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DISCUSSION PAPER

Leibniz Institute of Agricultural Development in Central and Eastern Europe

SOCIAL CAPITAL AMONG AGRICULTURAL PRODUCERS IN THE CZECH REPUBLIC: ITS IMPACT ON ECONOMIC PERFORMANCE

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ABSTRACT

The change of the political regime from the socialist central planning system to a market economy and pluralistic society required the reorganisation not only of agricultural production, but also of the organisations in their support. In the Czech Republic, agricultural production is characterised by a dualistic structure in these days, i.e. private farmers on the one side and corporate farms on the other. However, among both groups some had been economically more successful than others. In general, a varying adoption of production factors, i.e. land, labour and capital is identified as being of influence. Whether their ability to collaborate with other farms is an additional factor, which has been discussed under the concept of social capital since quite some time, will be analysed in this paper. Based on the findings of a survey among a sample of 62 farms by adopting factor and multiple regression analysis it can be deduced that social capital is indeed a significant factor determining the level of farm income.

JEL: C31, P32, Q12, Z13

Keywords: Corporate farms, private farms, social capital, cross sectional models, Czech Republic

ZUSAMMENFASSUNG

SOZIALKAPITAL LANDWIRTSCHAFTLICHER PRODUZENTEN IN DER TSCHECHISCHEN REPUBLIK: SEINE AUSWIRKUNG AUF DAS ÖKONOMISCHE ERGEBNIS

Der Systemwechsel von 1989 erforderte auch in der Tschechischen Republik eine Neuorganisation nicht nur der landwirtschaftlichen Produktion, sondern auch der Organisationen zur Unterstützung der landwirtschaftlichen Produzenten. In diesen Tagen ist die landwirtschaftliche Produktion durch eine ausgeprägte Zweiteilung charakterisiert: Große juristische Personen auf der einen Seite sowie relativ kleine Privatbetriebe auf der anderen. Allerdings sind innerhalb dieser beiden Gruppen große Unterschiede in Hinblick auf den wirtschaftlichen Erfolg zu beobachten. Gewöhnlich wird dies mit einem unterschiedlichen Einsatz der traditionellen Produktionsfaktoren Boden, Arbeit und Kapital erklärt. Ob die Fähigkeit, sich mit anderen Betrieben auszutauschen und zusammenzuarbeiten, einen zusätzlichen Erklärungsfaktor darstellt, wird seit einiger Zeit unter dem Konzept des Sozialkapitals diskutiert. Dies wird hier analysiert. An Hand einer Befragung von 62 tschechischen Betriebsleitern kann mit Hilfe einer Faktoren- und Regressionsanalyse nachgewiesen werden, dass Sozialkapital einen wichtigen Einflussfaktor auf das landwirtschaftliche Einkommen darstellt.

JEL: C31, P32, Q12, Z13

Schlüsselwörter: Landwirtschaftliche Großbetriebe, Familienbetriebe, Sozialkapital, Tschechische Republik.

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AA	Agricultural Association
APF	Association of Private Farmers
CA	Chamber of Agriculture
CEEC	Central and Eastern European Countries
CZK	Czech Koruna
VUZE	Institute of Agricultural Economics, Prague

1 INTRODUCTION

At the eve of the transformation from socialist central planning to the market economy in Central and Eastern Europe, it had been assumed that the collective and state farms would relatively quickly be transformed into private farms or even family farms. This seemed to be the conclusion not only in line with historical experience but also of most neo-classical and neo-institutional economists (see for a summary discussion: SCHMITT, 1993: 143-159). While many persons took up private farming based on the guiding rules of the transformation process, i.e. de-collectivisation, restitution and privatisation of agricultural assets, they have not become that important as anticipated. Particularly, in East Germany, Hungary, Slovakia and the Czech Republic agricultural production is dominated by corporate farms, i.e. transformed agricultural co-operatives, joint-stock companies and limited liability companies which had been transformed out of the former collective and state entities. In these countries a typical bimodal or dualistic pattern of agricultural producers can be observed these days, i.e. private farmers on the one side and corporate farms on the other.

Almost 15 years after transformation while still not as prosperous as anticipated at the start, a relatively diverse picture emerges. Some transition countries have been more successful than others in moving towards an agricultural sector that is economically as successful as in the West (SLANGEN et al., 2004: 246). Many factors seem to be of influence, of which the major ones can be summarised as follows (ROZELLE and SWINNEN, 2004; BEZEMER, 2002: 1301-1307): Underdeveloped rural financial systems and the complicated mode of farm restructuring led to a limited access to loans due to lack of profitability, collateral problems, risks and uncertainty. Similarly, the farm sector was characterised by a weak human capital structure to manage private farms, fragmented land ownership, rapid changes in agricultural policies and an incomplete legal framework. However, when looking at the two major groups of agricultural producers of the various countries, among and between them, quite a number had been successful while others not.

As an additional reason, besides a different access to the major production factors, it had been argued that a low level of social capital has led to a poor economic performance (e.g. PALDAM and SVENDSEN, 2000). This factor, which is being analysed since about more than a decade, concerns the issue of collaboration and linkages with people being confronted by a similar situation. Whether this concept constitutes an additional factor increasing economic welfare will be the focus of this analysis. It is guided by the hypothesis that, besides the provision of other production factors, social capital can be identified as a significant factor in determining the level of farm income of agricultural producers. We will test this hypothesis in making use of data of an empirical survey among agricultural producers, both private farmers as well as corporate farms, in the Czech Republic which had been executed in 2003.

2 CONCEPT OF SOCIAL CAPITAL

The concept of social capital had been adopted fairly recently in social and economic sciences. Conventionally, in economics, growth and development are based on the efficient adoption of the major production factors, i.e., in general, land, labour and capital or, more specifically, natural capital, physical or produced capital (i.e. tools and technology), some economists separate financial capital (i.e. savings, credit, and investment) out of physical capital, and since its recognition in economics during the 1960s human capital (i.e. education, health, and training). "Together they constitute the wealth of nations... Some natural capital will be depleted and transformed into physical capital" (GROOTAERT, 1998: 1). The latter will depreciate, and it is expected that technology will yield a more efficient replacement. The 19th and 20th centuries have seen a massive accumulation of human capital which helped to foster a rapid

increase in economic welfare. However, during the last years it has become more and more realised that similar endowments with production factors do not necessarily lead to similar patterns of economic growth and development.

In this connection the concept of social capital has gained much prominence. The idea is based on the assumption that social networks are vital in managing one's daily life. These networks, however, are not naturally given but must be constructed through investment strategies oriented to the institutionalisation of group relations, usable as a source of other benefits (PORTES, 1998: 3). Although there had been a long tradition of research on organisational development, particularly concerning co-operatives (see e.g. DÜLFER, 1994), a growing theoretical and empirical literature has helped to fuel a resurgence of interest in the social dimension of development. A range of new research has shown that communities endowed with a rich stock of social networks and civic associations are in a stronger position to resolve disputes, share useful information, set up informal insurance mechanisms, implement successful development projects, and confront poverty and vulnerability (ISHAM et al., 2002: 6). However, due to its recent emergence, broad ambit and multi-disciplinary nature, the conceptual literature is still evolving (PRODUCTIVITY COMMISSION, 2003: 5). There had been a lot of criticism about the vagueness of the concept, as simply too many meanings are associated with it and a consensus about a commonly acknowledged one is still missing. Therefore, some economists are very sceptical whether this concept should be applied at all in studying economic issues (e.g. MANSKI, 2000: 121-123). Others argue that these differences and disagreements are a good measure of the intellectual excitement of the current social capital literature and urge to go on with the debate (e.g. DURLAUF, 2002: F418).

