

The Relevance of Public Governance to National Environmental Performance

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Abstract: The study aims to examine the influence of public governance on national environmental performance. Public governance in this study consists of four attributes, namely government accountability, political stability, government effectiveness, and regulatory quality. This study was triggered by the phenomenon that countries with excellent economic performance, but they do not always have an excellent national environmental performance. The study involved 155 countries member of World Bank countries. This study adopted a Purposive Sampling technique. Path analysis was applied in this study because there is a correlation among independent variables. Public governance was measured using the Worldwide Governance Indicator (WGI) scores by the World Bank. Meanwhile, environmental performance was measured using the Environmental Performance Index (EPI) score by The Yale Center for Environmental Law & Policy (YCELP). Simultaneously, the result indicates that government accountability, political stability, government effectiveness, and regulatory quality have a significant influence on national environmental performance. However, partially, only government effectiveness has a significant influence on national environmental performance. Meanwhile, government accountability, political stability, and regulatory quality do not have a substantial effect on national environmental performance.

Keywords: *Environmental performance; Government accountability; Political stability; Government effectiveness; Regulatory quality*

Introduction

Activities carried out by humans give a considerable influence on the environment (Cochran, 2017). There is plenty of evidence that human activity can influence the environment. One of the environmental issues related to the impact of human activities is global warming. Global warming, in general, is caused by industrialization and deforestation. Global warming occurs because of the accumulation of CO₂ in the atmosphere earth that comes from combustion activity

such as cars, planes, and coal plants caused by humans and activities deforestation and thermal stratification. The existence of a causal relationship between human activity with its environment began to raise awareness of the world community to preserve and preserve the environment. United Nations Conference on the Environment on July 15, 1972, in Stockholm, Sweden is the earliest evidence of human attention to the environment. The latest is the Sustainable Development Goals (SDGs) initiated by the United Nations (UN). It implies that environmental issues

are significant for the international community and at the same time, become a challenge to deal with it collectively (Scruggs, 1999). The Yale Center for Environmental Law & Policy (YCELP) developed index widely known as the Environmental Performance Index (EPI). It was developed for measuring national environmental performance using ten dimensions of issues related to environment namely; health impact, air, water and quality sanitation, water resources, agriculture, forestry, fisheries, biodiversity and habitat, and climate and energy.

National environmental performance is a reflection of practice of industrialization and environment policy and management (Handoyo, 2015). Generally, the nations with friendly environmental, they also have high economic prosperity. However, increasing industrialization tends to obstruct the quality of the environment (Roy & Goll, 2014). Alvarez (2014) argued that national environmental performance increases along with the rise of national revenues level. Economy growth reflected by national revenues per capita and environmental performance has a positive and significant relationship (Alvarez, 2014). Jahn (1998) argued that the nation with high Gross Domestic Product (GDP) has adequate financial resources to overcome the problems related to environmental issues.

However, if analyzed further, it was found that national environmental performance did not depend on GDP per capita. Based on EPI data in 2016, it was found that the country with the highest EPI score does not mean having the highest GDP. Finland has the highest EPI score, however its GDP per capita only \$43,090.25, which is lower than the GDP of Icelandic that has an EPI score in second place. French has an EPI score at position 10 (ten). However, the GDP of French is \$36,854.97, which is exceeding GDP per capita countries like Slovenia, Spain, Portugal, Estonia, and Malta, which has the EPI score above France. It began to arise

the thought that other factors affect the environmental performance of the nation other than economic conditions. Esty and Porter (2005) explained that there are significant differences in national environmental performance, even though they are on the same economic level. Based on the authors perspective, national environmental performance is not only a function of economic performance but also other aspects, such as public governance.

National environmental performance is influenced by two parties, which play an essential role, namely government as a regulator and private companies as industry players (Handoyo, 2015). According to the World Bank, regulation is one of the indicators used in assessing public governance of the nation. National environmental performance can be affected by the practice of public governance (Dasgupta 2006). There are six attributes of public governance, namely government accountability, political stability, government effectiveness, regulation quality, the rule of law as well as control of corruption. In this study, authors are focusing only on four attributes of six attributes. It refers to public governance attributes, namely government accountability, stability politics, government effectiveness, and quality regulation. The purpose of the study is to reveal the influence of public governance attributes on national environmental performance.

