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Trade Liberalization and Environmental Pollution in Iran

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ABSTRACT

The environment is one of the main concerns in global policies and affects many other factors including the economy. Trade liberalization would affect environmental quality through its effect on production. This study aims to express the effect of the trade liberalization policy on environmental pollution in the frame of a multi-regional system model. Thus, the GTAP-E model was utilized for the year 2019, so that the environmental consequences (in terms of measurement of CO2 emission) could be studied as the result of reducing the tariffs on import in the forms of two scenarios. In the first scenario, the import tariff on agricultural, industry and services products was reduced by 5%, and in the second scenario, the import tariff on the agricultural, industry and services sectors was reduced by 5%, 10% and 15%, respectively. The results obtained in both cases indicate a reduction in the effect of scale, technique and composition. The results indicate that an import tariff reduction in the various sectors of the economy reduces pollution emissions and its effects improve the environment. The second scenario has a greater effect on the different sectors and also is closer to the reality of Iran's economy.

Keywords: Trade liberalization; Environment pollution; CO2 emission; Global trade analysis project model; Tariff
Jel Code: F13, Q53, C68

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1. Introduction

The world has experienced considerable economic growth within the last few decades due to industrialization and trade liberation (Dong & Dong, 2018). However, the environment and climate alteration have become a fascinating problem for debates globally because of the concerns for sustainable development (Bekun, Emir, & Sarkodie, 2021; Destek, 2019). It is argued that, because of such a development, developing countries are more likely to experience adverse environmental effects because of its consequence of having more trade. While the trade liberation policy is a path to achieving the important economic aims, e.g., growth, it can also lead to much pollution and environment degradation because of more extractions of natural resources. In this regard and simultaneously, the relationship between economic growth and pollution can be heterogeneous as the result of change in production technology, of importing goods with less pollution and of greener production technology.

International trade is considered amongst the numerous aspects describing the environmental issues (Gozgor & Can, 2016; Liu, Wang, Xu, Liu, & Luther, 2018, Nathaniel & Khan, 2020). The environment pollution and trade connection was initially deliberated by economists such as Grossman and Krueger (1991) and Shafik (1994). These researchers proposed a factual basis for the association between trade and the environment. Economic theory specifies that trade leads to development and growth, especially in underdeveloped and emerging countries. Trade liberation across borders has led to a number of ecological challenges, domestically and internationally, through anthropogenic research, such as energy consumption increasing, population growth, and economic development (Abduli & Hammami, 2016)

Due to the non-certainty of responsiveness to the directionality effect of trade liberation on environmental pollution, the main research question is that, is trade liberation effective by means of reducing import tariffs for reducing environmental pollution? The answer to this question will be analyzed in this study in terms of a general balance model of global business known as GTAP-E, because the energy agent is attributed as important goods in the production process and effective on the environment via CO2 emission and creating greenhouse effects.

By the project analysis of global business and considering the energy agent, GTAP-E, as a type of general balance model, the working method is that injecting an exogenous change (here, reducing tariffs on import) in an economic section can affect the entire system. Analysis and study of the result of these changes and effects in a whole economic system and various variables can be carried out in the form of general balance models. These models are preferred to partial balance models when investigating exogenous shocks. Despite the

various studies in the field of relationships between trade liberation and environmental pollution, the lack of implementing a general balance analysis model is a reason for doing such research with the case of Iran.

2. Theoretical Principles

In general, the impact of trade liberalization policy on the environment can be debated from two directions. Firstly, the direct impact of such a policy on the environment is explained. Secondly, trade liberalization as a shock to the equilibrium system initially affects economic growth and then economic growth will have its effect on the environment. The effect of this economic policy on the environment is also mentioned in the form of the theory of pollution haven hypothesis.

2.1. First Path, the Direct Effect

According to a study by Grossman and Crocker (1995), there are three effects of trade liberalization and the expansion of exports on environmental conditions: scale, technical and compositional effects.

