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MANAGING ENVIRONMENTAL QUALITY IN THAILAND: EXAMINING THE ROLE OF TRADE AND FINANCIAL DEVELOPMENT

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ABSTRACT

In the past few decades, greenhouse gases and global warming has attracted the attention of the world because it is the main reason of unwanted climate changes. This research highlighted the trade and financial development effects on the quality of the environment in the context of Thailand. The data were analyzed from 1970 to 2018 with the help of the autoregressive distributed lag model. All the variables, as mentioned earlier, are analyzed and the short and the long-run relationship were also observed. Furthermore, different pollutants were analyzed with the help of the Kuznets Environmental Curve (EKC) hypothesis. The outcome of this study reflects that environmental degradation is accelerated with financial development. However, environmental degradation is reduced when trade openness increases. Additionally, the EKC hypothesis is not validated for Thailand due to the fact that economic expansion also boosts the level of carbon emission which ultimately harms the environment. So, Thailand's government needs to improve the innovation of technology which is increased by the level of financial development that helps to reduce the carbon emission level and make the environment healthy and clean.

INTRODUCTION

One of the critical global issues is pollution and environmental protection, which is occurring due to the economies. Climate change has very scars effect on the natural system and humans globally. It is described by the fifth

assessment report of IPCC and working group II (WGII AR5). Many dryland and Marine species affected because of climate change and their geographical range, abundance, migration patterns, activities for different seasons, and interactions have changed because of the continuously changing environment. Currently, the effect of Climate Change on human health is small as compared to other worldwide stressors set as cyclones, heat waves, floods, droughts, wildfires, and other extreme weather conditions. The point to ponder is that these extreme weather conditions are coming frequently and producing scars effect on the environmental system. The ecosystem and human system are on stake because of this climate vulnerabilities. Energy-saving is not a severe issue for some countries, such as Iran who has fossil fuel assets. Change in climate encouraged due to rising in the focus of greenhouses gases is an essential element in altering the climate of the globe, to the amount that in numerous suitcases a minor variation in the condition of weather may conclude in simple variations in the number and intensity of economic loss and natural disasters. Therefore, the consumption and conversion of energy are of severe significance due to the significant impacts of the environment made in several stages of the energy production procedure. In the energy sector, the development pattern should only be accepted if there is small or minor degradation of the environment. In both global and regional levels, greenhouse gases and pollutants stopping from the energy sector activities have undisputable special effects on the environment. Vaporous pollutants cause climate change, global warming, health hazards to humans, acid rain and biodiversity. In the present research, the index of quality of the environment, which is the grouping of different pollutants, were found by employing the principal component analysis (PCA).

Several pieces of research argued about the nexus between the growth of the economy and environmental pollution in current years. However, the financial expansion influence on the environment has established slight courtesy. Though the financial development is affection the environment quality from different channels: (1) growth of the financial sector with the needed capitals establishing factory and industrial activities raise the pollution of environmental (Sadorsky, 2010). (2) intermediaries of the financial sector may achieve entree to current environmentally friendly technologies that better the environment (Tamazian, Chousa, & Vadlamannati, 2009) (3) financial development might offer fewer financial costs and additional financial resources, for example, projects of the environment (Tamazian et al., 2009; Tamazian & Rao, 2010). The financial growth and trade impact tried to find out in this study the quality of the environment from 1970 to 2011 Thailand with the help of the EKC hypothesis. Furthermore, the environmental quality index has also been observed that was founded by PCA.

Table1. Is showing the data collected from WDI world development indicators for 10 years? Five past years from 1991 to 1995 and five recent years from 2014 to 2018 of the constructs of GDP Growth, Co2 Emissions, overall Conventional Energy Consumptions, and the Renewable Energy Consumption. GDP Growth annual percentage almost constant in the past five years while in the last five years the GDP percentage is increasing gradually.Co2 Emissions are increasing in the past five years as well as in

recent five years. Energy consumptions in the typical case are increasing from the past five years to recent five years but in the case of utilization of renewable energy cases, the consumption first decreases than gradually increasing.

