for restitution leave more room for other factor to control restitution success, which is reflected in the much larger variation of all three people-related de-collectivisation measures in co-operative farms.

Finally, differences between the two *regions* studied were evident with regard to claims, transfers, and returns. Natural conditions in region 2 are more favourable than in region 3¹⁴, which obviously affects prospective farmer's expected productivity. In addition, smaller profit margins in region 3 may also have led traditional farm managers to improve their own farming prospects by discouraging claimants (for this interpretation see also tables 5 and 6 below).

One important determinant of future productivity and viability of individual farms is likely the size of the property (particularly land) that can be claimed. Post-reform land property throughout the region is fragmented and, as noted, the Czech Republic is no exception. In a 10 million Czech population, there were 3 million landowners not engaged in agricultural production in 1998 (Csaki et al, 1999:28-29). Hence, if much land must be rented from this pool of owners in addition to restituted property, search costs will likely be high. In table 4 below various figures related to land restitution are reported.

<table 4>

A first observation is that indeed, in general, the owners of more land left traditional farms: the difference in the average amounts of land taken out and land left in the farm is quite large. While the amount of land taken out per owner varied considerably over categories, restitution caused the distribution of land over other owners to become remarkably equal afterwards. A comparison of tables 3 and 4 also shows that overall, a larger fraction of owners claiming their land was associated with a larger amount of land taken out per claimant (note this direct relation in the 'size' and 'type' classifications and the equal table 4 figures in the 'region' categorisation). These findings all support the idea that the amount of land to which claimants were entitled was important in their decision to claim.

Still, the substantial 1998 ownership concentration figures also show that a number of owners who could have left if land availability *only* would have been decisive in fact did not leave. This is especially relevant in the smallest farms; it appears that the smaller the farm, the larger is the fraction of owners of large plots of land (more than 10 hectares). This endorses the arguments for less de-collectivisation in smaller farms presented above.

An interesting complement to these inferences is exit cost information explicitly reported by individual farmers themselves. These costs comprise (1) time lost in administrative procedures and (2)

¹⁴ Region 2 is characterised by brown earth soil, average temperature of 8 °C, 600-715 mm precipitation annually, and flat to moderately sloping land, which is largely (95 %) cultivated. Zone 3 is of the same soil type

loss of productive capacity because of a redistribution of assets to the disadvantage of prospective individual farmers (i.e. when they did not obtain sufficiently large plots of land or useful machinery and buildings). Respondents reported the time it took them to obtain property (table 5). They also provided information on their success in applying for land and assets in traditional farms (table 6).

<table 5>

<table 6>

Table 6 shows that almost all individual farmers (88 %) started out by applying for property in traditional farms. Table 5 indicates that somewhat over half of these applicants had to wait for over a year between applying for and obtaining property (or were still waiting at the moment of surveying). Only a fifth received property within half a year, but most of these claimants did not become either professional or larger-scale farmers. Professional farmers waited significantly longer on average, which was probably related to the larger difficulties in obtaining assets rather than land only. Only a small minority failed to obtain anything. This share is considerably larger in the non-professional and small-scale farm subgroup than among professional and large-scale farmers.

In region 4 fewer people applied, more applications were turned down, and fewer assets were received in comparison to the other two regions. Claimants in region 4⁵ also waited significantly longer than those in the other regions. The adverse production conditions in this region plausibly reduced the expected productivity and thus the number of application and transferrals. Additionally, the observations on waiting times would support the notion that traditional farm managers had both considerable discretion in the implementation of restitution procedures and more incentives to use this discretion in discouraging applicants as their own natural circumstances were more difficult (cf. table 3).

After successful application, land was received in most cases, assets much less often. Those claimants who later became professional and large-scale farmers more often succeeded in obtaining productive assets through restitution. The slow availability of assets apparently implied real exit costs: it discouraged claimants to wait, likely constraining many to supplemental-income farming by producing less technology intense and forcing others to buy assets in the market at considerable costs. Access to land in the restitution process was apparently less relevant for success; smaller-farm operators actually more often obtained land through restitution than did large-scale farmers. This finding anticipates the larger importance of land lease opportunities rather than restitution for farm expansion to a commercially viable size.

and about the same climatic conditions, but is mainly located on higher altitudes and more hilly, with only 17 % of land cultivated (Ministry, 1999).