Regarding the impact of scale, trade liberalization can have a negative impact on the environment. Most economic activities are damaging to the extraction of raw materials, either in exploiting renewable resources or in generating waste and contaminating the environment. Increasing the level of economic performance means increasing the level of damage to the environment unless the rules are correct and adequate to ensure that excessive activity does not result in harm or damage. One of the economic consequences of this work is the level of performance of that economy. In fact, the scale effect implies a change in the size of economic activity.

The technical effect, sometimes referred to as technological effects, refers to changes that take place in technology and manufacturing methods. Positive technological impacts are achieved when environmental degradation and pollution outcomes are reduced per unit of production. This reduction can be achieved in two ways: firstly, the production might become more efficient, which means for each output unit lesser inputs would be used and some of these inputs might be environmental pollutants. And, secondly, making certain changes in emission processes and pollution, as per use of each unit of input, will cause less pollution. The technical effects are due to the fact that trade liberalization affects the technology transfer process and changes the production methods used to make trade goods. Some argue that with the development of trade, the phenomena that have been effective in improving the environment of all countries, such as proliferation and international aid, are spreading. The technical effect represents a change in the technology and mode of production and the shift towards the use of clean technology.

The combination effect: in general, trade liberalization, structure and the composition of the economy of a country are subject to change. The combination of a country's economy refers to the share that each category of goods has in its entirety. Trade liberalization will make countries grow their products in sectors where they have comparative advantage and so-called specialty in their production. In fact, the effect of the combination is a change in the composition or basket of manufactured goods (Bostan, 2018). In this regard, Grossman et al. (1991) provide a systematic analysis of the interaction of environmental business with different impacts of different variables affecting pollution. According to the researchers, the effect of the scale is to increase the pollution caused by economic growth due to increased access to the market. The impact of technology on the change in production technology is due to the accompaniment of trade liberalization, so that economic growth can lead to increased demand for more environmental constraints and provide environmentally friendly technologies. Finally, the combination results affect the change in the level of production and trade in the economy that may occur due to trade liberalization. In addition, the effect of the combination increases the activity of countries with comparative advantage in specialized activities. Due to the dominance of the combination effect on the economic process, changes in the severity of pollution in an economy may be primarily due to a change in the pattern of business. Therefore, the composition is effective under the impact of trade liberalization on pollution. This effect has the most relevance with EKC[1]. The researchers noted the negative effect of scale on EKC on the early stages of growth, but after the threshold level, this effect with the positive effect of the EKC's impact on technology and structural effects is eliminated. Of course, there are other perspectives and these have represented U-shaped, N-shaped and inverse N curves in terms of the relationship between economic growth and the environment.

2.2. Second Path, Indirect Effect

The effect of trade liberalization on economic growth: so far, many studies have been conducted to explain the relationship between trade liberalization and economic growth. The traditional interpretation described by classical economists is that foreign trade can be the driving force behind the growth. Mint classifies the theory of classical international trade into three categories of daily theories for surplus, static relative cost theory and dynamic productivity theory.

Based on the daily view of the surplus, since land and labor force in the agricultural and industrial sectors of developing countries have not been used optimally and fully, with the expansion of trade relations, these countries will be able to create and increase the capacity

[1] - Environmental Kuznets Curve

for agricultural production and without exhausting domestic consumption, export their surplus. In this way, it is possible to enter industrial goods and other products required for the issue of this surplus as well. The static relative attitude is, in fact, Adam Smith's productivity attitude. This attitude further emphasizes the expansion of the market and the generalization of the division of labor by improving technology and production expertise in such a way as coping with the bottlenecks in the domestic market. The dynamic productivity perspective, in fact, interprets trade as a dynamic force, which, through the expansion of the market and the division of labor, allows the country to use more the machinery and capacities, while innovation in production is spurred and productivity of labor is also increased. In general, the country involved in trade acquires this capability to benefit from increasing returns and widespread economic development (Motevaseli, 2001).