Literature Review and Hypothesis Development

Stakeholders theory

The concept of stakeholders theory developed by Freeman explains about corporate behavior and social performance (Ghomi and Leung, 2013). Stakeholders theory describe that the company has responsibilities to the parties that both directly or indirectly related to the company (Freeman, 1984). Based on stakeholder

theory, the company is the entity that operates not only for its own interests but also must give benefits to the related stakeholders. The existence of a company is influenced by the support of the stakeholders (Ghozali and Chariri, 2007). Therefore, companies should also contribute to the stakeholders. One of the most important stakeholders of a business organization is the government. Concerning the government, the business organization will follow the rules and regulations from the government, including the matter related environmental quality protection from the harmful effects of business operation.

Environmental performance

Environmental performance is a measure related protection of the environment, which includes water, air, land, ecosystems, and natural resources (Bran et al., 2011; Grafton and Knowles, 2003). According to Scruggs (1999), environmental performance is a result of human response to environmental pollution problems. In measuring national environmental performance, there is no specific standard indicator commonly used (Fiorino, 2010). According to Fiorino (2010), Environmental Performance Index (EPI) is an indicator that the most representative measurement in describing the national environmental performance. EPI provides a focus of attention on two purposes, namely (1) reduction of the ecological burden that has an impact on humans health and (2) protection of ecosystems and natural resources (Alvarez et al., 2014). The EPI final score is converted to a scale of 0 (very bad) up to 100 (very good).

Public Governance

The World Bank defines public governance as a way of implementation power in regulating the country. Governance is believed as the key to

achieving the goals that have been set by the government. In the context of government, most researchers, policymakers, aid agencies, and recipients assistance recognize that good governance is a fundamental recipe for achieving sustainable development (Kaufmann and Kraay, 2007). In helping measure public governance, the World Bank has issued a standard measure adopting credit rating mechanism used by world financial institutions. That measure is known as The Worldwide Governance Indicators (WGI). There are six attributes of public governance identified by the World Bank, namely (1) Accountability, (2) Political stability, (3) Effectiveness of government, (4) Quality of regulation, (5) Regulations and legislation, and (6) Corruption control. Each of these indicators has a score that ranges between -2.5 (weak) to +2,5 (strong).

Government Accountability and National Environmental Performance

Accountability is defined by the OECD (2005) as an obligation to present reports of the responsibility implementation through political structures and constitutional. Rationalization between accountability with environmental performance is that funds are collected from the community used by the government to provide facilities for the benefit of the wider community including health support to improve the quality of life of the community. The government is required to disclose in conveying performance has been achieved, including issues related to the environment (Rechtschaffen and Markell, 2003). According to Bianchini and Ravelly (2011), accountability has a relationship with environmental performance in terms of fiscal factors. The budget collected by the government from the community in the form of tax must accountable back to society. Therefore, the hypothesis is formulated as follows:

Hypothesis 1: *National environmental performance is affected by government accountability, the higher government accountability index, the higher national environmental performance will be*

Political Stability and National Environmental Performance

Political stability is associated with a conducive condition of government covering internal, regional, and international. Rationalization between political stability and national environmental performance equals thinking of the relationship between political stability and economic growth. Investors have interest and trust to invest their capital in a country with a stable political condition.

When a country has a stable political situation, then the country will not be preoccupied with political issues so the country can focus more on economic development, including environment issues (Handoyo, 2015) Kelleher et al. (2009) argued that the national environmental performance is dependent on the institution politics. It implies that if the political condition of a country is stable, then policies taken by the government are more focus on national development, including policies relating to environmental protection. Therefore, the hypothesis is formulated as follows:

Hypothesis 2: *National environmental performance is affected by national political stability, the higher national political stability, the higher national environmental performance will be.*

Government Effectiveness and National Environmental Performance

Government effectiveness refers to the capabilities of internal government institutions to achieve the objectives stated in national development planning

(Handoyo, 2015). If the government institution functions well, then the problems related to the environment will be solved. Effective government institutions will be more successful in fighting environmental degradation compared to weak government institutions (Duit, 2005). Therefore, the hypothesis is formulated as follows:

Hypothesis 3: *National environmental performance is affected by government effectiveness, the higher government effectiveness, the higher national environmental performance will be*

Regulations Quality and National Environmental Performance

According to Coglianese (2012), regulations is the rules and norms that are adopted by the government accompanied by the consequences in the form of sanctions for whom who break it. Regulation quality can be measured by identifying the ability of regulations in achieving the goals previously determined. The quality of regulation will determine the environmental performance of the country (Esty and Porter, 2001).