Table 1: Economic Growth, Carbon Emission, Energy Consumption and Renewable Energy Consumption in ASAN countries Range from 1991 to 2018

Years	GDP growth (annual %)	CO2 Emissions	Energy Consumption	Renewable Energy Consumption
1991	8.558260321	1.743463906	65.09220971	33.01563167
1992	8.083388023	1.898928216	66.86594733	31.82377522
1993	8.251043122	2.141825983	71.73378721	26.42591045
1994	7.996904855	2.363623731	75.1366778	23.86782039
1995	8.120261844	2.70995521	75.98236301	22.6994113
2014	0.984414064	4.620377146	79.83902265	24.09572604
2015	3.133896962	3.665166178	72.44166795	22.86307013
2016	3.356488872	3.665166178	72.44166795	23.21940249
2017	4.024085781	3.665166178	73.49159056	23.21940249
2018	4.129226103	3.665166178	74.43811102	23.21940249

Figure 1 is showing the relationship of the GDP Growth annually, CO2 emissions Energy Consumptions and Renewable Energy Consumption as per the data collected from WDI – world development indicators for the period 1990 – 2018 which shows there exists a positive relationship for the CO_2 emission and GDP, energy consumption and utilization of renewable energy with time. In starting 1990 they all increase with the time and suddenly they all move down from 1996 to 1999 and after that, they combine continuous to increase. Hence it is concluded that there exists a positive association between the emission of CO_2 with total energy use and utilization of renewable energy.