¹⁵ This zone comprises the least productive areas in the Czech Republic: (sub-)mountainous terrain, an average temperature of 5 °C, varied soil types, 800 mm precipitation annually, and generally sloping land of which only 25 % is cultivated (often through forestry).

6.3 Investment and Integration Costs

Important for meeting the investment needs identified above obviously is a farmer's access to credit and subsidies. Respondents in both traditional and newly established farms reported the number of years in the 1992-1998 period in which they had such access (table 7).

<table 7>

Table 7 shows, first, that traditional farms have had an advantage in obtaining funds, though much clearer so in the case of credit than subsidies. Second, access to both credit and subsidies is linked to success in individual farming. Another way to present this evidence is to compare the average number of years of access to outside funding in the period under study. This was 0.7 for professional and 0.3 for other individual farms, but 3.0 for traditional farms (with negligible difference between the two types). Taken together, these findings on fund allocation appear to indicate a clear disincentive to engage in individual farming.

Smaller individual farms had generally better access to funds in 1993-1995 than medium-sized businesses. This is in line with the existence of support programmes for small farms and for farms operating in areas where cultivation was deemed environmentally valuable but economically less attractive. These programmes, typically benefiting the smaller farms, were mostly restricted after 1995 (Csaki et al, 1999:xiv), a policy change which apparently improved access to subsidies of medium-sized farms without worsening that of small farms (although the amount of funds transferred may well have fallen in this group).

The policy implications of these figures largely depend on their interpretation. The issue is whether the link between a large or professional farm status and access to credit is best explained in terms of rational credit allocation (based on track records, farm prospects, liquidity backing etc.), or perhaps more appropriately seen in terms of integration into an economic system where connections based on political leverage or personal considerations are vital to favourable allocation of resources.

This latter interpretation is the more plausible one, for several reasons. First and generally, the literature on production and transactions in Central European economies contains numerous indications of the importance of connections and networks for businesses (e.g. Grabherr and Stark, 1997). Assuming here that a vital success determinant such as access to external funding is independent from such relations would be unpersuasive. Second and specifically, the agricultural credit allocation system in the Czech Republic has indeed been far from being based on farm profitability, collateral quality or other conventional loan assessment factors. An explanation positing such causal links would simply be irrelevant to the setting. Credit has been largely guaranteed by state programmes, the main beneficiaries of which are banks and traditional farms (see e.g. Csaki et al., 1999:35-37 for a topical description of the fund allocation system).

Third, traditional (especially co-operative) farms are typically heavily burdened with ‘bad’ debts. This simultaneously decreased their financial transparency and may well have increased their leverage in applying for additional loans with the creditor bank. Both circumstances, perversely, tend to improve their access to credit. Indeed, “the growing share of state support is recently to the co-operatives, a category of farms whose performance remains the worse among the various legal forms of farming” (Csaki et al, 1999:36).

The consequences of differential access to funding were evident in the data on investment decisions and constraints. Table 8 presents evidence of the importance of land lease, as opposed to land restitution and purchase, for expansion of individual farms to a viable size.

<table 8>

Table 8 conveys two messages. First, endowment through land restitution was not important for success in farming. Second, the opportunity to rent land was. In small and medium size farms, over half of the acreage was acquired in restitution procedures. For large-farm operators this was less than a fifth, while here land lease or rent was of overwhelming importance.

Amounts of land purchased were marginal in all groups – a finding in line with official data showing that in the 1993-1998 period only about 1 % of Czech agricultural land was bought and sold. Land lease or rent from traditional farms was also unimportant, which is unsurprising given the fact that traditional farms *as such* do not generally legally own their land: only 10 % of it on average (Csaki et al., 1999: 30,xvii). Land rented from the state was important for a few individual farmers only (note the large standard variation). Only 18 respondents rented over 10 hectares from the state; some of these farm operators, leasing thousands of hectares, had evidently been in a position to take over an entire state farm.

