

## The effect of institutional quality on environmental performance (With emphasis on the Iran's economy)

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**ABSTRACT:** *Today's environment economic is important. Improving environmental performance On the one hand, requires knowledge of environmental threats to communities and on the other hand presents new approaches need to be developed to ensure environmental sustainability. Seems to be more research into the environmental quality of the affected communities has been neglected the quality of institutions in environmental protection. Institutional environment, one of the most important elements of the institutional framework - a structure that forms an economic system. An economic system based on the institutional environment is formed and maintained. The institutional environment - which consists of a set of institutions - state and market rules provide for a mechanism in addition to the structural relationships between entities in the economic system.*

*This approach is economics, institutional support, and the use of recently developed measures of institutional quality (IQ), to evaluate the environmental performance of the selected countries, in result of this research implies that development of institutions in different countries, and the important factor is the sensitivity of communities to environmental quality.*

**Keywords:** *Institutional quality, environmental performance*

### Introduction:

Twentieth century was the century of environmental crises. Crisis, such as the destruction of the ozone layer, storage of nuclear wastes and water pollution. Review of utilization of resources and increased pollution in the word represents an increase of human activities is an excess of capacity of the planet. Since the 1980s, following the failure of the classic model, with the consequences of increasing poverty, unemployment, environmental disasters, and the concept

of sustainable development was expressed by development experts and theorists. One of the components of sustainable development is effort to reduce harmful environmental standards.

Sustainable development has been defined in many ways, but the most frequently quoted

definition is from Our Common Future, also known as the Brundtland Report (1987):

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of **needs**, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of **limitations** imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

People concerned about sustainable development suggest that meeting the needs of the future depends on how well we balance social, economic, and environmental objectives--or

needs--when making decisions today (World Bank definition).

Now, the main question is what relationship between elements of institutions and environmental behavior? We have incomplete information and limited mental capacity by which to process information. Human beings, in consequence, impose constraints on human interaction in order to structure exchange. There is no implication that the consequent institutions are efficient. In such a world ideas and ideologies play a major role in choices and transaction costs result in imperfect markets (Douglass C. North 1990). Douglass (1990, 1995, and 1998) and Desoto (1989) emphasized the importance of institutional and political variables. Grossman and Krueger (1995) believed that the countries with per capita income under 8000\$, economic development associated with environmental degradation.

In this paper, examine effect of institutional quality on environmental performance with emphasis on the Iran's economy. In this study, we use annual data covering the 2000 to 2008 period for 100 countries and our method is panel data. Good governance indicator is representative of institutional quality, and other variables are per capita CO<sub>2</sub> and per capita GDP. Our results indicate that an increase institutional quality levels, reduces the pollution.

#### **LITERATURE REVIEW:**

First time, Kuznets searched about the relationship between economic growth and income inequality (1950). The theory of environmental Kuznets curve (EKC) reveals that environmental degradation increases at initial level of sustainable development and starts to decline as economy achieves high level of economic development. This relationship between environmental degradation and economic growth is term as inverted U-shaped curve.

Earlier papers by Shafik and Bandyopadhyay (1992), Panayotou (1993) and Selden and Song (1994) presented initial evidence that some pollutants followed and EKC pattern. These findings then led to some simple idea that economic growth is the remedy to environmental

problems. Luzzati and Orsini (2009) reviewed EKC curve for 113 countries, and haven't found any Kuznets curve in these countries. Using GMM estimator, Halkos and Tzeremes (2009) have found there isn't any relationship between environmental efficiency and income.

Grossman and Krueger (1995), Brajer, Mead et al (2008), Egli and Steger (2007) and Friedle and Getzner (2003) have shown that in first step, economic growth has positive effect on institutional quality, then in second step has negative effect on institutional quality.

Vollebergh, Melenberg et al (2009), Huang, Lee et al. (2008), Kelly (2003) and Khanna (2002) have obtained the inverse U relationship between economic growth and pollution.

In their study, Begun and Eicher (2008) have found weakly evidence on existence of EKC curve. Managi et al. (2008) found that quality of environment is improved if environmental regulation effect is stronger than capital labour effect. Alam and et al. (2007) in their study is discussed the effects of determinants of environment pollution in Pakistan. They obtained that increase of GDP and consumption of energy has positive effect on pollution and emissions of CO<sub>2</sub>.