The effect of Economic Growth on the Environment: inspired by the study of Kuznets (1955), entitled Economic Growth and Income Inequality, which states that in the direction of economic development, the relation between income and income inequality is inversely proportional to U. According to this hypothesis, in the early stages of economic development, with the increase in per-capita income, income distribution inequality increases, and after reaching a certain level or a return point, the inequality of income distribution gradually decreases. In the 1990s, with this regard that there is a relationship between environmental degradation indices and per-capita income in reverse U, the Kuznets curve has entered into environmental studies and the relationship between economic growth and environmental pollution indicators is U reversed, known as Kuznets' environmental curve.

2.3. Pollution Haven Hypothesis Theory:

According to the pollution haven hypothesis, it is believed that in an open economy, the intensity of environmental policies is effective on the mobility of countries. Hence, the hypothesis of pollution haven is a fundamental concept in the literature on trade interactions. Based on the hypothesis in cases where low environmental standards in a country are considered as a source of comparative advantage, this hypothesis will be confirmed and causes changes in the pattern of trade between countries. The pollution haven hypothesis states that when trade barriers are reduced, pollution-intensive industries from countries with severe environmental regulations will be transferred to countries with looser laws.

Of course, the relocation of industries is in many cases in the pursuit of comparative advantage, because according to this theory, a country will specialize in the production of goods and services, which, in relative terms, will provide goods and services to other countries at a cost where it produces fewer goods and supplies goods and services, which generates those goods and services in relative terms at a higher cost than other countries.

With regard to the close relationship between per-capita income per country and the severity of environmental policies, the pollution haven hypothesis states that developing countries are a source of pollution, while developed countries are experts in clean production. This hypothesis focuses on the effects of costs in environmental laws on countries, and assumes that the difference in cost of production is a sufficient stimulus for countries to replace their production potential (Barghi Oskooyi, 2008). In other words, the pollution haven hypothesis suggests that, when large industrialized nations attempt to set up factories or offices overseas, they will often opt for the cheapest choice in terms of resources and labor that provides the land and material access they need. However, this often comes at the cost of environmentally problems. Developing nations with cheap resources and labor tend to have less rigorous environmental regulations, while nations with stricter environmental regulations become more expensive for companies due to the effect of the costs associated with meeting these requirements. Therefore, companies that select to physically invest in other countries tend to (re)locate to the countries with the lowest environmental requirements or weakest enforcement.

3. Literature Review

As stipulated in detail in the section relating to theoretical principles, the relationship between trade liberation and environmental pollution is very complex. Moreover, it could be determined in two paths and in the form of the pollution haven hypothesis which does not represent a certain relationship. Thus, the research in this regard has tried to find a relationship using the traditional econometrics method and/or general balance methods.

Frankel and Rose (2002) in a study of the effect of trade on the environment, confirmed the hypothesis of environmental Kuznets curve in a way that the economic growth worsens the environmental situation at low income levels and in countries with a low per-capita income, while it improves the growth in countries with a high per-capita income. In addition, Abdulai and Ramcke (2009) showed that there is an environmental Kuznets curve for more pollutants in special conditions. Jha and Gamper-Rabindran (2004) in an investigation about the environmental impact of India's trade liberalization showed that export and direct foreign investment in the polluting sectors experienced growth in contrast to the less-polluting sectors before liberation periods. Thus, they confirmed the pollution haven hypothesis. However, the results of Antweiler et al. (2001) in a study which focuses on the relationship between trade and environment, rejected the pollution haven hypothesis and prescribed trade liberation as a way to reduce environmental pollution. Managi (2006) analyzed the relationship between exports, economic growth and environmental quality. His results indicated that exports lead to an increase in environmental pollution but that export (variable) entails a negative and significant impact on environmental pollution. Furthermore, the effect

of the measure variable is greater than the effect of the technology variable in all states of model estimation. As a result, his study rejects the Kuznets curve. Beladi and Oladi (2011) analyzed the relation between trade liberalization and pollution in a study which was concerned with the impact of trade openness on pollution in Iran states in terms of how Trade liberalization would affect environmental quality through its effect on production. Following trade liberalization, the international capital mobility is increased. According to the Pollution Haven Hypothesis (PHH) polluted industries will transfer operations from countries with high environmental policies to countries with moderate environmental policies. The study outcome indicated that the effects of trade liberalization in Iran could not cause the pollution resulting from greenhouse gases and the destruction of the environment.

