Institutions of sustainability in Central and Eastern European Countries

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by

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Abstract

The agricultural sector in Central and Eastern Europe (CEE) is confronted by two huge problems simultaneously: transition processes and sustainability. Institutions are very important for both these problems. The purpose of this paper is to make clear that the institutional setting is very important, and to give insight into the initial situation of institutions for sustainability and transitions. For this purpose we carried out surveys in CEE with questions about government performance, institutional environment, government structures and social capital.

There is strong relationship between the determinants of good government performance in general and those for good government for realizing sustainable agriculture. However, besides formal rules, the informal rules of the institutional environment and social capital are also very important for realizing of sustainable agriculture. Results of surveys show that these institutional elements and the level of social capital are different in the countries of CEE, and have to be developed. Knowledge of government performance, institutional environment and social capital is a necessary condition for developing more suitable governance structures for realizing sustainable agriculture.

Keywords: institutions, social capital, sustainable agriculture and Central and Eastern Europe

1. Introduction

In this study, we investigate the agricultural sector of the CEECs by focusing on the institutions that affect agriculture in these countries and the importance and role of social capital. In particular, we want to know why the agricultural sector in some CEECs has been more successful at transitioning towards a sector that typifies that found in the West than other countries. Since "neither proper assessment of the economic situation nor good policymaking are possible without the support of adequate quantitative information" (Rose and Haerpfer, 1994: 5), we employ a survey instrument. Surveys are important in Eastern and Central Europe because, prior to the collapse of communism, "it was not possible to conduct investigations of economic and political conditions in the way in which this is routinely done in open societies (Rose and Haerpfer, 1994: 7). We conducted two surveys in the CEECs – a survey of country representatives, who provided country-level information on the twelve countries in the study, and a survey of scientists, politicians, farm leaders, farmers and other individuals to elicit various opinions about the state of agriculture and institutions in their country.

We begin our task in the section 2 by providing a theoretical context for the analysis. Section 3 shows how we would like to model the analysis of the ''success'' of agriculture and sustainable development in CEEC's. In section 4 we give a short overview of our surveys in CEEC's. A descriptive overview of the results of the surveys, plus other secondary data of CEEC's, is provided in section 5. In section 6 we test the statistical relationship between performance of the countries' agricultural sectors and the measures of the institutional environment and social capital. That is conducted by regression analysis. The conclusions are presented in section 7.

2. Framework for Analyzing Agricultural Development

Institutions are important to the economic, environmental and social dimensions of agriculture. Many studies on economic development consider the institutional structure to be exogenous, in which case the problem becomes one of 'getting the prices right' so that economic agents behave in an efficient manner. Getting the prices right follows logically from the prior problem of *getting the institutions right*, but the latter problem is often ignored and existing institutions are not always the right ones (Bromley, 1999: 3). Recent research in economic development stresses the need for good institutions, as some institutions retard rather than promote growth (La Porta et al., 1999: 222). Regulatory agencies prevent entry, courts resolve disputes arbitrarily and sometimes dishonestly, and politicians use government property to benefit their supporters rather than the population at large (Shleifer and Vishny 1998: 8).

The role and performance of government is essential to economic success and sustainability. An increasing number of authors have demonstrated that there is indeed a link between economic success and good government (cf. La Porta et al. 1999; Landes 1998; Olson, 1996). The characteristics of good government can be summarized as follows (La Porta et al., 1999: 225-226):

- protects property rights and individual freedoms;
- generally non-interventionist (e.g., keep regulations on businesses to a minimum);
- provides adequate (efficient) levels of public goods (infrastructure, schools, health care, police protection and a court system);
- concerned about the less well off in society, using income transfers to address externality related to the existence of 'socially-excessive' poverty;
- government is efficient; and
- bureaucrats are of high quality, being competent and not corrupt.

Is good government also important for agriculture? In this study, it is assumed that, if determinants of good government can be identified, they can be used to judge government performance related to the agricultural sector. What is good for economic development is also good for agriculture. Therefore, the focus in this section is on institutions generally, rather than solely on agricultural institutions.

There is more to economic success than just institutions. Also important is "the shared knowledge, understandings, norms, rules, and expectations about patterns of interactions that groups of individuals bring to a recurrent activity" (Ostrom 2000: 176); these are often referred to as 'social capital'. Social capital may be correlated with good government, but it can exist outside of good government. It is our contention that social capital is important to agricultural success. Therefore, a second focus in this section is on the role of social capital in economic development.

The Institutional Environment

Over the past several decades, economists have increasingly been concerned with the role of institutions in economic systems. The institutional environment consists of human-made constraints that structure political, economic and social interactions (Davis and North, 1971: 6-7). It consists of both formal rules (constitutions, laws and property rights) and informal constraints (sanctions, taboos, customs, traditions, and norms or codes of conduct).[2] In agriculture, the most important formal rules probably concern property rights over the land and water, especially where water quality and/or its supply is limited. Thus, the institutional environment not only delineates the rules of the game within which economic activities are

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[2] Institutions constitute "a set of moral, ethical behavioral norms which define the contours that constrain the way in which the rules and regulations are specified and enforcement is carried out" (North 1984: 8). See also CPB (1997: 42) and North (1990, 1994).

coordinated, but prescribes the rules of conduct within which human activities and actions take place. For example, the legal system is a framework that defines the ways in which property rights can be implemented and enforced.

Governance Structures or Coordination Mechanisms
Williamson (1998: 24) distinguishes between the institutional environment – the rules of the game – and the institutional arrangements or governance structures – the play of the game. A governance structure is a way of implementing and operationalizing the rules of the game defined by the institutional environment. Governance structures support transactions and are embedded in the institutional environment (Ménard 1995: 175); they are mechanisms for coordinating economic transactions. Four economic coordination mechanisms or governance structures are available. The polar cases are markets (competition) and, at the other extreme, command and control (also called hierarchies). Between these polar cases, we have cooperative exchange (e.g. contracts, environmental co-operatives), common values and norms as coordination mechanisms. Competition may be more appropriate in a heterogeneous society, while common values and norms develop more easily in a homogeneous society (CPB 1997: 42 - 44).