2.1 General remarks

The term "social capital" had already been applied since a couple of decades. The concept, however, had become more popular during the 1980s. In general, it is referred to BOURDIEU (1983) who considers social capital as an attribute of an individual in a social context. One can acquire social capital through purposeful actions and can convert it into other types of capital, like e.g. physical capital. But, he stresses that a high degree of transformation work is needed and long-term investments are necessary (BOURDIEU, 1983: 195). Others, like COLEMAN (1988) and PUTNAM (1993) have focused on the collective point of view, although their concepts and objectives differ to a large extent. In general, sociologists and political scientists relate in their studies to trust, norms, networks and organisations through which people gain access to power and resources. In economics, the concept gained prominence with the execution of the "Social Capital Initiative" by the World Bank during the second half of the 1990s. When analysing economic performance the ambitious claim had been put forward that social capital might constitute an independent, and hitherto under-appreciated, factor of production (WOOLCOCK, 2002: 20-21).

Economists, in general, concentrate on the contribution of social capital to economic growth. At the microeconomic level this is seen primarily through the way it improves the functioning of markets. At the macroeconomic level institutions, legal frameworks, and the government's role in the organisation of production are seen as affecting macroeconomic performance (GROOTAERT, 1998: 2). Social capital is seen to affect economic development mainly by facilitating transactions among individuals, households and groups in society. This facilitating function can take the following forms: (1) Participation by individuals in social networks increases the availability of information and lowers its cost. This is true in formal and informal organisations, especially when the information can increase the returns from agriculture. For example, prices, location of new markets, sources of credit, treatment of plant or livestock diseases can be easily exchanged among members. (2) Participation in local networks and attitudes

of mutual trust make it easier for any group to reach collective decisions and implement collective action. Since the bargaining power of individual farm entities is, in general, too small of having any impact on price negotiations with buying companies, joint marketing through their own groups and organisations can help maximise their income. (3) Networks and attitudes reduce opportunistic behaviour by group members. Social pressures and fear of exclusion can make individuals behave in certain group-beneficial ways (IFPRI, 2004: 46-47).

More specifically, the social capital question concerns the benefits and costs of co-operation. OLSON's study (1965) about the logic of collective action can be seen as the basic work of research about organisational development. Incentives, costs and expected profits are discussed as the central issue that motivate people to act together. The basic hypothesis concerning social capital's impact assumes that the welfare within the group generally will be enhanced, in the sense that the collective gains net of costs to group members will be positive (KNACK, 2002: 43).

The major reason for the large spread of different understandings of social capital can be seen in the fact that different authors focus on different dimensions which in real life are interdependent and overlapping. Basically, four key dimensions can be distinguished: They are its scope (i.e. micro, meso and macro levels), its forms (i.e. structural and cognitive), its channels (i.e. information sharing, collective action and decision-making) and its type of relationship through which it affects development (i.e. intra- or inter-group relationships) (GROOTAERT and VAN BASTELAER, 2002: 2-4; BEBBINGTON and CARROLL, 2000: 6). Since individual authors emphasise different aspects of the various dimensions, it is no surprise that the adopted definitions of social capital vary to a large extent. Some authors have tried to cover as many dimensions as possible, so the definitions become highly complex. The major drawback of such an approach is the fact that it is almost impossible to make them operational for any empirical tests. As a consequence of this discussion voices became louder and called for a more tightly focused micro definition of social capital and advocated a "lean and mean" conceptualisation focusing on the sources – that is, primarily social networks – rather than its consequences (which can be either positive or negative, depending on the circumstances), such as trust, tolerance and co-operation. The focus is on the micro level and the structural elements. The upside of this approach is that it is more or less clear about what is, and what is not, social capital, making for cleaner measurement and more parsimonious theory building; the downside is that it tends to overlook the broader institutional environment in which communities are inherently embedded (WOOLCOCK, 2002: 22).

In our analysis we will follow this more pragmatic approach. In line with other authors (e.g. SOBEL, 2002: 139) we use a quite narrow definition of social capital. We refer to ROSE (2000: 1) who defines social capital as follows: "Social capital consists of informal social networks and formal organisations used by individuals and households to produce goods and services for their own consumption, exchange or sale". In general, informal social networks comprise face-to-face relationships between a limited number of individuals who know each other and are bound together by kinship, friendship, or propinquity. Informal networks are "institutions" in the sociological sense of having patterned and recurring interaction. However, they lack legal recognition, employed staff, written rules and own funds. In general, they are not formally structured as there is no principal but agents only exchanging information, goods and services. On the other side, formal organisations are legally registered and, hence, have a legal personality. They are rule-bound and have to follow formal procedures in their management. In general, they have a secured annual budget which might be made up by its members, the market and/or the state. A formal organisation can have as its members both, individuals and/or other organisations. In this respect, an organisation is a corporate actor who, as a principal, co-ordinates its agents' activities and benefits from the activities of the agents (ROSE 1999: 149; ABELE et al., 2001: 4).

Closely linked to the discussion about the definition of social capital is the question of how to quantify and measure it. Like human capital, social capital is difficult, if not impossible, to measure directly; for empirical purposes the use of proxy indicators is necessary. Years of education and years of work experience have a long tradition as proxies for human capital and have often proven their value in empirical studies, depending on the research question. Depending on the definition adopted, the number and focus of indicators varies which make any comparison of social capital studies quite difficult. Indicators differ both geographically and sectorally (GROOTAERT and VAN BASTELAER, 2002: 6-7). Some authors have developed up to 124 indicators which were grouped into 44 variables (see e.g. BEBBINGTON and CARROLL, 2000: 20-21). Needless to say, this approach required a lot of time and resources. In line with the call for a more tightly focused micro, or more pragmatic, definition of social capital the number of relevant indicators is supposed to be reduced. In our analysis we could make use of a limited range of indicators, only. Therefore, we will follow this more pragmatic approach and will concentrate in this analysis on passive membership in formal organisations, i.e. membership as such like paying the fees and participating in meetings which covers the structural side of social capital. We are aware that membership in organisations is not only motivated by economic, but also by social incentives (SVENDSEN and SVENDSEN, 2004: 3). However, this aspect could not be covered by this analysis.

2.2 Role of social capital in transitional agriculture

As stated above, the transition of the agricultural sector from a centrally planned to a market economy has not been that successful as originally anticipated. Besides a number of economic, human and legal factors, it had been argued that a low level of social capital had contributed to these disappointing results. PUTNAM (1993) stresses the correlation between time of dictatorship and its detrimental effect on trust and co-operation. This may also explain why national incomes in many post-communist countries are low relative to the levels of physical and human capital. Large parts of the populations tend to rely passively on the state, a feature to be found in the agricultural sector of many Central and Eastern European countries (CEEC) in particular. It is argued that, in all transition countries, farmers, including farm managers, have to regain initiative and relearn how to co-operate (CHLOUPKOVA and BJORNSKOV, 2002: 245).

The importance of connections and networks for managers of transformed co-operatives and privatised state-farms for doing businesses in comparison to individual farmers is underlined by BEZEMER (2002, 2003) in his studies about the access to financial services, including subsidies in the Czech Republic. For all types of farmers it is vital to build up longer-term relationships with market partners, including bank staff, in order to reduce transaction costs. Corporate farm managers have been by far more successful in doing so than private farm operators. The main reason seems to be that most of these relationships have been transferred from the socialist period and *de novo* private farmers have no option of joining. As these networks pre-date the economic reforms, the relatively new businesses such as individual farms have more limited access to resources allocated within the networks, such as e.g. credit (BEZEMER, 2002: 1312-1314). In this respect, it could be observed that social capital built up during the socialist period could be transformed step by step into new relations which helped to overcome the uncertainties of the newly established market economy. However, not all managers of the transformed farm production entities had been equally successful in building up this type of capital.