#### **Environmental performance measurement indicators:**

Now a day, the issue of protecting the environment and prevent its degradation as one of the major challenges facing the international community has been proposed. Many international organizations have been raised different criteria for evaluating sustainable development. Such as United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP) and World Resources Institute (WRI). The goal of all institutions are proposed indicators for that whether countries success in achieving the multiple objectives of economic, social and environmental. Environmental indicators used to compare countries can include:

a) Seven Goals Millennium Development Goals (MDG7)

MDG7 emphasizes on ensuring environmental sustainability. The other aims are include eradicate extreme poverty and hungry, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS and other diseases, ensure environmental sustainability and develop a global partnership for development. Each MDG has target set for 2015 (The World Bank).

b) Environmental Sustainability Index (ESI)

The Environmental Sustainability Index (ESI) was a composite index published from 1999 to 2005 that tracked 21 elements of environmental sustainability in 5 group including natural resource endowments, past and present pollution levels, environmental management efforts, contributions to protection of the global commons, and a society's capacity to improve its environmental performance over time. It was launched by Professor Daniel C. Esty in cooperation with Columbia University's Center for International Earth Science Information Network (CIESIN) and the World Economic Forum's Global Leaders for Tomorrow Environment Task Force (Center for Environmental Law & Policy).

c) Environmental Performance Index (EPI)

The 2005 ESI report, published at the World Economic Forum's Annual Meeting in Davos, Switzerland, ranked 146 countries with regard to the environmental sustainability of their past, current, and projected socio-economic and institutional development trajectories. The ESI, as a precursor to the Environmental Performance Index, helped demonstrate new conceptual hypotheses concerning the drivers of successful environmental protection (Center for Environmental Law & Policy).

D) Environmental Vulnerability Index (EVI)

A vulnerability index for the natural environment, the basis of all human welfare, has been developed by the South Pacific Applied Geoscience Commission (SOPAC), the United

Nations Environment Programme (UNEP) and their partners. The index was developed through consultation and collaboration with countries, institutions and experts across the globe. This index is designed to be used with economic and social vulnerability indices to provide insights into the processes that can negatively influence the sustainable development of countries (Vulnerability index website).

**A review of the Iranian status in environmental performance indicators:**

Iran's environmental performance index rank among the 130 countries in the 2006 was fifty-three (World Bank 2006). This rating compared to developing countries with similar economic condition, including Mexico, South Africa, Indonesia, China and India are better that due to conditions of environmental, quality, productive natural resources. But the quality of the water resources and sustainable energy was not good and has weakest performance in air quality. Therefore in 2008, ranking the environmental performance of Iran descent with 14 steps, reached 68th among 149 countries (World Bank 2008). In order to implement of Agenda 21 of the programs development, Iran plans to develop a holistic approach to the environment. Thus, the Law of Development Plan Iran, to maintain environment, health and quality of life were noted.

In the below graphical view of the situation of Iran, among other countries in terms of environmental performance indicators have been identified:

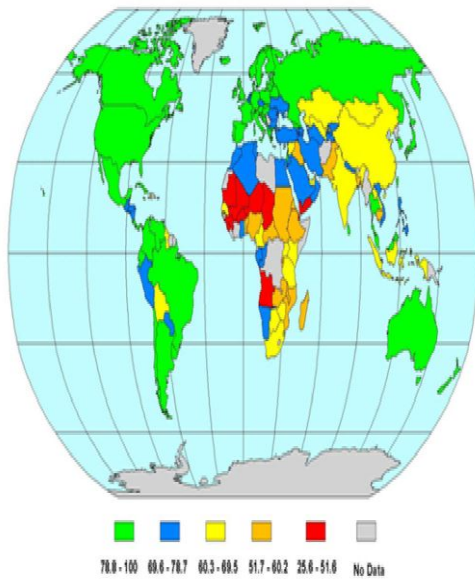


Figure (1): status countries in terms of environmental performance indicators (World Bank 2008)

### **The mechanism of the effect of institutional quality on environmental performance:**

Institutionalism school believes that the economy is not only the market, but the market is defined as an entity that is comprised of several sub-entities. And related with other institutions such as culture, government. The basic principle of institutional is based on the fact that the market alone is not a guarantee of distribution and resource allocation. Rather, it is an institutional and power organization in society that allows for the allocation of resources.

In this study, the index of good governance as a reflection of the institutional environment prevailing in the countries under case studies is used.