The ability to implement a given coordination mechanism depends crucially on the existing institutional environment within a jurisdiction. Without the 'right' institutional environment, farmers are unlikely to be concerned about how their farming operations affect the future quality of soil, water, air and wildlife and landscape; they need to have a stake in the land (or feel morally obliged to do "the right thing"), or somehow be 'coerced' to take future land quality into account. Where the required institutions are deficient or absent, it is usually not possible to use economic incentives to get agricultural producers to use less chemicals, to protect wildlife habitat, and so on. In the absence of appropriate property rights and their protection, farmers can continue to contract and cooperate with one another, relying on common value and norms, trust and personal networks rather than the rule of law. These elements are also the linkage to social capital.

We postulate (and later test) that the economic success of a country's agricultural sector will depend on the institutional environment, with institutions that encourage markets and lead to good government contributing more to agricultural development than other institutions. Institutions must also protect farmers against the political whims of (unstable) government, while enabling full participation in domestic and international markets.

Markets allow farmers to determine what to produce and how; some producers will produce biological or 'organic' products because they command a price premium, while others will chose not to do so. To address externality problems related to agricultural activities, the government could use instruments, such as levies on plant protection products, on minerals to reduce their use, and subsidies to encourage farmers to provide environmental services (e.g., wildlife, landscape, habitat).

Even in market economies, contracts are common; contracts are used to address market failure (markets are inadequate) and/or reduce transaction costs of using markets (Williamson 1998: 37). Contracts refer to the 'arrangements' between a 'principal' who demands some outcome and an 'agent' who supplies it. Contracts between farmers and landowners, or between agricultural producers and a processor are common. Rental contracts, contracts to supply a specified amount of grain at some future date at an agreed-upon price (a futures contract), and contracts for preserving wildlife and landscape are quite different; yet, they enhance economic efficiency and cannot function efficiently unless appropriate institutions, such as property rights and courts, are in place.

Governments can use contracts to get landowners to produce public goods, such as wildlife and landscape, habitats, watershed protection and so on. In agriculture, contracts

between farmers and government generally occur in the provision of nature - the creation or protection of wildlife and landscape, habitats or environmental amenities such as clean water. Provision of nature is not costless, but it could be made costlier by inappropriate choice of a coordination mechanism (see Barichello et al., 1995).

Common values and norms can serve as a coordination principle for groups, where groups range from a family to a club, from a church to a volunteer group or team of people (a community) working towards a common goal. Common values and norms diminish the incidence of opportunistic behavior between the members of the group and thereby reduce transaction costs. Effective coordination based on common values and norms coincides with a strong motivation and high commitment of individual members of a group to achieve their common goal (CPB 1997: 55).

Social Capital
When it comes to agricultural development in the CEECs, in addition to looking at market- or contract-based activities and associated transaction costs, it is important to consider non-contractual elements, such as trust, shared norms (social beliefs), and social networks. Collectively, these are referred to as 'social capital'.[3] Social capital is often referred as "the shared knowledge, understandings, norms, rules, and expectations about patterns of interactions that groups of individuals bring to a recurrent activity" (Ostrom 2000: 176). It is "fiendishly difficult to measure … because we do not quite know what we should be measuring" (Dasgupta 2000: 326). According to Ostrom (2000: 177), creation of social capital requires sacrifice: "investments made in one time period in building trust and reciprocity can produce higher levels of return in future time periods even though the individuals creating trust and reciprocity are not fully conscious of the social capital they construct" . Social capital may be correlated with good government, but it can exist outside of good government. It is our contention that social capital is important to agricultural success.

Trust is perhaps the most important component of social capital: "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time" (Dasgupta, 2000: 329).[4] If one's confidence in an enforcement agency falters, one does not trust people to fulfill their agreements and agreements are not entered into (Dasgupta, 2000: 332). There is an element of trust in any transaction where one has to decide (make a choice) before being able to observe the action of the other party to the transaction. Further, one has to assume that the other person is not acting with guile, keeping hidden information about themselves that can be used to their advantage at the expense of the other party to the transaction. Trust is the catalyst that makes an economy function efficiently. Trust is the catalyst that makes an economy function efficiently. In our research we take *trust in the people in one's community* and *trust in the government* as indictors for the level of social capital. Both are important for sustainable development.

Knack and Keefer (1997) used data from the World Values Survey to show that growth in GDP between 1980 and 1992 was higher in countries where people trusted one another, with the impact greatest in countries that were poorest in 1980. La Porta et al. (1997) found trust to be positively correlated with growth in GDP (among other things), but negatively correlated with an index of government corruption. In addition to trust, other elements of social capital include social norms, or behavioral strategies (always do *p* if *q* occurs) subscribed to be all in society, and networks of civic engagement (membership in swim clubs, church organizations, etc.) that enhance cooperation.

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[3] Neither Arrow (2000) nor Solow (2000) likes the term social capital, so the use of terms such as 'formal rules' and 'competencies' may be preferred.
[4] Dasgupta quotes K. J. Arrow, Gifts and Exchanges, *Philosophy and Public Affairs*, 1(1972): 357.

3. Modeling Agricultural Success in Central and Eastern Europe

In anticipation of entry into the EU, many countries in central and eastern Europe have adopted many EU laws directly, and have even implemented many of the EU's agricultural policies, although subsidy levels generally remain below those in the EU (Hartwell and Swinnen, 2000). Nonetheless, despite these changes in the institutional environment, economic success has not followed – the institutions do not seem to work as well as they do in western Europe. One reason is that the level of social capital is lower in the CEECs than in the EU-15 (and need time to build up), so the benefits of institutional change are not as strong as they are in the EU (see Dasgupta, 2000: 390-94; Olson, 1996).

