In Search of "Pembangunan Berkelanjutan" (A Case Study of Environmental Issues and Japan Foreign Direct Investment in Indonesia Period 1980-2010)

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"There are no passengers in spaceship earth. We are all crew"
(Marshall McLuhan)

Abstract

Climate change and global warming are the hot issues for the past ten years. People all around the world keep searching for the best method to calculate, mitigate, and dealing with climate change. A relations of climate change with economic performance believe really strong, in fact economy motives are the one that derive human activities which causing a climate change. Using a conceptual from Simon Kuznets in 1955 of Environmental Kuznet Curves (EKC) and from Viviek Suri and Duance Chapman of Pollution Haven Hypothesis in 1995, this study plans to examines and challenge the truth behind two famous concepts if we try to applied it into a real case between two countries. Is it true that GDP will increase in the same path of pollution increase ? or is it true that export and import play an important role in increasing the pollutant level ?. This study will prove all of the questions and argument using Japan and Indonesia as the model country.

Overview of the Research

Introduction

The question about relations between economy activities and environmental issues have been discussed for the past 50 years. It is believe that economic activities perform by all humans in the world responsible to the destruction of the environment that lead to what we called nowadays global warming. Intergovernmental Panel on Climate Change or IPCC clearly define that "Global warming are cause by human activities, although there is a natural cycle that also responsible but still its only 10% to total 90% of human activities that cause climate change". It is also believe that development countries can achieve clean energy and low pollutant level because they shifting the vertical economic activity to developing countries. The question then raise into an assumption that developed countries established a strict policies through well organized environmental bodies and developing countries was put in a dilemma of either they enhance the economic conditions or enhance the lower level of pollutant levels and environmental conditions.

To connect the and see the clear relations between economic activities and environmental issues, most of researcher use the concept that introduce by Simon Kuznets in 1955 called the Environmental Kuznets Curve that showed the clear relations between Environmental issues (in this case pollution level) and economics (in this case GDP). 40 years later in 1998 Viviek Suri and Duance Chapman did an extensive research from Kuznets point of view and EKC in regards to find more clear relations and factors between environment and economy. The hypothesis that famous by Pollution Haven Hypothesis put another factor that not explained by Kuznets which is the export and import factor.

This studies will be testing Environmental Kuznets Curve and Pollution Haven Hypothesis into real case between Japan and Indonesia. The reason why Japan and Indonesia choose as the sample countries in this research are based on the fact that Japan was the biggest country performing Foreign Direct Investment in Indonesia for USD $ 1.2 Billion. Both of the countries also binding in Kyoto Protocol and in fact Indonesia hosted UNFCCC conference in 2004 that created Bali Road Map which taking environmental issue to the next level of considerations by countries in the world.

Research Objectives

This study plans to testing and challenges the conceptual of Environmental Kuznets Curve and Pollution Haven Hypothesis into real case between Japan and Indonesia, therefore the objectives of this research are :

1. To analyze the environmental policies in Japan and Indonesia in the matters of how the policies pressuring the economic activity to meet certain pollutant levels
2. To analyze the economic activities of Japan in the matters of performing vertical FDI in Indonesia
3. To analyze the economic policies of Indonesia in the matters of vertical FDI and how it impact the GDP of Indonesia

Research Question

To address the objectives above, research question will be :

1. Is there any significant impact of development of environmental policies in Japan and the number of vertical FDI perform by Japan Companies in Indonesia ?
2. Is there any significant impact of vertical FDI by Japan Companies in Indonesia to the development of environmental policies in Indonesia ?

For each question there will be sub question which are :

For question 1 :

A. Does the development of environmental policies in Japan pressuring Japanese Companies to shifting their vertical operations to developing countries ?
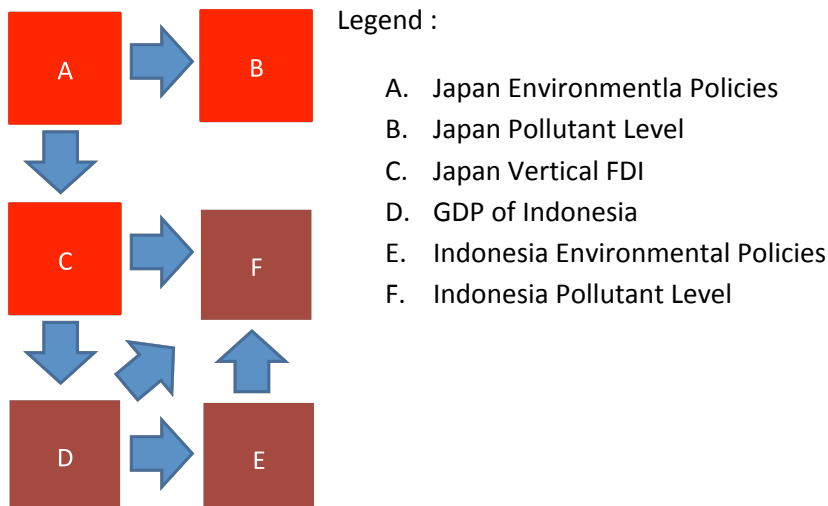B. What factors that make the companies choose Indonesia as their destination to perform their vertical FDI ?