Contrary to the situation in developing countries, not that many studies about the role of social capital on rural development in general and agricultural development in specific have been executed in transition economies, so far. A very comprehensive overview about research on social capital in Central and Eastern Europe has been presented by MIHAYLOVA (2004). While, like in other disciplines, the number of studies about the impact of social capital on

economic development is increasing, there are only a few when it comes to rural, or even, agricultural development. First studies have been organised by ROSE (1999) and O'BRIEN (2000) focusing on Russia, but the existence of social capital among rural inhabitants as such and not the agricultural development process was the focus of their work. However, during the last years various researchers started to look in more detail into the concept of social capital and its relevance for agricultural development. Besides BEZEMER (2002, 2003) and CHLOUPKOVA and BJORNSKOV (2002), HUDECKOVA and LOSTAK (2003) analysed data from the Czech Republic, SWAIN (2000) from Hungary, BADESCU and SUM (2005) as well as BALINT and WOBST (2006) from Romania, PELSE (2004) from Latvia, WOLZ et al. (2004, 2006) from Poland and HAGEDORN et al. (2002) from different CEEC. However, in not all of these studies social capital had been the central focus and the adopted approaches differ greatly.

Therefore, it has to be concluded that the weights ascribed to social capital in explaining the variations in economic performance, for the transition economies at least, stands in stark contrast to the dearth of empirical evidence that would support such conclusions (RAISER et al., 2001: 1). There is still a great lack of information regarding the economic effects of social capital with respect to the situation of agricultural producers in transition economies. The empirical analysis about this issue has just started. In our analysis we want to contribute in filling this gap by analysing farm survey data in the Czech Republic.

3 DEVELOPMENT OF THE AGRICULTURAL SECTOR AND ITS TRANSFORMATION SINCE THE CHANGE OF THE POLITICAL REGIME IN THE CZECH REPUBLIC

The existing structure of agriculture is embedded in the historical development. Since independence of Czechoslovakia in 1918 the agricultural sector passed through few far-reaching structural transformations. The first land reform had been executed in 1919, which was followed by the land expropriation of Germans after the Second World War. In the framework of the communist land reform in 1948 all those land owners were expropriated who owned more than 50 hectares. During the 1950s the collectivisation of agricultural land had been initiated. In a first phase agricultural production co-operatives had been set up according to the principle "one village – one co-operative". In general, these co-operatives came up to a size of 500-600 ha. During the 1970s a second wave of collectivisation had been executed based on the motto "several villages – one co-operative". In general, these enterprises managed land amounting to 3,000-8,000 ha. Even though the right to own farmland had not been suppressed and *de jure* private ownership still prevailed, the land use rights had been firmly linked to the collective farms (DOUCHA et al., 2002). During the Cold War the agricultural sector became a very important sector of the Czech economy. It obtained a high privileged status and was heavily supported by high subsidies. During that time the position of managers of agricultural collectives was held in high esteem. Following the revolution in 1989 the agricultural sector received a loss of status that referred mainly to the collective agricultural producer co-operatives. These co-operatives were seen as a symbol of the former political regime.

Up to 1989 Czech agricultural production had been organised as follows: There had been 1,024 collective farms, with an average farm size of 2,561 ha. They operated on 62 % of the total agricultural land and accounted for almost 70 % of agricultural production. Second in importance were 174 state farms, with an average farm size of 9,200 ha. They occupied about 37 % of the total agricultural land and accounted for about 29 % of agricultural production. Finally, there had been 3,205 individual farmers, with an average farm size of 12 ha. They cultivated less than 1 % of the total agricultural land and made up about 1 % of total agricultural production (CHLOUPKOVA, 2002: 2-3). All types of farms were closely integrated within state-owned upstream and downstream sectors under the central planning system. Similarly, the agricultural population was closely linked through mass organisations to national society.

After the change of the political regime a transformation process had been implemented based on the guiding principles of de-collectivisation, restitution and privatisation of agricultural assets. With respect to agricultural land, it had to be handed over to those persons or their heirs who had contributed it during the collectivisation period. All those persons whose land had been expropriated before 25th August 1948 had no chance of getting it back. Similarly, the newly legalised landowners had to be Czech citizens and had to live in the Czech Republic. Nevertheless, the restitution process stagnated in many cases of which quite a number has not been solved even today. One of the reasons seems to be that many co-operative managers tarried in returning the restoration property to the rightful owners. Many of them wanted to establish their own private farms. But managers of the now transformed co-operatives found additional ways to block the transfer of property to the restituents. In, what is called the "second transformation", co-operatives rented or handed over their property to newly established agricultural production companies, mostly registered as limited liability companies (Ltd.). That managers of the agricultural co-operatives and the managers of these Ltd.s were the same persons is no coincidence. The government did not interfere in these cases. In addition, there had been problems with restituting agricultural land due to missing documents. In many cases, the exact location and/or the legal owner of a piece of land could no more be unambiguously identified. Therefore, due to these and other reasons, the group of restituents had been very dissatisfied with the restitution process which led to sharp conflicts between them as newly established private farmers and the managers of the transformed collective farm entities.

Almost 15 years after transformation, the organisational structure of agricultural production has changed to some extent only (A-Table 1: Columns 2-5). As desired by agricultural policies right after the regime change the number of private farmers has increased to about 53,500 or about 94.6 % of all farms. However, they just cultivate about 26 % of all agricultural land. Their average farm size comes up about 18 ha. On the other side, the number of corporate farms stands at 3,027 making up about 5.4 % of all farms. They cultivate about 74 % of all agricultural land and their average farm size comes up to about 886 ha. With respect to the main legal forms, i.e. transformed agricultural co-operatives, joint stock companies and limited liability companies, it stands at about 1,420 ha, 1,262 ha and 541 ha, respectively. Hence, there is still a marked dual pattern of agricultural organisations.

In addition, the transformation of the agricultural sector involved the supporting organisations of the newly established agricultural producers. It is assumed that, besides other factors of influence, the competitiveness and the level of economic welfare of agricultural producers is restrained if they cannot rely on organisations to their support. Both, managers of the corporate farms and individual farmers were in urgent need of appropriate institutions and self-help organisations (see for general discussion on the role of institutions and organisations: NORTH, 1990: 3-6) to their support in order to participate actively in economic development, and not to be sidelined as passive producers. A new set of organisational infrastructure in support of agricultural producers which are membership-oriented and independent from any outside interference had to be established. These organisations could be set-up either from scratch or "traditional-ones" had to be transformed accordingly.

In Czech Republic both types can be observed these days among the three most important organisations in support of agricultural producers, which are (see for a detailed discussion: BAVOROVA, 2004: 240-245; YAKOVA, 2005: 9-11):

- Chamber of Agriculture (CA): It had been established in 1992 by law. The main objectives are to represent the interests of its members, i.e. all enterprises with respect to agriculture, food industries and forestry. The Chamber encompassed two levels, i.e. the central one and 60 regional branches (personal communication, Mrs ZIMÁKOVÁ, 15 June 2004). Membership used to be compulsory during the first year, but since

May 1993 it is voluntarily (RAKUŠANOVÁ, 2002: 44). Three major groups of members are the corporate farms, the private farmers and the agro-industrial enterprises. The organisational degree of two groups of agricultural producers is highly different. While just about 4 % of private farmers are members of CA, about two-thirds of the corporate farms have joined (A-Table 1: Columns 6-7). Particularly the transformed agricultural co-operatives and joint stock companies have become members. The low attractiveness of CA for the private farmers seems to be the consequence of their low influence in the decision-making process. There was no pattern of finding compromises between the often-conflicting interests of the more small-scale private farmers and the more large-scale corporate farms. Hence, quite a number of private farmers left during the late 1990s. But membership of private farmers also depends on the attractiveness of services offered by the respective district office and the trust developed due to that. For example, the district offices of CA had been very instrumental in setting up marketing co-operatives during the early 1990s. From the survey interviews as will be discussed in Chapter 4, it became evident that private farmers left CA particularly in those districts where these co-operatives collapsed after a short period, e.g. in the District of Klatovy, while they stayed on in those districts where these co-operatives had become relatively successful, e.g. in the District of Pardubice.

