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Social and Institutional Factors Capable of Improving Environmental Qualities: A Case Study of 5 ASEAN Economies

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ABSTRACT

This study aims to analyze the impact of social (human, educational, and financial development) and institutional factors (corruption and administrative effectiveness) on environmental quality. Data were obtained from 5 ASEAN economies from 2000-2018, with the Brush Pagon LM and Pearson CD used to test the cross-section dependency of variables. The results showed that OLS depicted positive effects of human, educational, and financial development, with administrative effectiveness on environmental quality, with negative effects due to corruption. In conclusion, the government needs to promote social and institutional factor in order to improve environmental performance.

Keywords: Social Factors, Institutional Factors, Environmental Quality, Corruption.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh faktor sosial (manusia, pendidikan, dan keuangan) dan kelembagaan (korupsi dan efektivitas administrasi) terhadap kualitas lingkungan. Data diperoleh dari 5 ekonomi ASEAN dari tahun 2000-2018, dengan Brush Pagon LM dan Pearson CD digunakan untuk menguji ketergantungan variabel cross-section. Hasil penelitian menunjukkan bahwa OLS menggambarkan dampak positif pembangunan manusia, pendidikan, dan keuangan, dengan efektivitas administrasi terhadap kualitas lingkungan, dengan dampak negatif akibat korupsi. Kesimpulannya, pemerintah perlu mendorong faktor sosial dan kelembagaan untuk meningkatkan kinerja lingkungan.

Kata Kunci: Faktor Sosial, Faktor Kelembagaan, Kualitas Lingkungan, Korupsi.

INTRODUCTION

Numerous studies have been conducted over the last decade on various strategies aimed at enhancing environmental ecology and hence the overall quality of the environment (Salman et al., 2019). According to (Ervine, 2018), administrative entrants need to ensure that administrative entrants meet their responsibilities towards the environment.

their subordinates are probable to knowledge regarding environmental quality.

(Benedetta and Vincenzo, 2019) stated that the linkage between environmental quality and different exogenous variables at the macro level has been examined in different studies. However, the focus of most of the studies was limited to economic factors concerning environmental degradation (Iwiñska et al., 2019). In addition, many other variables have significant effects on the environment, such as social, institutional, socio-economic, and structural factors (Ciarli & Savona, 2019).

Environmental modernization theory depicts the association between economic development and deterioration, which is realizable in progressive industrialized countries (Morse, 2018). This theory deliberates many other characteristics such as "role of science and technology, the importance of financial development, the role of administrative effectiveness and the ideology of social movements" (Maurer, & Bogner, 2019). Furthermore, this theory is essential for better environmental performance and shows that society transforms their organizations to ecological complications, which invariably improves the quality of the environment.

(Abdel Basset et al., 2019) stated that social, institutional, po- litical or structural factors are some additional economic related to environmental performance. These studies found significant disparities in the environmental quality of countries with parallel economic intensities and recommended that the quality of environment depends on economic, social and institutional factors.

This study aims to investigate the ability of social and institutional factors to improve environmental quality using 5 ASEAN economies, namely Indonesia, Thailand, Laos, Brunei and the Philippines. The study carried out by (Raymond, 2004) focused on the economic factors in relation to environmental degrada- tion. According to (Welsch, 2004), the theory of environmental modernization indicates that society transforms their organiza-

tions in response to ecological complications, which also improves the quality of the environment. In addition to economic and social factors, institutional factors tend to have a significant contribution to environmental performance (Meyer, Kooten & Wang, 2003). However, the effects of social and institutional variables are less focused on previous studies in relation to environmental quality. Therefore, this study aims to explore the collective impact of social (financial development, human development, and educational development) and institutional factors (corruption and administrative effectiveness) on the environment. This study collectively contributes to the environmental quality and investigates the impact of social and institutional factors in the 5 ASEAN economies.

Remaining sections of this research are structured as follows: Section 2 presents the review of existing literature, the outline of hypothesis and conceptual framework. Section 3 provides data and methodology. Section 4 depicts the empirical results, while Section 5 concludes the study with some limitations.

LITERATURE REVIEW

This section reviews the existing literature and constructs the hypothesis.