For question 2 :

A. How many percentage of Vertical FDI allow to be perform in Indonesia during the period ? What is the industries trend ?
B. Does the goal of increasing of GDP by the government pressure the development of environmental policies in Indonesia ?

Methodology

To analyze the question mention above, The research will be foundational based research because up to this level I still believe that EKC and PHH is conceptually and scientifically true, but applying it into real case between countries could be different since it will dealing with other real factors along with my researc

Conceptual Framework

Legend :

A. Japan Environmentla Policies
B. Japan Pollutant Level
C. Japan Vertical FDI
D. GDP of Indonesia
E. Indonesia Environmental Policies
F. Indonesia Pollutant Level

Data and Materials

Since I will do a foundational research therefore lots of data source is desperately need. How to compile and compare between data to data will be very essential for this part to look up the correlations between data. I will use the data from Ministry of Environment of Japan and Ministry of Environment of republic of Indonesia. To see if there is any development of new policies I will see if there are amendments or policies develop year to year.

In relations with the economic activities, For Japan I will use the data from Ministry of Economy, Trade and Industries for overseas activities. This because the classification of specific industries is the same with the classification guidelines of waste and pollutant management release by Ministry of Environment of Japan. For Indonesia I will use the data from Bank of Indonesia, Ministry of Trade and Industries, and Ministry of Finance. This three institutions was choose because they maintain a set of similar data and for the reason I want to make the data of vertical FDI more accurate.

For the pollutant level to make it more accurate and neutral I will use the data from world bank (this to look the country percentage on global climate change) compare with IPCC "Mauna Lona" report.

Literature Review

1. Environmental Kuznets Curve
   The basis argument are from Simon Kuznets point of view in economic growth and income inequality (1955) created Environmental Kuznet Curves (EKC). EKC shows the relations between level of pollution and per capita GDP. As seen in the table below the relations between pollutant levels and per capita GDP :

   Figure 2: Environmental Kuznets Curve (EKC)
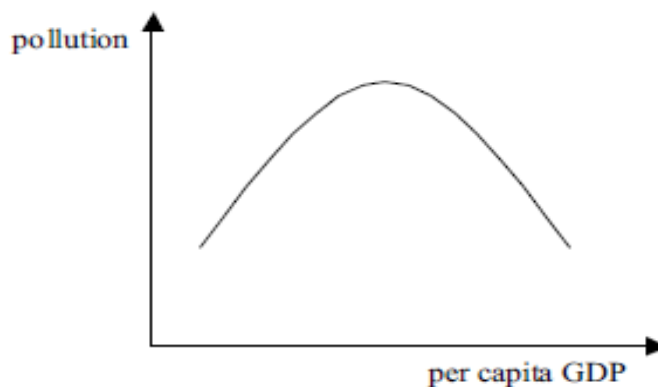
   Kuznets also explain there are two major factors that supported the EKC, first migration of workers from agriculture to industry and second movement of rural workers to urban jobs. Which is a common case happen in developing countries.

2. Pollution Haven Hypothesis

   The basis argument are came from analysis by Vivies Suri and Duane Chapman in economic growth, trade and energy: implications of environmental kuznets curve (1998). They argued that the most influential factors affected the EKC is the export and import factors. This is why there are sectors migrations and also movement of the workers. PHH itself somehow can see as the correction model of EKC with add on factors.

Implications of the results :

1. The implications of the result would raise awareness to the Government of Indonesia of how opening the countries for FDI could give a significant impact to the environment in the future.
2. This studies could also be a model studies for assessment of similar case happen in any developing countries of seeing the perspective of economic activity in relation to environment
3. This could also the new model of calculations and development of the next level of Kyoto Protocol or COP. For this of course another research need to develop a formula of calculations.