In this study, we examine the role of institutions and social capital in explaining why the agricultural sectors in some CEECs has performed better than that in other CEECs. To do so, we employ three simple ordinary least squares (OLS) regression models and a logistics regression (see also section 6). The OLS models are as follows:

$$y_{ij} = \alpha_{0i} + \alpha_{1i} x_{1j} + \dots + \alpha_{ni} x_{nj} + \varepsilon_{ij}, \ (i = \text{model 1, model 2, model 3}) \tag{1}$$

where y_{ij} is a variable measuring the "success" of agriculture, x_{ij} are institutional, social capital and control variables explaining "agricultural success", α_{ki} ($k=1, \dots, n$) are parameters to be estimated, $\varepsilon_{ij} \sim N(0, \sigma)$ are normally distributed error terms, and j refers to the 12 CEECs.

In the **first model**, we measure agricultural success (y_1) by the change in agriculture's share of GDP between 1990 and 1998. In the **second model**, agricultural success (y_2) is measured by the change in agriculture's share of total employment between 1990 and 1998, while, in the **third**, agricultural success (y_3) is the average annual growth in agricultural value added as a percent of GDP between 1989 and 1999.

We used as explanatory variables: (1) control variables that to take into account differences in the stages of development of various countries, and include income or GDP per head in 1990, change in GDP/head, inflation, unemployment rate, government debt, country debt, and farm size of the various countries; (2) other explanatory variables that address the role of institutions (institutional environment) and governance structures. These include an "index of the effectiveness of environmental laws" and an "index of property rights protection in agriculture"; (3) explanatory variables that address the role of social capital. These include an index of trust in the government, an index of trust in persons, and a government corruption index. A list of explanatory variables, their expected signs and an explanation of the expected sign are given in table 1.

Any variables that would explain economic development would have a negative impact on the "success of agriculture" variable employed in these regressions. The reason is that, if social capital does indeed lead to greater economic growth, the role of the agricultural sector can be expected to decline relative to the rest of the economy. Hence, the share of GDP accounted for by agriculture would be lower. Likewise, if unemployment in the economy rises because a country is less successful in making the transition from a communist economy to a market one, workers will turn to families on the farm to find employment; agriculture is often an employer of last resort.

The **fourth model** is similar to the others, except that it employs a logistics function to model the success of agriculture. In this case, the dependent variable, y_4, is an index of success that takes on values between 0 (the agricultural sector's development between 1990 and 1998 is judged to be a complete failure) and 1 (total success). Thus, y_4 can be interpreted as the likelihood of success. The regression model takes on a logistics functional form that can be estimated using OLS as follows:

$$\ln\left(\frac{y_4}{1-y_4}\right) = \alpha_{04} + \alpha_{14}\,x_{1j} + \ldots + \alpha_{n4}\,x_{nj} + \varepsilon_{4j}, \tag{2}$$

where the dependent variable is expressed as a log-odds.

The expected signs on the explanatory variables in table 1 will differ for the fourth model because agriculture's success is no longer considered to be relative to the rest of the economy. Rather, the index of success is a pure one. Therefore, one expects that "change in GDP per head", "inflation", "country debt", "government debt", "corruption", "trust in people", and "trust in government" to have the opposite sign of that presented in table 1. The effect of farm size on the likelihood of success will be positive, while the effect of strong environmental laws is unknown a priori. It may well be that, since they set the rule of the game and thus reduce uncertainty, their effect on agricultural success is positive; it could also be that, because farmers need to spend money (forgo production) to address environmental concerns, their effect is negative. Protection of property rights, including contracts that farmers enter into, will have a positive effect on the agricultural sector.

Table 1: Explanatory Variables and Expected Signs for Models 1, 2 and 3

Variable	Sign	Explanation
Control variables		
GDP per head	+	Countries with higher GDP are likely more successful in making the transition from communism to a market economy
Change in GDP/head	−	Agricultural success relative to the rest of the economy will be lower for a country that grows faster.
Inflation rate	+	Higher inflation leads to lower overall economic development and a relative increase in agriculture's role.
Unemployment rate	+	Higher unemployment indicates lower non-agricultural GDP, so agriculture's share is higher; it also indicates that more workers will return to the farm to find employment.
Government spending as proportion of GDP	+	Higher debt leads to lower rates of economic development and better relative success of agriculture
Public debt as proportion of GDP	+	Same as for country debt.
Foreign direct investment (FDI) per head	+	FDI is an indicator of how outsiders perceive the investment climate in a country. The higher the degree of FDI, the better the investment climate and the greater is the chance agriculture will thrive.
Farm size	+ (1) + (2) − (3)	Larger farms can take advantage of economies of size, thus leading to higher rates of growth in agriculture (models 1 & 2). Larger farms also mean fewer farms, so less opportunity for unemployed workers to return to family on the farm (model 2)
Institutional environment		
Effectiveness of environmental laws	−	In general, environmental laws can be expected to slow growth of the agricultural sector relative to all other sectors.
Effectiveness of private property laws	?	In general, protection of private property can be expected to boost the agricultural sector as well as other sectors. It is not possible to determine which sector benefits the most.
Social capital		
Corruption	+	General corruption drives people into agriculture to avoid corruption in the rest of the economy.
Trust in people	−	Trust in people leads to greater overall economic success, with lower relative success of agriculture.
Trust in government	−	Trust in government leads to greater overall economic success, with lower relative success of agriculture.

4. Surveys in Central and Eastern European Countries

Two surveys were designed under the auspices of CEESA Project (see footnote 1). The theoretical framework for analyzing institutions - used to construct the surveys - is found in

Slangen (2000). The country sub-contractors of the CEESA project filled up the **Survey of Institutional Structure in Countries in Transition** that provided background information on each of the countries. The **Survey of Agriculture in Economies in Transitions** was intended for experts in Central and Eastern Europe (CEE). Both surveys are found in Slangen et al. (2001: 49-60).