SOCIAL FACTORS AND ENVIRONMENTAL QUALITY

Human Development (HD)

Over the past few years, studies have been carried out on the relationship between human development and environmental performance. (Mukherjee & Chakborty, 2012) investigated the influence of human development on environmental performance and found positive linkage. (Costantini and Monni, 2011) stated that human development leads towards a sustainable environment. Their study further suggested that human progress need to be the first objective of any nation in order to achieve a sustainable environment. (Similarly,Uddin, 2014) carried out a research using a 1990-2013 data obtained from Bangladesh with the VECM technique, to examine the relationship between

human development and environmental quality. The study showed a positive association between human development and environmental quality in the long run. (Furthermore, Dhahri and Omri, 2018) used the data of 20 developing countries from 2000-2013 to examine the association between human development and environmental degradation, which revealed a negative linkage. Therefore, an increase in human development reduces environmental degradation.

H1a: Human development has a positive and significant relation with environmental quality.

Educational Development (ED)

Educational development is an essential factor with significant contributions in environmental performance. (Ervine,2018) stated that a nation with high educational progress is capable of handling more ecological disputes with assistance plans. (Cracolici et al., 2010) reported that education development is proficient in apprehending the variances among nations regarding eco- logical and social dimensions. The study revealed a positive rela- tionship between educational progress and environmental qual- ity. (Sohag et al., 2019) analyzed the effect of educational devel- opment on environmental performance, using literacy rates and CO_2 emissions as a proxy of educational development, and environmental quality, respectively. The study indicated that the higher the literacy rates, the lower the CO_2 emissions because the well-educated person portrays a higher level of information regarding ecological disputes. Therefore, the study concluded that there is a positive effect of literacy rates on environmental performance.

H1b: Educational development has a positive and significant relation with environmental quality.

Financial Development (FD)

(Frankel and Romer,1999) stated that financial development and ecological apprehensions are interdependent with the abil-

ity of financial development to promote FDI, which leads towards economic growth (EG). According to (Islam et al., 2013), EG needs higher energy demand to degrade the environment resultantly. Financial progress permits investors to use advance technologies that are environmentally friendly with less significant contributions in increasing CO_2 emissions and attaining economic development (Dhahri & Omri, 2018). Several studies have been carried out to determine the relationship between financial development and environmental performance, however, the results were conflicting. Tamazian and Rao (2010) stated that financial progress tends to increase CO_2 emissions, which reduces the quality of the environment. Similarly, (Al-mulali & Sab, 2012) reported that there are negative effects of financial development on environmental performance using data obtained from 12 MENA countries. (Ozturk & Acaravci, 2013) stated that environmental performance enhances financial development, thereby making it possible for industries to access advanced types of machinery which contribute less to environmental degradation. (Similarly, Adam et al., 2018) examined the influence of financial progress on environmental quality and stated that a positive linkage existed between financial development and environmental quality. Furthermore, the study claims financial division as a means of reducing CO_2 emissions.

H1c: There is a significant relationship between financial development and environmental quality.

INSTITUTIONAL FACTORS AND ENVIRONMENTAL QUALITY

Corruption (CR)

(Welsch, 2004) carried out a research, which analyzed the relationship between corruption and environmental quality. The study stated that the negative effect of corruption on the environmental quality of a nation tends to increase pollution. (Welsch, 2004) examined the effect of control of corruption on environmental performance and stated that both variables are positively

related to each other. (Welsch, 2004) reported that the quality of the environment enhances when corruption is controlled. (Gallego-Álvarez, García-Rubio & Martínez-Ferrero, 2018) carried out a research to determine the effects of corruption on the performance of the environment using data from 12 developing countries. They stated that corruption tends to reduce environmental performance. (Chen et al., 2018) conducted a valuable work on the relationship between corruption and environmental quality using data from 20 provinces in China from 1988-2018. The study concluded that an increase in the number of dishonest executives weakens the environmental conventions and increases illegal construction as well as manufacturing which in turn increases CO_2 emissions.

H2a: There is a significant relationship between corruption and environmental quality.

Administrative Effectiveness (AE)

Esty et al. (2008) carried out a research on the relationship between government effectiveness and environmental performance using the two proxies of environment, namely "carbon dioxide and sulfur dioxide". The study found that administrative effectiveness is partially positive with CO^2 emissions and marginally negative with sulfur emissions. Moreover, government effectiveness has positive effects on waterquality and health ozone (Fiorino, 2011). (Yin et al., 2015) stated that there is a positive linkage between government effectiveness and environmental quality. Therefore, when the government is efficient, it tends to make policies for improving the quality of the environment, which in turn improves the performance of the environment.