Part II

Analysis

Introduction

As I mentioned before, to compare and see the clear relations between Vertical Foreign Direct Investment (FDI) and pollutant level along with environmental policies, I need to gathered a lot of data. Since this was a foundational based research a lot of data source is needed to reach correct final conclusion. To begin I will analyzing the pollutant level for each country and see how the percentage shares of each country to the worlds pollutant level, the analysis will include what its inside the data, what particles that build up the concentration of Green House Gas emissions in atmosphere. The set of data that I will use are data set from Mauna Loa along with data set from United States Environmental Protection Agency Data. The result of what we see in the phase 1 of the analysis then will be negated to amendments of environmental policies in both countries, this to see that is it true that policies pushing down the pollutant level, categorization of amendments that chose are   amendments that related to economic activity. Result of negated phase 1 and phase 2 then going to be negated with Vertical FDI level in Indonesia that performed by Japanese Company and this should be phase 3. How much the FDI contributed to the GDP will be highlighted although the main point is to see if this vertical FDI had a significant impact to pollutant level in Indonesia and if there are any result or connection to the development of environmental policies in Indonesia. The last phase or phase 4 will be the challenge to the conceptual of EKC and PHH.

Phase 1

A.Mauna Loa Report

What is a Mauna Loa report ? and why I chose to use mauna loa report ?. Mauna Loa report was named after Mauna Loa volcanic mountain in Hawaii, United States of America. Established in 1956, Mauna Loa Observatory was started as and independent research that monitoring the concentration of atmospheric Carbon Dioxide (CO2) or also known as Keeling Curve[1]. There is a reason why Mauna Loa was chose as the o=location to conducted an observation on atmospheric CO2 because it was believed as one of the best (in average) air condition in the world. Although there is a volcanic layer being captured, scientifically it was easy to recognize and removed from captured data. Mauna Loa Observatory (MLO) still produced data continuously from 1956, the data itself was reported monthly in parts per million (PPM). MLO was part of Earth System Research which one of the division under National Oceanic and Atmospheric Administration (NOAA).

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[1] "Keeling Curve" was named after Charles David Keeling, which is the first person that make a frequent regular measurement of of atmospheric carbon dioxide concentration. Keeling itself was researcher at Scripps Institute of Oceanography in UC San Diego and initiate a continuous research on concentrated atmospheric CO2 in Mauno Loa Observatory center in Hawaii, United States of America.

B.United States Environmental Protection Agency

Initiated from the idea of President Richard Nixon in 2nd December 1970, the purpose of establishment of EPA is to protect human health and environment. Instead of focuses on domestic observations only, US-EPA also do observations on global carbon as well. The reason why I choose to use US-EPA data, although there is a lot of controversies surrounding the agency[2], US-EPA is because it was believed as one of the most reliable data and it was linked to Mauna Loa report on concentrated atmospheric CO2[3].

C.National Board of Climate Change Republic of Indonesia

NBCC was a newly established board in Indonesia, it was established in 2008 under Presidential Decree no.46 year 2008. The main task of NBCC is formulate national policies, strategies, and programs of climate change control activities. This include a monitoring of the level of GHG as well in Indonesia. The reason why I choose NBCC as the source of data mainly because, US-EPA data did not provide any detail data of country categorized "other country" in their report.

D.Ministry of Environment Government of Japan

Though Japan was categorized as a "strict country" in relation to environmental standards, Ministry of Environment was just established in 2001. It was established as an extension of long running environmental agency that was first operated in 1971. Ministry of Environment was responsible to maintain the data of GHG level and climatical change in Japan, which make it a reliable data source. I use data from MoE basically just as a comparison from data release by US-EPA.

E.Phase 1 Analysis

Table 2.1

Composition of Concentrated Green House Gases

No	Concentrated Gas
1	Carbon Dioxide (CO2)
2	Fossil Fuel Combustion
3	Atmospheric Compounds
4	Infrared Gas
5	Atmospheric Concentrations
6	Other Gases (Nitrousoxide, Methane, ETC)
7	Other activity Gases (deforestation gases, biomass excess gases, etc.)

Note : Definition of concentrated gas was define by Mauna Loa observatory, which release the latest data as per May 2013.