At the beginning of September 2000, we sent the **Survey of Agriculture in Economies in Transition** to 305 experts in 12 countries of CEE. At the end of 2000, we had back 165 filled in questionnaires. It meant a response rate of 54 %. The most important group which has filled in the questionnaire are scientists (53 %), next are the civil servants (15 %), and some small groups like farmers (11 %), farm group leaders (4 %) and politicians (5 %). Regarding the education level, almost 87 percent is graduated from an university and almost seventy-seven percent has an education in agricultural field.

A random sample of agricultural producers in the region was not used because this would be too time consuming and costly to administer, particularly since mailing lists for farmers are generally unavailable. Likewise, a public opinion survey was eschewed because such surveys are not yet common practice in all former communist countries, making it difficult to get reliable information, and the general public may be ill informed about agriculture and agricultural policy.

Since we use a non-probabilistic sample, it is not possible to calculate sampling errors and ascertain validity of references to the whole farmer population in the study region (Pedhazur and Schmelkin, 1991). It is important to recognize, however, that this research constitutes only a case study on the state of institutions for sustainability in agriculture in CEECs. In the next subsection, we provide some data from the two surveys. We also provide background data from other sources; this data is also used in the analysis. The main purpose here is to provide a statistical, descriptive overview of the current state of the twelve countries in our study.

5. Country Overviews: Variables on country level
Per capita GDP by country is provided in Figure 1 for 1998, and is measured in U.S. dollars. Slovenia has the highest per capita GDP followed by the Czech Republic and Hungary, while the Ukraine and Bulgaria have the lowest per capita GDP, about one-third as much as that of the richer CEECs. Change in GDP over the period 1989 to 1999 is provided for the high-income CEECs in Figure 2 and for the low-income CEECs in Figure 3[5]. With the exception of Croatia and Latvia that show some recovery in the past few years, the low-income countries have generally failed to show signs of recovery from the transition from communism to a market economy, and economic output in all the poorer CEECs remains in 1999 significantly below what it was in 1989 (Figure 2). Measured economic output in the richer countries in 1999 is about what it was in 1989, with the exception of Poland, which has managed to increase output by about 18% above what it was in 1989 (Figure 3). We postulate that the better performance of the countries in Figure 3 compared to those in Figure 2 is due to social capital and institutional factors, and we test that in section 6.

The agricultural sector in Bulgaria accounts for the highest proportion of GDP of any CEEC, followed by that of Romania; however, only agriculture in Bulgaria increased as a proportion of GDP between 1990 and 1998. As expected, agriculture also plays an important role in the economies of the Ukraine and Lithuania, both countries with a low GDP. The share of agriculture in employment is greatest in Romania, followed by Poland, Bulgaria and the Ukraine. Poland as it is a relatively well-off country, but there are quite few small farms in Poland. Employment in agriculture relative to the rest of the economy rose between 1990 and 1998 in half of the 12 CEECs, suggesting that agriculture is an "employer of last resort",
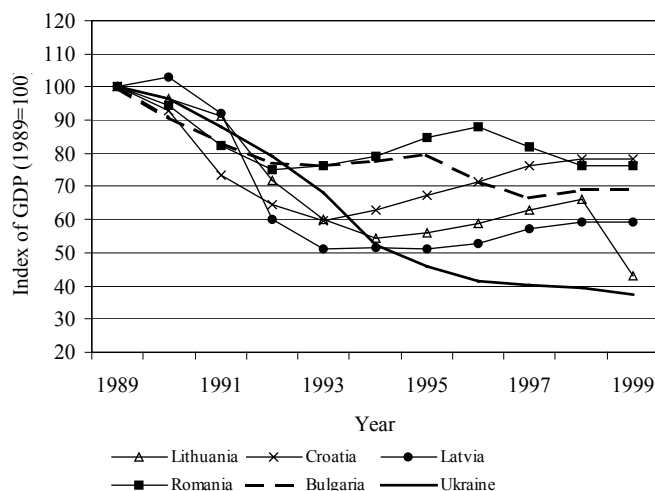
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[5] Estonia is not included due to incomplete data.

with those losing jobs in the non-agricultural sector returning "home" to the farm to find work (for more detailed information see Slangen et al. (2001: 20-25)).
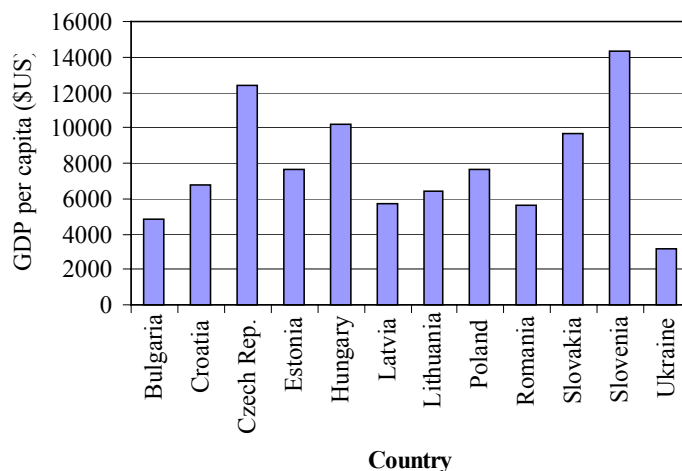
**Figure 1: Per Capita GDP, 1998, $US**

Figure 2: Change in GDP for Low Income CEECs, 1989-1999

Concerning macroeconomic indicators in 1999, public debt in the twelve countries varies from a high of 81.5 % of GDP (Bulgaria) to a low of 13.5 % for Estonia, while government spending in % of GDP varies from 10,4 % (Hungary) to 26.8 % in Croatia (Slangen et al., 2001: 22-23). These measures do not lie outside the experience of EU countries; indeed, average government debt is lower than in the EU-15, while public spending in % of GDP is generally significantly lower in the CEECs than in western European countries. Low government expenditure in these areas may reflect lack the citizen's *willingness to pay* taxes because they do not like what the government is doing, and this reflects good government. Alternatively, high expenditure on transfers and subsidies or on government consumption may reflect high levels of distortionary taxes and redistribution, and hence represent a failure to protect the public from government intervention. However, low government expenditure could also be the result of a bad tax system.