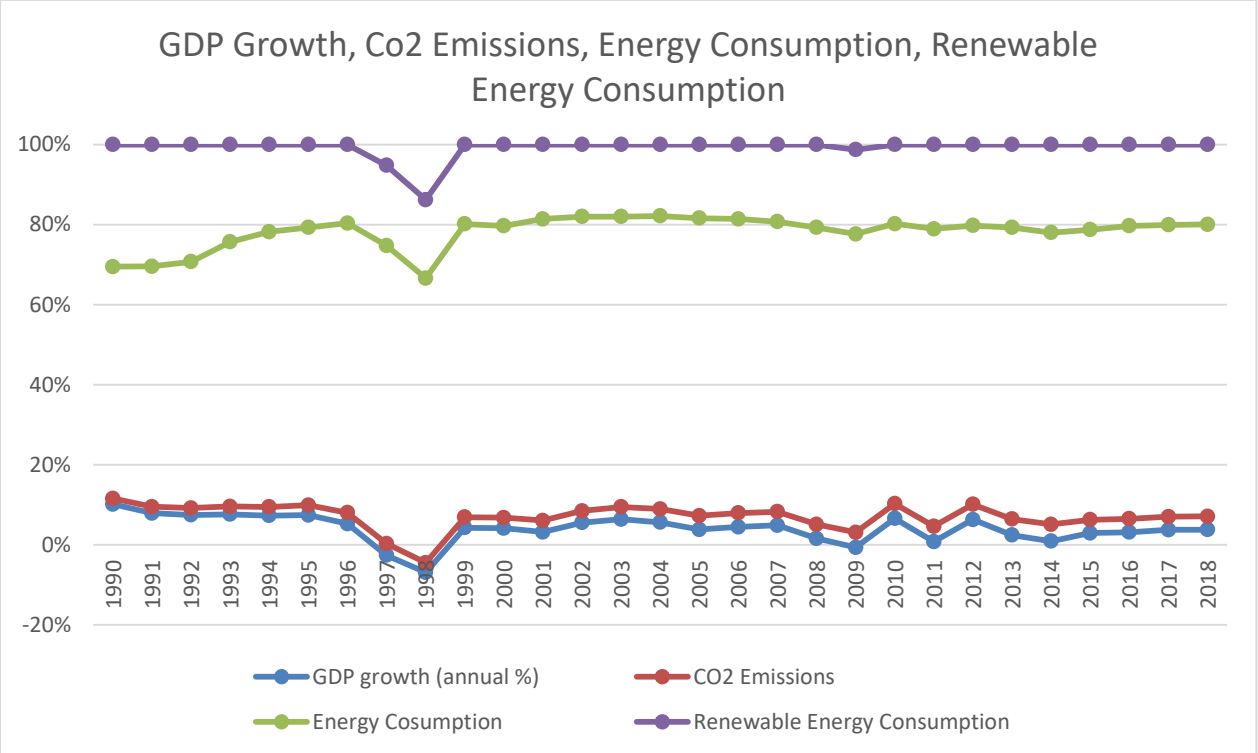

Figure 1: Economic Growth, Carbon Emission, Energy Consumption and Renewable energy Consumption in ASEAN countries

Theoretical Framework EKC

Fossil fuels, greenhouse gas emissions, and social activities stance a severe threat to global temperature.Humans disrupt activities and environmental effects by changes in weather patterns. Several types of research claimed that the association between degradation of the environment and growth of the economy with an inverted U-shaped curve based on the EKC curve. Therefore, the use of energy and natural resources to attain significant economic growth raises the initial steps of the streamlined procedure due to higher importance for employment and production over low technology and a clean environment. This increases pollutant emissions to the environment. At this period, the cost of decreasing pollution with less per capita income is hard for economic agents; thus, the effects of the growth of the economy on environmental degradation are overlooked. Though, ensuing steps of industrialization procedures rise in income per capita better the environmental quality when income touches a specific level.

According to the EKC curve, the first empirical study explored (Grossman & Krueger, 1991) and offered as the "Environmental Effects of the North American Free Trade Agreement." These researchers studied the environmental quality relation along with the economic growth and suggested different countries to have data of 42 economies. According to them, the bonding between the suspended particles of sulfur dioxide concentration and the growth of the economy has an inverted U-shaped curve. The current studies come to be a foundation for further studies in this context.

Several studies as Aldy (2005); Lau, Choong, and Eng (2014); Lieb (2004); Selden and Song (1994); Shafik (1994); Tao, Zheng, and Lianjun (2008) examined the EKC framework, though the EKC framework has been established in most researches, the findings of few studies recommend the presence of a third or further degree form of association among the growth of economic and emission of pollution. The framework of the EKC adopted that the first rise in environmental burden is short-term, but the following reduction in environmental pressure is lasting. Several researchers have asked that this pragmatic reduces may be a short term phenomenon with technology limitations (Dinda, Coondoo, & Pal, 2000).The findings based on a U-shaped curve. An increase in the EKC qualified for the trouble in supporting the effectiveness of innovations (improvement) through lasting production growth (Dinda, 2004).

The Impression of Financial Expansion and Trade on the Environment

Despite the several studies on the association among environmental quality and economic development, some authors (Pao & Tsai, 2011; Shahbaz, Hye, Tiwari, & Leitão, 2013; Shahbaz, Solarin, Mahmood, & Arouri, 2013; Tamazian & Rao, 2010; Zhang, 2011), have measured as the financial division development as a critical measure impacting the quality of the environment in

present years. The secure banking system and well-developed capital markets can raise the procedure of productivity and technology. In the developed financial system, the investment required for technologies that involve vast amounts of money can be delivered (Tamazian et al., 2009). Amongst investors, risk-sharing, the implementation of these technologies makes it possible due to financial markets.

Further financial development can ease further investment with small costs and with the investment in environmental developments. The capacity to raise the investment of this type that is used to protect the environment, which is the public sector responsibility, at the local government has great importance, national and state-level (Tamazian & Rao, 2010). Due to the improvement of the financial sector, companies attained entrance to clean and innovative technologies that concluded a rise in domestic production and a reduction of CO_2 emissions, such as the advancement of investment and financial procedures for the environmental advantages (Yuxiang & Chen, 2011). With better performance, financial systems abolish foreign restrictions of finance, which prevent corporative and industrial development, and thus impulsive economic growth (Monsef, Torki, & Alavi, 2001; Shahbazi & Saeidpour, 2013). Therefore, funding in the majority of industrial actions can raise the pollution of the environment (Levine, 2005).

