Did Globalization Promote Dirty Industries in Turkey?[1]

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Abstract

Globalization issue has been broadly discussed not only in economic, social, and cultural dimensions but also in its environmental impacts on countries. Globalization has some direct and indirect impacts on the environment. One of the dimensions of globalization is economic globalization and it refers to the globalization in trade and finance. Trade globalization, whose main indicator is the rising trade shares in GDP, has indirect and direct impacts on the environment. The trade activity itself directly generates pollution. For example, transport effect is considered as direct effect on environment. Trade liberalization causes increasing transport density, which expands gas emissions deteriorating air quality. Moreover, trade globalization gives rise to indirect environmental effects such as composition (structural), scale, income-consumption, product-technology and regulatory effects. Trade globalization may give rise to a comparative advantage for developing countries in 'dirty' industries because of lower environmental regulations. The main objective of this study is to investigate the validity of the pollution haven effect from trade perspective for Turkey. To reveal the links between trade and environment, special attention should be paid to export and import volume and growth rates of dirty industries, and the shares of some dirty industries in total manufacturing industry in Turkey for the 1996-2014 and 1980-2001 periods, respectively. From this point of view, the study has paid special attention to the evaluation of the impact of trade on environment. In other words, it is evaluated whether or not Turkey would experience a deteriorating quality of environment in the context of globalization. All data was received from Turkish Statistical Institute, and exports, imports data by SITC, Rev 3. It has been observed that foreign trade liberalization of Turkey has no significant negative impact on its environment, because of a modest increase in pollution intensive (so-called dirty industries) exports.

Keywords: Pollution haven, globalization, trade liberalization, environment, Turkey

1. Introduction

The impact of trade liberalization or globalization on the environment in developing countries has been a continuous debate in literature both theoretically and empirically. In the literature, there is a concern that the removal of trade barriers would lead to an intense competition for investment and jobs, which would result in negative impacts on environmental quality of developing countries. There are some direct and indirect links between globalization and environment. The scale, composition (structural), product, technology and regulatory effects are considered as the indirect effects of globalization. On the other hand, transport effect is a direct effect of increased trade on environment.

Some empirical research on how trade liberalization impacts the environment tended to investigate environmental regulations or regulatory stringency impact on trade. The others focus on the impact of direct foreign investment on environment. This study will examine the impacts of trade liberalization on Turkish environmental quality and will investigate the pollution haven hypothesis for Turkey.

The study will initially aim to reveal the relationship between globalization and environment. From that point of view, direct and indirect effects of globalization will be explained. Secondly, pollution heaven hypothesis will be introduced and the dirty industries will be assessed through the main approach/approaches in the literature.

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Finally, export and import volume of dirty industries, its growth rates and the shares of certain dirty industries in total manufacturing industry will be examined for Turkey.

2. Direct and Indirect Effects of Globalization on the Environment

The significant part of the economic globalization is the globalization of trade, which occurs through trade liberalization. Trade liberalization might have some potential negative impacts on environment. It can also be considered that the measures to protect environment are seen as the bridle of trade. According to the conventional approach, environmental regulations increase the cost of production in consequence production is switched to a country where the environmental regulations are lax. However, it can be argued that environmental cost has a very small part in the cost of production compared to share of other production factors like labor, capital, and raw materials. Moreover, due to the environmental regulations, resources are transferred from productive investment to environmental investment, which control and decrease the pollution. Consequently, according to this approach, environmental regulations have a negative impact on competitiveness of a country. However, a new approach focuses on the premise that environmental regulations induce clean technology and technology improvements. According to this approach, for environmental regulations cause additional costs for the corporations in the processes of production and recycling the waste, they could also result in innovations in production process and in the end products. Thus, with a dynamic approach, a consensus between environmental policies and competitive capacity could be reached (Dağdemir, 2003: 263).

In the early 1990's, researchers recognized that globalization is likely to affect environment through some channels such as the composition or structural, scale, income and consumption, product and technology, regulatory effects. While these are considered as indirect effects of globalization on the environment, transport effect is a direct effect of increased trade on environment.

