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Is Free Trade Good or Bad for the Environment? (Case study: Iran)[1]

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ABSTRCT

The debate over globalization and the environment can be given some much needed focus by asking the specific empirical question: What is the effect of trade on a country's environment, for a given level of GDP? In this paper we have attempted to establish the links among trade, economic growth and the environment by performing an extensive literature review. We discuss issues such as establishing direct and indirect effects of international trade on environmental quality, effects of trade on economic growth, environmental quality and their relation with each other, then estimate the model for Iran with using time series data and ARMA models to test Environmental hypothesizes and finally, the role of governments and international organization in this respect.

The finding is that trade may indeed have a beneficial effect on some measures of environmental quality. Results for broader environmental measures are not as encouraging, but one can at least say that there is little evidence that trade has the detrimental effect on the environment that the race-to-the-bottom theory would lead one to expect. The larger effect appears to come via income itself: Our results generally support the environmental Kuznets curve, which says that growth harms the environment at low levels of income and helps at high levels, and to support the proposition that openness to trade accelerates the growth process.
KEYWORDS: Openness • Growth • Air pollution • Kuznets curve
JEL Classification: F18

INTRODUCTION

Industrial revolution causes technology improvement and these technologies will all usage have great role on environment pollution. Industrial revolution, burgess spread, and increasing informing have direct influence on nature poverty. By reviewing the samples of now crisis we either concluded that human showed found a solution found a solution for environmental problem, or reverse the destruction way so quickly.

It also clear those environmental risks are global and this is the reason for global poverty. For example pollution of Holland have a great share on destructing Brazil forests and the source of acidic rain that cause destruction in Canada forest is on the united state.

So any country can't immune itself of process that threaten word population. It is a truth that at the side of sail erosion, Iran is one of the country that this first place and now every hour 11 hector is added to the salt desert so we can found that this country don't have ecological safety and in so many is so concessional.

Many countries have clearly demonstrated extraordinary levels of economic performance over the last century, but the question remains as to the costs of such success; whether it is achieved through the sacrifice of environmental quality, and in turn, whether there is actually any contribution by environmental degradation negatively to economic growth and growth ceases eventually. Many recent studies of the Environmental Kuznets Curve EKC have tried to answer this question.

Opponents of globalization often fear the adverse effects of trade on environmental quality. Should they? The first time environmental concerns entered the international arena were at the 1972 United Nations Stockholm Conference on development and environment. Such concerns stem from the fact that globalization has both positive and negative effects on environmental quality. Accordingly, an important challenge identified during the Earth Summit 1992, was to ensure that trade and environment are mutually supportive. This led to incorporation of environmental concerns in trade agreements such as General Trade Agreement on Tariff and Trade GATT and in World Trade Organization WTO.

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The central focus of the paper is to estimate the effect of trade on the environment for a given level of income per capita. This is an interesting question for two reasons. First, it is the most fundamental question for policy.

In this paper we have attempted to establish the links among trade, economic growth and the environment by performing an extensive literature review. We discuss issues such as establishing direct and indirect effects of international trade on environmental quality, effects of trade on economic growth, environmental quality and their relation with each other, then estimate the model for Iran with using time series data and ARIMA models to test environmental hypothesizes and finally, the role of governments and international organization in this respect.

I.REVIEW OF LITREATURE

Eiras and Schaeffer (2002) for example, find: In countries with an open economy, the average environmental sustainability score is more than 30percent higher than the scores of countries with moderately open economies, and almost twice as high as those of countries with closed economies.

Antweiler, Copeland, and Taylor (2002), which is probably the most careful existing study explicitly focused on the effects of trade on the environment, estimates an effect that is favorable

World Bank as a main encourager for freeing trade has a positive view to this result. Base on the reports of the universal bank 1987, internal economics have better performance to internal economic and growth by high speed and have more percent on factory good for produce and export rate.

