Quality of national governance and rural development: The case of the European Union countries

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Paper prepared for presentation at the EAAE 2014 Congress
'Agri-Food and Rural Innovations for Healthier Societies'

August 26 to 29, 2014
Ljubljana, Slovenia

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Abstract: Employing correlation analysis, we investigate whether rural development in the EU countries is associated with their institutional quality represented by "good" governance indicators of the World Bank (voice and accountability, political stability, government effectiveness, regulatory quality, control of corruption). Generally, our results provide empirical support for the view that better nation-state governance goes hand in hand with better performance of rural economy and show that in new member states those relationships, in many cases, are stronger than in the oldest ones. Improving government quality in new member states would help their rural areas to achieve better convergence with the EU-15.

Key words: institutional environment, rural areas, development, European Union

1. Introduction

Historically, agriculture and, therefore, rural areas have been considered by the governments of many countries as an exceptional case for interference. Consequently, dilemmas concerning the appropriate role of government in the development of agriculture and rural areas as well as suitable institutions and policies to fulfil this role have been debated in the economic literature for a long time. Obviously, in the developed countries, like the EU members, rural development is not longer synonymous with agricultural development since agriculture, generally, is not the principal sector in their rural economies. However, it still plays the crucial role in managing land and other natural resources as well as in the expansion of many rural activities, goods and services depending on agriculture, so remains vital for rural prosperity.

Recently, we observed the growing interest of researchers (particularly institutional and political economists) in the quality of government institutions, good governance and related concepts. As a result of this concern, a quite large body of empirical evidence has been collected to show that strong economic and political institutions at the domestic level as well as effective ways by which they are enforced (for example, property rights, the rule of law and democracy) are (or might be) good for economic performance, economic growth and social welfare, both in developing and developed countries.

Due to the paper length limitation, it is impossible to provide here in-depth literature review on the subject. Some major efforts of such research should yet be mentioned and they include: Mauro (1995) who studied the relationship of corruption and bureaucratic efficiency with per capita GDP growth in 67 countries over the 1960-85 period; Knack and Keefer (1995) who investigated the institutional roots of growth in per capita GDP in all countries covered by indices provided by the International Country Risk Guide (ICRG) and the Business Environmental Risk Intelligence (BERI) in the years 1974-1989; Alesina et al. (1996) who analyzed the impact of political instability on per capita GDP growth in a sample of over 100 countries around the world in the period 1950-1985; Assane and Grammy (2003) who compared the effects of institutional efficiency and quality (government performance and political risk) on per capita GDP growth between less- and medium-developed states in 1989-1995; Rodrik et al. (2004) who explored the importance of the rule of law and property rights protection in explaining cross-country differences in per capita GDP by using data from 137

states for 1995; Law and Bany-Ariffin (2008) who estimated association between government quality (government corruption, rule of law, bureaucratic quality, repudiation of contracts by government, risk of expropriation) and per capita GDP for 72 countries and their groups at different economic development levels over the period 1980-2001; Aghion et al. (2009) who studied empirically how political institutions (democracy, political rights and civil liberties) affect production and GVA growth in less and more technologically advanced sectors of 180 economies in the years 1963-2003.

Building strong, transparent government and establishing institutions of good governance were placed high on the political and academic agenda for reforming the EU's post-socialist countries; first time during their political and economic transition at the beginning of the 1990s, and then during the EU pre-accession periods. Relationship of various dimensions of state governance quality with economic growth and development in transition states (inter alia the current EU members from the CEE region) was empirically studied by Chousa et al. (2005), Redek and Sušjan (2005) and Próchniak (2011). Chousa and co-authors (2005) observed, in their study of 20 former socialist countries over the period 1990-2000, that institutional efficiency and democracy help their economies grow faster and achieve successful conditional convergence with the EU. Redek and Sušjan (2005), examining the interrelation between institutional quality and economic development in 24 transition countries over the 1995-2002 period, found the positive correlation between per capita GDP and the Heritage Foundation indexes of economic freedom. Próchniak (2011) employed the same indexes to analyze the impact of economic freedom on the economic growth in 10 EU's CEE member states from 1993 to 2009. His findings suggest that more economic freedom fosters economic growth in those countries.