For the majority of respondents, renting land from an individual was most important for expansion to a professional-farmer status. Typically, the owner would have rented the plot to a traditional farm before transferring it to individual-farm use. By implication, the opportunities to rent land from both individuals and the state are for a large part determined by the quality and extend of relations that the individual farmer has. Because of the high fragmentation of land ownership, the problem with renting additional land typically is finding the owners of larger or more productive plots. These people must be located either through state agencies like the land register (the Czech Office for Surveying, Mapping and Cadastre, with 77 regional offices) or via information from traditional farm management who presently use the land. In interviews, farm operators pointed out that the decision to rent additional land often depended on such search and transaction costs as much as on land attributes. In addition, there is the general problem that land leases are typically short to medium-term, mostly one-year. This seriously impedes investments (cf. Csaki et al, 1999:29-31).

For productive assets, the opposite pattern was observable. Individual farmers reported whether they fully owned, partly owned, or fully leased their capital assets. Two thirds of the 180 respondents fully, and one third partly, owned it, with a negligible 2 respondents (both non-professionals) fully leasing. Whereas there is little difference in own/rent patterns over farm sizes, professional farmers more often (71%) own their entire asset stock than do non-professionals (54 %); they also less often partly rent it (28 % and 40 %, respectively). The difference in ownership is plausibly attributable to differences in credit market access. It endorses the notion that, if credit markets fail, an asset lease market is important for farm development by widening the scope for access to productive resources (as suggested in Swinnen en Mathijs, 1999). Still, leasing appears a second-best option, practised only by the less successful farmers who cannot afford to own their assets¹⁶.

For an evaluation of farm type related differences in resource access to both resources, the respondent subset of farm operators or managers who indicated they would like to expand their farms (75 % of traditional farms and 62 % of individual farms) was studied. For these selections of both samples, the question “how important was the availability of technology for product decisions” can plausibly be interpreted as “how technology constrained are you”. Responses differed in line with expectations, though not dramatically. On a scale of 1 (important) to 3 (neutral) to 5 (unimportant), traditional farm managers scored on average 3.2 (neutral) while individual farm operators averaged 2.8 and 2.2 (neutral/fairly important) for professional and other respondents, respectively.

Respondents were also asked to report on the importance of acreage changes for product decisions. Again interpreting this as an indication of the land constraint for the subset with expansion preferences, it was on average ‘fairly unimportant’ (3.7) for traditional farms, while ‘fairly important’ (2.4) for professional individual farmers (and ‘neutral’ (2.7) for other individual farmers). These figures, as well as the technology figures cited above, are in line with the prevalent idea that resource constraints disadvantage newly established farms and may have prevented many non-professional farmers from expanding to a more viable farm size.

As a final topic of analysis, it is useful to consider explicitly what the data suggest about the importance of integration costs. Postulating positive integration costs for those who are supposedly outsiders in the existing system is equivalent to positing an advantage for those who already have achieved some degree of integration in it. In other words, if ‘insiders’ are consistently shown to be successful, there is likely a disadvantage to being an ‘outsider’. With this in mind, evidence of integration costs was contained in the facts that the more successful farm operators often had better access to credit and subsidies; obtained more frequently assets rather than land only in the restitution process; and better managed to expand their acreage by renting land from the state and from individuals. Significantly, success in all of these allocation processes is to a considerable extent conditional on access to information and on co-operation of local bureaucrats or traditional farm

¹⁶ Information on land and asset ownership was not gathered for traditional farms, because they are known to typically rent most of their acreage from owners/members, while they mostly own their entire asset stock.

management. Evidence on human capital attributes of individual farm operators, presented in table 9, further supports the idea of integration costs.

<table 9>

The figures show that professional individual farmers are on average younger than non-professional practitioners, but still of middle age, with rather little variation. They also more often have a vocational background in both the agricultural sector and in managerial work in the traditional farming system, and have slightly more frequently a college or university education. Using the size criterion, the differences are roughly of the same order, but for the education factor: operators of large farms have nearly twice as often a higher education than do those of smaller farms.