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[2] We cannot deny the fact that US-EPA was one of the most controversial agency in relation to climate change issues. One of the biggest controversies is that a statement in US-EPA annual report in 2008 (it was a release a year after so it was a 2007 report), which the administrator at that time, Stephen L. Johnson, made a conclusion that global warming is not danger to public.

[3] This was mainly because both NOAA and US-EPA was under United States Government, therefore both of the agency could easily cooperate in working on global warming and climate change monitoring.

Table 2.2

Average Global GHG and Countries Percentage

Year	Average Green House Gases	Interpolated Green House Gases	Indonesian Average Green House Gases	Japan Average Green House Gases	Percentage of Indonesia GHG in the world	Percentage of Japan GHG in the world
1980	338,68	338,68	36,11	23,71	11%	7%
1981	340,10	340,10	36,60	23,82	11%	7%
1982	341,44	341,44	37,59	24,20	11%	7%
1983	343,03	343,03	37,66	24,42	11%	7%
1984	344,58	344,58	37,85	24,21	11%	7%
1985	346,04	346,04	36,97	23,75	11%	7%
1986	347,39	347,38	35,27	22,73	10%	7%
1987	349,16	349,16	35,25	22,20	10%	6%
1988	351,56	351,56	35,61	21,50	10%	6%
1989	353,07	353,07	35,93	21,20	10%	6%
1990	354,35	354,35	35,50	20,98	10%	6%
1991	355,57	355,57	34,73	20,56	10%	6%
1992	356,38	356,38	35,42	18,24	10%	5%
1993	357,07	357,07	34,09	17,95	10%	5%
1994	358,82	358,82	33,97	17,72	9%	5%
1995	360,80	360,80	34,04	17,75	9%	5%
1996	362,59	362,59	34,59	17,83	10%	5%
1997	363,71	363,71	35,01	17,95	10%	5%
1998	366,65	366,65	32,64	18,21	9%	5%
1999	368,33	368,33	33,26	18,34	9%	5%
2000	369,52	369,53	33,72	18,48	9%	5%
2001	371,13	371,13	31,80	18,52	9%	5%
2002	373,22	373,22	31,47	19,25	8%	5%
2003	375,77	375,78	31,08	18,98	8%	5%
2004	377,49	377,49	30,73	17,72	8%	5%
2005	379,80	379,80	29,70	16,62	8%	4%
2006	381,90	381,90	26,91	16,78	7%	4%
2007	383,76	383,76	26,52	15,83	7%	4%
2008	385,59	385,59	24,89	15,71	6%	4%
2009	387,37	387,37	26,62	15,52	7%	4%
2010	389,85	389,84	27,89	15,59	7%	4%

Note :

1.Numbers are in parts per million (ppm)

2.Data source obtained from Mauna Loa report for Average GHG and Interpolated GHG

3.Data Source for Indonesia and Japan is average comparison data from US-EPA, NBCC, and MOE. Extra measurement was include by obtaining data from world bank and UN Statistical Divisions.

F.Conclusion of Phase 1

- The trends of GHG both in Japan and Indonesia are decreasing although there is a percentage shares that increasing but still in overall it was decreasing
- Starting from 1980, the positions of Japan in terms of percentage is already lower than Indonesia, conclusion that I can make is geographically Japan landscape is smaller than Indonesia, and this had a significant impact to GHG emission since the larger the area, established industry will be larger.
- Second arguments are, it was related to populations. IPCC always stated a relations between human activities and their contribution to the global warming[4]. Indonesia populations was larger than Japan, means that human activities are bigger than Japan. This was related to consumption of energy that produce GHG.

Phase 2

A.Japan Environmental Policies

- Basic Environmental Law (Law no.91 year 1993, ratified on November 13, 1993 and amended in 1997 by Law no.81 of 1997)
  Japan first basic environmental law was established in 1993 and contain of 46 articles which divided into 3 chapter. Which if we breakdown, Chapter 1 (articles 1-13) only talk about general provisions and basically just a general explanations of why they established environmental policies. Chapter 2 (article 14-40) which is the most articles, was more into a technical part of how to formulate and how to implement basic environmental policies, Chapter 3 (article 41-46) are focuses on environment council which tackle also the issues of pollution control.
  More or less we can related the released of this basic environmental policies to Rio World Summit in 1992[5] since Japan also participants of the conference therefore since Japan binding already to put highlight on environmental issues, basic environmental law was established. If we take a look the level of GHG in japan 1993 and compare it to the previous ten years which is 1983 and the next ten years, generally we can say yes there is a positive trend it was decreasing,

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[4] IPCC report in 2008, clearly stated that 60% of global warming that happen in the world was contributed by human activities. This make an assumption that population issues is a crucial issues to climate change and global warming issues.
[5] Rio World Summit or also famously known as Earth Summit, was believe the first step that global warming and climate change issues put on highlight globally. It was held under United Nations Statistical Divisions. The conference itself was held form june 3rd to june 14th 1992 in Rio de Janeiro Brazil.

but even before the establishment of this law, the level of GHG and pollutant are already decreasing in Japan. As a conclusion for this I can there is no significant impact of establishment of this Law to the level of GHG and pollutant emissions in Japan.

