

REGULATORY QUALITY AND SUSTAINABLE ECONOMIC DEVELOPMENT

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Abstract

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Recently, an importance of often contradictory relationship between the environmental quality and economic performance has been discussed both at economic and political level. Whereas the quality of environment is an essential condition to simply survive and can be considered as one of consumers' goals, economic performance seems to be a primary goal of the majority of firms and consequently of the whole economies. The cohesion of both aspects then seems to be inevitable. However, necessary protection of environment can be reinforced only in presence of correct, enforceable institutions and sufficient wealth that shift preferences towards clean environment. The study is dedicated to the assessment of the relationship among institutional context, environmental quality and degree of economic development using panel vector autoregressive techniques for the sample of 166 countries. It is aimed to show, how the environment can be conserved taking satisfactory living conditions into account. The study demonstrates that more efficient institutional setting leads to a situation, in which environmental quality improves together with economic development.

Keywords: Sustainable economic development, regulatory quality, panel VAR, income-level country classification

1 INTRODUCTION

Issues regarding the quality of environment are reflected in official goals of various economies or communities (e.g. Europe 2020 Strategy, United Nations Rio+20 conference). These address often contradictory interests between producers searching for profits implying higher product at macroeconomic level, even at the expense of polluted environment, and consumers demanding an acceptable life quality in a clean environment. A sustainable compromise between economic and ecological interests can be facilitated by a strong institutional framework that helps to implement both economic and environmental policies. Sustainable development then necessarily depends on economic possibilities of an economy, its attitude to environmental issues, as well as on institutional framework that determines the implementation of particular policies. It can be expected that well-performing economies with strong institutions and regulatory policies

give support to environmental protection. Hence, the understanding of the relationship among economic, environmental and institutional aspects is important to achieve objectives of sustainable economic development.

Only few studies (Leitão, 2010; Pellegrini and Vujic, 2003) have dealt with the relationship among economic development, pollution and various institutions that affect the environmental protection. No study, however, has focused right on the capacity to manage and implement environmental protection policies, i.e. regulatory quality that plays a decisive role in pollution abatement. The aim of this study is, therefore, to show that institutional framework determines both economic development and environmental quality.

The study is organized as follows: the following section explains the importance of the topic and essential links among institutions, economic development and environmental quality; second part of the study justifying the empirical strategy is followed by the section discussing results; the last

part concludes and summarizes the motivation and main findings.

2 THEORETICAL BACKGROUND

During the last two decades, the economic development has raised income levels of millions of households, however, at the expense of clean environment and non-renewable resource depletion. This renders the sustainable aspect of economic development essential world's priority compromising immediate and long-term benefits for both people and planet.

In contrast, the attention was paid mainly to economic development and its determinants among which institutions, as the major goal of economies. Economic literature, both theoretical and empirical, reflected the main focus on the relationship between economic development and institutional quality, and is quite widespread and well developed.

The theoretical works are mainly inspired by the studies of new institutional economics (e.g. North, 1990) stating that strong formal legal rules facilitate economic exchanges and so support economic development, because well-established formal institutions as protection of property rights and contracts enhance market exchanges, investments and innovations at reasonably low cost. In order to protect from opportunism and to reduce uncertainty, regulatory quality, effective enforcement of rules and sanctions are necessary to be implemented by government of a state and reinforced by state coercive power to enforce rules (Aron, 2000). Thus, accountability, regulatory quality, rule of law, political stability, property rights protection and contract enforcement, and control of corruption are important aspects of growth-enhancing institutions. From this theoretical argument implies that inefficient formal institutions cannot prevent from high transaction costs and would be unable to support private activities, market exchanges, investments, and economic development. Thus, institutional settings are extremely important for fostering economic development. With an increased interest in the role of institutions in supporting economic development the demand for descriptive tools of institutional quality has emerged. A lot of work on this topic has been done by World Bank researches, who concentrate on the construction of institutional quality indicators.

Growing awareness of importance of institutional framework and its available measures stimulated empirical research. In fact, a large number of models are interested in the impact of various institutions as the rule of law, property rights protection, political stability or corruption on economic growth (Knack and Keefer, 1995; Mauro, 1995; Dollar and Kraay, 2000; Butkiewicz and Yanikkaya, 2006; Kouba and Grochová, 2012; Valeriani and Peluso, 2011; Acemoglu and Verdier, 2000; Grochová and Otáhal,

2013, respectively). This demonstrates that the analysis of institutional framework, in which an economy operates, has become substantial.