The composition or structural effect depends on the changes in the patterns of economic activity, consumption, investment, or geographic effects, as a result of the increased trade. Increased trade has positive environmental effects or cause negative consequences. If, for example, liberalization causes an economy's service sector to expand and its heavy industry to contract, the country's total emissions would likely fall since the expanding sector is less emission intensive (McAusland, 2008:7). However, trade liberalization causes negative consequences if it encourages the drainage of wetlands to satisfy new demands in trade (Panayotou, 2000:4).

The other indirect environmental effect of liberalization is the scale effect. To the extent that trade liberalization stimulates economic growth, both the scale of economic activity and income rise. Expanding economic activity would largely increase the aggregate level of natural resource use and environmental pollution. Thus, higher production levels lead to more pollution. However, if it would improve resource efficiency and structural change, resource use and pollution intensity per unit of output would decrease. Negative scale effects are more noticeable where there are market failures such as ill-defined property rights, non-priced ecosystems, non-internalized and underprovided public goods (Panayotou, 2000:4).

Income and consumption affects the gains from trade and trade-induced economic growth results in increase in income, which impacts the environment in a variety of ways. First, higher income result in both higher levels of consumption and related to environmental externalities, and in higher willingness to pay for environmental improvement, and related to increases environmental expenditures of public and private sector. (Panayotou, 2000: 5). Higher income causes consumer to pay a higher price for environmental products. Thus green product demand has affected the production structure. Firms gravitate the use of clean production technologies and produce environmental-friendly products (Gökalp and Yıldırım: 2004:101). Second, economic growth makes more resources available for the protection of the environment, and raises environmental quality in a country's list of priorities, prompting governments to increase environmental expenditures. Third, to the extent that trade and growth benefits are widely distributed, trade liberalization might help reduce the pressures placed by poverty on the environment through the overexploitation and degradation of natural resources (Panayotou, 2000: 5)..

Product and technology effect would increase with trade openness process of a country. Trade liberalization facilitates the transfer of products, technologies and processes across countries. The environmental impacts of these transfers depend on the characteristics of the products and technologies that are being transferred. The trade of some products is harmful to the environment such as toxic chemicals, hazardous waste, and endangered species. Trade liberalization expands the potential market for both more efficient capital equipment and cleaner production.

Technologies on the production side, greener products, such as organic foods, and on the consumption side, low-emission vehicles and recyclables could be considered (Panayotou, 2000:7). Technological developments in these directions have positive impacts on environmental quality.

The regulatory effects of trade liberalization on the environment arise from improved environmental policies, standards and enforcements in response to economic growth from enhanced trade. Furthermore, environmental measures included in trade agreements are the other regulatory effect of trade liberalization (Panayotou, 2000:8). However, if a country develops lax environmental standards, environment problems would increase and polluting industries would rise.

The scale, composition (structural), technology and regulatory effects are considered as the indirect effects of globalization. However, the transport effect of increased trade has a direct effect on environment. Trade liberalization largely increases the transport volume. Since alternative transport systems have different pollution effects, dimensions of pollution emanating due to transport come from which transport systems are used predominantly. For example, the global transport sector accounts for approximately 14% of anthropogenic greenhouse gas emissions. Of this 14%, freight trucks account for 23%, ships 10%, and international aviation 7% (McAusland, 2008:19). Moreover, increased trade with further freight density leads to augmenting accidents, which have harmful effects on the environment.

3. Period of Trade Liberalization in Turkey

The period of 1980-1988 could be designated as the period of liberalization of foreign trade in Turkey and integration into the world economy with an increased trade in goods and services. Regulations were enacted in favor of liberalization of imports; promotion of exports and changes in exchange rate policies.