H2b: There is a significant relationship between corruption and environmental quality.

DATA AND METHODOLOGY

This study aims to investigate the effect of social (financial

development, human development, and educational development) and institutional (corruption and administrative effectiveness) variables on environmental quality (EQ). The samples consist of 5 ASEAN economies, namely Indonesia, Thailand, Laos, Brunei and Philippines with data obtained from world bank from 2000-2018. The Brush Pagon LM and Pearson CD were used to test the cross-section dependency of study variables. Meanwhile, ADF and ordinary least square model were used to test the stationarity and estimate the results. The study further analyzed the country-specific long-run associations among the variables across the selected countries.

SOURCES OF DATA AND SPECIFICATION OF MODEL

The study used CO_2 emissions as a proxy of environmental quality, with literacy rates, corruption control and government effectiveness used for educational development, and the control of corrupt and administrative proxies. All data were gathered from the World Bank, except those of EQ, which were available in index form. The following econometric model is used to investigate the influence of social and institutional factors on environmental quality:

$$EQ_{it} = \hat{a}_0 + \hat{a}_1 (HD)_{it} + \hat{a}_2 (ED)_{it} + \hat{a}_3 (FD)_{it} + \hat{a}_4 (CR)_{it} + \hat{a}_5 (AE)_{it} + \mu_t \quad \text{——————(1)}$$

Where "EQ denotes the environmental quality, HD is human development, ED is educational development, FD is financial development, CR is corruption, and AE is administrative effectiveness $\hat{a}_0$ is intercept and $\hat{a}_1$ —— $\hat{a}_5$ are coefficients of variables for time *t*, and countries *i* while μ is the stochastic (disturbance/residual) error term."

RESULT AND DISCUSSION

This section presents the empirical findings of the study.

CROSS SECTION DEPENDENCE

Table 1 shows the results of "Breusch-Pagan LM, BFK and

Pearson CD" tests applied for checking the cross-section dependence of variables which means that they shock in a selected country with a possible tendency to be transferred. The research obtained a Null hypothesis, which is accepted, thereby indicating the absence of cross-section dependence among variables.

TABLE 1: CROSS-SECTION DEPENDENCE

Variables	Breusch-Pagan LM	Pearson CD	Decision
EQ	0.8364	0.9823	H_0 Accepted
HD	1.7399	1.7636	H_0 Accepted
ED	1.8322	0.9264	H_0 Accepted
FD	0.9264	1.8364	H_0 Accepted
CR	0.6727	0.8265	H_0 Accepted
AE	1.7836	0.9264	H_0 Accepted

TABLE 2: DESCRIPTIVE STATISTICS AND CORRELATION MATRIX

PANEL A: DESCRIPTIVE STATISTICS						
Variables	EQ	HD	ED	FD	CR	AE
Mean	47.63864	4.050909	0.855455	63.56955	6.584000	93.50455
Median	52.10000	4.330000	0.895000	67.91500	3.850000	94.25000
Maximum	64.30000	7.670000	0.990000	92.33000	13.28800	103.5000
Minimum	24.30000	1.010000	0.690000	38.40000	7.788300	73.10000
Jarque-Bera	2.392460	0.413963	2.178024	1.447608	1.272793	4.668132
Probability	0.302332	0.813035	0.336549	0.484904	0.529196	0.096901
PANEL B: CORRELATION MATRIX						
Variables	EQ	HD	ED	FD	CR	AE
EQ	1					
HD	0.0462	1				
ED	0.2794	0.2219	1			
FD	0.3552	0.1843	0.2327	1		
CR	0.0524	0.1202	0.1429	0.2222	1	
AE	0.0779	0.2418	0.1737	0.1337	0.2720	1

DESCRIPTIVE STATISTICS AND CORRELATION

Table 2 consists of 2 parts, namely panel A and B, which shows the results of descriptive statistics and correlation matrix, respectively. Panel A shows the mean, median and standard deviation of the data. Furthermore, it also shows themaximum and minimum values of the data, with the Normality of residu-

als checked through the Jarque Bera test. Theprobability values of the residuals are normal and insignificant in providing reports. Therefore, the null hypothesis was rejected. Panel B elaborates the results of correlation matrix used to check the multicollinearity among the variables. The result showed that there is no multicollinearity in the data, with the highest correlation value between FD and EQ at obtained at 0.35, while the lowest correlation value of HD and EQ is 0.04.