In spite of a large body of literature on the subject, there are limited empirical studies assessing the linkage of state governance institutions with economic and social performance of rural areas in the EU, especially in the new member states from the Central and Eastern Europe. Our research attempts to contribute to fulfilling this gap and would provide a novel contribution to political economy of rural areas in the EU.

Since the focus of our paper concerns the quality of government and good governance, we are probably expected to provide critical review of definitions of those concepts. Here, however, we show only those which seem to be the best suited to our research. For an overview of alternative definitions and their discussion we suggest to refer to La Porta et al. (1999), Andrews (2010), Rothstein (2011), Holmberg and Rothstein (2012), Agnafors (2013).

Notions of quality of government and good governance refer to a desired character of the exercise of public authority (Agnafors, 2013). The definition offered by Huther and Shah (2005: 40) describes governance as "*a multifaceted concept encompassing all aspects of the exercise of authority through formal and informal institutions in the management of the resource endowment of a state*". Widely cited Kaufmann et al. (2011) define governance as "*the traditions and institutions by which authority in a country is exercised*." Their approach to governance was adopted by the World Bank and served as a basis for construction of the worldwide governance indicators which are employed in our empirical work.

We agree with Andrews (2010) and Rothstein (2011) that concepts of good government and good governance denote different things in different countries. Moreover, they mean diverse things to different scholars and practitioners (for overview see Grindle, 2010). To take some examples, for La Porta et al. (1999) good governance means good for economic growth; for Huther and Shah (2005) – good for quality of life enjoyed by citizens; for Diamond (2013) – that which promotes democracy and delivers broad improvement in people's life, fights against corruption and power abuse and strengthens the rule of law.

The remainder of the paper is organized as follows: The section 2 provides a description of methods and sources used in the present study. Section 3 reports the results of an econometric analysis of the relationship between good government and governance attributes and key variables describing rural economy and agriculture. The final section summarizes some of the main results and offers conclusions.

2. Methodology and data

Our research draws on the new institutional economics and new political economics (Demsetz, 1967; North, 1990; March and Olsen, 1989; Williamson, 2000; Ostrom, 2009). Within these streams of economic thought, institutions – either formal or informal – are generally understood as "*the rules of the game in a society*" while governance is "*playing the game*". Institutional and political factors are believed to be powerful in explaining why countries or regions differ in economic and social performance and human well-being.

The main objective of the research was to explore whether quality of state governance is correlated with rural development in the European Union countries. Based on the literature review, it was hypothesized that in states having better performing governments (government institutions) economic (and social) situation of rural areas is better. As an agricultural sector is an important foundation of rural development, additionally we have examined some relationships between its characteristics and governance indicators.

A set of variables describing rural economy of the EU states was employed. They cover various dimensions, such as: agricultural output and productivity, agricultural foreign trade, technical progress in agriculture, rural economic growth and standard of living, rural labour market situation, etc. The importance of rural areas in each country is represented by the rural proportion of total area, population, GVA and employment at a country level. Rural economic development is measured by per capita GDP (expressed in PPS, as % of EU-27 average) and also is reflected in the structure of the rural economy and rural employment (the primary and tertiary sectors' share of GVA and employment). Rural labour market conditions are captured by both the employment and unemployment rate. Educational attainment and internet take-up were chosen as proxies for living standards of rural population. Level of agricultural development is expressed by an average farm acreage, labour productivity and agricultural investments. Agricultural technical progress is represented by farm machinery equipment.

In the literature, researchers widely accepted that the institutional quality can be measured with a range of perception-based indices. In our research, quality of governments and governance at a country level is represented by subjective empirical indicators of governance suggested by Kaufmann et al. (2011) and provided by the World Bank's World Governance Indicators database (Table 1).

Statistical data on economic and social situation in the rural areas as well as agricultural sector indicators were drawn from the Eurostat and World Bank's World Development Indicators databases. The choice of variables was constrained by the availability of comparable data.