However, enhanced economic growth often influences environment. The dominant theoretical explanation of how stimulated economic development affects environment is twofold: (i) greater scale of production generates more pollution but (ii) higher living standard also changes attitude towards ecological issues. In particular, the demand for health and environmental quality increases with income. These preferences are then forced to be reflected in environmental regulations affecting the composition of output, and in the production technologies. More efficient technologies reduce the cost of pollution abatement and enable the shift to cleaner production or eventually save non-renewable resources.

The discussions on the link between economic development and environment are based on the concept of scarcity, roots of which can be found in the 1970s as some studies (e.g. Meadows *et al.*, 1972) published their results referring to unsustainability of economic growth. This problem was then elaborated in the 1990s when World Commission on Environment development introduced environmental sustainability aspects into economic growth strategies.

The description of the impact of economic growth on the quality of environment is often presented with the use of the Environmental Kuznets Curves. The relationship between economic growth and pollution is non-linear and follows an inverted U shape since at lower income levels the use of natural resources is elevated and an increased production results in more pollution, while when a certain level of income is achieved the awareness of the problems caused by the environmental degradation increases. This stimulates demand for environmental quality. Several empirical researches (e.g. Grossman and Krueger, 1995; Halkos, 2003; Mills and Waite, 2009) affirm the correlation between environmental quality and economic development. These models seem to conclude that the increasing income will automatically guarantee the improvement in environmental quality.

Andreoni and Levinson (2001) add that even in the case of absent environmental regulations the relationship between environmental quality and economic development can still be of an inverse U-shape, accompanied, however, by an inefficiently high amount of pollution. In fact, the establishment of strong institutions, such as clear legislation, political stability, and well-defined property rights are efficient instruments of environmental protection (Bhattarai and Hammig, 2004; Dasgupta *et al.*, 2001; Leitão, 2010; Magnani, 2000). The study of the institutions and their impact on the development of environmental policies maintaining a reasonable economic growth has thus become crucial.

Nonetheless its importance, the relationship between the environment and the institutional settings remains unexplored. The reason can be rooted in difficulties with measuring and limited availability of data on institutions. There are few studies showing that the successful implementation of environmental policies is affected by institutional settings and there are even less studies, two in particular (Leitão, 2010, and Pellegrini and Vujic, 2003), linking all three aspects of sustainable economic growth – the institutions, economic development and environment. Both studies focus on the impact of corruption on economic development and environmental quality. While Pellegrini and Vujic (2003) run OLS and 2SLS IV regressions to study the relationships per capita income – Corruption Perception Index, and Environmental Protection Stringency Index – per capita income, separately; Leitão (2010) estimates the effects of corruption on income level at the turning point of sulphur emissions – income relationship. They both conclude that the effect of corruption is not negligible in terms of economic development. Pellegrini and Vujic also add that corruption paralyzes environmental policy. Corruption, however, is not the only obstacle for economic development or environmental protection. The way, how relevant policies are implemented and realized is a key to economy and environment protection enhancement. This necessary, even if insufficient, condition has not been studied yet.

The lack of literature on this threefold relationship, as well as the possibility to deal with this issue from different methodological point of view represent challenges to contribute in this field of study having a possibility to profound the knowledge of the link among institutional framework, economic development and environmental quality. In particular, in contrast to all previously mentioned studies, this paper can, due to panel VAR (PVAR) method, explore the dynamic relationship, causal mechanism and the effects of institutional and economic changes on environment pollution taking into account the endogeneity problem. It enables verification whether the reinforcement of the institutional context can stimulate both the realization of environmental protection and economic development.