To check the impact of trade openness on the environmental quality, the effect can be divided into three terms; technology, composition, and scale effect. The most important effect is the technology effect, which serves the purpose of manufacturing technology variation and shifting towards clean technology. The second effect which is composition effect characterizes the composition or suitable modification at the production level. The scale effect is a necessary term to find out the impact which signifies the economic activities and its variations. The scale effect increases because of the degradation of the climate and environment while the degradation can be decreased with the effect of technology by trade liberalization. The kind of comparative advantage determines the composition effect.

Therefore, the comparative advantage is an essential term and has a perception that the impact of the composition effect on the environment will be harmful if the nation has the production of goods that harms the environment. While the composition effect is better for the environment because the nation is only producing the goods, which keep the environment healthy and clean.So, it has a positive impact on betterment in the environment. Usually, rendering the liberalization of trade, if the technology effect leads at the composition and scale effects (in a nation in polluting industries with a comparative advantage) or if the effect of composition and technology (in a nation in clean industries with a comparative advantage) leads the influence of scale, trade openness concludes the optimistic environment conclusions (Grossman & Krueger, 1991).

Furthermore, in this study, based on these sections, section 2, based on literature review, data and methodology in discussion in section 3, section 4

consists of the results and discussion. Finally, the last section made up results and conclusions.

Literature Review

Various researches have-been showing the association among environmental quality and economic development. Several studies examined the part of factors like consumption of energy (Alam, Fatima, & Butt, 2007; Ang, 2007), rise in population growth and energy consumption (Tol, Pacala, & Socolow, 2006), foreign trade (Halicioglu, 2009) capital and human development (Soytas, Sari, & Ewing, 2007) towards the environment. Similarly, development in the financial sector is one of the useful environmental aspects.

Tamazian et al. (2009) Discovered the influenced of-the financial growth by using an appropriate modeling approach of the reduced standard in the BRIC[1] nations from 1992 to 2004.The findings showed that an increase in the growth of economic and finance decreases environment pollution, whereas financial openness and financial liberalization are essential factors to decrease the CO_2emissions. Additionally, policy acceptance, which applies not only to financial liberalization but also trades openness in order to appeal to more substantial development and research levels and FDI (foreign direct investment), might decrease the pollution of the environment in these economies.

Tamazian and Rao (2010) Examined the influence of two variables; institutional growth and financial growth on the emission of CO_2 for a time period from 1993 to 2004 for 24 economies.The findings revealed the presence of the EKC hypothesis The institutional development along with the financial growth significance on the quality of the environment was established. Rendering to the outcomes, financial sector growth has a progressive influence on the environment of these economies. The outcomes of the study showed that financial liberalization influences environmental quality if not realized in a robust structure of the organization. In these economies, trade liberalization leads to higher pollution. Employing the Granger causality and panel cointegration among BRICS nations, (Pao & Tsai, 2011) examined the association among dynamic and long-run causation of energy utilization, emission of CO_2, GDP and FDI. The findings revealed that when energy consumption compared, FDI is elastic in the long run. Furthermore, the conclusions showed the validation of the framework of EKC in these economies.

Zhang (2011) Explored the effect of FDI on the emission of CO_2 for the time period from 1994 to 2009 in China, by using the employed Granger causality Johansen cointegration and variance analysis techniques.The outcomes revealed that FDI is a crucial factor in China to spur in rising emissions of greenhouse. The scale and size of financial intermediaries were further vital than other factors of financial growth. However, the outcomes of financial mediators were incredibly pathetic. The scale and size of the stock market of

[1] Brazil, Russian Federation, India and China.