The analysis in this study refers to the European Union (consisting of 28 or 27 member states – with exclusion of Croatia) as a whole and additionally compares the two subgroups of countries characterised by different levels of economic development and time of EU accession, namely pre-2004 members or the „old" EU-15 versus post-2004 members or the „new" EU-13 (or EU-12). Not only intuition but also literature suggests that richer countries in general have stronger and more efficient economic and political institutions.

Table 1. Description of governance indicators

Acronym	Variable description
WGI	Worldwide Governance Indicators (scores from -2.5 to +2.5, with larger values signifying a better score)
VA	Voice and Accountability – score indicating perceptions of political rights, civil freedom and media independence (a proxy for democracy)
PS	Political Stability/Absence of Violence – score indicating perceptions of the likelihood that the government will be destabilized or overthrown
GE	Government Effectiveness – score indicating perceptions of the quality of public services, the civil service and policy formulation and implementation
RQ	Regulatory Quality – score indicating perceptions of the ability of the government to formulate and implement sound policies and regulations
RL	Rule of Law – score indicating perceptions of the confidence in the rules of society and rule-abiding (the quality of contract enforcement, the police and the courts, the likelihood of crime and violence).
CC	Control of Corruption – score indicating perceptions of the extent to which public power is exercised for private gains (i.e. of political corruption)

Contrary to the dominant tendency observed in the scientific literature, our ambition was not to use sophisticated statistical and econometric models. Rather, we applied very simple technique of Pearson correlation analysis. Correlation coefficients were estimated for EU-28 (EU-27) economy and two subsets of countries, and compared for selected time periods. We should note here that the correlation does not imply causality.

3. Empirical results

In this section we show the results from examining the relationship between six indicators of nation state governance quality and various variables representing economic and social condition of rural areas and agricultural sector development in the EU member states.

First, we focus on those relationships for rural areas looking at the differences between the two subsamples of countries over the same periods of time (Table 2 and Table 3). Then, we limit our analysis to agricultural sector and four governance indicators, and compare correlations obtained for the years 1996, 2004 and 2012 (Tables from 4 to 7).

As concerns the measure of democracy, when considering rural areas in all EU-27 states, it is strongly, significantly, and positively correlated with their per capita GDP, employment (total and in service sector) as well as with labour productivity and investments in agriculture (Table 2). It is important to note that there is little evidence of higher coefficients for the EU-12 on the EU-15, suggesting that strengthening political rights and civil freedom in new member states is more important than in old ones for improving rural economic development and fostering agricultural productivity, which together affect living standards of rural population. In opposition to the EU-15 case, in the EU-12 no significant correlation was found between democracy indicator and rural unemployment rate, educational attainment of rural population, farm size and gross capital formation in agriculture. Positive correlation of voice and accountability indicator for EU-12 countries with contribution of rural tertiary sector to GVA and employment may suggest that democratic institutions would enhance growth of more technologically advanced sectors in rural areas.

The relation between political stability and country's economic situation presents an important issue in view of the recent increases in socio-economic inequalities and economy collapse in many countries. In our research, an indicator of political stability has, as expected, positive (and significant) correlation with rural GVA and GDP per capita (in the EU-27 as a

whole, as well as in EU-15 and EU-12), and additionally with relative number of rural population, employment and employment rates, the share of people with at least upper-secondary education (EU-27; EU-15), with access to internet (EU-15) and labour productivity in agriculture (EU-12). Political stability indicator is more frequently significantly correlated with selected rural and agricultural indicators in the EU-15 than in the EU-12.

Based on the literature, there is reason to believe that improvements in quality of government bureaucracy as well as in policy formulation and implementation encourage economic development and vice versa. So, our question is whether government effectiveness and rural development outcomes share a positive correlation. Our findings generally do not conflict expected relationships (Table 2). Across EU-27, government effectiveness measure is highly and positively correlated with rural GDP per capita and employment in tertiary sector, whereas reverse high correlation is with employment and GVA in the primary sector. Effectiveness of government is also positively associated with average farm size area, agricultural labour productivity and investments. In the oldest EU members, when compared with the EU-12, correlation coefficients are higher for rural employment, educational attainment and gross fixed capital formation. For the full sample and the two subsamples of countries government efficiency is insignificantly correlated with GVA in rural areas.