- Law concerning the promotion of procurement of eco friendly goods and services by the state and other entities (Law on Promoting Green Purchasing) (Law no 100 of 2000)
  A grand idea of this Law is to promote and enhance products (service and goods) that was the activities (production and consumption) considering its effect to environment. This law was break down into 4 different set of documents which is consist of set 1 the "law" itself that concern on the promotion and/or procurement of eco friendly goods, basic policy that will be the background for all of its activities, the list of entities listed in government ordinance, and the image of the law itself. This law was a big news in Japan the time it was releases because it was a big project conduct by Government of Japan and make a positive perspective that Japan is a country that put environmental issues in a big highlight. Indeed that a lot of company in Japan shifting its operations into more eco friendly because of this law, but there are no significant impact to pollutant level. As other laws, policies, and amendments the connection between this law to reducing pollutant level is very small.

- Law concerning the promotion of business activities with environmental consideration by specified corporations, etc., by facilitating access to environmental information, and other measures (Law no.77 of 2004)
  This law consist of 7 chapter and it was one of the most crucial part since it was directly related economic activities. Publishing information to public was a crucial part of conducting business because it will attracted investor and indeed business is a public activities. This law are mostly about business information shared to public. Start from 2000, Government of japan through MoE doing a big and most significant promotion and campaign for "eco-friendly" business activities and this law is part of it. The last chapter (chapter 7) was interesting because the content are penalties that will be given to the companies if they reporting a false report to public. Penalties are in amount of money (Japanese yen).
  Again as a conclusion, there are no significant relations between these law and the positive trend of GHG level in Japan since it was decrease already even before the establishment of this law and yet there are no significance decreasing in pollutant level.

B.Indonesia Environmental Law

- Basic Establishment Law of Ministry of Environment Republic of Indonesia (Law No.4 Year 1982)
  This was perhaps the most important Law in relations to define the roots of climate change. Seeing the establishment year of this law it was actually 10 years before Rio World Summit[6]. The law was clearly stated that "Human activities was the part of climate change and controlling human activities is the way to achieve sustainability in development". Supposed to be by releasing this law Indonesia could be more advance in terms of performing economic activities

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[6] Rio World Summit refers to Earth Summit in Rio De Janeiro in 1992, the first convention that bring up the issues of climate change and global warming into highlight.

that are more "eco-friendly", but in fact this law just stop as it is, means there are no promotion nor publications to any related ministries such as Ministry of Economy, Ministry of Trade, etc. There were no publications nor promotion as well to public which are not increasing any public awareness at all. This was make no sense of this policies and law could be run effectively since there are no public awareness at all and establishment of MoE are just an "another minister establishment story". This was make sense if I say there are no impact at all of this policies to decrease the pollutant level of Indonesia. The positive trend in pollutant level could happen because the number of pollutant level in the world was increasing therefore percentage of shares of Indonesia would be naturally declining (this somehow related to population as well).

- Law about the usage of natural resources (Law no.5 Year 1990)
  "All of natural resources within territory of republic of Indonesia should be use wisely and should be guarantee the conservation and sustainability of it". Indonesia was a country that seriously trapped in developing countries dilemma with all of its rich natural resources but lack of capabilities to maximize the usage of the resources. Although the law itself clearly stated about sustainability issues means that activities that include the cultivation of natural resources should be guaranteed of its sustainability. But again as the first sample of Indonesia environmental policy, there is no proper publications to any sides regarding this policies. Second are this are the situation where Indonesia government need to choose whether to enhance economic by not to be really demanding on any company that invest in cultivation of natural resources or being a really demanding by promoting this law and extend it into a detail points of requirements. Again since this was not properly promoted, therefore no significant impact to reduce pollutant level in Indonesia.