3 METHODOLOGY

In this study the relationship among economic development, institutions and pollution is modelled. Per capita GDP in constant 2005 US\$ (GDP) is used as the indicator of economic development emphasizing income level in a country. The governmental capacity to manage environmental issues is represented by World Bank regulatory quality index (RQ) that “captures [...] the ability of the government to formulate

and implement sound policies and regulations” (World Bank, 2006). The RQ index sums up to 15 weighted surveys, ranges between -2.7 – 2.25 , the higher value the better regulatory quality is indicated. The chosen pollution measure is that of carbon dioxide emissions in metric tons (EQ), which is most frequently used for the analysis since it is regarded as responsible for global warming. The dataset covers 166 countries in the time span between 1996 and 2013. Moreover, the chosen world economies are classified in accordance to World Bank classification based on income levels (low income (WB 1), lower middle income (WB 2), upper middle income (WB 3) and high income (WB 4) and this classification reflects actual evaluation of countries, i.e. the classification is not fixed for the whole time period.

The described relationship is estimated using the panel vector autoregressive model extending the traditional vector autoregression by Sims (1980) with panel-data approach. The general form of PVAR specifies our model as follows:

$$y_{it} = Aa_{it} + B_1y_{it-k} + \dots B_ky_{it-k} + e_{it}, \quad (1)$$

where y_{it} is a 3×1 vector of endogenous variables [GDP, RQ, EQ] for the i^{th} country in time period t , a_{it} is a vector of deterministic terms, A is the associated parameter matrix, $B_1 \dots B_k$ are 3×3 matrices of associated parameters of lagged variables y_{it} , the order of lags is denoted with k , and e_{it} is a vector of error terms that consists of three components:

$$e_{it} = \mu_i + \gamma_i + u_{it}, \quad (2)$$

where μ_i captures a country specific effect, γ_i represents time effects, and u_{it} is a white noise.

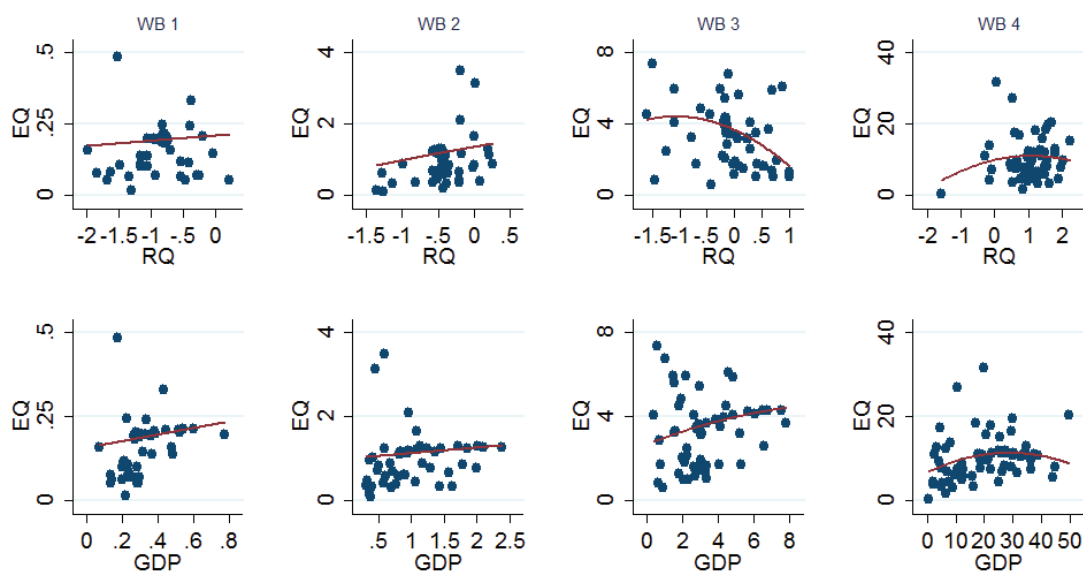
The PVAR model is chosen as it is considered to be suitable in dealing with endogeneity and without worrying about casual mechanism problems. Applying panel-data extension proposed by Love and Zicchino (2006) allows for unobserved individual heterogeneity. The PVAR also goes beyond resulting coefficients as it explores the dynamic effects of the variables to unitary shocks revealing their adjustments in time.