As we can see from Table 3, regulatory quality scores have statistically reliable correlation with all rural and agricultural variables for the EU-27, except for size of rural areas and GVA generated by the rural economy. Like in the case of indicators of government efficiency and democracy, there is high positive correlation between regulatory quality indicator and GDP per capita, employment (total and in service sector), productivity of farm labour and agricultural investments. Strong association of regulatory quality (and rule of law) with gross capital formation in agriculture may suggest that an inadequate protection by the state of property rights over physical capital could severely hamper farm investments. Surprisingly, in the EU-12 member states, agricultural investments are not significantly correlated to the regulatory quality, and less strongly to rule of law than in the EU-15 countries. However, we found that regulatory quality in new member states, compared with old ones, is stronger associated with employment and GVA in the primary sector. Across the EU-12 countries no statistically significant correlation is between regulatory quality and educational attainment and internet take-up in rural areas.

The indicator of rule of law, which reflects the citizens' perception of the security provision by the state, has statistically significant correlations with most of measures of rural economy performance excluding the employment size (EU-15; EU-12) and unemployment rate (EU-12) in rural areas (Table 3). We would suppose that the rule of law affects decisions of individuals to undertake or not undertake entrepreneurial activity and official employment, so the indicator was expected to be negatively correlated with unemployment rate. Indeed, an inverse correlation between the two is present but only for the EU-27 and EU-15.

The widespread presumption is that corruption in the country is shaped by the weak control (enforcement) mechanisms of the state and society, and that corrupt practices hamper economies (at least in the developed world). The first suggests that indicator of corruption control is relatively high correlated with both rule of law and regulatory quality indicators. As anticipated, control of corruption (like rule of law and regulatory quality) is tightly and positively associated with GDP per capita in rural areas, with slightly higher coefficient across less developed EU countries (EU-12). The latter can suggest that fighting political corruption is more crucial for economic development in new than old EU member states. Interesting finding is that control of corruption is negatively (although moderately) correlated to the rural population size in the EU-27, which indirectly indicates that with increasing (declining) percentage of rural population in national population political corruption is decreasing (increasing).

Table 2. Correlation results for selected rural and agricultural indicators and indicators of VA, PS and GE in the European Union

Indicators	Periods	VA			PS			GE		
		EU-27	EU-15	EU-12	EU-27	EU-15	EU-12	EU-27	EU-15	EU-12
Size of rural areas (% of country's territory)	2008-2010	-0.13	-0.14	0.28	0.17	0.25	-0.25	-0.06	-0.04	0.31*
Rural population (% of national population)	2008-2010	-0.34***	-0.01	0.01	0.24**	0.35**	-0.05	-0.26**	0.03	0.08
GVA in rural areas (% of total national GVA)	2008-2010	-0.19	0.01	0.23	0.32***	0.36**	0.43**	-0.14	0.04	0.29
Employment in rural areas (% of total national employment)	2008-2010	-0.31***	-0.01	0.07	0.25**	0.34**	0.01	-0.24**	0.02	0.14
GDP (PPS) per capita in rural areas (EU-27=100)	'2007'-'2009'	0.86***	0.63***	0.70***	0.39***	0.38**	0.86***	0.76***	0.43***	0.74***
GVA in tertiary sector (% of rural GVA)	2008-2010	0.43***	-0.37**	0.44**	-0.15	-0.29*	-0.14	0.40***	-0.23	0.43**
Employment in tertiary sector (% of rural employment)	2008-2010	0.80***	0.51***	0.67***	0.16	0.07	0.34*	0.77***	0.47***	0.78***
Rural employment rate (%)	2010, 2012	0.74***	0.72***	0.42*	0.48***	0.60***	0.28	0.73***	0.69***	0.39*
Rural unemployment rate (%)	2009-2010, 2012	-0.43***	-0.56***	0.01	-0.44***	-0.58***	-0.10	-0.36***	-0.47***	0.16
Employment in primary sector[1] (% of rural employment)	2009, 2011, 2012	-0.75***	-0.66***	-0.84***	-0.42***	-0.39***	-0.64***	-0.76***	-0.56***	-0.91***
GVA in primary sector (% of rural GVA)	2009, 2011, 2012	-0.82***	-0.51***	-0.89***	-0.41***	-0.39***	-0.68***	-0.77***	-0.40***	-0.88***
Internet take-up in rural areas (% of households with DSL subscription)	2010, 2012	0.33**	0.30	0.23	0.26*	0.21	0.34	0.29**	0.22	0.22
Educational attainment (% of adults attained at least upper-secondary education)	2010-2012	0.16	0.71***	0.18	0.42***	0.60***	0.21	0.19*	0.72***	0.08
Average size of farm (ha/farm)	2007, 2009	0.34**	0.55***	0.14	0.28**	0.32*	0.28	0.39***	0.63***	0.16
Labour productivity in agriculture (GVA/AWU; EU-27=100)	'2008', '2009','2011'	0.73***	0.46***	0.69***	0.15	0.06	0.44***	0.65***	0.40***	0.74***
Gross fixed capital formation in agriculture (% of GVA)	2008-2010	0.61***	0.69***	0.25	0.52***	0.69***	0.14	0.61***	0.62***	0.32*