- Agricultural Association (AA): This organisation had been registered in 2001 and been transformed from the former Association of Agricultural Co-operatives which had been set up in 1968. Therefore, it could make use of all the assets of its predecessor organisation. It is the political lobbying organisation of all large farms which employ staff regardless of the legal form. More than one third of all corporate farms have become members. However, there is a marked difference between those farms which have been transformed directly out of the former collective entity, i.e. agricultural co-operatives and those which had been transformed in a second step or set up due to privatisation of the former state farms, i.e. joint-stock companies and limited liability companies (A-Table 1: Columns: 8-9). While about two-thirds of the former have joined, just a bit more than 20 % of the latter did so. The average farm size of the corporate member farms comes up to about 690 ha. This is about 200 ha smaller than the average farm size of all corporate farms. It can be assumed that larger-scale corporate farms do not see the need of forming or joining this formal organisation to their support.
- Association of Private Farmers (APF): It had been founded in 1999. Its main task is to defend the economic, social and professional interests of individual farmers. It is guided by the respect for family farming and the belief that these farms will form an important part of modern agriculture and a developed countryside. It is a merger of three small predecessor organisations which had been set up during the early 1990s. All of them started from scratch. With a small annual budget it depends mainly on honorary work of its board members. It has not been very successful in organising private farmers effectively (A-Table 1: Columns: 10-11). Just about 6 % of all private members have joined. Nevertheless, a large number of non-members approach APF for advise (personal communication, Mr. SEBEK, 19 September 2005). However, contrary to the corporate farms, it is particularly the large-scale private farmers who have joined. The average farm size of the members comes up to about 100 ha. It is a competing association with AA in the political lobbying process, but seems to be not that successful.
- Marketing co-operatives: Since about the early 1990s, a number of marketing co-operatives have been set up. In 2002 their number stood at 84 spread all over the country (N.N., 2002). Their main role is to strengthen the position of agricultural producers in

face of consumers and agricultural processing industries. Particularly, since the late 1990s, it had also been the objective to strengthen the position of Czech producers in the EU common market. Very often, the formation of marketing co-operatives has been supported by CA and the government. They mainly focus on strengthening the bargaining position of the agricultural producers which is reflected in higher farm gate prices for agricultural products and lower input prices. However, quite a number of marketing co-operatives failed during the 1990s, so their reputation is not so good among agricultural producers. Nevertheless, bigger farms have joined this type of co-operative, while small farms in general sell their products directly to agri-trade companies. For the time being marketing co-operatives mainly concentrate on milk and beef, pork, fruits and vegetable markets. First marketing co-operatives, which are operating at regional levels, have joined and formed secondary co-operatives at national level. These national marketing co-operatives not only provide marketing channels at national and international levels, but also information and legal services to their members.

- Branch organisations: With the change of the political regime, the number of branch organisations in the agricultural sector increased rapidly. They can be seen as specialised societies which promote information sharing, extension and the interests of their members with respect to political bodies but also the society at large. Their goal is to permanently increase the quality and the economic performance with respect to the respective product at the farm level. In 1996, it has been estimated that there are in total about 360 professional organisations in the Czech Republic (BROKL, 1997: 153). Unfortunately, no information with respect to the number of agricultural professional organisations is available. So far, 21 different ones could be identified. Similarly, there is no information at all about their respective importance, i.e. number of members, annual turnover, etc. With respect to this survey, the most important ones are the Pig Breeders' Association, Holstein Cattle Breeders' Association and the Sugar Beet Growers' Association.

The first conclusion which can be drawn out of these data is that there is a marked dual farm structure in the Czech Republic. Private farms are important in number, but not that much when it comes to land coverage and production. They could not resume their significance as before collectivisation and do not play such an important role like in Western Europe. Corporate farms dominate agricultural production. Hence, any investigation of agricultural production in the Czech Republic has to reflect its dual farm structure, i.e. private farms and corporate farms (CHAPLIN et al., 2004: 63).

The second conclusion refers to the fact that corporate farms are by far better organised than their private competitors. This seems to support the thesis that particularly private farmers have a low stock of social capital which explains their relatively modest economic success. They seem to be disorganised, but they had to build up an organisation to their support from scratch. Managers of corporate farms can rely on personal ties which had been built up during the pre-transition period. Similarly, they can spare relatively more time for joining and participating in activities of the organisations to their support while private farmers have to concentrate more on their direct occupation in order to earn a decent income. In addition, they can make use of an organisation which, although transformed itself, continued to exist from the socialist period (SCHLÜTER, 2001: 275-277; BEZEMER, 2003: 36-37).

However, there is not only the dichotomy of private versus corporate farms, but also a marked difference of economic success within these two groups. As, for example, could be deduced from A-Table 1, the largest corporate farms do not seem to have joined their "obvious" organisation to their support, i.e. the Agricultural Association. Does that mean that these largest

corporate farms have also a lower stock of social capital, like the private farmers? We will test our hypothesis that social capital is an independent factor affecting farm income based on data of an empirical survey in the Czech Republic executed in 2003.

4 DATA ANALYSIS

In this contribution, we want to analyse the impact of social capital in promoting agricultural development in transition economies. We assume that membership in organisations will lead to higher economic performances. Hence, our analysis is based on the central hypothesis that, besides the provision of the major production factors, like land, labour and capital, social capital can be identified as a significant factor explaining economic development at national, regional and local levels. More specifically, we follow the hypothesis that the economic welfare of agricultural producers is, at least to some extent, determined by their membership in formal organisations. We could test this hypothesis in making use of the data of an empirical survey among agricultural producers in the Czech Republic. The survey was developed by VUZE (Prague) and had been executed during late summer of 2003 referring to the figures of 2002.

4.1 Survey area

Administratively, the Czech Republic is made up by 8 areas (NUTS 2 level), 14 regions (NUTS 3 level) and 76 districts (NUTS 4 level). For this analysis, four different districts in four different regions had been identified. These four regions were selected according to their natural production conditions (highland or lowland) and their economic indicators (farm size, yields, gross value added) based on FADN-data. In order to get a rough overview of the survey area, the main indicators describing the four regions where the four districts are located are summarised in Table 1.

Table 1: Key indicators describing the four regions for 2002

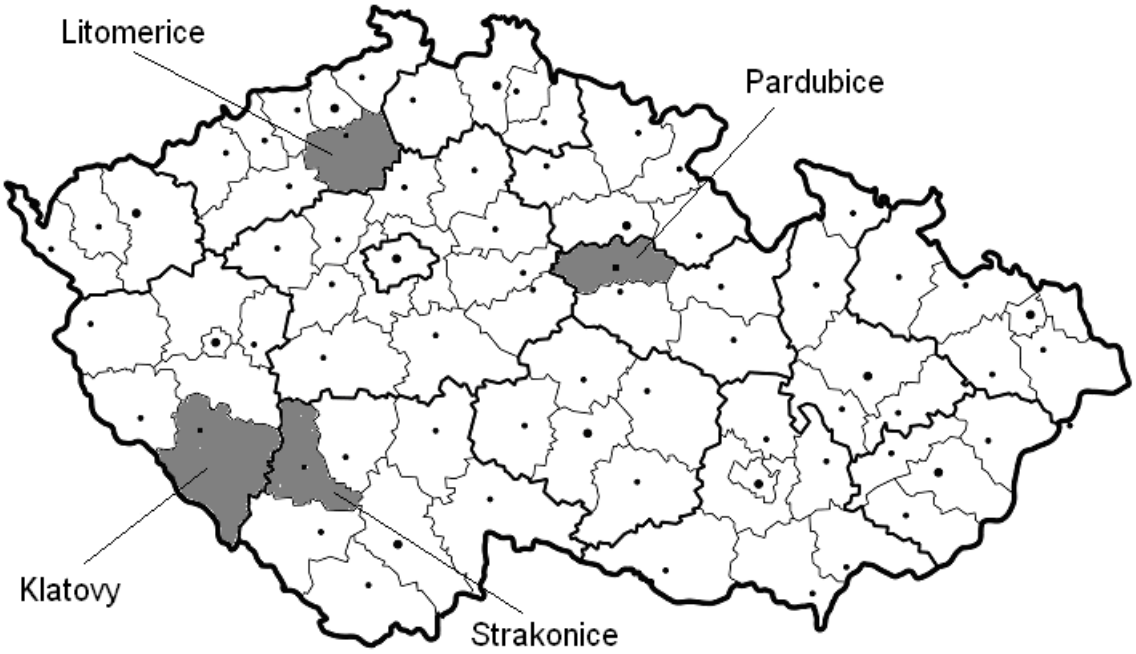
	Ustecky kraj Region, incl. District of Litomerice	Plzensky kraj Region, incl. District of Klatovy	Pardubicky kraj Region, incl. District of Pardubice	Jihocesky kraj Region, incl. District of Strakonice	Czech Republic
Geographical characteristic	Lowland	Highland	Lowland	Highland	
Unemployment rate	13.0	5.1	5.7	4.6	7.3
GDP in € PPP/head	11,465.2	13,156.4	11,840.4	12,748.3	14,318.5
Economically active population in agriculture (%)	3.0	5.7	5.3	7.5	3.9
Gross value added in agriculture (%)	2.0	5.4	5.3	6.6	3.1
Wheat yield (t/ha)	6.13	5.77	5.95	5.64	5.96
Milk yield (l/cow + day)	16.44	14.55	16.78	14.62	16.39