China have a comparatively, more significant influence on carbon emissions. In contrast, FDI, as the portion of economic expansion, is small and has the smallest contribution to the emissions of CO_2. By employing the ARDL econometric technique, (Bakhtyar, Kacemi, & Nawaz, 2017; Jalil & Feridun, 2011) explored the influence of energy utilization, financial growth and emission CO_2 increment over the period from 1953 to 2006 and 1987 to 2006 in China. In their research, from GDP commercial bank assets, the portion of cash debt from total assets of the foreign assets, liabilities and banking system from GDP was used as a measure of financial growth. The conclusion of this study shows that the financial sector growth will decrease the environmental pollution for the studied country (China). Furthermore, EKC is valid in this country.

Shahbaz, Solarin, et al. (2013) Inspected the effect of financial sector growth on the emission of CO_2, energy consumption and economic growth over the time period from 1971 to 2011 in Malaysia.According to the study, the development of the financial sector in Malaysia leads to a reduction in the emission of CO_2 through energy utilization, and the growth of the economy raised the emissions of CO_2. While according to, (Shahbaz, Hye, et al., 2013) considered the influence the trade openness, energy consumption, outcome of economic development, and financial expansion on CO_2 emissions in Indonesia throughout 1975–2011. The study showed that financial growth in the private sector to domestic credit. The findings revealed that energy utilization and growth of the economy lead to higher carbon emissions in Indonesia whereas trade and financial development decreases it. Moreover, the inverted U-shaped cure show the nexus between emission of CO_2 and financial growth was established.

Ozturk and Acaravci (2013) studied the influence of trade, financial evolution, utilization of energy, and growth of the economy for the emission of CO_2 in Turkey from 1960 to 2007, using the co-integration method. The outcomes revealed that in the long-run trade raises the CO_2 emissions. The financial growth variable was insignificant concerning the emission of CO_2. EKC was valid for the Turkey dataset. Several authors examined the effect on the quality of the environment in Iran. Different studies discover the association between growth of the economy and quality of environment (Pourkazemi & Ebrahimi, 2008; Salimifar & Dehnavi, 2009), trade openness (BARGHI, 2008; Behboodi, Fallahi, & Barghi Golazani, 2010), energy utilization (Behboodi & Barghi Golazani, 2008; Lotfalipour & Fallahi, 2010; Mohsin, Kamran, Nawaz, Hussain, & Dahri, 2021; Nawaz et al., 2020; Nawaz et al., 2021; Shair, Shaorong, Kamran, Hussain, & Nawaz, 2021; Sun et al., 2020) capital and labor force factors. SADEGHI and FESHARI (2010) analyzed, using the co-integration method of Johansen from 1971 to 2007 concerning the directories of arable land and CO_2 (carbon dioxide) emissions for the quality of environment determined that by adding to long term balance among the environment quality and export indices, the variables of foreign direct investment and exports had a significant opposing influence on the quality of environment indices. Fotros and Maboodi (2010) engaged the Yamamato econometric technique to examine the presence and way of causation between urbanization, energy use, emission of CO_2 and development of economy from

1971 to 2006. The outcomes showed the association between GDP, emissions, urbanization and energy use. Assessment of the nexus between GDP, urbanization, energy use and emission of CO_2 in Iran was right. SADEGHI and FESHARI (2010) talked about the causation among FDI and emission of CO_2, GDP and per capita consumption of energy in the EKC framework in Iran for 1980–2008. The outcomes showed the mutual causation nexus among per capita consumption of energy and GDP. By employing the generalized method of moments on panel data (Barqi Askooei, Fallahi, & Zhande Khatibi, 2012) expected the influence of such variables like carbon dioxide, use of energy, FDI, economic growth and factory products from 1990 to 2010 in D8 economies. The findings exhibited all variables without FDI had a significant and positive association with CO2 emissions by applying the fixed effects method.