II.THEORETICAL BASIS

The relationships between trade and the environment, on one hand, and economic growth and the environment, on the other hand, are multidimensional and intricate. Neo-classical trade economists emphasized the importance of trade in promoting economic growth and stress the dangers of environmental policy for the trade system rather than the reverse. Environmental economists, however, question the positive relationship between trade and environmental quality and ability of trade system itself to promote sustainability. Here, we consider the effect of trade on environment of two aspects:

II.1. DIRECT EFFECTS

What is the effect of trade on environment without its income effect, on the other word, what is its effect in the level of capita income? In this area would introduce two hypotheses:

1.1. Race to the Bottom; Many believe that openness harms the environment. Most widely discussed is the race to the bottom hypothesis, which says that open countries in general adopt looser standards of environmental regulation, out of fear of a loss in international competitiveness.

The discussion logic is this that if countries want to introduce their goods on international competition, should reduce the price of products, attract the international request to them, and be successful in international competition. Environmental laws such as tax on pollution, Causes the increasing on expenses and finally increasing price for production is the result and that' competition power on international level on free trading is decrease. So, Countries that are on the free trading way, for reducing expenses on productions, should decrease the environmental laws.

It seems that this hypothesis is not confirmed completely, because it doesn't attention to technology and initiative roles. On international competitions, Companies that have cheap production and higher capacity are not successful also, technology improvement and constant initiatives causes constant for companies on international competition. These initiatives consist of introducing new product to market that causes a kind of restriction for their producer and better producing technology for reducing expenses and present better quality on produce.

1.2. Gains from trade hypothesis; The possibility of an effect in the opposite direction, which we call the gains from trade hypothesis. If trade raises income, it allows countries to attain more of what they want, which includes environmental goods as well as output that is more conventional. Openness could have a positive effect on environmental quality even for a given level of GDP per capita. for a number of reasons. First, trade can spur managerial and technological innovation, which can have positive effects on both the economy and the environment. Second, multinational corporations tend to bring clean state-of-the-art production techniques from high-standard source countries of origin to host countries. Third is the international ratcheting up of environmental standards through heightened public awareness. While some environmental gains might tend to occur with any increase in income, whether taking place in an open economy or not, others may be more likely when associated with international trade and investment.

Another possibility is that, because trade offers consumers the opportunity to consume goods of greater variety, it allows countries to attain higher levels of welfare for any given level of domestically produced output which, as under proposition above, will raise the demand for environmental quality. Again, if the appropriate institutions are in place, this demand for higher environmental quality will translate into effective regulation and the desired reduction in pollution

II.2. INDIRECT EFFECTS

One fundamental question that introduces for all politicians and economical planner is this, what is the effect of increasing income and economic growth that arise from increasing trade and economic on countries environment.

For answering to this question at first we attention to the relation between trading and economic growth and continuously we consider to economic growth' effect on environment.

Most of trade theories introduce that opening economic causes high growth in long term and beside of the effect on incoming way, have influences such as transferring external creations and quietly attraction of initiatives. We can introduce the reason of welfare improving and growth by trade in the following ways:

1-Trade create these possibility for countries to use of their sources better, beside this, people is skilful in their productive activities and use of incoming for buying good and services for other countries by less expense.

2-free trading encourages efficiency initiative. Economical growth is associated by initiative and technology usage and finally internal producer find enough motivation for improving quality in productions.

3-Free trading increases the ways for people that can find various goods easily and society comfortable level.

ENVIRONMENT KUZNETS CURVE

Word studies illustrate that economic growth could have positive relationship with the degree of openness. Now could study the effect of economic growth on environment. We incorporate into our analysis - without relying on - the environmental Kuznets curve EKC. This is a rough U-shaped relationship between income per capita and certain types of pollution, brought to public attention by the World Bank (1992) and Grossman and Krueger (1991,1994,1995). Growth increases air and water pollution at the initial stages of industrialization, but later on can reduce pollution given the right institutions, as countries become rich enough to pay to clean up their environments. In this area some sights are:

1. Some of authorities say that at early stages of growth, by transferring of agriculture to industry, pollution increases and by increasing in growth and expansions, transferring is made on services part that causes pollution.
2. By increasing incoming, requests for environment quality increases and these subject clear by increasing population requests for democracy and forming environment laws that here we have two hypothesis:

a. The **Pollution Haven** hypothesis: To the extent that countries are open to trade and investment, some e.g., those with low demand for environmental quality. will adopt lax environmental standards to attract multinational corporations and export pollution-intensive goods, while others e.g., those with high demand for environmental quality. will adopt high standards and import pollution-intensive goods. It is worth emphasizing one of the differences between the race-to-the-bottom hypothesis and the pollution haven hypothesis: while the former implies an overall world level of environmental regulation that is less than optimal, the latter does not. Some countries may choose high environmental standards for their own production, and import from others goods that embody pollution.

b. The **Porter Hypothesis**: a tightening of environmental regulation stimulates technological innovation and thereby has positive effects on both the economy and the environment -- for example, saving money by saving energy. The analytical rationale for this view is not entirely clear. Is the claim that any sort of change in regulation, regardless in what direction, stimulates innovation, or is there something special about pro-environment regulation? Is there something special about the energy sector? Nevertheless, the Porter hypothesis is sufficiently widely discussed that it merits a position on our list of propositions to be taken into account.

By attending to these arguments, now, we study the experimental models that examine the direct and indirect effect of trade on environment.

IV.MODELS OF EKC HYPOTHESIS

In the simplest model specification shows a relationship between an environmental indicator E, and the income per capita y.

The following forms are normally present in the studies on the EKC hypothesis:

Linear, Quadratic, Log- linear Log- Quadratic. This forms founded in Hettige et al. (1992) , Shafik (1994) and Kahn (1998) papers:

$E_{it} = B_0 + B_1 Y_{it} + \varepsilon_{it}$ *Linear*

$E_{it} = B_0 + B_1 Y_{it} + B_2 Y_{it}^2 + \varepsilon_{it}$ *Quarderatic*

$E_{it} = B_0 + B_1 Ln(Y_{it}) + \varepsilon_{it}$ *Log – Linear*

$E_{it} = B_0 + B_1 Ln(Y_{it}) + B_2 (LnY_{it})^2 + \varepsilon_{it}$ *Log – Quarderatic*

Several model on the EKC hypothesis include population as an important variable, the most common specification includes population density p in log- quadratic form. This form founded in Selden and Song (1994), Roberts, and Grimes (1997) papers:

$$E_{it} = B_0 + B_1 Ln(Y_{it}) + B_2 Ln(P_{it}) + B_3 (LnY_{it})^2 + B_4 (LnP_{it})^2 + \varepsilon_{it}$$

Some models include income per capita, population density and geographic. Characteristics in order to reflect the dispersal properties of the local atmosphere. The most common specification is shown in a quadratic form. This form, founded in Grossman and Krueger (1991) and Grossman and Krueger (1995) papers:

$$E_{it} = B_0 + B_1 (Y_{it}) + B_2 (P_{it}) + B_3 (G_{it}) + B_4 (Y_{it})^2 + B_5 (P_{it})^2 + B_6 (G_{it})^2 + \varepsilon_{it}$$

Models that are more comprehensive include income per capita, population density, growth, and policy variables. The most common specification is a cubic form. This form founded in Panayotou (1997) paper:

$$E_{it} = B_0 + B_1 (Y_{it}) + B_2 (Y_{it})^2 + B_3 (Y_{it})^3 + B_4 (P_{it}) + B_5 (P_{it})^2 +$$

$$B_6 (P_{it})^3 + B_7 (g_{it}) + B_8 (g_{it})(Y_{it}) + B_9 (K_{it}) + B_{10} (K_{it})(y_{it}) + \varepsilon_{it}$$

Other models include income per capita and variables related to trade such as, intensity of commerce (T), import-manufacturing ratio, export-manufacturing ratio, or prices of goods such as, steel or timber. The most common specifications are shown in a quadratic form:

$$E_{it} = B_0 + B_1 Y_{it} + B_2 Y_{it}^2 + T_{it} + \varepsilon_{it}$$

This form, founded in Suri and Chapman (1998) paper.