Yang (2001) used the general balance model to study the effects of trade liberation on the environment in Taiwan. His experimental results indicate that CO2 emissions increase as a result of trade liberation because the change in the production structure occurs in those sections that need more carbon. Shapiro (2014) in a study of trade, CO2, and environment showed that international trade increases the environmental costs while the regional tax or globalization increases the CO2 emission of moveable goods, global welfare and regional GDP and damages poor countries.

Kolcava et al. (2019) analyzed whether and in what way trade liberalization via preferential trade agreements (PTAs) assists the shifting of consumption-based environmental loads from developed countries (through imports) to poorer countries (through exports). They completed their research using panel data regression analysis of 183 countries from 1987 to 2013, and they found a partial indication for trade-induced environmental problem shifting. They observed an increase in footprint exports from low-income countries when these countries liberalize trade which was not accorded by an increase in footprint imports of high-income countries. Their findings proposed that PTAs as a policy instrument for trade liberalization are, per se, unlikely to encourage exploitation of low-income countries' natural capital by richer nations.

Arsalan Wasti and Zaidi (2020) in an empirical investigation of CO_2 emission, energy consumption, trade liberalization and economic growth in Kuwait examined the relation between CO2 emissions, energy consumption, GNP, and trade liberalization as interrelated to Kuwait. The research used yearly data, from 1971 to 2017 that had been collected from the world development indicator of the World Bank. Based on the integration of the variables, an Autoregressive Distributed Lag Model was used on the data and the result was in provision of the long and short-run association between variables. Carbon dioxide and energy consumption speed-up economic growth and a rise in CO2 emissions also plays an important role in growing energy consumption. In addition, the Granger Causality test

indicated a bi-directional causality between CO2 emissions and energy consumption. A unidirectional causality was also seen from the GNP to CO2 emissions and energy consumption to trade liberalization.

Liu et al. (2021) in their study raise the question of whether trade liberalization can promote green production for China's manufacturing enterprises and analyzed trade liberalization's effect on environmental functioning using unique firm-level pollution data. By imposing maximum tariff charges from China's agreement as involved variables for real tariff rates, they found that decreasing import tariffs improved the normal SO2 emission. The study also stipulated that changes in the structure of products in the polluting and non-polluting industries can clarify the significant rise in the average SO2 emission. But, using multiple firm-level indicators, they showed the presence of the trade-induced technique result - that trade liberalization can help cleaner production.

Onwachukwu et al. (2021) investigated the causal effect of trade liberalization on the environment. Their study analyzed the effect of trade liberalization on carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) emissions. The exogenous decrease in trade limitations due to countries' agreements with the World Trade Organization were used as a measurement of trade liberalization. By using the difference-in-difference technique, the research estimated the effect of the agreement on environmental quality. The outcomes directly challenged the use of a single environmental quality indicator when measuring the association between trade liberalization and the environment.

In the prevailing literature, as mentioned above, numerous studies have discovered the relation between trade and the environment in several countries. The role of trade liberalization in encouraging or discouraging environmental issues has been a much discussed problem in the literature and is still a subject matter of economist and environmentalist analyst. By studying the literature, it can be seen that there are not enough studies available that analyze the relationship between trade and the environment by means of reducing import tariffs in the framework of General Balance Models which is an incentive for doing this research with the case of Iran.