- Law about the legalization and adaptation of Stockholm Convention on persistent organic pollutants (Law number 19 year 2009)
  Stockholm Convention on persistent organic pollutants are basically talked about how to controlled economic activities (business) by private companies that will produce wasted. The problems of managing the wasted or excess of the economic activities are the main point of Stockholm Convention. The convention itself was established under the umbrella of UNFCCC which means any country that binding under UNFCCC or Kyoto Protocol will be ratified the result. Again, although it was precisely adapted into Indonesian Law, but there are no activities that enhanced the effectiveness of this law, make it non-sense to improve the decreasing level of pollutions.

C.Conclusion of Phase 2

- Conclusion that I can take from amendments point of view are, the problems are in the matters of applying the new law to public.
- Applied a new law need a lot of compensation from the government in terms of cost, this is (so far) why in the case of Indonesia it is not in line with the pollutant levels.
- There are no significant correlations of establishment or amendments of new environmental policies because the trends of pollutant level is decreasing this because the indicator of

pollutants is getting bigger therefore percentage from countries are look smaller and going into a positive way. But overall there are no strong and clear relations between this two.

Phase 3

Table 2.3

Vertical FDI percentage compared to GDP in Indonesia

No.	Year	Percentage of FDI in GDP
1	1980	0.13
2	1981	0.14
3	1982	0.24
4	1983	0.34
5	1984	0.25
6	1985	0.35
7	1986	0.32
8	1987	0.51
9	1988	0.65
10	1989	0.67
11	1990	0.96
12	1991	1.16
13	1992	1.28
14	1993	1.27
15	1994	1.19
16	1995	2.15
17	1996	2.72
18	1997	2.17
19	1998	-0.25
20	1999	-1.33
21	2000	-2.76
22	2001	-1.86
23	2002	0.07
24	2003	-0.25
25	2004	0.74
26	2005	2.92
27	2006	1.35
28	2007	1.60
29	2008	1.83
30	2009	0.90

| 31 | 2010 | 1.94 |

Note: The data sources for FDI percentage are obtained from International Monetary Fund (IMF)

We can see that the percentage of FDI in Indonesia are very small in comparison with GDP make it not reliable at all if we linked all of this into the effect of environmental policies that pushed towards Japanese government policies that performed FDI in Indonesia. Even though the level of vertical FDI from Japan is the highest in Indonesia, it doesn't make sense how it can affected a pollutant level if percentage of FDI is only around 1% ?. Start from this I can say that there are no strong relations between FDI level and pollutant level in Indonesia.

Phase 4

Both EKC and PHH are talking about Pollutant level will going hand in hand with GDP, so when GDP is increasing automatically pollutant level will be increasing too, PHH as the extension of EKC said that there was another factor that should be included to see the relations between economy (GDP) with pollutant level which is export and import. Based on this two arguments I performed a research that challenge this arguments.

Result from the first phase we can see that it is not true that pollutant level is increasing soon after GDP is increase. Both data of Indonesia and Japan shows that there is a positive trends of pollutant level. This result appear because there are 1 factors that EKC and PHH forgot to put on as a factor, population growth. Indeed the level of pollutant in the world as in total average is increase but this cannot just be blame to Indonesia and Japan. It is really possible to said that the trends in these two countries are declining but in other countries is increasing, therefore there is "filling the box" assumptions about this. One country lose but one country add.

Result from the second phase we can see that establishment of environmental policies in Japan does not promote any Vertical Foreign Direct Investment performed by Japanese Company. There is no clear relations we can see between these two. Things that enhance Japan in decreasing the pollutant level are the system that running by Japanese Government and in fact the percentage are pretty much stagnant in Japan, this mainly because there are only small chance to do vertical investment in Japan since limitation of the area and expensive cost of establishment (this including tax as well). In other hand in case of Indonesia, they actually established a strict rule as well in terms of environmental policies the problems are in the matters of applying the new law to public. Applied a new law need a lot of compensation from the government in terms of cost.

Result from the third phase are there phase are there are no strong relations (perhaps I can say very weak relations) between vertical FDI performed by Japanese government to pollutant level in Indonesia. This because the percentage of FDI is only around 1% to the GDP and infact the trends of pollutant level is going to a positive way.

Globalization that brought up modernization and new factors to be notice make EKC and PHH a little unrealistic nowadays. This might work if we calculate it as in Global number instead only a relations between 2 countries. Facotrs such as population growth, advance technology, and application to public are the key factors that could keep country tracking down their performance along with pollutant level.

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