UNIT ROOT TEST

Table 3 shows the findings of the ADF test in terms of the unit root used to test the stationarity and order of integration data. Therefore, a non-stationary data produces spurious results. This research produced a null hypothesis with a non-stationary series. The table indicates that all variables are significant at all levels, thereby indicating that the data are stationary.

TABLE 3: ADF TEST

	Level		
Variables	Intercept	Trend and Intercept	Decision
EQ	2.8464 **	4.9933 **	I (0)
HD	4.8274 **	3.8264 *	I (0)
ED	2.9475 *	-4.8113 ***	I (0)
FD	-4.8267 **	4.8224 **	I (0)
CR	-4.8726 **	5.9274 ***	I (0)
AE	3.9847 **	3.8264 **	I (0)

Note: "*, **, *** represent level of significance at 1%, 5% and 10% respectively"

OLS REGRESSION OUTCOMES

Table 4 shows the results of OLS regression, with a negative coefficient value of HD (-.4434) which is significant at the level of 5%. This depicts that 1-unit increase in HD tends, reduces CO_2 emission by -0.4432 units, which means that HD has positive effects on EQ. Therefore, H1a is accepted. Similarly, the coefficient of ED (-0.2927) is negative and significant at 5% with positive effects of ED on EQ. The results further show that 1-unit increase in ED tends to reduce CO_2 emissions by 0.3987

units. Therefore, H1b is also accepted. Coefficient of FD (-0.1982) is also negative and significant at 10% level of significance. Hence, an increase in 1-unit leads to a rise in FD tends, and a decrease in CO_2 emissions by 0.1982 units. Results elaborate on the positive effect of FD on the quality of the environment. Therefore, Hypothesis H1c is also accepted. Meanwhile, a positive coefficient value of CR (0.1626) indicates negative effects of CR on EQ. The result shows that a 1-unit increase in CRtends to increase CO_2 emissions by 0.1626 units. A coefficient is significant at 10% level of significance therefore, H2b is accepted. Finally, the coefficient of AE (-0.2436) also shows positive effects of AE on EQ, with a coefficient significant at 10% level, thereby depicting that 1-unit increase in AE tends to reduce CO_2 emissions by 0.2436 units. Therefore, hypothesis H2b is accepted. Furthermore, the value of adjusted R square is 0.9283, thereby indicating that 92.63% variations in EQ are collectively explained by Social (HD, ED and FD) and institutional (CR, AE) factors.

TABLE 4: OLS REGRESSION

Variables	EQ		Decision
	Coefficient	P-value	
C	0.3545	0.0457**	$H_{1a:}$ Accepted
HD	-0.4434	0.0056**	$H_{1a:}$ Accepted
ED	-0.3987	0.0323**	$H_{1b:}$ Accepted
FD	-0.1982	0.0982*	$H_{1c:}$ Accepted
CR	0.1626	0.0827*	$H_{21:}$ Accepted
AE	-0.2436	0.0773*	$H_{2b:}$ Accepted
R^2		0.9938	
Adjusted R^2		0.9263	

Note: "*, **, *** represents the significance at 1%, 5% and 10% respectively."

COUNTRY-WISE LONG-RUN ASSOCIATION

The study further analyzes the country-specific long-run associations among the variables across the selected countries. Table 5, shows the findings for individual countries with a significant positive effect of HD on EQ in all the sample countries. This tends to decrease CO_2 by 0.3462 units in Indonesia, 0.5547 units

in Thailand, 0.2534 units in Laos, 0.2331 units in Brunei and 0.4351 units in the Philippines. Similarly, ED also has positive effects on enhancing EQ by reducing CO2 emissions. The table shows that 1-unit increase in ED leads to a decline in CO_2 emissions by 0.2983 units in Indonesia, 0.3748 units in Thailand,