4. Aim and Methodology

In this study, the use of computable general equilibrium models can be a suitable method for exploring and visually examining the effects of reduced tariffs on imported Iranian goods (total effect). Therefore, by using the Global Trade Analysis Project model, which is a general equilibrium model, the effects of trade liberalization in Iran can be examined for the year 2019. This method uses Iran's matrix data on social accounting. The main purpose of the study is to determine the effects of trade liberalization on environmental pollution. In

this regard, due to the lack of an energy factor as an environmental contaminant in the standard GTAP model, the energy factor in the GTAP-E model and the resulting CO2 emissions are in equilibrium conditions. Then, the effects of trade liberalization on the equilibrium system and CO2 emissions are measured.

4.1. The Structure of Standard GTAP Model

In standard models of global trade analysis, markets are considered to be quite competitive, where the zero-interest condition is true and all markets are clear. Each region consists of four economic factors: the household representing the region, the private household, the state, and enterprises. The regional household has the basic elements used in the production of enterprises and allocates its expenditure to three groups of costs: private households, government and savings. Household expenditures are offset by the revenue generated by the sale of primary factors to producers who produce these goods by combining these factors with domestic and imported intermediate goods of the final goods. These goods, in turn, are sold internally for private and public households and are exported to a range of countries. Also, the government and private households import consumer goods from a range of countries. The two global divisions, which include the Global Transportation Division and the World Bank, complement the regional accounting and equilibrium relationships. The transportation sector is a service value collector that reflects the difference between the prices of CIF and FOB for various goods in different transportation routes. This section serves as an interface between supply and demand for international transportation services. The World Bank is also the interface between investment and global savings. Therefore, if all markets are in balance, all firms will have a zero-interest condition and household balance is based on their budget, according to Walras law, savings should be equal to investment.

Since there is no environmental section in the standard model in order to see the effects of liberation on it, it is necessary, in addition to having a more precise explanation of this structure, to attempt to place the energy factor in order to investigate the environmental effects.

4.2. Production Structure in GTAP-E

Enterprises express their production in the form of a technology tree (as shown in Figures 1 to 5), because of the difference in production technology between the inputs that are included in the primary and intermediate factors. Figure 1 shows a technology tree that is a standard GTAP model. At the low level, there are two existing nest production functions. Separate nests show how the firm combines labor, capital, and land in a value-added portfolio, including initial inputs, and how intermediary inputs, including internal and

external inputs form the medium. Moving upwards, the aggregate production function explains how the firm combines the value-added portfolio with the intermediary portfolio and generates the final product. As shown in this figure, the energy input is included in the intermediate input nest. When the technology of the various processes is significantly different, the nesting production function is an appropriate approach. Another advantage of nesting is that the selection of the entities in each nest process is independent of the components of other nestings. This assumption of autonomy simplifies the required database and model solving considerably. Instead of making two-by-two decisions about all inputs, the firm assumes that a decision will be made on the components of the value-added basket and will make a decision on the ratio of value added and intermediary portfolio in the final product. The change in the ratios of the basket's inputs does not affect the ratio of the inputs of the value-added portfolio. The model specifies a particular type of production function, like that of Cobb-Douglas, or a constant succession pull in each final building nest. The GTAP standard approach takes the functions into account that allow a degree of substitution (CES)[2] between the value creation nesting and nesting factors, but maintains the stacking ratios of these two.

In the GTAP-E model on the production side, energy should be considered outside the nest of intermediate inputs in order to join the value-added nest (see Figures 1 and 2), since the intermediate input is the only division of goods into internal and external ones, therefore, the energy technology cannot be viewed more precisely as a factor contributing to pollution and environmental impacts.

Adding energy to the costly nest is done in two steps. In the first step, the goods are initially separated into electric and non-electric groups and some grades of succession are accepted in both non-electric and electric groups and between coal and non-coal ones. Then, combined energy will be combined with capital to generate mass energy mixtures, which, in turn, have been combined with other basic factors in the energy value nest through a CES structure.