In the context of economic measures, as means of promotion of exports, direct monetary payments, tax exempts or low-interest credits were implemented in the period after 1980 in which Turkey adopted an open development strategy. Import regime was rearranged in January 1980 and import regulations with annual changes in import regime implemented to reach liberalization in the following years. With the 1981 Import Regime, quotas were decreased and import procedures were simplified. In the 1984 Import Regime, more comprehensive regulations were implemented by changing import lists substantially. New arrangement declared a list of prohibited goods to be imported by achieving permissions and liberalized import of other goods and services.

Membership in WTO, Turkey-EU(European Union) Customs Union and further policies for full membership to EU were outstanding developments within the context of foreign trade policies of Turkey. In accordance with Ankara Agreement signed in 1963, Turkey entered the custom union process with EU in January 1, 1996. Thus, Turkey accepted the cancellation of all import levies, mass housing fund payments and quotas on the goods originated from EU (European Union) and EFTA (European Free Trade Association) countries, and implemented a common customs tariff for the third countries. Consequently, weighted rate of protection on the goods originated from EU and EFTA countries was decreased from 5.9 % to zero percent as of January 1st 1996. In addition, rate of import protection implemented on the goods coming from third countries decreased from 10.8 % to 6 % in 1996. However, import taxes implemented on certain specific products (e.g., automobiles, trucks, leather, and shoes, ceramic goods) were diminished gradually (Central Bank, 2002: 10). Custom Union was a significant part of the trade liberalization process in Turkey. As a result of these developments, export and import volumes in Turkey increased significantly (Türker, 2007:174-177).

4. The Pollution Haven Hypothesis

The pollution haven hypothesis refers to the relocation of heavy polluting industries from developed countries with stringent environmental policies to developing countries, which have lax environmental regulations, decreasing the cost of production of dirty industries in those countries. Consequently, developing countries have become pollution havens for dirty industries, while the developed countries import products, which have high pollution content from the developing countries. Moreover, rich countries could get a chance to have a clean environment at home and sustain a higher quality of life. However, ecologic system and economic system have been affected by the transnational environmental problems. Transnational environmental problems like ozone depletion, global warming and global climate change, deforestation and acid rain have cross-border effects so they have an impact on every country. Consequently, rich countries could not sustain high quality of life as a result of global deterioration of environmental and natural resources.

Copeland and Taylor (2003)'s explanation of pollution haven was specified as; "A region or country with a concentration of pollution-intensive activity that has been induced by pollution policy that is weak relative to its trading partners"(Copeland and Taylor, 2003: 143 cited by Gassner, 2008: 4). The models are generally based on the following assumptions: First, they suggest that the location of production of pollution-heavy goods is based on environmental costs. Second, they assume that environmental protection is a normal good and therefore environmental policy is influenced by the income level of a country (Copeland and Taylor, 2003, p. 144 cited by Gassner, 2008: 5). Since the distribution of income levels across the world is unequal, so the level of environmental protection is different among the countries as well. It is argued that countries with higher income levels have stricter environmental laws and are therefore greener than their developing counterparts. Third, pollution havens also exist due to differences in institutions and differences in the carrying capacity environments (Gassner, 2008: 5).

5. Defining Dirty Industries

To determine whether or not Turkey is a pollution haven since the period of trade liberalization, it is necessary to define dirty industries initially. In literature, two main approaches for the classification of dirty industries were used. The first approach measures the pollution content of sectors to identify pollution intensive sectors using pollution abatement expenditures per unit of output (Robison (1988), Tobey (1990), Mani (1996)). With this approach, five sectors emerge with a 'dirty industry' status: Iron and Steel, Non-Ferrous Metals, Industrial Chemicals, Pulp and Paper, and Non- Metallic Mineral Products. Another approach focuses on pollution intensity and directly measures emissions to estimate the pollution intensity of industries (emissions per unit of output). Selection and rank of dirty industries are stipulated based on the actual emissions intensity in this approach. Mani and Wheeler (1997) have used the second approach to determine the dirty industries and classified pollution intensive industries as shown in Table 1. When the two approaches are compared, it could be observed that both of them are concurrent on designation of dirty industries. However, Mani and Wheeler (1997) also designated petroleum refineries as dirty industries. According to Table 1 the highest six pollution intensive sectors with respect to their overall ranks are Iron and Steel, Non-Ferrous Metals, Industrial Chemicals, Petroleum Refineries, Non-Metallic Mineral Products, Pulp and Paper Industries. In this study, the second approach was maintained and the highest six pollution intensive sectors were denominated as dirty industries. Thus, iron and steel, non-ferrous metals, chemicals, petroleum refineries, non-metallic mineral products and pulp and paper are referred as the dirty industries in the study. In this context, this study examines the density of dirty industries inn foreign trade and manufacturing industry in Turkey, for the 1996-2014 and 1980-2001 periods, respectively.