The unemployment rate in 1999 was highest in Croatia (22%) followed by Slovakia (19%). The latter is somewhat surprising given that the Czech Republic has one of the lowest unemployment rates and that the economy of Slovakia is doing reasonably well (Figure 3). Likewise, it is surprising that according to available data Romania and the Ukraine have the

lowest unemployment rates (except for Hungary), despite economies that are not performing well (Figure 2). Per capita GDP in the Ukraine has fallen by nearly half in the past decade (Slangen et al., 2001: 22-23).
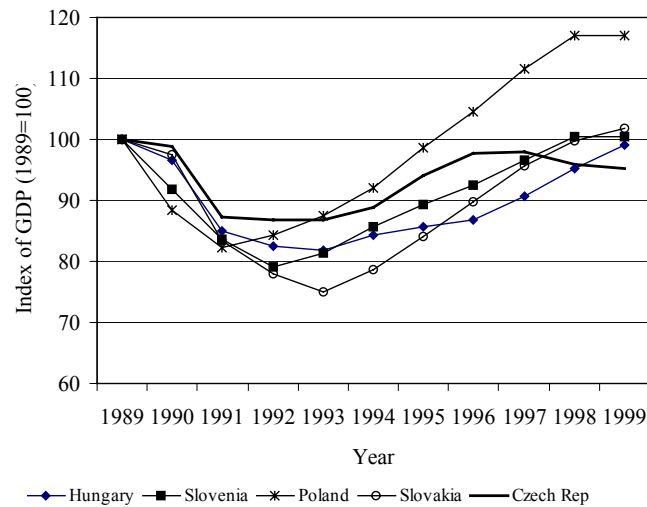
Figure 3: Change in GDP for High Income CEECs, 1989-1999

Institutional Environment

In this subsection, we examine those variables that constitute the institutional environment – rules of law, enforcement, monitoring and so on. An excellent summary measure of the institutional environment is the index of economic freedom (see Gwartney et al., 2001). Indexes for 1990 and 1999, including a more detailed index for 1999, are provided in table 2. The ''general index'' uses data on personal choice, protection of private property and freedom of exchanges to construct an index that ranges from 0 (least economic freedom) to 10 (greatest economic freedom). The index is used to rank 116 countries in 1990 and 123 countries in 1999. The ''detailed index'' measures freedom in seven areas and aggregates these to provide a single ''summary index'' (table 2). The ''detailed index'' is available for only 58 countries because of lack of data; data are available for only five of the 12 CEECs in table 2. Again, the index ranges from 0 to 10. According to table 2 the Ukraine and Romania have the least economic freedom, while Hungary, the Czech Republic and the Baltic States have the most economic freedom of CEECs vying for membership in the EU.

A comparison of economic freedom over time is only available for six of the CEECs, because some of the central and eastern European countries were still emerging as separate countries at the time data for the 1990 index were compiled. The Baltic States and the Ukraine were in the processing of separating from the collapsed Soviet empire. Slovenia and Croatia were being carved out as a result of civil war in Yugoslavia. The available data on economic freedom for 1990 and 1999 indicate that there has been a tremendous increase in economic freedom in the CEECs during the 1990s.

Two other measures of the institutional environment for sustainable agriculture used in this study were measures of the degree to which environmental laws were monitored (provided in figure 4), and the enforcement measures (provided in figure 5). Both of which are constructed from our survey of stakeholders. We asked a number of questions about monitoring and enforcement of environmental laws dealing with soil, air, water, land, wildlife and landscape, and bio-diversity in each of the 12 CEECs. The scale used runs from 1 (no monitoring or enforcement) to 5.0 (strong monitoring and enforcement).

Table 2: **Indexes of Economic Freedom, Central and Eastern European Countries, 1990 and 1999**

| | General Index | | | | Detailed Index: | |
| | 1990 (116 countries) | | 1999 (123 countries) | | (58 countries) | |
Country	Score	Rank	Score	Rank	Score	Rank
Bulgaria	3.9	95	5.9	79	5.2	52
Croatia	n.a.	n.a.	5.2	95	n.a.	n.a.
Czech Rep.	3.8	97	6.6	60	5.9	44
Estonia	n.a.	n.a.	7.4	36	n.a.	n.a.
Hungary	4.7	72	7.1	43	n.a.	n.a.
Latvia	n.a.	n.a.	7.0	46	n.a.	n.a.
Lithuania	n.a.	n.a.	6.5	62	n.a.	n.a.
Poland	4.6	80	5.7	85	5.4	48
Romania	4.2	90	3.8	118	5.4	48
Slovakia	3.8	97	6.3	68	n.a.	n.a.
Slovenia	n.a.	n.a.	6.2	72	n.a.	n.a.
Ukraine	n.a.	n.a.	4.6	106	4.5	57

Source: Gwartney et al. (2001). n.a. indicates not available. Note that the data for 1990 for the Czech Republic and Slovakia are based on a united Czechoslovakia.