[2] - Constant Elasticity of Substitution

Figure 1. Structure of Standard GTAP Production

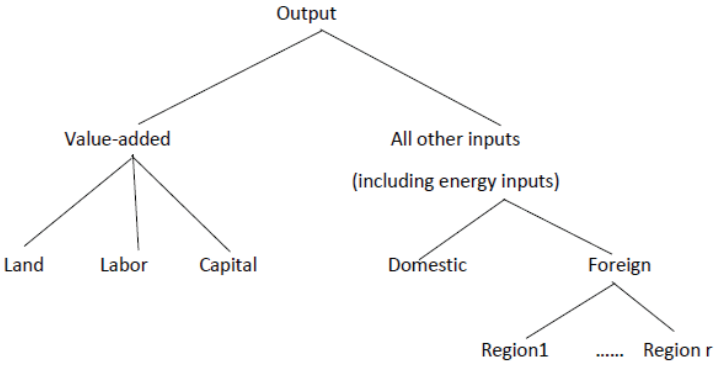


Figure 2. GTAP-E Production Structure

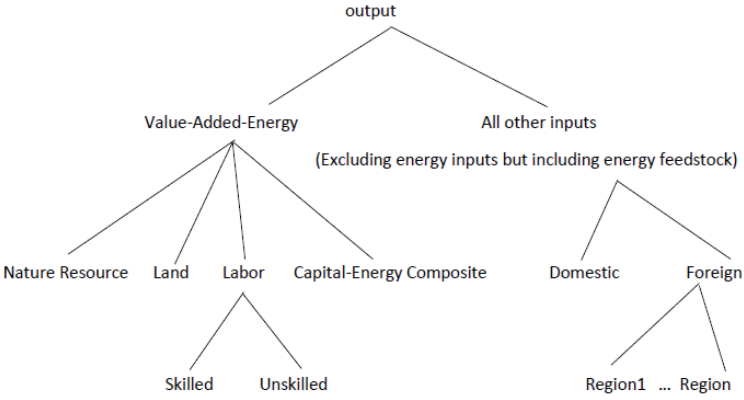
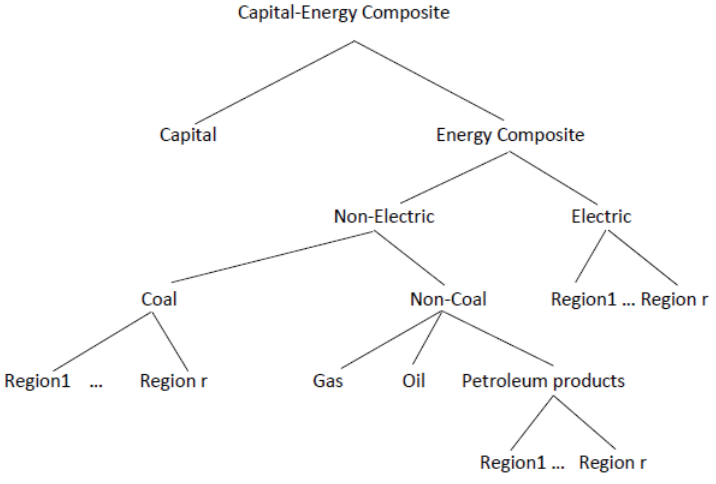


Figure 3. GTAP-E Capital-Energy Composition Structure



4.3. The Structure of Consumption

On the consumption side, the GTAP structure separates private consumption from government consumption and private savings. The consumption expenditure of the government in this model is assumed to be Cobb-Douglas, considering all commodities. While in the GTAP-E model, energy products are separated from non-energy goods by the CES nesting structure, as shown in Figures 3 & 4. As a result, household consumption expenditure has been shaped by the GTAP and GTAP-E models in the CDE structure, and the only difference between these two models is the separation of energy and non-energy consumption.