Table 1: Ranking of Pollution-Intensive Industries

Rank	Air	Water	Metals	Overall
1	371 Iron and Steel	371 Iron and Steel	372 Non-Ferrous Metals	371 Iron and Steel
2	372 Non-Ferrous Metals	372 Non-Ferrous Metals	371 Iron and Steel	372 Non-Ferrous Metals
3	369 Non-Metallic Min. Prd.	341 Pulp and Paper	351 Industrial Chemicals	351 Industrial Chemicals
4	354 Misc. Petroleum, Coal Prd.	390 Miscellaneous Manufacturing	323 Leather Products	353 Petroleum Refineries
5	341 Pulp and Paper	351 Industrial Chemicals	361 Pottery	369 Non-Metallic Min Prd.
6	353 Petroleum Refineries	352 Other Chemicals	381 Metal Products	341 Pulp and Paper
7	351 Industrial Chemicals	313 Beverages	355 Rubber Products	352 Other Chemicals
8	352 Other Chemicals	311 Food Products	383 Electrical Products	355 Rubber Products
9	331 Wood Products	355 Rubber Products	382 Machinery	323 Leather Products
10	362 Glass Products	353 Petroleum Refineries	369 Non-Metallic Min. Prd.	381 Metal Products

Reference: Mani and Wheeler (1997: 5)

Foreign trade volumes of dirty industries are displayed in Table 2 for the period of 1996-2014. Table 2 demonstrates the import and export volumes of dirty industries. According to this table, Turkey's imports of dirty industry products are higher than exports of dirty industry products except nonmetallic mineral products, iron and

steel industry particularly during the recent years. However, imports of iron and steel industry rose more than exports of iron and steel industry both in 2013 and 2014.Iron and steel industry exports and imports volume were not significantly different and in some particular years, the import of iron and steel industry were higher than exports of the same industry, except 2013 and 2014. In addition, exports of non-metallic mineral products exceed non-metallic mineral products in the period of 1996-2014 in Turkey.