It is evident that successful entrepreneurship is not so much for the young and adventurous as for the mature, the educated and the experienced – and by implication: the well connected (an interpretation supported by Majerová, 1997:375). This is further confirmed by a comparison of these figures to labour force data from traditional farms. Table 9 shows that of those with a farming background, 47 % (53 out of 112 individuals) used to be a farm manager. Other survey information indicates that in traditional farms, management in 1998 constituted on average 5 % of the labour force. The outflow of management out of traditional agriculture to individual farming was thus highly disproportional to management-to-worker ratios in traditional farms – which is understandable if professional experience and related attributes indeed imply success in individual farming.

6.4 A Partial Synthesis

The above analysis relied on comparing averages (and standard deviations, if relevant) of attribute measures, supposedly controlling success in farming, over success categories. While this is indispensable for a reasonably informative presentation of those attributes, an obvious drawback is that they were not considered in combination. Table 10 complements the analysis, displaying the results from multinomial logistic regressions, allowing for an assessment of the relative importance of the various attributes on success in individual farming¹⁷.

<table 10>

¹⁷ Note that these analyses are based on the individual-farm sample. They necessarily only include attributes measured in that sample, omitting the impact of characteristics of the traditional farm in which the individual farmers' land and assets used to be. These effects were shown in tables 3 and 4.

The results for four specifications of the ‘success-attributes’ relation are presented. In regressions A1 and B1 all factors¹⁸ investigated in this paper as possible explaining success in individual farming are considered, using both the size criterion and the ‘professionalism’ criterion. Using either criterion, the amount of land obtained through rent, expressed as a share in total acreage expansion, is the single most important and statistically most significant factor explaining success. For becoming a full-time, full-income farmer, experience in agriculture is additionally important while being older is a disadvantage – but only weakly so. This last relation also holds when the large-scale criterion is considered, while here there appear to be no other important factors. For both criteria, quite large but statistically less significant effects were found for asset ownership, managerial experience and education level. In addition, for the large-farm criterion the year in which the farm was started has a rather large positive coefficient – though not statistically significantly so (see however e.g. McCloskey (1998) on statistical and substantive significance).

Regressions A2 and B2 were specified on the basis of both the results for the first two regressions and inspection of correlation coefficients between explanatory variables¹⁹. The results confirm the role of age and, particularly, the opportunity to rent land. Both the A2 and B2 model were investigated using alternative specifications on the basis of the same set of explanatory variables. This produced no evidence of the importance of other factors than the two mentioned, nor did that their importance disappear in the process.

7. Discussion and Conclusion

This paper is motivated by the observed limitations to de-collectivisation (or individualisation) of farming during transition, which appear to contradict the theoretical expectations that underpinned the reform programmes throughout Central and Eastern Europe. No mono-causal explanation can be given for this observation, and in the literature several components have already been identified. The aim here is to study the problem for the Czech case and from the angle of institutional change as a path with barriers, categorised as exit costs, investment costs and integration costs.

The level of these costs can be argued to be affected by the relative power position of prospective individual farmers on the one hand and interest groups opposing individualisation of farming, such as traditional farm management, on the other. This latter group of agents can increase an individual’s switching costs either by direct choices based on their discretion in the course of the individualisation process, or through their role in defining the rules governing that process. This

¹⁸ Except location, which was so far treated as a grouping rather than an explanatory variable. Nevertheless, dummy variables for regions were included in earlier versions of the analysis. They are omitted here because the location effect appeared neither large nor statistically significant.

¹⁹ For instance, statistically significant Pearson correlation coefficients of around .30 were found to exist between the number of years in which credit was obtained and a managerial background; and likewise, unsurprisingly, between education and managerial background (among other correlations).

approach is used as a framework to analyse survey data collected by the author in 1998-1999. The findings can be recapitulated as follows.

Although practically all individual farmers started out by applying for property restitution in traditional farms, subsequent success in farming seemed partly controlled by the exit costs implied in the restitution procedure. A variety of exit cost sources were identified, including natural conditions connected to location, asset incompatibility, social cohesion or pressure, the size of property claims, and the length and success rate of restitution procedures.