Figure 4. Government Purchases GTAP-E

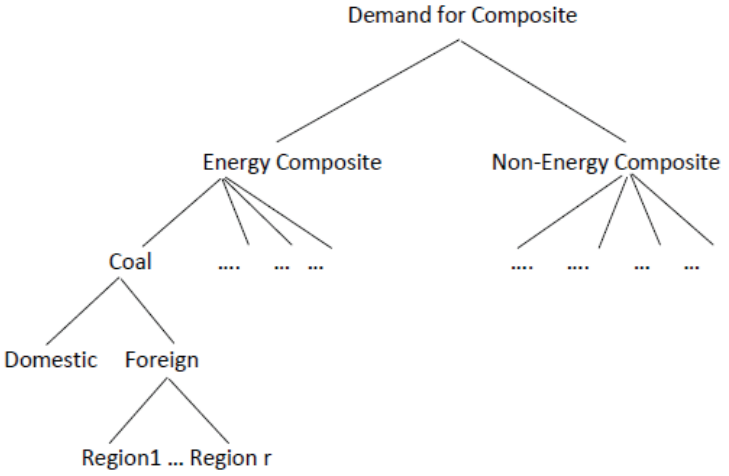
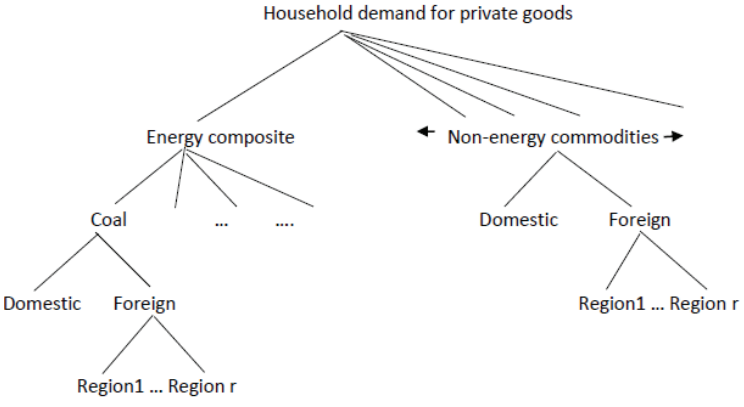


Figure 5. GTAP-E Household Private Purchases



The data in the GTAP covers five production factors, 57 sectors and 113 regions, with the five factors for the production being skilled and unskilled labor, capital, land and natural resources. In order to investigate the environmental impacts of trade liberalization policies, the factors of production are divided into labor, capital, land and energy-capital mixture, since the factor of energy is counted as a factor using which leads to using CO2 and greenhouse gas emissions, thus, environmental pollution.

Table 1: Details of the Model

Set	Subset
Sector	Agriculture, industry, services, oil, oil products, gas, coal and electricity
Regions	Iran, rest of the world
Production Factors	Labor, land, natural resource, energy capital, composition
Environment	CO2 emissions

Source: Authors' Report

5. Simulation and Findings

The purpose of this article is to investigate the effect of trade liberalization on environmental pollution, in which the effect of trade liberalization on environmental pollution is divided into three effects - scale, technical and compositional effects. In order to implement the simulations, two scenarios are defined including reducing the import tariff by 5% in agriculture, industry and services sectors and reducing tariffs on imports by 5, 10 and 15 percent in these respective sectors. Following that, changes in the variables of the value of gross domestic product, the release of CO2 and the sum of the value added of the 8 sections are defined in the model as indicators. Then, the calculating scale, technical, combination effects and the percentage of all environmental changes arising from the trade liberalization policy are attained by summarizing these effects.

First Scenario: a 5 percent reduction in tariff rates on imports of goods in agricultural, industry and services sectors.

In this scenario, the economy's equilibrium system is characterized by three economic shocks: a 5 percent reduction in each non-energy sector, including agriculture, industry and service sectors. What is certain is the result of these shocks, the inequality of the economic balance at the point before the shock and the change percentage in the variables and parameters in the equilibrium system in order to reach the new equilibrium point. All variables have changed including GDP, CO_2 emissions and the sum of the value added of the eight sections in the model, which indicate the effect of the scale, the technical effect and composition of the effect which are considered in this study. The implementation of this scenario is shown in Table 2. The results indicate that the value of GDP has fallen by 2.98%, which itself indicates the lower use of inputs in order to produce more, since the contributing

factor is one of the inputs of production. The reduction of the scale effect means an improvement of the environment quality by a 1.56 percent CO2 decrease, which suggests environmental improvements due to the increased use of clean technology as a result of tariff cuts and reduced trade barriers. Also, the total value added of the economic sectors is reduced by 0.94 percent, which reflects the advantage of the clean industry as a result of the trade liberalization policy. Summing up these three, the percentage of total environmental changes in this scenario is an environmental improvement of 5.48%.