4 EMPIRICAL RESULTS AND DISCUSSION

The role of institutional framework in determining economic development and environmental quality is studied. For this purpose the following proxies are chosen: regulatory quality index (RQ); per capita GDP (GDP); and per capita CO2 emissions. Tab. I reports descriptive statistics of chosen variables. As can be seen mean per capita income corresponds to the country classification group, WB 1 achieving 373 US\$ per capita, while in WB 4 an average per capita income is 25,817 US\$. The only positive results of regulatory quality together with the highest level of pollution can be found in WB 4. The intensity of pollution corresponds

I: Descriptive statistics

Variable	Sample	Obs	Mean	Std. Dev.	Min	Max
GDP	whole sample	2656	9893.63	15365.3	72.455	112029
	WB 1	496	373.56	185.384	72.455	1127.06
	WB 2	592	1289.86	814.802	246.188	3940.6
	WB 3	704	4293.36	2567.43	407.276	15423.4
	WB 4	864	25817.2	18389.6	567.66	112029
RQ	whole sample	2656	0.05	0.755	-1.982	2.247
	WB 1	496	-0.82	0.144	-1.982	0.208
	WB 2	592	-0.467	0.127	-1.878	0.259
	WB 3	704	-0.143	0.171	-1.595	1.002
	WB 4	864	1.062	0.178	-1.574	2.247
EQ	whole sample	2656	4.891	4.63	0.015	62.102
	WB 1	496	0.199	0.072	0.015	1.266
	WB 2	592	1.199	0.374	0.101	8.076
	WB 3	704	3.825	0.643	0.604	9.032
	WB 4	864	10.983	2.327	0.257	62.102



1: Relationship among pollution, GDP and regulatory quality based on World Bank countries classification

to the incentives to economic development. The higher per capita income, the more CO₂ emissions are present. While in the poorest countries the average pollution is 0.2 metric tons of CO₂, countries with highest per capita income emit almost 11 metric tons.

Let's focus on environment in more detail now. Pollution is influenced by both economic development and institutional framework (see Fig. 1). In low-income and lower-middle-income countries environmental quality worsens as per capita income increases, while the effect of regulatory quality is negligible. This is due to low motivation to abate pollution as the priorities include basic needs. Upper-middle-income countries still do not have enough motivation to reduce pollution when GDP increases.

The situation can be improved only with stronger institutions focused on pollution abatement. An elevated income shifts preferences towards the environment in which people live. As a result people are aware of environmental issues and opt for environmental protection as active policies. These can be strengthened by clear and well-targeted policies that implement environmental awareness and protection into formal institutions. Therefore increased regulatory quality together with financial background (i.e. sufficient income level), are key aspects of pollution abatement.

Next, the threefold relationship is examined in more detail. Following the PVAR approach some data transformations are required (removing trend, maintaining variation, etc.). In order to avoid a problem of correlated fixed effects with

II: *Hadri test for unit roots (the null hypothesis: all the panels are stationary)*

	Levels		differences	
	z-statistics	p-value	z-statistics	p-value
GDP	65.793	0.000	-0.681	0.752
RQ	37.281	0.000	-0.431	0.667
EQ	37.035	0.000	-1.938	0.974

III: *Westerlund test of cointegration*

statistic	value	z-value	p-value
Gt	-1.459	-0.951	0.171
Ga	-3.153	6.293	1.000
Pt	-12.330	-0.194	0.423
Pa	-1.519	2.575	0.995

Note: 166 series, 2 covariates

the independent variables due to lags of dependent variables (Arellano and Bond, 1991), Helmert procedure, i.e. forward mean-differencing, is used to eliminate fixed effects (Love and Zicchino, 2006). Time specific effects are removed as well, subtracting the mean of each variable for each country-year, i.e. time-demeaning. Then the variables are stationarized using first differences (see Tab. II).

As the variables are found to be non-stationary, it is proceeded with Westerlund test for cointegration (see Tab. III). The absence of cointegration directs the research to short-run analysis with the use of differenced variables.

Having applied the identifying assumptions, having run the abovementioned tests and having transformed data, PVAR model is estimated. Five variants of the model based on the World Bank country classification are performed. Once unknown parameters are calculated, dynamic simulations are run. In particular, the impulse-response functions are computed using the estimated PVAR coefficients, standard errors are computed with Monte Carlo simulation, in which parameters of the model are recalculated 2000 times. The confidence intervals are the 5th and 95th percentiles of the distribution.