In figures 4 and 5, countries are arranged along the abscissa according to declining per capita GDP. It is clear that, with some exceptions (principally Lithuania), monitoring and enforcement of environmental laws is inversely related to per capita GDP. Poorer countries in central and eastern Europe are more lax about monitoring and enforcing environmental regulations, and thus one would expect their agricultural sectors to be less sustainable.
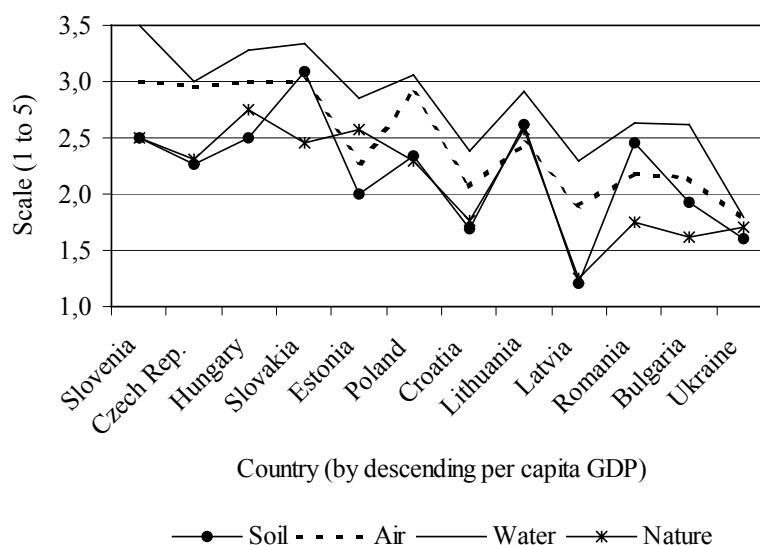

Figure 4: Monitoring of Laws Dealing with Natural Environments

Survey respondents also answered three questions relating to their confidence in government and public institutions using a 5-point scale, with 5 representing the greatest confidence. In particular, stakeholders were asked to evaluate: (1) whether institutional outcomes met their expectations; (2) whether or not the government generally acted in a neutral fashion; and (3) whether institutional arrangements encouraged business. These are indicators of the institutional environment. Responses are plotted in figure 6, where countries are arranged in declining order according to per capita GDP. There appears to be a weak inverse relationship between these three measures that pertain to the institutional environment and per capita GDP, as expected.
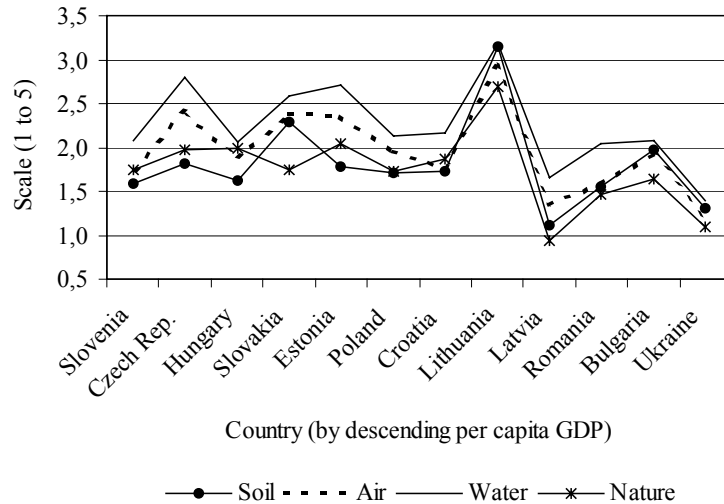
Figure 5: Enforcement of Laws Dealing with Natural Environments
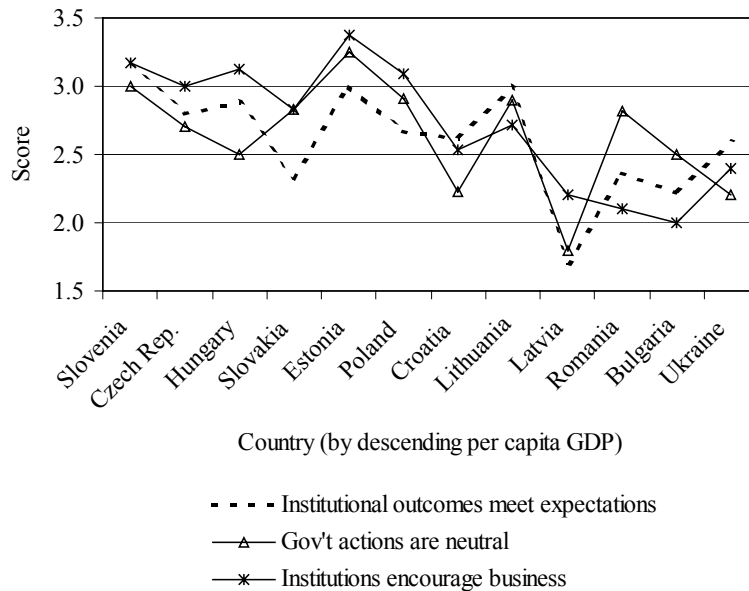
Figure 6: Expressed Confidence in Government and Public Institutions

Social Capital

As indicated in our discussion on social capital, trust in the people in one's community and trust in the government are important for economic development. Average measures of trust in people and government are plotted in Figure 7. The trust index is obtained from responses to questions in the stakeholders' survey, with the measure ranging from 1 (total lack of trust) to 5 (complete trust). Again, countries are arranged from highest to lowest GDP on the abscissa. Somewhat surprisingly, trust in people remains constant as income declines, but trust in government falls.