Some models include per capita(Y), and variables related to instruments such as political rights and civil liberties, and macro-policy related variables such as black market premium on the exchange rate or debate as a proportion of GDP. The most common model specification is shown in a linear form:

$$E_{it} = B_0 + B_1 Y_{it} + B_2 Y_{it} + B_2 I_{it} + B_3 M + \varepsilon_{it}$$

This form, founded in Torras and Boyce (1998) paper.

V.DATA

In this survey for noting have available data that are related to Iran air pollution, we use of air production' analyzes method, and for each of air pollutant a proxy is made and inserted accounting formula. These data are collected of Iran Statistical Annuals, Iran Energy Balance Sheets, and Iran Economic web site. In this article, pollutant rate, by not attending wind speed on region and raining rate more that actual rate, air pollution and decreasing environment quality, but these data are so appropriate supersede for reviewing the possibility of Kuznets hypothesis.

VI. MODELING

How can study the effect of trade on environment without its income effect? Is it sufficient to regress environment on openness? In this paper like Frankle and Rose (2003), has been estimated model that gone below for Iran:

$$d \ln EnvDam_t = \alpha_0 + \alpha_1 d \ln(\frac{GDP}{POP})_t + \alpha_2 d \ln(\frac{GDP}{POP})_t^{\wedge 2} + \beta d \ln(\frac{X + M}{GDP})_t + \gamma_1 trend + \gamma_2 Dum59 + \gamma_3 Dum57 + \varepsilon_t$$

- dlnEnvDam is the growth of one of three measures of environmental damage
- $\{\alpha,\beta,\gamma\}$ are control coefficients
- dlnGDP/pop. represents the growth of real GDP per capita
- dlnX+M./GDP represents the growth of openness index
- Dum59: Dummy variable for Iran and Iraq war
- Dum57:Dummy variable for Iran revolution

The coefficient of interest to us is β, the partial effect of openness on environmental degradation. Income plays a strong role in determining environmental outcomes. In this report, analysis results are combining by environmental Kuznets curve. This hypothesis says that incoming coefficient is negative. So, the curve of pollution is as down side.

β coefficient have special importance because have special efficient for decreasing environmental quality. Income have special role on environment. This hypothesis introduce that income coefficient is negative. Therefore, pollution curve is at down side.

VII. ESTIMATE AND ANALYSIS

The result of five air pollutants as dependent variable for this model showed in table1. This estimating for carbon monoxide on air, because of low level of F stochastic is not significant. In this research for being particle in air that have positive coefficient for free trading, not accepted race to the bottom and say that trade is bad for environment. This curve follows other estimate for result and review the α_2 coefficient. If α_2 is significant and positive, in high level of income, have rising growth by emission and improving on environmental quality.

Table I
ESTIMATE'S RESULTS

	SPM	NO2	CO2	SO2	CxHy
α1	0.29	1.14	0.49	1.11	0.91
(t)	(-3.1)	(-2.9)	(-3.7)	(-6.3)	(-3.1)
α2	-5.49	-14.48	-3.95	11.4	-3
(t)	(-5.61)	(-3.75)	(-5.25)	(-2.87)	(-0.8)
β	0.263	-0.34	0.03	-0.8	-0.07
(t)	(-5.58)	(-1.8)	(-0.44)	(-8)	(-0.6)
γ3	0.12	-0.27	0.01	-	-0.01
(t)	(-3.3)	(-2)	(-0.41)	-	(-.00)
γ2	-0.014	0.14	0.01	-	0.19
(t)	(-0.68)	(-1.6)	(-0.48)	-	(-1.4)
γ1	-0.006	-0.01	-0.004	-	-0.004
(t)	(-4.67)	(-2)	(-4.28)	-	(-1.7)
AR	2	1	-	4	1
MA	1	1	-	1	1
R2	0.81	0.91	0.72	0.97	0.46
DW	2.086	2.25	2.065	2.09	1.99
F	11.18	29.8	10.9	121.4	2.32
(prob)	0	0	0	0	-0.05

In this research, as shown in table1 , fig.1 and fig.2, Kuznets environmental curve is confirm for pollutant such as SPM, NO2, and CO2 but for SO2 pollutant the quality of environment decreased with income for being positive the α_2 coefficient.