Source: EUROSTAT (2005) and CZECH STATISTICAL OFFICE (2004).

All four regions are, considering the GDP per head, economically less prosperous than the average of the Czech Republic but both highland regions are better off than the lowland ones. In addition to the lowest GDP the Region of Ustecky kraj shows the highest unemployment rate and is therefore the region with the least economic capacity in the survey. The unemployment rate in the other three regions is lower than the national average. The agricultural sector is more important in the highland regions but the lowland regions have higher wheat and milk yields. We suggest that higher yields rather reflect an effect of better natural production conditions than of a more intensified production.

The survey was performed in the highland districts of Klatovy and Strakonice and the lowland districts of Pardubice and Litomerice, respectively (Figure 1). In Klatovy data collection was performed by a commercial survey company which interviewed randomly selected farms. In the other three districts the survey was performed by staff of the Chamber of Agriculture which focussed more on their members. In total, the survey included 42 corporate farms, i.e. joint stock companies, transformed agricultural co-operatives or limited liability companies as well as 20 family farms. Hence, the survey results are by no means representative for the Czech agricultural producers in general, but they provide exploratory evidence for more in-depth analysis. A copy of the questionnaire is attached as Annex 2.

Figure 1: Map of the Czech Republic showing the selected districts



Source: VUZE with own modifications.

Based on the replies of the respondents, nine variables could be used for analysing their influence on two variables measuring economic performance of which five variables are representing social capital and another four other influencing variables (see Chapter 4.2). The data analysis starts with descriptive statistics to get an overview over the sample. Because economic performance depends a lot on correlated variables, further evaluation was done using factor analysis in order to extract independent factors from the set of correlated variables. These factors were used in the final evaluation step to calculate a multiple regression model and to test whether the factors have a significant impact on economic performance. All the calculations were done with the software package SPSS.

4.2 Descriptive statistics

The nine explanatory variables could be put together under five categories (i.e. labour, land, capital, social capital and production intensity). These categories were used in the quantitative analysis below. As dependent variables we applied two variables for economic performance (i.e. total output and gross farm income). We did not use variables describing human capital in our multivariate analysis but we will discuss the impact of the two variables of human capital, i.e. education and age, in Chapter 4.5. In the following text we describe the 11 variables separated according to the legal form of the farm, i.e. corporate and private farms, and as a pooled sample:

Labour: The labour input is measured as the sum of the total annual working time calculated from the total number of the work force multiplied by 2,000 hours for full-time workers and 1,000 hours for part-time workers. The median labour input comes up to 148,000 hours per corporate farm and 4,000 hours per family farm, respectively (Table 2 for summarising statistics).

Land: This indicator covers the total size of land operated by the farm including permanent pastures, perennial crops, and land under buildings (Table 2). Corporate farms are with an average size of 1,723.5 ha remarkably larger than family farms operating about 112.0 ha. As shown in Chapter 3, these figures are almost double the average size of corporate farms and about six times larger than average private farms in the country. Therefore, we have to admit that our sample does not represent the national average, but the larger agricultural producers.

Capital: The questionnaire did not collect data about the value of capital (buildings, machines, animals, etc.). But it had been asked about the value of annual depreciations per farm. Therefore we have used this variable as a proxy indicator for the capital of the farm (Table 2). The average depreciations for corporate farms amount to 5,609.0 thousand CZK[1] and 350.0 thousand CZK for family farms.

Table 2: Descriptive statistics for variables describing labour, land, capital and production intensity

Variable	N	Median
Sum of the total annual working time (hour)		
all farms	62	77,000
corporate farms	42	148,000
family farms	20	4,000
Amount of total farm's land (hectare)		
all farms	62	1,170.5
corporate farms	42	1,723.5
family farms	20	112.0
Value of depreciations (thousand CZK)		
all farms	61	2,500
corporate farms	42	5,609
family farms	19	350
Production intensity (t/ha)		
all farms	59	3.8
corporate farms	40	3.5
family farms	19	3.8

Source: Own calculation with data from the VUZE farm survey 2003.

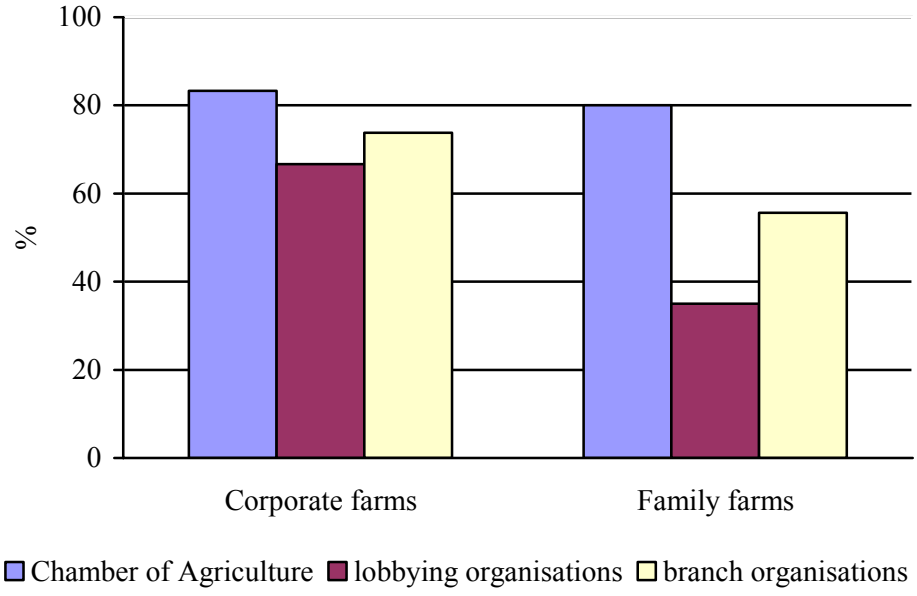
[1] CZK: Czech Koruna, 1 US$ = 32.81 CZK, 1 € = 30.91 CZK in 2002 (OANDA, 2005).

Production intensity: The intensity of production has an undisputed effect on economic performance. As almost all farms cultivate cereals, we decided that the average yield of cereals can be seen as a viable proxy of production intensity. Nevertheless, we are aware that production intensity is not only dependent of economic and human production factors, but also reflects the natural conditions. The corporate farms yielded on average 3.5 t/ha whereas family farms harvested 3.8 t/ha (Table 2). The difference is statistically not significant (Mann-Whitney-Test).