TABLE 5: COUNTRY SPECIFIC LONG-RUN OUTPUTS

Variables	Indonesia		Thailand		Laos		Brunei		Philippines	
	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value	Coef.	*p*-value
C	0.3454	0.0023 ***	0.2674	0.07322 *	1.6365	0.0933 *	1.9634	0.0374**	1.9983	0.0032 ***
HD	-0.3462	0.0543 **	-0.5547	0.0364 **	-0.2534	0.0254 **	-0.2331	0.0273**	-0.4351	0.0042 ***
ED	-0.2983	0.0036 ***	-0.3748	0.0732 *	-0.4563	0.0363 **	-0.2098	0.0744*	-0.3987	0.0372 **
FD	0.0836	0.0567 **	-0.1734	0.0834 *	-0.1672	0.0263 **	0.0243	0.0364**	0.0053	0.0947 *
CR	0.1983	0.0635 *	0.1324	0.0364 **	0.1783	0.0857 *	0.2816	0.0832 *	0.2552	0.0367 **
AE	-0.2073	0.0355 **	-0.3582	0.0264 **	-0.3674	0.0327 **	-0.1982	0.0872 *	-0.2874	0.0263 **
R^2	0.8394		0.8386		0.7165		0.7639		0.78833	

"*** and * shows level of significance at 1% and5%, respectively"

"*** and ** shows level of significance at 1% and 5%, respectively"

0.4563 units in Laos, 0.2098 units in Brunei, and 0.3987 units in the Philippines. Meanwhile, FD has mixed effects in selected countries. For instance, it has positive effects in Thailand and Laos which means that 1-unit increase in FD tends to reduce CO_2 emissions in Thailand by 0.1783 units and in Laos by 0.1672 units. Furthermore, it has negative effects on the rest of the countries which means that 1-unit increase in FD leads to a rise in CO_2 emissions by 0.0836 units in Indonesia, as well as 0.0243 and 0.0053 units in Brunei and Philippines, respectively. CR causes a decline in EQ in all the sample countries which means that 1-unit increase in CR tends to increase CO_2 emissions by 0.1983, 0.1324, 0.1783, 0.2816, and 0.2552 units in Indonesia, Thailand, Laos, Brunei, and the Philippines. AE has a positive effect on EQ, with a 1-unit increase in AE capable of reducing CO_2 emissions in Indonesia, Thailand, Laos, Brunei and Philippines by 0.2073, 0.3582, 0.3674, 0.1982 and 0.2874 units, respectively

CONCLUSION

Over the last decade, numerous studies have been carried

out on the varying policies regarding ways to improve the environmental ecology in order to enhance the quality of the environment. Currently, the environment has become the main area of concern for policymakers at the micro and macro levels. At the micro-level, managers are highly concerned on the environmental quality of their industries. Meanwhile, at the macro level, the environmental quality of nations is explained as its capability to produce public goods. The present study aims to investigate the effect of social and institutional factors on the quality of the environment with data obtained 5 ASEAN economies, namely Indonesia, Thailand, Laos, Brunei and Philippines from 2000-2018. The Brush Pagon LM and Pearson CD were used to test the cross-section dependency of study variables. Meanwhile, ADF and ordinary least square model were used to test the stationarity and estimate the results.

The results showed that HD has positive effects on EQ, with the ability to increase human welfare and provide a sustainable path. Therefore, human progress needs to be the first objective of a nation. This research is consistent with the studies carried out by (Mukherjee & Chakborty, 2012), (Costantini & Monni, 2011) and (Dhahri & Omri, 2018). Moreover, ED also positively contributes to EQ as a nation with high educational progress capable of handling more ecological disputes with assistance plans. This is in accordance with the studies carried out by (Cracolici et al.,2010).

Similarly, FD also positively contributes to improving the quality of the environment because financial progress permits investors to use advance technologies that are environmentally friendly with less significant contributions in increasing CO_2 emissions. It also helps in attaining economic development. These results are consistent with the studies carried out by (Islam et al., 2013) and (Tamazian & Rao, 2010). Therefore, the study concludes that social factors significantly contributions to improving environmental quality. Furthermore, a nation in need of sustainable environment needs to promote social factors.

The study showed that there is a negative effect of corruption on environmental quality, which reduces the income of a nation and increases pollution. Furthermore, a rise in the number of dishonest executives weakens environmental conventions. It increases illegal construction and manufacturing, thereby leading to a rise in CO_2 emissions that degrade the quality of the environment. These results are similar to the research carried out by (Welsch, 2004). There is a positive impact of AE on EQ in accordance with the research carried out by (Esty et al., 2018). The study concludes that improvement in institutional factors also leads to a rise in the quality of the environment.

This study used only 5 ASEAN economies; therefore, future study needs to be carried out using all ASEAN economies. Furthermore, the study examined linear relationships, therefore future studies need to be carried out to examine nonlinear relationships.

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