In addition to costs of leaving the traditional farm, also costs of investment in the new farm and of functioning in the agribusiness environment were identified. Some barriers to success seem to be a lack of access to credit and (to a lesser extent) subsidies, and connected to that: a failure to acquire capital assets and to find and rent additional land. The results of an analysis of all factors simultaneously in a logit regression suggest that the opportunity to rent land has been the single most important determinant of success in individual farming.

Throughout the analysis, there was evidence of opposite interests of traditional farm management and individual farmers. It also appeared that the former group was able to discourage individualisation by using opportunities, implied in their large discretion in the implementation of de-collectivisation procedures, to raise switching costs. In addition, it was observed that success in many aspects of the individualisation process is typically conditional on both access to the relevant information and co-operation from traditional farm management and local bureaucrats. In consequence, the individual farmer's quality of connections in the traditional farming system appears to co-determine his prospects – which again underlines the key role of traditional farm management in the process. This interpretation is supported by human capital data showing that successful individual-farm operators are typically of middle age and often are former participants in the traditional farming system, frequently at the managerial level.

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Tables

Table 1: Much Farm Land Is Still Worked By Non-Individual Farm Structures

country	year of observation	share in total agricultural land worked by individual farms (%)*
Hungary	1996	28
Czech Rep.	1998	24
Slovakia	1998	8
Estonia	1997	63
Lithuania	1996	67
Latvia	1997	95
Bulgaria	1995/6	52
Romania	1998	65
Albania	1995	95

** This includes (sometimes largely reflects, as in Albania) household plots and part-time farming. Remaining land is worked by co-operative farms, farming companies and state farms. Sources: Swinnen and Mathijs (1999:24), Cungu and Swinnen (1999:607)*

Table 2: Farm Structures: National Statistics and Survey Findings

organisation type	survey (1998)			official figures (1997)		
	sample size		mean size (ha)	number		mean size (ha)
	count	%		Count	%	
corporate farms	29	11	1,512	1,869	7	666
co-operative farms	40	15	1,707	1,011	4	1,349
individual farmers*	193	74	79	22,850	89	36
of which :- part-time	70	27	40	-	-	-
- full-time	123	47	101	-	-	-
other farms **	-	-	-	52	0	557
all farms	262	100	494	25,746	100	127

*General note: figures are averages. *The official figures on individual farmers are exclusive of 1,896 individual land owners not registered as farmers. ** In this category are the remaining state-owned farms and farms maintained for educational purposes. Sources: survey findings, Ministry (1998) and author's calculations.*

Table 3: De-collectivisation rates differ over traditional farm sizes, types, and regions.

category (n)	de-collectivisation measures (% of total owners)*			
	d	Claimants	Transfers	returns
<i>size**</i>				
small (n=14)	6.5 (14.7)	5.8 (6.9)	5.0 (5.2)	1.2 (1.7)
medium (n=32)	11.6 (12.1)	8.5 (15.9)	6.8 (15.1)	0.7 (0.7)
large (n=20)	11.5 (10.5)	5.9 (8.3)	4.6 (7.3)	0.7 (1.3)
<i>farm type</i>				
corporate (n=28)	7.7 (12.4)	6.7 (8.8)	5.1 (6.9)	1.1 (1.6)
co-op. (n=38)	12.6 (11.9)	7.5 (14.2)	6.2 (13.7)	0.7 (0.8)
<i>region</i>				
2 (n=34)	12.0 (13.8)	7.9 (15.4)	6.8 (14.3)	0.5 (0.6)
3 (n=28)	8.4 (9.5)	5.8 (5.6)	3.8 (3.3)	1.3 (1.6)

General notes: Figures are average percentages with standard deviations added between brackets. Here and in subsequent tables, standard deviations, reported for all averages were relevant are provided instead of statistical significance indications based on t-test results, allowing for comparison of the spread in each single category. * D is the number of hectares lost in the restitution process during 1992-1998 as a percentage of total acreage in 1992. The three other columns list, left to right: number of restitution applications; actual property transfers; and number of property returns - all measured over the period 1992-1998 and as a percentage of the number of owners in 1998. ** Traditional farms are grouped in three size categories on the basis of acreage worked in 1998: small (less than 1,000 ha), medium (1,000-2,000 ha) and large (over 2,000 ha). Source: survey findings.