Social capital: The focus of this paper is on social capital. As discussed above, we had to restrict the analysis on its structural form. Therefore, no variables reflect the informal side or, even, the cognitive side of social capital. At this stage, we focus on different indicators describing passive membership in formal organisations and percentage of agricultural sales by two different marketing channels. In total, there had been five different variables referring to social capital.

With respect to formal organisations, four different types could be distinguished: (a) the Chamber of Agriculture, (b) political lobbying organisations, (c) branch organisations and (d) marketing organisations. As discussed above, the Chamber of Agriculture plays a distinguished role. The membership in the Chamber is for both, corporate farms as well as family farms, very high in our sample. 83.3 % (35 of 42 farms) of the managers of corporate farms and 80.0 % (16 of 20 farms) of the heads of family farms stated that they are members. One reason for this high level of membership seems to be the fact that representatives of the Chamber were handling the interviews in three of the four districts. The membership in lobbying organisations like the Agricultural Association of the Czech Republic and the Association of Private Farmers shows a slightly different picture. About two thirds of the corporate farms were members of the Agricultural Association, while about one third of the private farmers had joined the Association of Private Farmers (Figure 2). Again, corporate farms were better organised, but when compared with the national level, the organisational degree of both forms in the sample is very high.

Figure 2: Membership in formal organisations for corporate farms and family farms (percentage of farms)



Source: Own calculation with data from the VUZE farm survey 2003.

Since membership in lobbying organisations focuses more on the representation of interests with respect to policy makers, it is therefore not directly connected with farm production as such. In order to get highly specialised professional information and to improve technical knowledge, farmers join specialised branch organisations. Membership seems to be motivated by the production profile of a farm. Since corporate farms are larger than family farms and have therefore a more diversified production profile, they are members in more branch organisations (up to 5 in our sample) than family farms (up to 3 in our sample). Only 26.2 % of the corporate farms are not members in at least one branch organisation whereas 44.4 % of the family farms did not join any (Figure 2). For the calculation, we used the absolute number of memberships.

Table 3: Share of production sold by joint marketing organisations and own sales (%)

Variable	N	Median
Share of production sold by joint marketing organisations		
all farms	58	41.9
corporate farms	40	41.9
family farms	18	43.3
Share of production sold by own sales		
all farms	58	41.5
corporate farms	40	41.5
family farms	18	35.0

Source: Own calculation with data from the VUZE farm survey 2003.

The used marketing channels are a good proxy-indicator for the ability of managers to build up networks promoting their economic situation. We are concentrating on two marketing channels, only. Joint marketing through marketing co-operatives based on voluntary membership forms the one side. As quite a number of them failed during the 1990s, their image is not that good among agricultural producers. All sales by other marketing channels are seen as "own" sales and stand for the second marketing channel in our survey. A third options concerns the self-consumption of farm products. While marketing through joint marketing organisations requires the build-up of social capital with other farms, own sales do not need this type of capital. Therefore, we see high shares of sales by joint marketing organisations as a proxy for a high level of social capital whereas high shares of own sales stand for a lack of social capital.

Farm directors and managers had been asked about the share of production sold by the two marketing channels in 2002 (Table 3). Both marketing channels amount on average to about two fifths of the sales and have therefore the same importance in our sample. The differences between corporate farms and family farms are not significant for both marketing channels (Mann-Whitney-Test).

Legal form: The survey includes corporate farms as well as family farms. In total, 42 corporate farms and 20 family farms responded to the questionnaire. For our regression analysis, we coded corporate farms with 0 and family farms with 1.

Economic performance: We used two indicators to measure economic performance (as dependent variables). The first indicator refers to total output and includes not only the turnover of agricultural production but also other types of income, i.e. services and tourism. With respect to corporate farms the average total output came up to 48.4 million CZK; with respect to family farms it amounted to 1.9 million CZK. As the second indicator we refer to the gross farm income calculated as the total output minus the intermediate consumption, i.e. specific costs and farming overheads. This variable will be used as a proxy for farm performance. On average, the gross farm income amounted to 11.5 million CZK for corporate farms and 600 thousand CZK for family farms, respectively (Table 4).

Table 4: Total output and gross farm income (thousand CZK)

Variable	N	Median
Total output		
all farms	62	28,003.0
corporate farms	42	48,392.0
family farms	20	1,900.0
Gross farm income		
all farms	49	9,057.0
corporate farms	40	11,490.5
family farms	9	600.0

Source: Own calculation with data from the VUZE farm survey 2003.

4.3 Factor analysis

The focus of this paper is to test the influence of social capital on total output and gross farm income. Therefore, it is necessary to make sure that social capital is not correlated in the sample with other influencing variables like the value of capital or the amount of used land. The factor analysis is a multivariate procedure that extracts independent factors from a set of correlated variables. The independent factors extracted can be used in further, more advanced calculations instead of the correlated variables. As input data a matrix of correlation coefficients (Kendall's tau) was used. The Kaiser-Meyer-Olkin criterion (MSA: Measure of sampling adequacy) came up to 0.69, proving the matrix as mediocre and therefore suitable for factor analysis (BACKHAUS et al., 2003: 276). By principal component analysis with varimax rotation and Kaiser normalisation four factors could be extracted from the set of nine variables explaining 79.2 % of the total variance in the variables included. Only factors with an eigenvalue greater than 1 are used in the further analysis because a factor should at least explain as much variability as one variable causes (Kaiser criterion). Hence, those factors with a lower eigenvalue are not further considered.

Table 5 summarises the results of the calculations by showing all factor loadings and those greater than 0.6 or less than –0.6 in bold letters for the nine variables on four factors. We labelled the four factors according to the variables that have factor loadings greater than 0.6 or less than –0.6. Factor 1 summarises the three variables that describe the classical production factors land, labour and capital. Two factors indicate partial aspects of social capital. We named them marketing through joint marketing organisations (factor 2) and membership in supporting organisations (factor 3). Factor 4 stands for the production intensity.

At this stage, it can be concluded that the factor analysis separated the classical production factors clearly from factors indicating social capital. The membership in supporting organisations and the use of different marketing channels are independent from farm size or the volume of capital. Or, in other words, it also shows that farm size *per se* is not related to membership in formal organisations, and hence to a higher level of social capital. Therefore, we feel encouraged to proceed with a more in-depth analysis.

In a final step, the factor scores for the four independent factors were computed to replace the nine correlated variables in the multiple regression model and to test whether the two social capital factors have a significant effect on total output and gross farm income.

Table 5: Factor loadings for nine variables on four factors (principal component analysis, varimax rotation with Kaiser normalisation)

Variable	Factor			
	1	**2**	**3**	**4**
Production intensity	-0.014	0.054	0.009	**0.974**
Total annual working time	**0.908**	-0.027	0.094	-0.008
Used land	**0.888**	0.017	0.160	-0.060
Membership in the Chamber of Agriculture	-0.106	-0.031	**0.844**	-0.060
Membership in lobbying organisations	0.300	0.113	**0.716**	-0.039
Membership in branch organisations	0.380	-0.020	**0.608**	0.289
Percentage of total agricultural sales by joint marketing organisations	-0.020	**-0.947**	-0.065	0.012
Percentage of total agricultural sales by own sale	-0.024	**0.946**	-0.015	0.073
Depreciations	**0.875**	0.008	0.089	0.074
Eigenvalue	**2.63**	**1.81**	**1.64**	**1.05**

Source: Own calculation with data from the VUZE farm survey 2003.

Note: Relevant factor loadings greater than 0.6 or less than –0.6 are in bold letters.