Good governance promotes equity, participation, pluralism, transparency, accountability and the rule of law, in a manner that is effective, efficient and enduring. In translating these principles into practice, we see the holding of free, fair and frequent elections, representative legislatures that make laws and provide oversight, and an independent judiciary to interpret those laws (United Nations General Assembly 1990).

Good governance is an indeterminate term used in international development literature to describe how public institutions conduct public affairs and manage public resources. Governance is "the process of decision-making and the process by which decisions are implemented (or not implemented). The term governance can apply to corporate, international, national, local governance or to the interactions between other sectors of society (World Bank).

The concept of "good governance" often emerges as a model to compare ineffective economies or political bodies with viable economies and political bodies. The concept centers on the responsibility of governments and governing bodies to meet the needs of the masses as opposed to select groups in society. Because the governments treated in the contemporary world as most "successful" are often liberal democratic states concentrated in Europe and the Americas, those countries' institutions often set the standards by which to compare other states' institutions when talking about governance. Because the term good governance can be focused on any one form of governance, aid organizations and the authorities of developed countries often will focus the meaning of good governance to a set of requirement that conform to the organization's agenda, making "good

governance" imply many different things in many different contexts. Based on a long-standing research program of the World Bank, the Worldwide Governance Indicators capture six key dimensions of governance include (World Bank):

1. Voice & Accountability, 2. Political Stability and Lack of Violence, 3. Government Effectiveness, 4. Regulatory Quality, 5. Rule of Law, and 6. Control of Corruption.

### Model specification and Data:

Review of studies on environmental performance, indicating positive and negative effects of economic growth on environmental quality of communities. New institutional economics approach used in this study to investigate the hypothesis that: 'institutional quality has a positive effect on environmental performance'.

We use annual data for 100 countries during the period of 2000 to 2008, containing per capita CO<sub>2</sub>, per capita real GDP and good governance index as reflection of institutional quality. They are obtained from World Bank Database. For estimate, we used panel data method. The form of panel data used provides us with greater number of data points than time-series or cross-sectional data sets. According to the division of the World Bank in 2008, are located in the following groups:

The 36 countries with high institutional quality, the 74 countries with average institutional quality and the 31 countries are low institutional quality that we choose 22 countries with high institutional quality, 54 countries with average institutional quality and 24 countries with low institutional quality. The countries shown in table (1):

Table (1): Countries' institutional quality differentiation

High institutional quality				
Hong Kong	Singapore	New Zealand	United States	Switzerland
Canada	United Kingdom	Ireland	Australia	Chile
Luxembourg	Estonia	Netherlands	Denmark	Finland
Austria	Iceland	Germany	Panama	Japan
Belgium	Australia	Bahrain	Sweden	El Salvador
Spain	Norway	Costa Rica		
Average institutional quality				
Portugal	Belize	Morocco	Hungary	Uganda
Turkey	Jordan	Albania	China	Kuwait
Nicaragua	Sri Lanka	Peru	Namibia	Madagascar
Korea, South	Ivory Coast	Mali	Thailand	
Brazil	Slovak Republic	Malaysia	Trinidad & Tob.	Bulgaria
France	Mexico	Botswana	Poland	Lithuania
Ghana	Latvia	Haiti	Cyprus	Egypt
Italy	Ireland	Bahamas	Barbados	Czech Rep.
India	Honduras	Tunisia	Uruguay	Bolivia
Zambia	Paraguay	South Africa	Yemen	Philippines
Pap. New Guinea	Kenya	Dominican Rep.	Greece	Croatia
Guatemala	Indonesia	Argentina	Guyana	Iran
Low institutional quality				
Tanzania		Cote d'Ivoire	Cameroon	Bangladesh

a	ussia	d'Ivoire	oon	esh
Rwanda	enin	Ecuador	Colom bia	Senegal
Pakistan	alawi	Gabon	epal	Sierra Leone
Chad	kraine	Algeria	Centra l Afr. Rep.	Guinea- Bissau
Congo, Dem. R.	Congo , Rep. Of	Venezu ela	Myan mar	Zimbab we

The applied model in this article is from the studies of Grossman (1991) and empirical experience EKC which is:

$$C_{it} = \delta_i + \beta_1 Y_{it} + \beta_2 Y_{it}^2 + \beta_3 Y_{it}^3 + \varepsilon_{it} \quad (1)$$

Where  $C_{it}$  is environmental pollution index,  $\delta$  is Country-specific effects,  $Y_{it}$  is per capita income and  $\varepsilon_{it}$  is error term. Institutional quality as a new variable into the model, basic model is defined as follows:

$$(2)$$

$$C_{it} = \delta_i + \beta_1 Y_{it} + \beta_2 Y_{it}^2 + \beta_3 Y_{it}^3 + \beta_4 IQ_{it} + \varepsilon_{it}$$

Where  $IQ_{it}$  is institutional quality of countries  $i$  which represents a good governance index.