High-quality regulation will help realize public policy objectives which include safety, security, health, and environment (Treasury Board of Canada Secretariat, 2011). Strict regulations will provide incentives for governments and business organization to be more flexible to work together in achieving better environmental performance (Scruggs, 1999). Therefore, the hypothesis is formulated as follows:

Hypothesis 4: *National environmental performance is affected by regulation quality, the higher quality of regulation, the higher national environmental performance will be*

Research Methodology

This study treated public governance as an independent variable and national environmental performance as the dependent variable. Public governance in this study includes four attributes, namely government accountability, political stability, government effectiveness, and regulatory quality. This research involved 155 countries member of the World Bank selected using purposive sampling technique. The type of data used in this study is quantitative secondary data sourced from the Environmental Performance Index (EPI) report and the Worldwide Governance Indicators (WGI) report for the period 2010, 2014 and 2016. The data was obtained through the official website of YCELP and World Bank. The 2012 report data cannot be used because of differences in reporting data with the 2012 EPI report which made it incomparable with other reporting years. The analytical method used in this study is path analysis because there is an indication of a strong relationship among variables independent. Through path analysis, the direct effect of four attributes of public governance on national environmental performance, as well as its indirect effect can be identified.

The equation of the research model formulated as follows:

$$Y = \rho yX1 + \rho yX2 + \rho yX3 + \rho yX4 + e,$$

Where;

- Y = Dependent variable
- X₁, X₂ = Independent variable
- P = Path coefficient between independent and dependent variables
- e = residual variables

Results

This study applied a program named statistical data processing application Eviews version 10. The reason for using Eviews statistical application because of data was tested in this study is a type of panel data. The model test was conducted before doing the regression analysis and path analysis. The Chow test was conducted to identify the fitness research model. The Chow test is used to determine whether the selected model is pooled least square or fixed effect. H₀ is rejected if the value of probability F is smaller than Alpha, which is smaller than 0.05. H₀ is a pooled least square model and H₁ is a fixed effect model. The result of the Chow Test presented in Table 1

Tabel 1. Chow Test Result

Chow-Test	Statistic	Prob.
Cross-section F	1.517035	0.0011

Based on the information presented in Table 1 above, it can be identified that the probability of cross-section F is 0.0011 which means less than the value of α (0.0011 < 0.05) so that the decision taken is using the fixed effect model. Because the Chow test decision is to choose the fixed

effect model, then a Hausman test is needed to decide whether the panel data used in this study is better estimated by using a random effect model or still using the fixed effect model. Based on the results of the Hausman test that have been carried out obtained the following results presented in Table 2.

Tabel 2. Hausman Test Result

Hausman Test	Statistic	Prob.
Cross-section Chi-square (X ²)	1.334439	0.8555

Based on the information presented in Table 2 above, it can be identified that the value of chi-square(X^2) probability is 0.8555, which means that it is greater than

0.05 ($0.8555 > 0.05$) so that the decision taken is using a random effect model. Descriptive analysis was conducted to describe the data of each variable studied.

Table 3. Descriptive Analysis

	National Environmental Performance	Government accountability	Political stability	Government Effectiveness	Regulation Quality
Observations	465	465	465	465	465
Mean	58.23959	-0.10	-0.10	0.01	0.02
Maximum	93.50	1.68	1.53	2.24	2.23
Minimum	18.43	-2.26	-2.48	-2.06	-2.27
Std. Dev.	14.84077	0.97873	0.85634	0.96678	0.98102

Based on the descriptive analysis summarized in Table 3, it can be identified that the average value of environmental performance is 58.23959. Whereas for public governance attributes have an average value between - 0.10 to 0.02. This figure illustrates that the sample, in general, has poor government accountability (X_1) and political stability (X_2) below moderate value, but has good government effectiveness (X_3) and regulatory quality (X_4) (above moderate values). All variables appear to have high category standard deviations, so it can be assumed that the sample has a variety of environmental performance and high governance.