METHODOLOGY AND DATA

According to the theoretical literature, this research verifies the trade and financial growth impact on the environmental quality in Thailand. The most important issue around the globe is environmental protection and relevant pollution, which is the agenda of the Government of every country. The environment can be affected with the financial growth through different channels: (1) the environmental pollution can be increased with the financial growth i.e., providing capital to increase the industry and manufacturing processes (Sadorsky, 2010); (2) financial intermediaries can be used to improve the environment by accessing new technologies which are environment friendly (Tamazian et al., 2009); (3) More financial resources can be brought into use financial growth for environmental projects (Tamazian et al., 2009; Tamazian & Rao, 2010). The environment has a significant effect of trade open which plays an important role in preventing the environment. Environmental results will be positive because of the trade openness (Grossman & Krueger, 1991), so the general will become similar;

$$ENVI = f\,(GDP, FD, TRADE, EC) \quad \ldots \qquad (1)$$

Where ENIV= CO_2 emission in kt used as a proxy of the environment is the dependent variable, and independent variables are GDP determined by the annual GDP growth rate, FD = financial development and determined by domestic credit to private sector % of GDP and EC is energy consumption and Energy use (kg of oil equivalent per capita) used as a proxy of energy used. We have time-series dataset analysis; therefore, firstly, the stationary level of data should be checked.

Unit Root Test:

The dependability of statistical interpretation relies on the difference between the stability of the time series data and the non-stationary degree. Stationary of the series means its mean values are zero and constant variation in the data that series called the stationary series. On the contrary, the non-stationary time series have a time-dependent average (the average value is not 0) and the variance generates (not constant over time) the impact of the permanent fluctuations. When considering the importance of time series, unit-root tests of

the appropriate should be verified with the variable's stationary characteristics. Moreover, use the improved rooster for more in-depth testing.

Co-integration Test:

To study the long-term co-integration relation of variables, various econometric methodologies are proposed. Engel and Granger (1987) firstly proposed the univariate econometrics model and have completely modified by (Hansen & Phillips, 1990). Johansen (1988); Johansen and Juselius (1990) Empirically purposed the multivariate econometrics model which is broadly used in the empirical study. Johansen co-integration methodology is preferable to other methodologies because it is not only a multivariate method but also provides more than one cointegration relationship, overcoming small sampling errors. However, what these collaborative integration methodologies require is that they require the integration of all variables in the same order. If the variables do not have the same integration level, then the Autoregressive Distribution lag model (ARDL) deals with a single co-integration analysis and introduces by (Pesaran, Shin, & Smith, 2001), expanded initially by (Pesaran & Smith, 1995). However, if the integration for the variable has the same level, then the best model is Engle Graner/ Johansen Cointegration because this method has an econometric advantage for another is that it estimates that the simultaneous estimation of the model's long- and short-term parameters. In this study, we apply the ARDL. Firstly, we check the stationary value of the variables. If the integration order of the variables is mixed, we apply the ARDL.

Econometric Model

$$\log(ENVI)_t = \alpha_o + \sum_{i=1}^{p} \alpha_1 \Delta\log(ENVI)_{t-1} + \sum_{i=0}^{p} \alpha_2 \Delta\log(GDP)_{t-1} + \sum_{i=0}^{p} \alpha_3 \Delta\log(FD)_{t-1} + \sum_{i=0}^{p} \alpha_4 \Delta\log(TRADE)_{t-1} + \sum_{i=0}^{p} \alpha_5 \Delta\log(EC)_{t-1} + \alpha_7 \log(ENIV)_{t-1} + \alpha_8 \log(GDP)_{t-1} + \alpha_9 \log(FD)_{t-1} + \alpha_9 \log(TARDE)_{t-1} + \alpha_{10} \Delta\log(EC)_{t-1} + \varepsilon_t \quad (2)$$

Taking a look at the equation, emission of CO_2 is a dependent variable which is proxy of environment, and independent variables are lag of CO2, GDP annual growth, financial development (domestic credit to the private sector), Trade (Trade % of GDP) and energy consumption (energy use kg of oil equivalent per capita).

Data Source

Annual data of Thailand of the time span of 1970 to 2018 has been taken from the WDI (World Bank, 2020).

Results and Discussion

First of all, we discuss the variables summary which is given in Table 2.