Notes: [1/] Primary sector includes agriculture, forestry and fishing; EU-27= EU-28 without Croatia; '2009' etc. = three year (2008, 2009 and 2010) average; Pearson correlation coefficients significant at: * the 10% level; **the 5% level; *** the 1% level.
Source: Authors' calculations based on data from Eurostat and Word Banks' WGI database.

Table 3. Correlation results for selected rural and agricultural indicators and indicators of RQ, RL and CC in the European Union

Indicators	Periods	RQ			RL			CC		
		EU-27	EU-15	EU-12	EU-27	EU-15	EU-12	EU-27	EU-15	EU-12
Size of rural areas (% of country's territory)	2008-2010	-0.12	-0.15	0.45**	-0.06	-0.05	0.44**	-0.12	-0.12	0.47***
Rural population (% of national population)	2008-2010	-0.23*	0.03	0.08	-0.27**	0.07	0.04	-0.30**	0.00	0.22
GVA in rural areas (% of total national GVA)	2008-2010	-0.13	0.04	0.08	-0.15	0.07	0.17	-0.18	0.01	0.38**
Employment in rural areas (% of total national employment)	2008-2010	-0.21*	0.02	0.14	-0.24**	0.06	0.16	-0.28**	0.00	0.28
GDP (PPS) per capita in rural areas (EU-27=100)	'2007'-'2009'	0.75***	0.61***	0.34*	0.80***	0.52***	0.60***	0.83***	0.59***	0.66***
GVA in tertiary sector (% of rural GVA)	2008-2010	0.27**	-0.38**	0.43**	0.40***	-0.36**	0.56***	0.34***	-0.38**	0.41**
Employment in the tertiary sector (% of rural employment)	2008-2010	0.75***	0.55***	0.78***	0.77***	0.46***	0.73***	0.71***	0.47***	0.48***
Rural employment rate (%)	2010, 2012	0.68***	0.66***	0.23	0.77***	0.71***	0.53**	0.76***	0.69***	0.49**
Rural unemployment rate (%)	2009-2010, 2012	-0.39***	-0.49***	0.14	-0.40***	-0.45***	-0.02	-0.44***	-0.45***	-0.12
Employment in primary sector (% of rural employment)	2009, 2011, 2012	-0.67***	-0.67***	-0.78***	-0.71***	-0.57***	-0.81***	-0.62***	-0.62***	-0.66***
GVA in primary sector (% of rural GVA)	2009, 2011, 2012	-0.66***	-0.51***	-0.69***	-0.78***	-0.46***	-0.85***	-0.73***	-0.49***	-0.75***
Internet take-up in rural areas (% of households with DSL subscription	2010, 2012	0.25*	0.23	0.08	0.30**	0.22	0.26	0.31**	0.23	0.29
Educational attainment (% of adults attained at least upper-secondary education)	2010-2012	0.33***	0.78***	0.07	0.16	0.74***	0.05	0.11	0.65***	-0.10
Average size of farm (ha/farm)	2007, 2009	0.47***	0.69***	0.28	0.37***	0.66***	0.10	0.32**	0.63***	-0.10
Labour productivity in agriculture (GVA/AWU; EU-27 =100)	'2008', '2009','2011'	0.64***	0.43***	0.76***	0.66***	0.35**	0.75***	0.72***	0.44***	0.71***
Gross fixed capital formation in agriculture (% of GVA)	2008-2010	0.60***	0.61***	0.27	0.59***	0.59***	0.31*	0.60***	0.62***	0.17