4.4 Multiple regression analysis

In the last step of the analysis the following linear multiple regression models were calculated to test whether there is any significant impact of social capital factors on total output and gross farm income:

$$(1) \quad Z\_TO = b(5) * legal\_form + \sum_{i=1}^{4} b(i) * factor(i)$$

$$(2) \quad Z\_GFI = b(5) * legal\_form + \sum_{i=1}^{4} b(i) * factor(i)$$

Z_TO : standardised total output
Z_GFI : standardised gross farm income
b(5) : coefficient for variable legal_form
legal_form : dummy variable (0=corporate farm, 1=family farm)
b(i) : coefficient for the i^{th} factor, i=1..4
factor(i) : scores for the i^{th} factor, i=1..4

In addition to the four factors a dummy variable was introduced with respect to the legal form of the farm. Due to missing values and one outlier the total number of observations came up to 53 farms in equation 1 and to 43 farms in equation 2, on whose data the calculations of the regression analysis were based. The calculation started with the full model which was backwards reduced thereby that non-significant factors were excluded step by step from the model. A factor was treated as non-significant if its level of significance was higher as 0.10. Table 6 summarises the results of the regression analyses, i.e. on the one side the influence of all five factors and on the other, of the significant ones, only.

Table 6: Results of the multiple regression analyses

Dependent variable: Standardised total output N = 53	**Model with all factors**		**Model with significant factors only**	
	b(i)	Level of significance*	b(i)	Level of significance*
Land, labour and capital	0.746	0.000	0.785	0.000
Marketing through joint marketing organisations	0.070	0.135		
Membership in supporting organisations	0.065	0.210		
Production intensity	0.096	0.041	0.082	0.078
Legal form	-0.085	0.407		
Corrected R^2	**0.85**		**0.85**	
Dependent variable: Standardised gross farm income N = 43				
Land, labour and capital	0.601	0.000	0.647	0.000
Marketing through joint marketing organisations	-0.226	0.048	-0.177	0.093
Membership in supporting organisations	-0.034	0.775		
Production intensity	0.184	0.077	0.171	0.096
Legal form	-0.366	0.224		
Corrected R^2	**0.52**		**0.52**	

Source: Own calculation with data from the VUZE farm survey 2003.

Note: * A significance level lower than 0.10 indicates a significant effect of the factor on the dependent variable.

On total output (equation 1) have only the classical production factors land, labour and capital and the production intensity a significant impact whereas our both social capital variables as well as the legal form of farms are without influence. The measurement of determination is with 0.85 satisfying high and demonstrates that our model includes most of output-determining factors. The coefficient of the factor "land, labour and capital" is positive indicating that larger farms have higher outputs. That is not surprising and in concordance with neoclassical economic theory. The likewise positive factor "production intensity" shows that farms using modern technologies and/or operate under favourable conditions obtain higher outputs.

The second model (equation 2) tests the impact of the five factors on gross farm income. Again, the model is highly significant and explains 0.52 % of the variance of gross farm income. Like in the first model, the two factors "land, labour and capital" and "production intensity" increase gross farm income. In addition, and contrary to the first model, the factor "marketing through joint marketing organisations" is significant, i.e. this social capital variable shows a significant impact on gross farm income only, but not on total output. Its coefficient is negative. Since there is a negative factor loading of the variable "percentage of total agricultural sales by joint marketing organisations" on this factor, the negative coefficient stands for increasing gross agricultural income for higher percentages of sales by joint marketing organisations. Marketing through joint marketing organisations covers one aspect of social capital and, therefore, we conclude that our hypothesis, i.e. social capital increases the economic performance of agricultural enterprises in the Czech Republic is confirmed by this analysis.

This result, i.e. a significant impact on gross farm income, but not on total output is a little surprising since higher prices for common sales are one objective of joint marketing organisations. But marketing organisations do not only provide higher prices for common sales but also lower prices for common input purchases whereby the costs of production decrease. This cost-decreasing effect becomes stronger taking into account that marketing through joint

marketing organisations also decreases marketing costs and provides the farmers with useful information about prices and qualities. Therefore, we suggest that the cost-decreasing effect of marketing through joint marketing organisations outnumbers the return-increasing effect.

The second social capital factor "membership in supporting organisations" is not significant in both models. We conclude that it is not passive membership that increases economic performance but active participation in formal organisations as shown by WOLZ et al. (2005a). As there were no data about active membership collected in this survey, we cannot assess this question in more detail. Similarly, the legal form of the farms shows no significant influence on both dependent variables. So we cannot conclude that family farms are more or less successful than corporate farms.

The number of respondents is rather small in our study. Therefore, we have to be cautious to generalise our results for all farms in the Czech Republic as this survey is of exploratory character. In separate studies, the role of formal organisations as a facet of social capital could be confirmed, but further, more in-depth investigations among agricultural producers in the Czech Republic are needed (WOLZ et al, 2005a and 2005b). The results presented in these papers in addition to this analysis confirm our thesis that social capital is an underestimated but nevertheless important production factor.

4.5 The impact of education and age

We did not use human capital indicators, e.g. education and age, in factor and regression analysis because they had not only no high factor loadings on any of the four factors but also built no self-contained factor themselves. Nevertheless, education and age of farm owners and employees as indicators of human capital have an often-proved impact on economic performance. In this chapter we want to analyse how these two variables affected our nine explanatory variables and the economic performance of the farm with the help of correlations coefficients (Kendall's tau).

In the survey, the managers and household heads were asked to state the number of employees (including the household head and working family members) in three categories, i.e. primary education (1), secondary or vocational education (2) and university degree (3). We calculated a weighted average from the answers as a variable describing the educational level of all the total farm labour force. The average educational level for all working members of a family farm amounts to 2.0 (Table 7) and is significantly higher than for corporate farms (1.9, tested by Mann-Whitney-Test). The large work force of corporate farms seems to be of a lower educational and skill level than the few family workers on family farms.

Table 7: Descriptive statistics for the average educational level and age

Variable	N	Median
Average educational level (1: primary, 2: secondary or vocational, 3: university)		
all farms	61	1.9
corporate farms	41	1.9
family farms	20	2.0
Average age (year)		
all farms	62	44.9
corporate farms	42	45.0
family farms	20	41.7

Source: Own calculation with data from the VUZE farm survey 2003.

The age of the total work force was measured in the four categories "up to 30", ">30 to 40", ">40 to 50", and "older than 50". The average age was computed as weighted average using

25, 35, 45 and 55 years as proxy for the average age within the four categories. The average age of all employees comes up to 45.0 years for corporate farms and 41.7 years for family farms, respectively (Table 7). The difference is statistically significant (Mann-Whitney-Test).

Table 8: Correlation between the average education, average age, and other variables in the survey

Variable	Average educational level		Average age	
	Kendall's tau	Level of significance *	Kendall's tau	Level of significance *
Production intensity	-0.051	0.577	-0.010	0.911
Total annual working time	**-0.305**	0.001	**0.207**	0.019
Used land	**-0.273**	0.002	**0.259**	0.003
Membership in the Chamber of Agriculture	-0.112	0.300	0.158	0.135
Membership in lobbying organisations	**-0.322**	0.003	**0.207**	0.050
Membership in branch organisations	-0.150	0.134	**0.226**	0.022
Percentage of total agricultural sales by joint marketing organisations	0.008	0.933	0.010	0.913
Percentage of total agricultural sales by own sale	0.048	0.608	0.005	0.957
Depreciations	**-0.245**	0.006	**0.187**	0.035
Total output	**-0.259**	0.004	**0.243**	0.006
Gross farm income	**-0.189**	0.057	**0.169**	0.088

Source: Own calculation with data from the VUZE farm survey 2003.

Notes: * A significance level of lower than 0.10 indicates a significant correlation.
Significant correlation coefficients are in bold letters.

Both variables, i.e. average educational level and age, show significant but low correlations with a number of considered variables (Table 8). These low but nevertheless existing correlations are the reason why in the factor analysis "education" and "age" could not be extracted as an independent factor but also have low factor loadings on all four extracted factors. Therefore, we excluded these two variables from our factor and regression analyses.