- - - - Trust government ———— Trust people in community
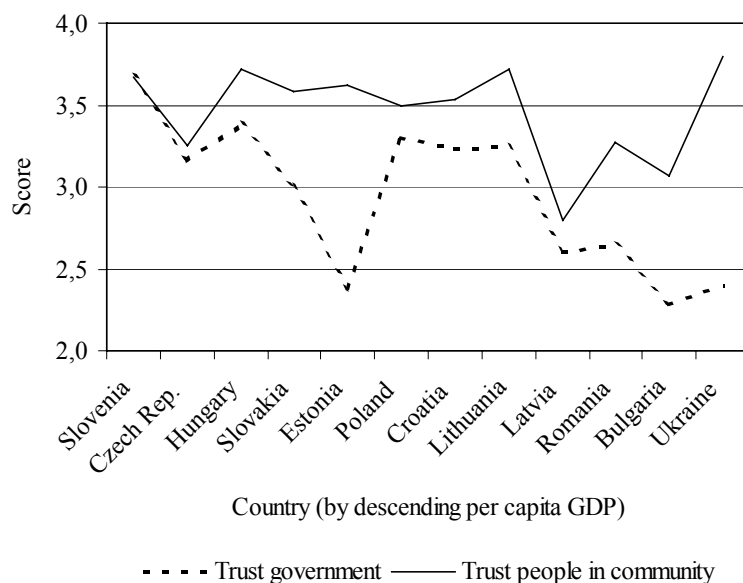
Figure 7: Trust in Government and People

Finally, Transparency International (2001) in Berlin develops an annual corruption perceptions index (CPI). It is based on data from 14 sources (surveys of businessmen, the general public and country analysts) from seven independent institutions (see Lambsdorff 2001a, 2001b; The Economist, 2001c). The CPI ranges from 10 (highly clean) to 0 (highly corrupt). Finland (CPI of 9.9) appears to be the least corrupt country and Nigeria (1.0) possibly the worst, with the 12 central and eastern European countries in our study falling in the middle to the low end of the scale (table 3.). Estonia is the least corrupt of our CEECs and Ukraine is the most corrupt. Since the 2001 CPI is the same for several CEECs, we employ an average of the 2000 and 2001 CPIs, which is provided in the last column of table 3.

Table 3.   Corruption Perceptions Index, 2000 and 2001

Country	2001 Index	Rank (out of 91)	2000 Index	Rank (out of 90)	Average Index (2000-2001)
Bulgaria	3.9	47	3.5	52	3.70
Croatia	3.9	47	3.7	51	3.80
Czech Rep.	3.9	47	4.3	42	4.10
Estonia	5.6	28	5.7	27	5.65
Hungary	5.3	31	5.2	32	5.25
Latvia	3.4	59	3.4	57	3.40
Lithuania	4.8	38	4.1	43	4.45
Poland	4.1	44	4.1	43	4.10
Romania	2.8	69	2.9	68	2.85
Slovakia	3.7	51	3.5	52	3.60
Slovenia	5.2	34	5.5	28	5.35
Ukraine	2.1	83	1.5	87	1.80

Source: Transparency International (2001)

6. Explaining agricultural success in Central and Eastern European Countries

Our objective here is to determine whether institutions and social capital affect the performance of the agricultural sectors in central and eastern European countries. Due to the nature of the econometrics (country-level observations cannot be regressed on stakeholder responses due to incompatibility of the left and right hand sides of the equations), the regressions use only limited summary data from the stakeholder survey. We use regression analysis to test for a statistical relationship between performance of countries' agricultural

sectors and measures of the institutional environment and social capital. In practice, measures based on expressed opinions can be used as explanatory variables in regression analysis, but they themselves cannot generally be regressed on secondary data (Bertrand and Mullainathan, 2001).

The dependent variables that we use to represent "performance" in the agricultural sector are given in model (1), p.6. We also constructed an index of agricultural performance using data from the survey of country subcontractors. It is based on responses to the following questions:

i) Does your country have an established Farm Accountancy Network following EU guidelines? The response is binary, with a value of 1 representing a 'yes' response. If the respondent indicated that their country employed a system similar to the EU one, a score of 0.5 was assigned; if the respondent indicated that their country was on the verge of establishing such an accountancy network, a score of 0.75 was given.

ii) What proportion of agricultural output is accounted for by state enterprises?

iii) What proportion of total employment is accounted for by the agricultural sector?

iv) What proportion of total land ownership is in private hands?

Responses to the latter three questions have a value between 0 and 1. The dependent variable – index of agricultural performance (IAP) – is constructed as

$$IAP = 0.25 \left[i + (1 - ii) + (1 - iii) + iv \right] \tag{3}$$

The IAP is not based on opinion questions and takes on values between 0 (poor performance) and 1 (excellent performance). It measures the success or extent to which a country's agricultural sector deviates from that found under a communist system. Clearly, some countries had progressed further towards communism in agriculture than others, so this static measure fails to address the dynamics within the sector since 1990. Nonetheless, in the absence of another measure of "performance", we feel that "nearness to an EU-type sector" is the best measure available. Values of the index of agricultural performance are provided in table 4.

Table 4: Indexes of Agricultural Performance, Central and Eastern European Countries

Country	IAP	Country	IAP
Bulgaria	0.63	Lithuania	0.81
Croatia	0.83	Poland	0.82
Czech Rep.	0.88	Romania	0.58
Estonia	0.76	Slovakia	0.82
Hungary	0.94	Slovenia	0.67
Latvia	0.84	Ukraine	0.24

Each of the four dependent variables was regressed on the 15 explanatory variables described in table 5. (Variables 9, 10, 13, 14 and 15 in table 5 are derived from the survey of stakeholders.) Since the number of observations is 12 and the explanatory variables 15 a step-by-step regression procedure was employed. For each model, explanatory variables were introduced one at a time in the order given in table 5. If the t-statistic on an entered variable was less than 1.0, the variable was removed in the next step. The order for entering variables was specifically chosen so control variables entered before institutional and social capital variables to ensure that the latter were the true drivers of agricultural success. The final regression results are provided in table 6.