Notes and source as in Table 2.

Table 4. Correlation results for selected agricultural indicators and indicator of democracy in the European Union countries (1996-2012)

Indicators	Voice and Accountability											
	1996			2004			2012			1996-2012		
	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13
Tractors/100 sq. km of arable land	0.44**	0.02	0.54*	0.14	-0.24	0.35	0.68*	0.50	0.23	0.20*	-0.23	0.37***
Labour productivity (GVA/worker/[1])	0.61***	0.02	0.46	0.58***	0.20	0.51*	0.48**	0.55*	0.30	0.49***	0.16*	0.35***
Agriculture, value added (% of GDP)	-0.69***	0.13	-0.54*	-0.77***	-0.28	-0.81***	-0.86***	-0.37	-0.90***	-0.71***	-0.19**	-0.65***
Employment in agriculture (% of total employment)	-0.75***	-0.52**	-0.61*	-0.72***	-0.50*	-0.75***	-0.67***	-0.70***	-0.66**	-0.67***	-0.48***	-0.64***
Agricultural raw materials imports (% of merchandise imports)	0.06	-0.25	0.10	-0.03	0.15	0.01	0.19	0.44	0.09	0.11**	0.08	0.10
Agricultural raw materials exports (% of merchandise exports)	-0.28	0.31	-0.25	-0.24	0.51*	-0.31	0.02	0.42	-0.20	-0.18***	0.42***	-0.20***

Notes: [1/] constant 2005 USD; Pearson correlations significant at: * the 10% level; ** the 5% level; *** the 1% level.
Source: authors' calculations based on the World Bank's WGI and WDI databases.

Table 5. Correlation results for selected agricultural indicators and Government effectiveness in the European Union countries (1996-2012)

Indicators	Government Effectiveness											
	1996			2004			2012			1996-2012		
	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13
Tractors/100 sq. km of arable land	0.35*	0.06	0.44	0.03	-0.42	0.32	0.40	0.59	0.15	0.14	-0.38**	0.30**
Labour productivity (GVA/worker)	0.64***	0.25	0.46	0.11	-0.13	0.32	0.50**	0.52	0.39	0.50***	0.27***	0.36***
Agriculture, value added (% of GDP)	-0.80***	-0.38	-0.84***	-0.66***	0.50	0.28	-0.76***	-0.19	-0.89***	-0.72***	-0.18**	-0.79***
Employment in agriculture (% of total employment)	-0.83***	-0.42	-0.82***	-0.73***	-0.64***	-0.83***	-0.70***	-0.62**	-0.78***	-0.71***	-0.55***	-0.80***
Agricultural raw materials imports (% of merchandise imports)	-0.15	-0.58**	-0.20	0.01	0.05	0.20	0.06	0.35	-0.16	0.05	0.04	-0.03
Agricultural raw materials exports (% of merchandise exports)	-0.32	0.07	-0.33	-0.12	0.38	-0.08	0.12	0.44	0.00	-0.15***	0.35***	-0.18**

Notes and source as in Table 4.