In detail, the average educational level is significantly negatively correlated with three variables describing the factor "land, labour and capital" (i.e. total annual working time, used land and depreciations) and the two variables indicating economic performance (i.e. total output and gross farm income). This does not mean that higher educated farmers operate smaller farms or have a lower economic performance but is caused by the fact, that the average educational level among family farms is higher than corporate farms (see explanations on the top of this chapter). Also membership in lobbying organisations is negatively correlated with education. In Chapter 4.2 we discussed that family farms with their higher educational level are not more eager to join lobbying organisations than corporate farms, which explains this phenomenon.

Age is positively correlated with the variables describing the factor "land, labour and capital" and performance indicators as well as with membership in lobbying and branch organisations except the Chamber of Agriculture. As the average age of the work force of corporate farm is significantly higher than among family farms and corporate farms are larger than family farms, it is not surprising that all indicators related to farm size are positively correlated with the average age. This is also true with respect to membership in lobbying and branch

organisations. Corporate farms are more often members in lobbying organisations and are members in more branch organisations than family farms (Chapter 4.2).

Finalising this discussion, it can be concluded that both human capital variables, i.e. education and age, could not be identified as independent factors having a direct impact on farm performance. The reason is that these variables have a broader impact and show many small but nevertheless significant correlations with variables related to farm size. Therefore, we suggest that education and age play an important indirect role for the economic performance of agricultural farms in this survey.

5 CONCLUSIONS

In this paper we discussed the impact of social capital on farm performance. We could draw on an empirical survey among farm managers (N=42) and private farmers (N=20) spread over four districts in the Czech Republic. The survey had been executed during late summer 2003. It had been the objective of this survey to test the hypothesis whether social capital does have an impact on farm performance.

By running a factor analysis, it could be shown that two social capital related factors, i.e. "marketing through joint marketing organisations" and "membership in supporting organisations" could be clearly separated from the classical production factors. Therefore, we continued in testing our hypothesis by running a regression analysis. As expected by neoclassical theory farm performance is significantly determined by the traditional production factors, i.e. land, labour and capital and by production intensity. The legal form of the farms, however, does not show any significant influence on economic performance. Therefore, we cannot conclude that private farms are more or less successful than corporate ones.

With respect to our first performance variable, i.e. standardised total output, both social capital factors did not show any significant influence. However, with respect to our second performance related variable, i.e. standardised gross farm income, the social capital factor "marketing through joint marketing organisations" had a significant impact. Therefore, we conclude that our hypothesis has been confirmed by this analysis. On the other side, it could not been shown that our second social capital related factor "membership in supporting organisations" had any significant influence on farm performance. We suggest that it is not passive membership in a supporting organisation which could only be assessed in this survey, but active participation which will have an effect on farm performance.

In this way, it can be concluded that social capital does have a significant positive influence on farm performance in the Czech Republic. Our hypothesis has been confirmed by the analysis. Therefore, a first recommendation can be drawn: Both types of farms, i.e. corporate and private farms, can improve their income if they join marketing co-operatives. It is evident that it is not their existence as such, but their efficient management which will lead to higher gross farm incomes. The main benefit seems to be the cost reducing effects through the joint purchase of inputs and not higher product prices.

Nevertheless, we have to admit that the impact of social capital is not as strong as anticipated. One major reason seems to the relatively small number of cases. In addition, there is need for improving the concept. We covered the structural side of social capital with respect to formal organisations, but we had no data with respect to informal networks or to the cognitive side. Similarly, we cannot say anything about the costs in building up social capital. Hence, there is ample room for improving the methodological approach. More in-depth research will be needed in order to clarify the concept of social capital, its measurability and its impact on farm income.

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ANNEX 1: ORGANISATIONS OF AGRICULTURAL PRODUCERS IN THE CZECH REPUBLIC 2003

A-Table 1: Organisations of agricultural producers in the Czech Republic 2003

Status of Holdings	Number of Holdings		Area cultivated		Member of Chamber of Agriculture (CA)		Member of Agricultural Association (AA)		Member of Association of Private Farmers (APF)	
	Number	%	ha	%	Number	% of Col. 2	Number	% of Col. 2	Number	% of Col. 2
1	2	3	4	5	6	7	8	9	10	11
Legal Entities	3,027	5.4	2,680,548	73.6	2,016	66.6	1,031	34.1	-	-
- Agric. Coops.	746	1.3	1,059,453	29.1	649	87.0	505	67.7	-	-
- Joint Stock Comp.	621	1.1	783,810	21.5	600	96.6	140	22.5	-	-
- Ltd.s	1,441	2.6	779,732	21.4	619	43.0	331	23.0	-	-
- Others	211	0.4	57,553	1.6	148	70.1	55	26.1	-	-
Private Farmers	53,460	94.6	962,325	26.4	2,326	4.4	-	-	3,100	5.8
Total	56,487	100	3,642,873	100	4,342*	7.7	1,031	-	3,100	-

Source: Columns 2-5: Czech Statistical Office, 2004; Columns 6-7: Personal communication: M. Zimáková, Head of Chamber of Agriculture, Hodonín, 15 June 2004; Columns 8-9: Agricultural Association of the Czech Republic: Self-Presentation. (<www.zemsvazpraha.cz>) (Accessed: 19 April 2005); Columns 10-11: Bavorova, Miroslava, Jarmila Curtiss, Ladislav Jelinek: Czech agricultural associations and the impact of membership on farm efficiency, Paper presented at the 94th EAAE Seminar on Institutional Units in Agriculture, held at Wye, UK, 9-10 April 2005, p. 5 (<www.eaae-wye.org.uk>) (Accessed: 19 April 2005).

Note: * In addition, 2,150 agro-industrial enterprises are member of CA. So the total number of members comes up to 6,492.

ANNEX 2: QUESTIONNAIRE

I. General information about the farm

1. Title and place of business …….

2. Legal form ……..

3. Main orientation of farm enterprise ……..…

Crop production Production in (t) Yield (t/ha)

a) Cereals and oil-bearing crops ……..

b) Sugar beet ……..

c) Potatoes ……..

d) Fruit and vegetables ……..

Livestock production Heads Yield (l or kg/year)

a) Dairy cattle …….

b) Cattle fattening …….

c) Pork …….

d) Poultry …….

Non-farm production ……

4. Area of enterprise (ha), including buildings, etc. …….

5. Sale and consumption of farm products

a) Share of production sold through marketing co-operatives? ……..

b) Share of production sold through other channels? ……..

c) Own consumption? ……..

II. Evaluation of social structure of farm enterprise

1. Number of employees

a) Full – time ……

b) Part – time ……

2. Is the present number of employees optimal? Yes / no

3. Educational level of employees or farm members (numbers):

a) Primary ……..

b) Secondary, vocational ……..

c) University ……..

4. Age of employees or farm members (numbers)

a) Below 30 years ……..

b) 30 – 40 years ……..

c) 40 – 50 years ……..

d) More than 50 years ……..

III. Economic evaluation (in CZK)

1. Returns (revenues) ……
2. Own consumption ……
3. Gross added value ……
4. Depreciation ……
5. Balance of subsidies and taxes ……
6. Net added value ……

IV. Organisational Issues: Membership

a) **Marketing co-operative**? Yes / no

if yes, state which one(s) ……..…….……

……..

Reasons for joining: more information ……..

better bargaining position …….

higher prices …….

better terms of payments …….

simplification of sales …….

Relevance: great significance small none negative

if not, state the reasons: ……..

……..

b) **Lobbying organisation** (e.g. Chamber of Agriculture, Agricultural Asssociation, Association of Private Farmers, etc.) Yes / no

if yes, state which one(s) ……

……

……

Reasons for joining: ……..

…….

……

if not, state the reasons: ……..

……..

c) **Professional associations** Yes / no

if yes, state which one(s) ……

……

……

Reasons for joining: ……..

…….

……

if not, state the reasons: ……..

……..

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