The highest environment performance value reaches 93.50, which is owned by the Icelandic National (2010), while the lowest value is 18.43 owned by Mali (2014). The highest value of government accountability reaches 1.68, which is owned by the Norway (2014), while the lowest value is -2.26 owned by the Turkmenistan (2014). The highest value of political stability reaches 1.53 owned by the Singapore (2016), while the lowest value is -2.48 owned by the Iraq (2014). The highest government effectiveness value reaches 2.24, which is owned by Singapore (2010), while the lowest value is

-2.06 owned by Haiti (2016). The highest quality regulation value reaches 2.23 owned by the Singapore (2014), while the lowest value is -2.27 which is owned by the Libya (2016).

Gujarati and Porter (2009) explained that the equations that meet the classical assumptions are equations using the Generalized Least Square (GLS) method. In the Eviews data processing program, the estimation model that uses the Generalized Least Square (GLS) method is only a random effect model, while the common effect model and fixed effect model use the Ordinary Least Square (OLS) method. Because the results of the model test in the panel data regression using random-effect models, in this study, there is no need to test classical assumptions. Correlation analysis was conducted to identify the strength of the relationship between variables independent and variables dependent. The level of strength of relationships between variable dependent (environmental performance) and variable independent (Government accountability, government effectiveness, political stability, regulation quality) can be identified through the value of the correlation coefficient. The summary of correlation analysis is shown in Table 4.

Table 4. Correlation Analysis

Variable	Environmental Performance	Government accountability	Political stability	Government Effectiveness	Regulation Quality
Environmental Performance	1				
Government accountability	0.431	1			
Political stability	0.399	0.597	1		
Government Effectiveness	0.559	0.734	0.710	1	
Regulation Quality	0.494	0.787	0.666	0.924	1

Based on information in Table 4 above, it can be identified that government accountability (X_1), government effectiveness (X_3), and regulatory quality (X_4) have correlations a reasonably strong with the country's environmental performance (correlation value is between 0.40 - 0.599), while political stability (X_2) has low correlation (correlation value between 0.20 - 0.399). Thus, overall the attributes of public governance have a strong positive correlation with the national environmental performance. It means that an increase in the value of public governance will be followed by an increase in the value of the national environmental performance.

In addition, Table 4 shows that government accountability (X_1) and political stability (X_2) has a strong correlation (correlation value between 0.60 - 0.799) to government effectiveness (X_3), while regulatory quality (X_4) has a very strong correlation (correlation value between 0.80 - 1.00). It means that the value of government effectiveness is very dependent on the value of government accountability, political stability, and the quality of regulation. After conducting correlation analysis, path analysis is next procedure to identify the influence of each independent variables on variable dependent both individually or simultaneously. The results of path analysis are presented in Table 5.

Table 5. Path Analysis

Variable	Path Coefficient	Simultaneously Effect	Residual Effect
Government Accountability	0,100	0,31965	0,68035
Political Stability	-0,006		
Government Effectiveness	0,701		
Regulation Quality	-0,228		

Based on results of Path analysis presented in Table 5, the path equation is formulated as $Y = 0,100X_1 - 0,006X_2 + 0,701X_3 - 0,228X_4$. The effect of government accountability on the national environmental performance (Py_{X_1}) is 0.100 with a positive sign. The path coefficient for the influence of political stability on the national environmental performance (Py_{X_2}) is 0.006 with a negative sign. Path

coefficient for the effect of government effectiveness on the national environmental performance (Py_{X_3}) is 0.701 with a positive sign. The path coefficient for the influence of regulatory quality on the national environmental performance (Py_{X_4}) is 0.228 with a negative sign. The path coefficient value of the government effectiveness variable (X_3) is the highest among the other variables, which is equal to 0.701. This