Table 6. Correlation results for selected agricultural indicators and Rule of law in the European Union countries (1996-2012)

Indicators	Rule of Law											
	1996			2004			2012			1996-2012		
	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13
Tractors/100 sq. km of arable land	0.39*	0.04	0.50*	0.10	-0.34	0.41	0.57*	0.54	0.28	0.20*	-0.35**	0.39***
Labour productivity (GVA/worker)	0.67***	0.25	0.53*	0.58***	0.24	0.52*	0.49**	0.46	0.36	0.54***	0.22***	0.46***
Agriculture, value added (% of GDP)	-0.69***	-0.33	-0.56**	-0.78***	-0.48	-0.82***	-0.80***	-0.27	-0.87***	-0.73***	-0.31***	-0.71***
Employment in agriculture (% of total employment)	-0.74***	-0.57**	-0.57*	-0.72***	-0.49*	-0.75***	-0.62***	-0.61**	-0.60**	-0.68***	-0.51***	-0.67***
Agricultural raw materials imports (% of merchandise imports)	-0.03	-0.41	-0.05	-0.01	0.01	0.12	0.10	0.28	0.02	0.03	-0.04	-0.02
Agricultural raw materials exports (% of merchandise exports)	-0.33	0.34	-0.37	-0.14	0.41	-0.08	0.03	0.28	-0.04	-0.18***	0.34***	-0.20***

Notes and source as in Table 4.

Table 7. Correlation results for selected agricultural indicators and perception of political corruption in the European Union countries (1996-2012)

Indicators	Control of Corruption											
	1996			2004			2012			1996-2012		
	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13	EU-28	EU-15	EU-13
Tractors/100 sq. km of arable land	0.42**	-0.01	0.60**	0.10	-0.38	0.58*	0.52*	0.33	0.21	0.17	-0.36**	0.50***
Labour productivity (GVA/worker)	0.58***	0.09	0.42	0.55***	0.14	0.60**	0.52**	0.49	0.57*	0.51***	0.19**	0.45***
Agriculture, value added (% of GDP)	-0.64***	-0.29	-0.51*	-0.67***	-0.35	-0.75***	-0.74***	-0.28	-0.80***	-0.64***	-0.25***	-0.61***
Employment in agriculture (% of total employment)	-0.32	-0.60**	-0.50	-0.67***	-0.56**	-0.77***	-0.57***	-0.63**	-0.55**	-0.61***	-0.54***	-0.61***
Agricultural raw materials imports (% of merchandise imports)	-0.12	-0.45	-0.07	0.03	0.19	0.11	0.15	0.11	0.24	0.10**	0.08	0.07
Agricultural raw materials exports (% of merchandise exports)	-0.40**	0.29	-0.59**	-0.15	0.46*	-0.25	-0.01	0.35	-0.13	-0.16***	0.41***	-0.27***

Notes and source as in Table 4.

According to our findings, in the EU-27 and EU-15 indicator on control of corruption is significantly, and as expected, positively and strongly correlated with capital accumulation in agriculture. Inverse correlation between corruption level and investments as a share of GDP was documented, among others, by Mauro (1997). The next important observation is that only in the EU-15 control of corruption measure is positively associated with educational attainment in rural areas, which suggests that political corruption is lower in the EU countries with greater percentage of persons having medium and high education.

The next step in our research is focusing on the relationships between agricultural sector performance and national governance in the EU-28 over the period of 1996-2012 as well as addressing the question of how stable these relationships have been over the time. We look at changes in correlation coefficients by their comparison in 1996, 2004 and 2012. Year 2004 correspondents with the middle of time series and marks the EU's 2004 enlargement.

When looking at the association between labour productivity in agriculture and the four governance indicators in the years 1996-2012 (Tables from 4 to 7), it appears that in the new members states it is stronger than in the old ones. Both across the EU-15 and EU-13 correlation coefficients are positive and statistically significant. Between 1996 and 2012 there has been decline in their value for the EU-28 and, in some cases, for both subsets of countries.