Table 5: Description of Explanatory Variables used in the Regression Models

Control variables
 1. GDP per head in 1990 ($US)
 2. Change in GDP between 1990 and 1999 (ratio)
 3. 1999 rate of inflation (proportion)
 4. 1999 unemployment rate (proportion)
 5. Public debt as a proportion of GDP in 1999
 6. Government spending as a proportion of GDP in 1999
 7. Foreign direct investment in 1999 ($US per person)
 8. Average farm size (ha)

Institutional and social capital variables
 9. Index indicating effectiveness of environmental monitoring (1 to 5, with 1=least)*
 10. Index indicating effectiveness of environmental enforcement (1 to 5, with 1=least)*
 11. Index of economic freedom (0 to 10, with 0=least freedom)
 12. Corruption perceptions index (0 to 10, with 0=most corrupt)
 13. Index indicating trust in people (1 to 5, with 1=least trust)*
 14. Index indicating trust in government (1 to 5, with 1=least trust)*
 15. Index indicating degree to which government actions are considered neutral people (1 to 5, with 1=least trust)*

* indicates variable was constructed using data from survey of stakeholders.

Interestingly, the institutional environment and social capital are the most important factors explaining success in agriculture, regardless of how success is measured. Of the control variables, only public debt (model #1), foreign direct investment per person (models #2 and #4), change in GDP between 1990 and 1999 (model #3), and farm size (model #4) – four of eight variables – are important in explaining agricultural success in the central and eastern European countries being considered for membership in the EU. Of the institutional environment and social capital variables, trust, economic freedom, perceived corruption and the extent to which the government is perceived as being neutral are the most important factors explaining economic success – or six of seven potential variables. The economic freedom index and perceptions about government neutrality are used to represent the "protection of private property" variable.

Consider each of the models in turn. Public debt, economic freedom, and trust in government explain the change in agricultural output as a proportion of GDP. From table 1, the signs on the three entered explanatory variables are as predicted for two of the variables. Greater public debt (+ sign) and less economic freedom (– sign) result in lower overall economic growth, causing agricultural output to increase relative to output in other sectors. We postulated that, as trust in government increases, workers would move out of agriculture into other sectors, thus reducing agricultural output and increasing output in other sectors. The empirical results show an opposite relationship, but this might be due to the fact that government plays a bigger role in agriculture than in other sectors of the economy and respondents are agricultural stakeholders after all. An expressed trust in government therefore implies that public policies will tend to favour the agricultural sector, perhaps to the detriment of other sectors, causing agriculture's share of GDP to increase.

In model #2, the signs on foreign direct investment and trust in people are as expected (see table 1), but the sign on perceived corruption (a lower score implies higher perceived corruption) is opposite what is expected. However, neither perceived corruption nor trust is statistically significant.

Table 6: Regression Results[a]

Explanatory Variable	#1 Δ in agric output 1990-98 as proportion of GDP	#2 Δ in agric employ 1990-98 as proportion of total employ	#3 Average annual growth in value added as % of GDP, 1989-99	#4 Index of agricultural success[a]
Intercept	-0.101 (-0.20)	2.580 (3.41)*	4.642 (0.57)	0.284 (0.30)
1990-98 growth in GDP			6.460 (2.07)	
Public debt	1.056 (3.05)**			
Per capita FDI		-0.002 (-3.50)*		0.003 (3.38)**
Farm size				-0.001 (-3.89)*
Economic freedom	-0.074 (-1.42)		-1.127 (-1.90)	0.149 (1.30)
Perceived corruption		-0.066 (-1.03)		
Trust in people		-0.322 (-1.44)	-3.825 (-1.64)	
Trust in government	0.260 (1.75)			
Index for monitoring of environmental laws				1.349 (3.84)*
Government actions are neutral			2.892 (1.40)	-1.284 (-3.46)**
R^2	0.5645	0.7054	0.6805	0.9376
F-statistic	3.457	6.384**	3.727	18.025*

[a] t-statistics provided in parentheses. * indicates statistical significance at the 1% or better level and ** at 5% level or better.
[b] Estimated as a logit model, but in log-odds form so that OLS regression could be used.

In model #3, change in GDP is statistically significant but has an estimated coefficient that is opposite in sign to what is predicted in table 1. An interpretation opposite that given in table 1 is that agriculture is an economic driver in developing countries, with an increase in agriculture's share of total value added not unexpected as the economy grows. Trust in people has the correct expected impact. The predicted impact of property rights protection is unclear (table 1), and this appears to be supported by the evidence. In the regression, the estimated coefficients on economic freedom and "the perception that government acts neutrally" have opposite signs, although the sign on the latter is statistically insignificant.

Finally, model #4 is perhaps the easiest to interpret, because the index of success is not directly related to GDP. As expected, higher levels of FDI per head will increase success in the agricultural sector. Increased farm size reduces success, but that is because countries such as the Ukraine continue to have large, inefficient (even state-run) farms. The larger, efficient farms of the Czech Republic do not offset this impact. Monitoring of environmental laws and higher economic freedom are indicative of institutions associated with capitalistic countries, and lead to greater success in the agricultural sector of CEECs. The perception that government acts neutrally has an opposite impact on agricultural success to what might be expected (as was the case for trust in government in model #1). Perhaps this is because those in agriculture – the stakeholders that answered this question – prefer a government that acts in anything but a neutral fashion towards the agricultural sector.

Despite some contrary findings, what the empirical analysis presented in table 6 indicates is the importance of institutions and social capital in explaining "success" in the agricultural sectors of the CEECs. This finding supports the central theme of this study.

7. Conclusions

Institutions and social capital play an important role in economic development. It is not surprising, therefore, that institutions and social capital are important variables explaining why the agricultural sector in some central and eastern European countries performed better than that in other CEECs. In particular, the effectiveness of government (as measured by its perceived neutrality and consistent enforcement and monitoring of laws) and trust explain some of the success of agriculture. The lesson is that, if countries in central and eastern Europe hope to achieve a level of agricultural performance approaching that of the EU-15, it is necessary that their governments become more efficient, more consistent in application of the rule of law and less corrupt. In addition, efforts also need to be made to increase the overall level of social capital in civil society. While political will can achieve the former, the task of building social capital is much harder. However, since lack of social capital can be an obstacle to attainment of living standards comparable to those in the extant EU, all members in society must be involved in addressing this task.

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