Table 2: Summary Statistics

Variables	Mean	Maxi	Mini	Std. Dev.	Observations
ENVI	11.527	12.664	9.640	0.965	49
EC	1028	1992	361	574	49
FD	88	167	19	44	49
GDPG	6	13	-8	4	49
TRADE	87	140	34	37	49

The environment is measured by CO_2 emission; the average value is 11.527, with the maximum value is 12.664 and the minimum value is 9.60, consumption of energy, financial growth, economic development, and trade has, respectively, mean values 1028, 88, 6 and 87.

Before going to the analysis, we check the variables' integration order by Augmented Dickey-Fuller testing, and outcomes are depicted in Table 3.

Table 3: (ADF) Unit Root test

Variables	I (0)		I (1)	
ENVI	-3.506	0.539	-3.509***	0.000
EC	-4.161	0.401	-3.509***	0.000
FD	-4.166	0.280	-3.509**	0.033
GDPG	-4.161*	0.005		
TRADE	-3.506	0.756	-3.509***	0.000

Note: ***,** *and*
* *show* 1%, 5% *and* 10% *level of significance respectively.*

Looking at the table free, one can see that there is one stationary variable at the level i.e., growth of the economy and other variables are stationary at first difference i.e., trade, financial growth, use of energy, and environment. The unit root testing outcomes show that the model is moved to ARDL, short-run outcomes depicted in Table 4 and long-run outcomes depicted in Table 6.

Table 4: ARDL Short-Run Results

Variable	Coefficients	SD	t-stat	Prob.
D (ENVI(-1))	-0.182	0.146	-1.240	0.226
D (ENVI(-2))	-0.280*	0.137	-2.049	0.051
D (ENVI(-3))	-0.108	0.094	-1.143	0.264
D(GDPG)	0.014***	0.003	5.429	0.000
D(GDPG(-1))	-0.007**	0.003	-2.752	0.011
D(EC)	0.000	0.000	-0.028	0.978
D(EC(-1))	0.001**	0.000	3.429	0.002
D(FD)	0.001	0.001	1.179	0.249
D(FD(-1))	-0.001	0.001	-1.513	0.142
D(TRADE)	0.000	0.001	0.051	0.960

D (TRADE(-1))	-0.001	0.001	-0.574	0.571
D (TRADE(-2))	0.000	0.002	-0.279	0.783
D (TRADE(-3))	-0.003**	0.001	-2.216	0.036
CointEq(-1)	-0.158**	0.076	-2.089	0.047

Note: ***,** *and* * *show* 1%, 5% *and* 10% *level of significance respectively.*

According to Table 4, which shows the short-run ARDL results, where Environment (CO2) is the dependent variable, and growth of the economy, use of energy, financial development, and trade are exogenous variables, economic growth at first lag increase the carbon dioxide emission and second lag decrease the emission of CO_2. The use of energy boosts emission of CO_2 which increases the environment unhealthy and trade at third lag effects on environment degrading.

While according to the error correction term, which is significant statistically and its coefficient is negative which ensures that the model has a long-run relationship with the speed of adjustment of almost 16 % annually. After ensuring the error correction term of a long-term relationship of variables within the model will also confirm from the bound test and outcome of the bound test is given in table 5;

Table 5: ARDL Bound Test

Critical Value	11.087	
Significance	Io Bound	I_1 Bound
5%	2.86	4.01
1%	3.74	5.06

According to the bound test, the critical value is higher than the 1 and 5% significance level, which specifies the null hypothesis rejected which is their exits the long-run relation amongst mentioned variables in the model which is also confirmed the error correction term. Long run results are given in Table 6.