Similar to the results obtained for shorter periods (Table 2 and Table 3), over the years from 1996 to 2012 there were negative correlations between, on one side, employment and GVA in agriculture, and on the other, voice and accountability, government effectiveness (Table 4 and Table 5), rule of law and control of corruption (Table 6 and Table 7). Again, much tighter correlations are across the EU-13 than across the EU-15 states. Since 1996, coefficients of correlations between agricultural value added and the governance indicators have increased (in absolute value) in the EU-13 and the EU-28 (with exception of GE).

Agricultural mechanization (technology) level in the selected countries, represented here by the number of tractors per 100 square kilometres of arable land, generally exhibited strong positive association with all institutional indicators merely in the new member states in the long period (with strongest correlation for control of corruption). An interesting is that in the old member states those relationships were negative. Considering EU-28 as a whole, in the long period there were weak positive significant correlations of tractor intensity with the indicator of voice and accountability as well as with indicator of rule of law, but visible increase in their value between 1996 and 2012 was observed.

Since agricultural foreign trade is one of key issues in government policy formulation and implementation, it is important to discover whether and how agricultural raw materials imports and exports are associated with domestic governance institutions. Particularly interesting could be the foreign trade's relationship with corruption. According to Leite and Weidmann (2002), for instance, natural resource exports tend to increase corruption.

In our research, imports of agricultural raw materials (as percentage of merchandise imports) appear to be unrelated to governance indicators except for their negligible positive long-run relationship with control of corruption and voice and accountability for the EU-28. Export of agricultural raw materials was weakly inversely correlated with the four governance indicators across the EU-28 and the EU-13 over the 1996-2012, while the direction of association across the EU-15 was opposite. The open question is why better (worse) scores for quality of public services and policy formulation and implementation (GE) as well for the quality of contract enforcement (RL) in new member states were associated with decline (rise) in agricultural raw materials' share of merchandise exports. In individual years, correlations between exports and governance indicators were rarely significant.

Generally, we found difficult to discover any special pattern of change in correlations between agricultural measures and governance measures for new member states after 2004.

4. Summary and conclusions

This study examines how rural and agricultural sector development in the EU countries is associated with their national institutional quality represented by the subjective attributes related to the sphere of government and politics. Our research draws on new institutional economics and new political economics under which institutional and political factors are powerful in explaining cross-country differences in economic performance and population well-being. Institutions, either formal or informal, are generally understood by them as the rules of the game in a society. The way government provides institutions and the processes by which it enforces them can be called government governance (or game playing).

Our main findings and conclusions can be summarized as follows:

1. Assuming, that the researcher is confident in cross-national subjective measures of good governance provided by the World Bank, our general results of correlation analysis for the European Union countries show statistically significant relationships of those governance indicators with several measures of economic and social situation of rural areas and agricultural sector characteristics. Among those, the most crucial seems to be positive correlation of all governance indicators with rural GDP per capita, which in new member states of the EU is stronger (except for regulatory quality) when compared with the old ones. This suggests that improving government quality in new member states would help their rural economies to achieve better income convergence with EU-15 rural areas.
2. An important observation is also that in new member states, opposite to the old ones, there is no significant relationship between institutional quality and percentage of rural population with at least medium education, which would suggest, on the one hand, that in countries at a higher level of economic development good governance institutions can (but not necessary must) improve the rates of educational attainment, and, on the other hand, that by having more educated people in the rural areas the society can build more strong political institutions.
3. As concerns the tendencies in relationships between institutional indices and agricultural indicators in new member states from 2004 to 2012, we did not observe any specific changes after their accession to the EU. So, in order to capture any possible impact of this accession, further study, covering the longer period, is needed on the interaction between the quality of domestic institutional environment and agricultural economy performance.
4. Our research has some limitations: Although we considered different measures of governance, it is important to stress that they are highly correlated between themselves. The same is true for a number of economic and structural variables. Additionally, countries with similar values for particular governance indicator measured by the WGI can differ in their institutional characteristics measured by other indicators.
5. In terms of practical implications, results of our research (although do not provide casual evidence) suggest that national governments, especially in the new member states of the EU, should emphasize on improving those dimensions of institutional quality, which are likely to deliver more positive effects on quality of life and work in rural areas.

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