Table 2: Foreign Trade of Dirty Industries (Million Dollar), 1996-2014

Years	Iron and Steel Industry		Chemical Industry		Non Ferrous Metals		Petroleum		Non Metallic Mineral Products		Paper and Paper Products	
	Imp*	Exp**	Imp	Exp	Imp	Exp	Imp	Exp	Imp	Exp	Imp	Exp
1996	1. 970	1. 926	5. 777	998	815	298	3 .998	250	459	781	836	125
1997	2 .334	2. 248	6. 476	1.169	965	338	3 .716	169	438	932	836	154
1998	2 .230	1. 824	6 .579	1.152	896	365	2 .575	233	498	945	860	150
1999	1 .565	1. 737	6. 288	1.120	816	317	3 .482	308	411	957	897	158
2000	2 .422	1 .865	7. 415	1.242	1. 105	374	5 .43	292	428	1 .121	1.151	164
2001	1. 803	2 .500	6 .243	1.366	811	386	4 .675	399	325	1. 231	784	241
2002	2. 198	2. 831	7. 909	1.522	1 .090	351	5 .411	651	412	1 .468	1.007	302
2003	3. 282	3 .342	10 .428	1.893	1. 411	458	6. 579	819	516	1. 800	1.318	367
2004	5. 325	6. 050	14 .211	2.566	2 .239	664	8 .636	1. 111	717	2. 317	1.712	457
2005	6. 747	5. 827	16. 439	3.060	3 .006	917	12 412	2 027	1 009	2 687	2.009	559
2006	6. 747	7. 239	18. 408	3.923	4. 880	1 448	16 608	3 260	1 419	2 799	2.345	601
2007	11. 341	9. 586	22. 107	4.739	6. 357	1. 778	7. 555	4 .836	1. 542	3. 398	2.831	835
2008	15 .034	16. 842	25 .542	6.121	6 .386	2. 095	11 .396	7. 167	1 .550	4. 321	3.013	1 .051
2009	7 .680	9 .081	20. 266	5.292	3. 931	1 .378	8. 756	3 .578	1 .148	3. 769	2.508	981
2010	9 .721	10. 199	25. 446	6.805	6. 340	2. 152	11. 391	4. 026	1. 528	3. 989	3.286	1 .194
2011	11.544	12 .849	31 .191	8.047	8. 187	2. 748	15. 246	6 .028	1. 827	4 .045	3.634	1. 407
2012	11.096	12.837	29.686	8.913	7.681	2.747	16.179	6.965	1.692	4.083	3.457	1.646
2013	12.193	11.151	31.873	9.456	7.720	2.612	16.116	6.174	1.979	4.290	3.754	1.934
2014	11.302	10.768	33.211	10.09 9	7.905	2.652	16.094	5.602	2.164	4.329	3.874	1.985

Reference: Turkish Statistical Institute, Sataistics by Theme, Foreign Trade Statistics, STIC, Rev 3. http://www.turkstat.gov.tr/UstMenu.do?metod=kategorist, *Imp:Import; **Exp:Export

As shown in Table 3, the imports of dirty industries exceeded the exports of them for the period of 1996-2014 in Turkey. The exports of dirty industries increased from 11.431 million dollars in 1996 to 33.451 million dollars in 2014. However, the imports further increased from 13.857 million dollars in 1996 and it reached 70.676 million dollars in 2014.

Table 3: Total Foreign Trade of Dirty Industries and the Dirty Industries Export-Import Growth Rates, 1996-2014

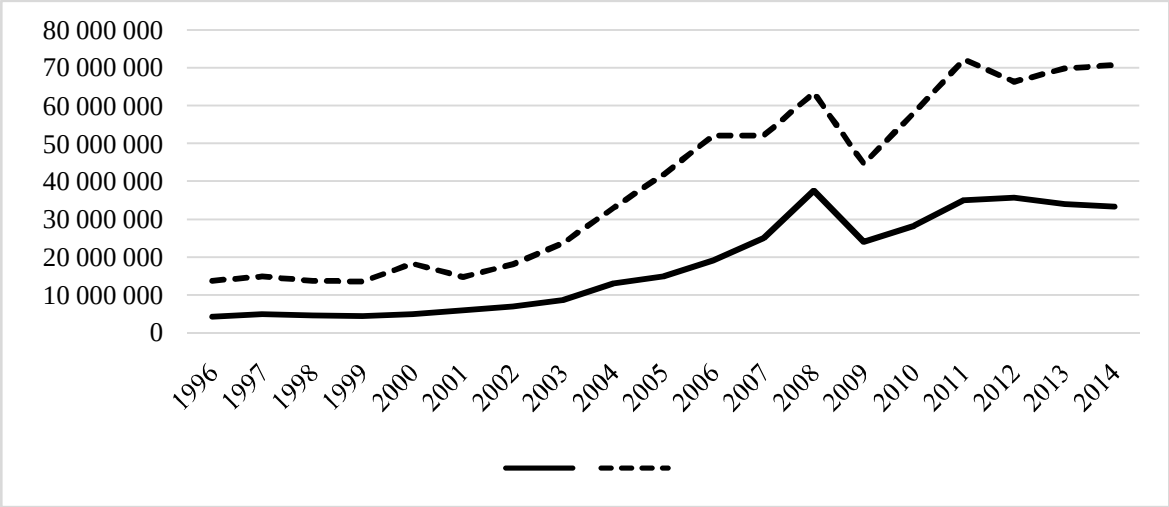
Years	Total Foreign Trade of Dirty Industries(Million Dollar)		Growth Rates of Foreign Trade	
	Export	Import	Growth Rate of Exports	Growth Rate of Imports
1996	11. 431	13. 857	**1996-2014 Averages* 0.0620.095**	
1997	10. 648	14 .771	-0.07	0.07
1998	8. 815	13 .638	-0.17	-0.08
1999	9 .594	13. 463	0.09	-0.01
2000	8. 558	18 .178	-0.11	0.35
2001	8 .681	14. 642	0.01	-0.19
2002	8 .669	18. 043	0.00	0.23
2003	9 .360	23. 543	0.08	0.30
2004	12. 499	32 .848	0.34	0.40
2005	13. 543	41. 629	0.08	0.27
2006	16. 714	51. 814	0.23	0.24