Table 4: Frequency and Extend of Land Restitution by Traditional Farm Category

category (n)	land owners, 1992 (#)	land taken out per claimant, 1992-1998 (ha)	land left per owner, 1998 (ha)	ownership concentration 1998 (%)*
<i>size</i>				
small (n=14)	289 (272)	6 (12)	4 (3)	17 (14)
medium (n=32)	505 (348)	15 (23)	4 (2)	13 (13)
large (n=20)	870 (389)	14 (18)	5 (9)	6 (4)
<i>farm type</i>				
corporate (n=27)	537 (449)	7 (14)	4 (2)	13 (14)
co-op. (n=40)	604 (385)	17 (22)	4 (7)	11 (10)
<i>region</i>				
2 (n=32)	580 (351)	14 (20)	4(2)	13(12)
3 (n=25)	497 (408)	14 (21)	5(8)	10(10)

General notes: Figures are averages with standard deviations added between brackets. See table 4 for category definitions. The number of respondents varied somewhat over the questions. *Defined as the percentage of all landowners having over 10 hectares. Source: survey findings.

Table 5: Restitution Was More Difficult For Successful Individual Farmers

category (n)	time between applying for and obtaining property (% yes)			
	< 3 mths	3-6 mths	6mths-1yr	>1yr/still waiting
<i>size*</i>				
small (n=24)	13	28	18	50
medium (n=34)	9	9	33	52
large (n=99)	3	14	34	54
<i>farm type**</i>				
professional (n=109)	3	14	33	56
other (n=48)	10	19	28	45
<i>region***</i>				
2 (n=51)	10	10	38	47
3 (n=79)	3	22	27	54
4 (n=25)	4	8	36	56

General notes: reported figures are percentages of positive category responses. Percentages add up to slightly over 100 because some respondents checked several options. * Individual farms are grouped in three size categories on the basis of revenue level in 1998: small (less than 100,000 Crowns), medium (100,000-300,000 Crowns) and large (over 300,000 Crowns). There were no significant differences in land acquisition patterns between small and medium farms; these categories are merged. ** 'Professional' individual farms are farms where the owner both derives more than three-quarters of his income from the farm and devotes over 40 hours weekly to farming. Source: survey findings.

Table 6: Obtaining Assets was Important for Success

category (n)	application status (% response)			
	did not apply	Applied and...		
		Failed	obtained land	obtained assets
<i>Size*</i>				
small (n=32)	13	9	78	41
Medium (n=39)	10	0	82	64
large (n=111)	9	4	77	59
<i>Farm type**</i>				
Professional (n=123)	11	4	81	63
other (n=58)	12	10	77	47
<i>Region***</i>				
2 (n=55)	11	2	78	60
3 (n=92)	9	5	82	62
4 (n=33)	21	15	73	42

General notes: reported figures are percentages of category responses. See table 5 for definitions of categories. Source: survey findings.

Table 7: Access to Resources is Both Difficult and Important for Individual Farms

farm category	year				
	1993	1994	1995	1996	1997
“did you have access to subsidies in...?” (% yes)					
traditional (n=66)*	20	19	21	25	30
<i>individual by size</i>					
small (n=26)	12	19	15	15	19
medium (n=32)	10	13	13	19	22
large (n=100)	24	19	20	23	23
<i>individual by farm type</i>					
professional (n=109)	20	22	16	20	24
other (n=46)	19	16	18	21	21
“did you have access to bank credit in .. ?” (% yes)					
traditional (n=66)*	26	32	26	27	27
<i>individual by size</i>					
small (n=26)	4	8	15	0	8
medium (n=32)	7	6	3	6	3
large (n=100)	20	27	12	14	14
<i>individual by type</i>					
professional (n=112)	16	21	13	14	13
other (n=46)	10	20	7	2	7

General notes: reported figures are percentages of positive category responses. For definitions of categories, see tables 3 and 5. * No significant differences between corporate and co-operative traditional farms could be observed. Source: survey findings