Table 6: ARDL Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.746***	0.263	33.240	0.000
FD	0.017***	0.004	4.194	0.000
TRADE	0.031***	0.006	5.116	0.000
GDPG	0.142**	0.063	2.258	0.033
EC	0.002**	0.001	2.549	0.017
Model Diagnostics				
R-squared				0.999
Adjusted R-squared				0.999
DW				2.229
LM Test				0.184
Breusch-Pagan-Godfrey				0.624

Note: ***,** *and*
* *show* 1%, 5% *and* 10% *level of significance respectively.*

According to Table 6, financial development, trade, growth of economy, and use of energy plays a vital role in the unhealthy environment of Thailand. According to model diagnostics model is a good fit because its R square values are 99% which indicates that the exogenous variables almost explain the dependent variable and DW value indicates the model is a good fit, LM test indicates there does not exist the autocorrelation in the model and Breush Pagan Godfrey indicates that there does not exist the heteroscedasticity problem in the model.

Increasing financial development in carbon emissions, the financial sector can facilitate lower-cost investments, including investments in environmental projects. This type of investment should be increased to protect nature and to control the environment's degradation which is the duty of the government and should be held at the national, and local states (Tamazian & Rao, 2010). The best performing economic systems prevail over the restrictions on external financing, which hinders industrial and corporate growth and thus accelerates economy (Monsef et al., 2001; Sameti, Ranjbar, & Hematzadeh, 2013 Shahbazi & Saeidpour, 2013). The environmental degradation may increase with industrial financing (Levine, 2005). Tamazian and Rao (2010) Also said that environmental protection has a positive effect of financial expansion

The increase in trade brings the environment to unhygienic conditions, due to the effect of the composition for relative benefit, and the blend of products manufactured in a country turns into clean products, so there is positive effect of the composition in the environment. General according to trade openness, if the technology influence the composition effect and scale effect (countries having polluting industries) or if the composition and technology (countries having clean industries) influence the scale effect then there will be the positive result of trade towards the environmental degradation (Grossman & Krueger, 1991). Tamazian and Rao (2010) also confirmed that the commercial opening has led to increased pollution. Ozturk and Acaravci (2013) also confirmed this.

According to Table 6, economic growth increases the level of pollution in environmental. Shahbaz, Hye, et al. (2013) real income per capita was considered as financial growth for the private sector. For the Thailand, the consumption of energy and the growth of economy increases the emission of CO_2. Energy consumption has increased by the level of emission of CO_2 in Indonesia, (Shahbaz, Solarin, et al., 2013) energy consumption increased CO_2 emissions (Ozturk & Acaravci, 2013; Shahbaz, Hye, et al., 2013).

CONCLUSION

Mobilizing financial resources and financial development increase the innovation of the technology and finds out the best technology for the production and allow to invest in the projects relevant to environmental

sustainability and purity. However, an increase in industrial activities through financial development can directly reduce the quality of environment.

The model used for this study is long-run ARDL because the variable contains different order of integration. The result shows the coefficient for financial development and suggests that the quality of environment is adversely affected by financial development as of economic growth. There is an increase in the financing for industrial activities which directly reflects that environmental degradation will be the result. The environment is damaging because of financial development. Indeed, the investment is only increasing the industry size, activities' scale, and did not require any technology intervention. Therefore, environmental issues should be taken into consideration by the government while preparing the financial system. For example, the investment will be encouraged by the banks which have technology as their first priority through which the carbon-related activities will be reduced.

Therefore, government policies and their initiatives to finance low carbon technologies is very essential. The result shows that the use of energy is the main cause of the emission of CO_2 in the long run. When the energy consumption reduces then it well directly reduces the emission of CO_2. Other policies should be made to reduce the intensity of energy and the efficiency of energy can be increased if renewable energy sources utilized rather than fossil fuel energy sources. The environmental degradation will be reduced, and the quality of the environment will be increase if better energy sources i.e. (wind, solar, natural gas) utilized for production.

The result of other studies reflects that environmental quality is affected by the increase in trade openness. Thailand is not reducing its revenue to reduce the emission of CO_2. Because of the trade openness, if the technology influences the composition effect and scale effect (countries having polluting industries) or if the composition and technology (countries having clean industries) influence the scale effect then there will be the positive effect of trade on the environment.

The innovation and technology can be increase with the financial development which can mobilize financial resources by investing for projects which will minimize the emission of CO_2 and increases the economic growth through which the environmental health will be increased along with the economy.

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