Table 2: Percentage Change in the Scale, Technical and Compositional Effects of the 1st Scenario and the Percentage of Total Environmental Change

The scale effect (percentage change in the value of gross domestic product)	Technical Effect (percentage change in CO_2 emissions)	The effect of the combination (percentage change in the sum of the value added of the 8 parts of the economy in the model)	Total effect (total effect of scale, technical and composition effect)
-2.98	-1.56	- 0.94	-5.48

Source: Estimation Output

Second Scenario: a reduction of 5, 10 and 15 percent of the tariff rate on imports on agricultural, industry and services sectors, respectively.

In order to simulate this scenario, the equilibrium system outlined in the previous chapter is used - three economic shocks are implemented through reduction of tariffs by 5% in the agriculture sector, 10% in the industrial sector and 15% in the service sectors. This kind of scenario is basically closer to the reality of Iran's, since agricultural commodities are considered as strategic goods for any country, so tariffs on imports of goods in this sector are hardly reduced, and the service sector has the most tariff reduction in reality. The results of such a policy indicate a decrease in the scale, technical and composition effect respectively of 5.82, 3.34 and 1.62%, which in total led to a change of 10.78% in the country's environmental climate.

Table 3: The Percentage Change in the Scale, Technical and Compositional Effects of the 2nd Scenario and the Percentage of the Environmental Change.

The scale effect (percentage change in the value of gross domestic product)	The technical Effect (percentage change in CO_2 emissions)	The combination effect (percentage change in the sum of the value added in 8 parts of the economy)	Total effect (total effect of scale, technical and composition effect)
-5.82	-3.34	-1.62	-10.78

Source: Estimation Output

6. Conclusion and Discussion

In this paper, we investigated the possible simulation in two forms of scenarios for reducing import tariff in various sectors in Iran's economy and examined the impacts of the

import tariff reduction on pollution emissions. Our analysis mainly contributes to examination of the impacts of tariff reduction on environment from the macro perspective. The simulation technique which was applied can rarely be observed in the literature that elaborated the relationship between trade liberation and environment pollution, as mentioned in the literature review. The study explored and investigated the specific impacts through technique, composition and scale effects. The results of the first scenario indicate a 2.98% reduction in the value of GDP as an indicator of the scale effect, indicating an improvement in the quality of the environment due to a reduction in the use of the input of pollutants into the products. The reduction of CO2 emissions by 1.56% as an indicator of technical effect, which is the result of the country's relative advantage in using clean technology in its economy is another reason for improving environmental quality. Also, the 0.94 percent reduction in the total value-added composition of the 8-part sections defined in the model represents a reduction in the utilization of the energy input, which is recognized by the combination effect. Summing up the scale, technical and combination effects: the percentage of total trade liberalization policy changes in the environment shows a recovery of 5.48%. The second scenario also indicated a 10.78% improvement in environmental quality, as a result of the decline in gross domestic product, CO2 emissions and value added in the economic sectors as indicators of the scale, technical and composition effects of 5.82, 3.34 and 1.62 percent, respectively. Our results suggest: (1) import tariff reduction in the various sectors of the economy reduces pollution emissions and, as a consequence, improves the environment. (2) The second scenario has greater effects in the various sectors and is closer to the reality of Iran's economy, since agricultural goods are considered as strategic commodities for any country. So, tariffs on imports of such a sector are hardly reduced while the service sector has the capability to impose more tariff reduction, an area in which policymakers must pay more attention to the capacity of various sectors of the economy in potential tariff reduction for environmental protection.

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