Table 8: Successful Farm Expansion Occurs Through Land Rent, Not Restitution or Purchase

farm category		increase in acreage:						
		claimed	bought	rented from...			used for free**	increase 1992-1998
				trad. farm	state	individual*		
<i>by farm size***</i>								
small/medium (n=58)	#ha	20 (30)	1 (4)	1 (3)	3 (9)	12 (21)	1 (3)	38 (69)
	share (%)	53	3	2	8	31	2	100
large (n=112)	#ha	23 (28)	3 (13)	2 (21)	36 (233)	65 (129)	1 (5)	131 (429)
	share (%)	17	3	2	28	50	1	100
<i>by farm type</i>								
professional (n=121)	#ha	20 (23)	3 (9)	0 (2)	30 (224)	60 (125)	2 (5)	115 (388)
	share (%)	17	2	0	26	53	1	100
other (n=54)	#ha	24 (37)	3 (15)	5 (33)	12 (45)	13 (20)	1 (2)	57 (152)
	share (%)	42	5	9	20	23	1	100

General notes: Figures are averages, standard deviations are added between brackets. For definition of farm categories, see table 5. * Farm land rented from an individual was mostly previously in use by a traditional farm. **Land used for free usually belonged to relatives or friends. *** There were no significant differences in land acquisition patterns between small and medium farms. Source: survey findings.

Table 9: Human Capital Matters To Success In Individual Farming

category	age	university or college education (%)	professional experience (% yes)*			
			farm worker	farm manager	Worker, other sectors	manager, other sectors
<i>size</i>						
large (n=116)	46 (11)	25	35	34	20	12
medium / small (n=65)	54 (13)	11	28	25	39	8
<i>farm type</i>						
professional (n=128)	47 (12)	21	38	33	21	10
other (n=59)	53 (13)	19	24	24	40	11

General note: Category columns list percentages of positive responses except the age column, where standard deviations are added between brackets. For definitions of categories, see table 5.

* Respondents could check several categories. Source: survey findings.

Table 10: The Relative Importance of Some Success Factors in Individual Farming

independent variables	A. dependent variable: PROFESS		B. dependent variable: LARGE	
	coeff. estimate (std error), significance ¹		coeff. estimate (std error), significance ¹	
	Regression A1	Regression A2	Regression B1	Regression B2
(Constant)	-1.374 (4.950)	.911 (.863)*	-12.591 (9.515)	1.510 (.835)*
AGE	-.036 (.023)	-.0276 (.015) *	-.048 (.023)**	-.038 (.015)***
EDUCATION	-.107 (.570)		.980 (.665)	
FARREST	.032 (.051)		.156 (.102)	
MANEXP	-.286 (.504)		-.138 (.514)	
AGREXP	.882 (.511)*	.899(.366)**	.549 (.5087)	
RENTLAND	1.304 (.646)**	1.619 (.511)***	2.333 (.685)***	2.147 (.508)***
OWNASSET	.399 (.482)		-.193 (.516)	
YRCREDIT	.043 (.130)		-.096 (.126)	
YRSUBS	-.100 (.134)		-.034 (.139)	

General notes: The logistic regression procedure with a maximum likelihood estimation method was employed, using the software package SPSS. There were 120 and 166 valid observations in equations A1,B1 and A2,B2, respectively. FARREST is the year in which the farm was established. MANEXP AND AGREXP indicate whether the individual had professional experience at the management level or in agriculture. EDU signifies the education level. RENTLAND is the amount of land obtained through rent, expressed as a share of total acreage expansion. OWNASSET indicates whether the individual completely owns his productive assets. YRCREDIT AND YRSUBS are the number of years in 1993-1998 in which the individual had access to credit and subsidies, respectively. Note that AGE assumes values between 22 and 79, RENTLAND values are in the interval (0, 100) FARREST in (43,97), and YRCREDIT and YRSUBS in (0,5). EDU, MANEXP, AGREXP, and OWNASSET are binary variables.

¹ Levels of **a** for which estimates are statistically significant are indicated by *** (if **a** < 1 %), ** (if **a** < 5 %), and * (if **a** < 10 %)

Source: survey findings