Fig.I
THE EMPRICAL RESULTS OF EKC FOR CO2

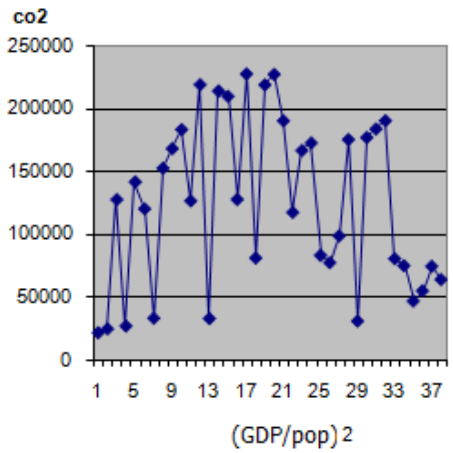


Fig.II
THE EMPRICAL RESULTS OF EKC FOR SPM

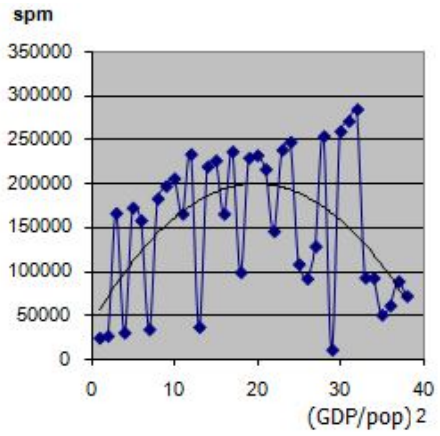
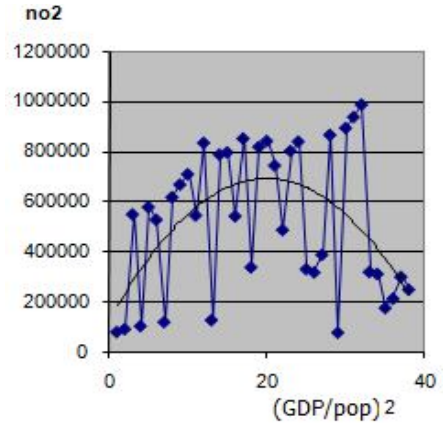


Fig.III
THE EMPRICAL RESULTS OF EKC FOR NO2



The dummy variable of Iran revolution has not significant influence of pollutant this is for changes on refinery products and oil products.

The coefficient of dummy variable of war for NO2 is negative but for SPM is positive and by the beginning the war and oil usage, the particle in air increases and by using white oil in 1359, NO2 is decrease.

VIII. CONCOLUSION

By attending to result of this research, trade has positive effect on air some particle of environment quality, and for some particle that have not a reason for being harmful of trade on environment, trade have positive effect on economic growth and have indirect effect, at first in down level the quality of environment decrease and then this effect is increases by continuing growth and income.

Therefore, the effect of trade on the environment resulting from the interaction of both direct and indirect effects.

As we have seen, such as the findings of the results of most studies show positive effects toward free trade in the long-term affects on the environment. The short-term effect on the severity of this phenomenon is the effect of trade on the environment.

However, further study is needed to estimate the difference between the two is not statistically significant. But if we read a general rule, an empirical model has two key values can be obtained from:

1-With the rise of free trade, even if the two effects cancel each other out, the economy was at a higher level without a change in environmental quality will be achieved.

2-When the maximum point of the Kuznets curve leave behind, both direct and indirect effects of trade in the direction of being a positive influence on the environment will both.

IX. REGULATION AND SUGGESTIONS

By spreading global process in future after world transition for nanotechnologies, competition in word trade, Can help to economical growth and in vesting. So, we can't denial the influence of global growth in international competition at the side of economical. Thus, for constant in economical growth and social welfare, especially in improving countries, doing building is necessary.