Tab. IV reports estimated coefficients of the three-variable system, in particular pollution, regulation quality and GDP per capita for the whole sample and for groups of countries classified according to World Bank classification – high-income, upper-middle-income, lower-middle-income and low-income countries. The results confirm a significant impact of income level and regulatory quality on environment pollution as the average effect of shocks in regulatory quality (-0.324) and even GDP (-0.247) reduce pollution in the whole sample. This is mainly due to upper-middle- and high-income countries (-0.573 and -0.516 response to the change in regulatory quality, -0.082 and -0.259 response to the GDP shocks), in which pollution abatement plays an important role as it becomes of high priority in cases of elevated average

incomes. In lower-middle-income and low-income countries this issues seems to be less relevant. The intuition behind is quite straightforward – in poorer countries the primary goal is to deal with poverty and other related issues even at the expense of polluted environment. Additionally, also GDP is influenced by the changes in regulatory quality as the average response is 0.284 confirming both theoretical and empirical works on institutions as determinants of GDP.

The impulse response analysis represents the dynamic view on the reactions to unitary shocks and for all included countries is reported in Fig. 2 (results for each particular group of countries is available upon request).

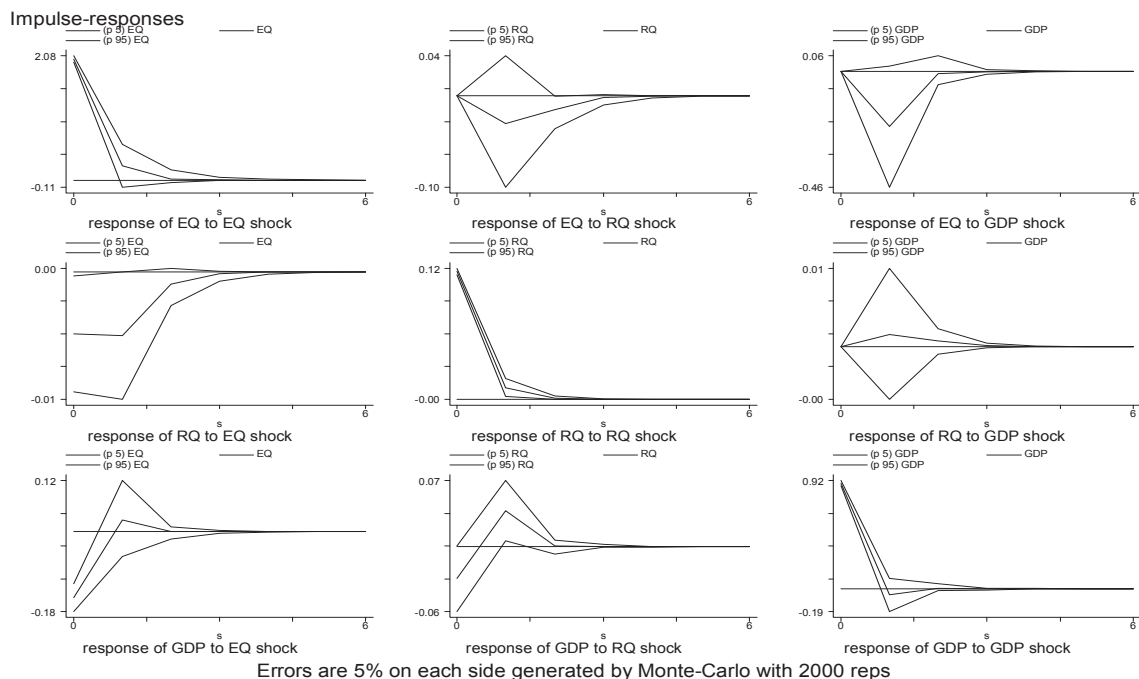
The regulatory quality affects environment directly and indirectly through the enhancement of economic development. The counter response of pollution to positive changes in ability to implement and realize environmental and economic development enhancing policies implies, that an improvement in regulatory quality increases pollution abatement.

The response of pollution to GDP shocks is negative, as well. The reduction of carbon dioxide emissions is greater in magnitude switching from lower-income level countries to higher-income level countries, with an exception of high-income level countries. This can be interpreted as the change in income leads to a higher environmental responsibility. The developed countries reach the aimed level of environmental protection so that the response to additional shock in GDP is not as big as in the countries in which sound environment is about to become at least a bit important. Moreover, the impulse-response functions show that the adjustment of environmental quality takes from 4 to 6 years and is quicker in higher-income level countries. This is consistent with the expectations that higher-income level countries can devote a greater financial amount for environmental quality correction after a GDP shock.