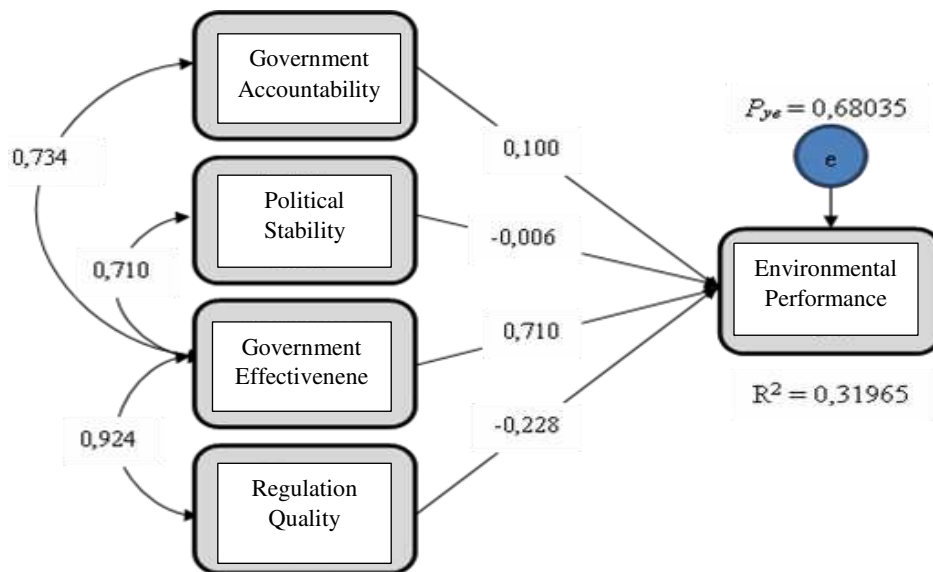
shows that the government effectiveness variable is very decisive value of the national environmental performance compared to the variables of government accountability, political stability, and quality of regulation both directly and indirectly.

Based on Table 5, it can also be identified that the influence of the four attributes of governance on a national environmental performance is 0.31965 or around 31.965%, while the influence of other factors outside of this study on the national environmental performance is at 0.68035 or around 68.035%. In other words, national environmental performance can be explained by 31.965% by the government accountability, political

stability, and quality of regulation. Meanwhil, the remaining 68.035% can be explained by other variables not examined in this study. Therefore, in the future, adding others variables related national environmental performance is relevance. Characteristic of the nation such as population density, poverty index, national income, education index, economic growth, purchasing power are relevant factors to be investigated.

The following is a path diagram that illustrates the influence of government accountability (X₁), political stability (X₂), government effectiveness (X₃), and quality of regulation (X₄) on national environmental performance (Y).

Diagram 1. Path Diagram



Based on the results of data processing using Eviews 10, the results of statistical

test to make conclusion related the hypothesis proposed are presented in Table 6.

Table 6. F Test and t-Test

	Environmental Performance	Government accountability	Political stability	Government Effectiveness
Uji F (F Prob.)	0.0000	0.0000	0.0000	0.0000
Uji t (t-Prob.)	0.1570	0.8380	0.0000	0.0631

Based on Table 6 above, it can be identified that the F-statistical probability value is smaller than the value of α ($p < 0.05$). Using a confidence level of 95%, the decision related the hypothesis 1 is to reject. It means that government accountability, political stability, government effectiveness, and quality of regulation simultaneously have a significant influence on national environmental performance.

Based on information presented in Table 6, partial analysis indicated that only government effectiveness has a significant influence on the national environmental performance. It was showed with the value of t-statistical probability that is smaller than the value of α ($p < 0.05$). Government accountability (prob. T-stat = 0.1570), political stability (prob. T-stat = 0.8380), and the quality of regulation (prob. T-stat = 0.0631) does not have a significant effect on national environmental performance (t-statistical probability value is greater than α).

Conclusion

Government accountability, political stability, government effectiveness, and quality of regulation simultaneously have a significant influence on national environmental performance. Government accountability does not have a significant influence on national environmental performance. It means that good or bad government accountability in certain country does not have an impact on its national environmental performance. Political stability does not have a significant influence on the environmental performance. It means that whetere the country has stability or not the political conditions, it will not have an impact on its national environmental performance. The effectiveness of government has a significant and positive influence on the national environmental performance. It means that the higher government

effectiveness, the higher national environmental performance will be. The quality of regulation does not have a significant effect on the national environmental performance, which means that the better the quality of regulation of a country does not affect the national environmental performance.

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