**Empirical results:**

In the first step, we have done diagnostic tests for each of the four equations using F Limer and Hasman tests. The results are shown in tables 3 and 4.

Table (3): The result of F Limer test

	Independent variable: per capita income	Independent variable: per capita income
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			and institutional quality	
	F statisti c	Accept ed model	F statisti c	Accept ed model
100 countries	1.47	Panel data	1.37	Panel data
High institutional quality	2.4	Panel data	2.46	Panel data
average institutional quality	1.05	Panel data	1.05	Panel data
Low institutional quality	0.93	Panel data	0.55	Panel data

$$(1)$$

Table 4): The result of Hasman test

	Independent variable: per capita income		Independent variable: per capita income and institutional quality	
	F statisti c	Accept ed model	F statisti c	Accept ed model
100 countries	14.35 (0.0025)	Fixed effect	16.97 (0.002)	Fixed effect
High institutional quality	25.3 (0.000)	Fixed effect	25.1 (0.000)	Fixed effect
average institutional quality	19.5 (0.0002)	Fixed effect	14.3 (0.006)	Rando m effect
Low institutional quality	3.19 (.036)	Rando m effect	3.9 (0.418)	Rando m effect

Then, we estimate the main model for four equations. The result is showed in table 5 and 6:

Table(5): the results of estimating of per capita income on environmental performance

	All countries	High institutional quality	Average institutional quality	Low institutional quality
$C_{it}$	-0.32 (-1.54)	-1.79 (-1.17)	-0.42 (-1.51)	-1.05 (-3.02)
$\beta_1$	0.0005 (11.4)	0.0005 (2.98)	0.0005 (8.56)	0.0013 (5.07)
$\beta_2$	-9.2 (-4.3)	-1.04 (-1.47)	-1.26 (-3.6)	-1.29 (-3.27)
$\beta_3$	1.13 (4.46)	1.03 (1.49)	2.42 (5.2)	4.99 (3.03)
Number of countries	100	24	55	22
$R^2$	%73	%66	%77	%51.9
Adjusted $R^2$	%70	%61	%74	%51

Table(6): the results of estimating of per capita income and institutional performance on environmental performance

	All countries	High institutional quality	Average institutional quality	Low institutional quality
$C_{it}$	1.99 (1.96)	-17 (-2.5)	4.43 (2.52)	2.8 (1.67)
$\beta_1$	0.0005	0.0005	0.0005	0.0013

	(11.6)	(2.5)	(8.7)	(5.11)
$\beta_2$	-9.5 (-4.5)	-8.3 (-1.19)	-1.25 (-3.72)	-1.32 (-3.35)
$\beta_3$	1.12 (4.43)	8.9 (1.3)	2.37 (5.34)	5.2 (3.46)
$\beta_4$	-0.39 (-2.33)	-2.1 (2.38)	-0.7 (-2.61)	-0.7 (-2.33)
Number of countries	100	24	55	22
$R^2$	%74	%67	%74	%53
Adjusted $R^2$	%70	%62	%74	%52

The coefficients of  $Y_{it}^2$  and  $Y_{it}^3$  are significant. But the coefficients of  $Y_{it}^2$  and  $Y_{it}^3$  are not significant on high quality equations. The results confirm the Grossman and Krugman model and in all of model the shape of environmental incurve are N.

Notice that for every one unit increase in level of institutional quality in 100 countries, pollution reduced to 0.39, and in high institutional quality's countries reduced to 2.1, and in average institutional quality's countries reduced to 0.7 and reduced to 0.7 in low institutional quality's countries.

### Conclusion:

By using panel data method for 100 countries in 3 groups with high, average and low institutional quality, in this article, we analyze the effect of institutional environmental. Hence, by using annual for 2000 to 2008, we observed that threshold income level increase due to institutional quality in 100 countries. In high

institutional quality, institutional quality has positive effect on pollution.

According to N-shape of curve, it can be concluded that with economic growth, Kuznets curve increases.

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