IV: PVAR model estimation

Whole sample				WB 1			
Response of:	Response to:			Response of:	Response to:		
	EQ _{t-1}	GDP _{t-1}	RQ _{t-1}		EQ _{t-1}	GDP _{t-1}	RQ _{t-1}
EQ	0.101 (0.060)*	-0.247 (0.145)*	-0.324 (0.152)**	EQ	0.106 -0.137	-0.086 -0.102	-0.014 -0.02
GDP	0.009 -0.027	-0.06 -0.094	0.284 (0.141)*	GDP	-0.067 -0.077	-0.111 -0.108	0.036 (0.016)**
RQ	-0.002 -0.001	0.001 -0.321	0.092 (0.042)**	RQ	-0.246 -0.187	-0.105 -0.203	0.183 (0.064)**
WB 2				WB 3			
Response of:	Response to:			Response of:	Response to:		
	EQ _{t-1}	GDP _{t-1}	RQ _{t-1}		EQ _{t-1}	GDP _{t-1}	RQ _{t-1}
EQ	-0.112 -0.173	-0.036 -0.069	-0.136 (0.076)*	EQ	0.022 -0.097	-0.082 (0.039)*	-0.573 (0.311)*
GDP	0.083 -0.106	-0.021 -0.072	-0.002 (0.001)*	GDP	0.018 -0.041	-0.055 -0.057	0.234 (0.130)*
RQ	0.018 -0.031	0.028 -0.037	0.019 (0.008)**	RQ	0.008 -0.012	0.001 -0.022	0.054 (0.021)**
WB 4							
Response of:	Response to:						
	EQ _{t-1}	GDP _{t-1}	RQ _{t-1}				
EQ	0.103 -0.111	-0.259 (0.073)**	-0.516 (0.283)*				
GDP	0.011 -0.027	-0.056 -0.099	0.887 (0.474)*				
RQ	-0.002 -0.001	0.001 -0.003	0.164 (0.061)*				

Note: Standard errors in parentheses, * p-value < 0.05, ** p-value < 0.01



2: Impulse-response functions among pollution, GDP and regulatory quality for the whole sample

SUMMARY

In the 1970s first results of unsustainability of economic growth were published. By that time the economic development represented the main goal of economies over the world. The economic development was often fostered, even at the expense of clean environment and non-renewable resource. With the new findings the focus on the sustainable aspect of economic development necessarily became a priority. A harmony between sound environment and economic development is searched. As if producers are not forced to use environmental friendly technologies, economic development is at the expense of sound environment, the use of such technologies must be enforced. The enhancement of environmental friendly economic development can be facilitated by strong institutional settings. Especially, the governmental capacity to formulate and implement suitable policies reflecting and supporting both economic development and environmental quality plays an important role in this problem. For this purpose well established institutions can support sustainable development.

This study is then aimed at the assessment of the relationship among environmental quality, institutional framework and economic development contributing so to not very defused literature. Starting from the sustainable economic development rationale, attention is paid to the impacts of changes in GDP and regulatory quality on environmental quality. In contrast to few empirical works in this field, this study applying a panel vector autoregression explores the dynamic relationship, causal mechanism and the effects of institutional and economic changes on environment pollution with the aim of finding the channels how the environment can be conserved taking satisfactory living conditions into account. Following the Environmental Kuznetz Curve background, it is expected that with increasing per capita income pollution evolves in the same direction, however, at certain level of income the turning point will emerge. Moreover, the institutional enhancement of both economic development and environmental protection can facilitate the achievement of the turning point.

The results bring the evidence of the relationship among environmental quality, regulatory quality and income per capita in the whole sample of 166 countries, as well as in the upper-middle- and high-income level countries. The average effect of shocks in GDP (−0.324) and even regulatory quality (−0.247) reduce pollution in the whole sample. The indirect effect of institutions on environment is through enhancing economic development (0.284). Thus, a reinforcement of regulation quality leads to a situation, in which pollution decreases together with increased per capita income. These conclusions are supported by the study of accommodation to shocks, i. e. impulse response analysis that shows that the negative response of pollution to positive changes in regulatory quality and per capita income takes from 4 to 6 years.