We can conclude of Iran founding that going to free trading in long term positive effect on environment. The influence of this phenomenon in short term is depending on the direct effect of trading on environment.

WTO as a sign of trading should be operating in performing environmental low in a way that respecting them would be useful for all countries. It is necessary to use the laws between societies that this state is based on spreading democracy in countries and unify their aims. Using environmental laws is based on high guaranty and having appropriate situation by states man for attracting internal investing and pure technology transferring.

There are some methods for facing with ecological insecurity, and best of them is determining product in environment. As we said there are so many problems for ensample, in countries that are equipped to war instrument and country to create some changes for being universal process and use them in a way for accessing to ecologic security at regional and local level.

REFRENCES

Antweiler, W., Copeland B. and Taylor M.S.. (2001). Is Free Trade Good for the Environment?. NBER Working Paper No. 6707. American Economic Review, 91, no. 4, September, 877-908

Copeland, Brian, and M. Scott Taylor. (2001). International Trade and the Environment: A Framework for Analysis. NBER Working Paper No. 8540, Oct

Eiras, Ana, and Brett Schaefer. (2001). Trade: The Best Way to Product the Environment Backgrounder. the Heritage Foundation, no. 1480, September 27

Frankle, Jeffrey; and Androw Rose. (2003). An Estimate of the Effect of, Common Currencies on Trade and Income. KGS Working Paper, April 10, 2001 – Forth Coming, Quarterly Journal of Economics, May

Frankel, Jeffrey A.; and Andrew K. Rose. (2004). Is Trade Good or Bad for the Environment? Sorting out the Causality. Internet:http://www.ksg.harvard.edu/fs

Frankel, Jeffrey; and David Romer. (1999). Dose Trade Cause Growth? American Economic Review, 89, no.3, June, 379–399

Grossman, G.M and Kruger, A.B. (1991). Environmental Impacts of a North American Free Trade Agreement, National Bureau of Economic Research ,Workings paper No .3914

Grossman, G.M. and Kruger, A.B.(1994). Pollution and Growth: Evidence from the United States, Princeton University, forth coming.

Grossman, G.M. and Kruger, A.B. (1995). Economic Growth and the Environment. Quarterly Journal of Economics, CX, 353-379.

Hung, Shaw. (2002). Is Free Trade Good or Bad for the Environment? Internet: http://www.sciencedirect.com

Hettige, H.Lucas, R.E.B. and wheeler, D. (1992). The Toxic Intensity of Industrial Production: Global Pattern, trends and trade policy. American Economic Review, 82,478-481

Kahn, M.E. (1998). A Households Level of Environmental Kuznets Curve. Economics Letters, 59, 269-273.

Pamayotou, T. (1997). Demystifying the Environmental Kuznets Curve: Turning a Black Box into a Policy Tool. Environment and Development Economics, 42, 462-484

Porter, Michael, Vander Linde , Claas (Fall 1995). Toward a New Conception of the Environment-Competitiveness Relationship. Journal of Economic Perspectives , 49, 97-118

Robert.J.T. and Grimes, P.E. (1997). Carbon Intensity and Economic Growth 1962-91: A Brief Exploration of EKS. World Development, 25 ,191-198

Selden, Thomas, and Daqing Song. (1994). Environmental Quality and Development: Is There a Kuznets Curve for Air Pollution Emission. Journal of Environmental Economics and Management, 27, 147-162.

Shafik, N. (1994). Economic Development and environmental quality: An Economic Analysis. Oxford Economic papers, 40, 757-773.

Suri, V. and Chapman, D. (1998). “Economic Growth, Trade and Energy: Implications for the Environmental Growth”. Trade and Ecological Economics, 25, 195-208.

Torras, M. and Boyce, J. (1998). Income, Inequality and Pollution: a Reassessment of the Environmental Kuznets Curve. Ecological Economics, 25, 147-150.

World Bank. (1992). Development and the Environment. World Development Report Oxford University Press: NY.