The results are in line with Pellegrini and Vujic (2003) who study the role of corruption in economic development and in implementing environmental policy separately. They find that institutions are relevant determinants of the per capita income and important factors in shaping environmental policies.

To sum up, pollution abatement and environmental protection can be realized if strong institutions with an elevated ability to formulate and implement sound and suitable policies, stimulating both economic development and environmental quality, are established.

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REFERENCES

- ANDREONI, J., LEVINSON, A. 2001. The Simple Analytics Of The Environmental Kuznets Curve. *Journal of Public Economics*, 80(2): 269–286.
- ARELLANO, M., BOND, S. 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58: 277–297.
- ARON, J. 2000. Growth and Institutions: A Review of the Evidence. *The World Bank Research Observer*, 15(1): 99–135.
- ACEMOGLU, A., VERDIER, T. 2000. The Choice Between Market Failures and Corruption. *The American Economic Review*, 90(1):194–211.
- BHATTARAI, M., HAMMIG, M. 2004. Governance, economics policy, and the environmental Kuznets curve for natural tropical forests. *Environmental and Development Economics*, 9(3): 367–382.
- BUTKIEWICZ, J. L., YANIKKAYA, H. 2006. Institutional Quality and Economic Growth: Maintenance of the Rule of Law or Democratic Institutions, or Both? *Economic Modelling*, 23(4): 648–661.
- DASGUPTA, S., MODY, A., ROY, S., WHEELER, D. 2001. Environmental regulation and 10 development: a cross-country empirical analysis. *Oxford Development Studies*, 29(2): 173–187.

- DOLLAR, D., KRAAY, A. 2000. *Property Rights, Political Rights, and the Development of Poor Countries in the Post-Colonial Period*. World Bank Working Papers.
- GROCHOVÁ, L., OTÁHAL, T. 2013. How Does Corruption in Central and Eastern Europe Hurt Economic Growth? Granger Test of Causality. *Ekonomický časopis*, 61(6): 563–577.
- GROSSMAN, G. M., KRUEGER, A. B. 1995. Economic growth and the environment. *Quarterly Journal of Economics*, 110: 353–377.
- HALKOS, G. E. 2003. Environmental Kuznets Curve for sulfur: evidence using GMM estimation and random coefficient panel data models. *Environment and development economics*, 8(04): 581–601.
- KNACK, S., KEEFER, P. 1995. Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures. *Economics and Politics*, 7: 207–227.
- KOUBA, L., GROCHOVÁ, L. 2012. Financial Crisis, Elite Political Instability and Economic Growth in Central and Eastern European Countries. In: STAVÁREK, D., VODOVÁ, P. (eds.): *Proceedings of the 13th International Conference on Finance and Banking*. 184–195.
- LEITÃO, A. 2010. Corruption and the environmental Kuznets Curve: Empirical evidence for sulfur. *Ecological Economics*, 69(11): 2191–2201.
- LOVE, I., ZICCHINO, L. 2006. Financial development and dynamic investment behaviour: Evidence from Panel VAR. *Quarterly Review of Economics and Finance*, 46(2): 190–210.
- MAGNANI, E. 2000. The Environmental Kuznets Curve, environmental protection policy and income distribution. *Ecological Economics*, 32(3): 431–443.
- MAURO, P. 1995. Corruption and Growth. *The Quarterly Journal of Economics*, 3: 681–712.
- MEADOWS, D. H., MEADOWS, G., RANDERS, J., and BEHRENS III, W. W. 1972. *The Limits to Growth*. New York: Universe Books.
- MILLS, J. H., WAITE, T. A. 2009. Economic prosperity, biodiversity conservation, and the environmental Kuznets curve. *Ecological Economics*, 68(7): 2087–2095.
- NORTH, D. C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- PELLEGRINI, L., VUJIC, S. 2003. Political Economy of the Environment. In: *Corruption, economic development and environmental policy*. Institute for Environmental Studies, IVM, the Netherlands.
- VALERIANI, E., PELUSO, S. 2011. The Impact of Institutional Quality on Economic Growth and Development: An Empirical Study. *Journal of Knowledge Management, Economics and Information Technology*, 1(6): 443–468.
- WORLD BANK. 2006. *A Decade of Measuring the Quality of Governance*. Washington, DC.