2007	21. 667	51. 598	0.30	0.00
2008	32 .588	62. 789	0.50	0.22
2009	19 .929	44. 144	-0.39	-0.30
2010	22. 719	57. 589	0.14	0.30
2011	28 .066	71. 505	0.24	0.24
2012	35.723	66.333	0.02	-0.08
2013	34.083	69.880	-0.05	0.05
2014	33.451	70.676	-0.02	0.01

Reference: Turkish Statistical Institute, Statistics by Theme, Foreign Trade Statistics, STIC, Rev 3 http://www.turkstat.gov.tr/UstMenu.do?metod=kategorist
*It is calculated by myself which is based on the formulation of long-term average growth rate of exports and imports.

While the growth of exports in dirty industries was at an average of 6.2% in the period of 1996-2014, the dirty industry imports increased at a rate of 9.5% in the same period**.** The domestic demand for pollution intensive industry products in Turkey was increasingly supplied via imports. Especially since 2000, import of dirty industries has been increasing continuously, and consumption demand of dirty industry products was met by imports from other countries. Thus, the quality of environmental in Turkey has not been deteriorating considerably during the period of 1996-2014 (Table 3).

Figure 1: Exports and Imports of Dirty Industries, 1996-2014, (thousand $)



Reference: Turkish Statistical Institute, Statistics by Theme, Foreign Trade Statistics,STIC, Rev 3, http://www.turkstat.gov.tr/UstMenu.do?metod=kategorist

Exports and imports of dirty industries are shown in Figure 1. According to Figure 1, the imports of dirty industries exceeded the exports. On the other hand, the difference between exports and imports of dirty industries has increased since the beginning of 2000's.

6. Structural Effect of Trade Liberalization in Turkey: The Environmental Perspectives

As mentioned before, the composition or structural effect depends on the changes in the patterns of economic activity. The structural change in economic activities has an impact on environment of the country.If, for example, liberalization induces an expansion in an economy's clean industries and dirty industries, which are pollution intensive to contract, the country's total emissions will likely to fall since the expanding sector is less emission intensive. In this context, basic metal industries such as chemical, petroleum, coal, rubber and plastic products industries are considered as dirty industries.

When sectorial developments are examined at constant prices in Turkey, the share of agriculture in gross national product was decreased from 24,2% in 1980 to 8.8% in 2014. The share of industrial products in gross national product was increased from 20.5% in 1980 to 32.9 % in 2014.

The share of services in gross national product increased from 55.4% in 1980 to 59.1% in 2014(Turkish Statistical Institute, 2011:689 and http://www.tuik.gov.tr/UstMenu.do?metod=temelist). The share of the service sector, which is considered as a clean sector, in gross national product rose between 1980 and 2014 and it had the largest share when compared to the other sectors.

If the share of dirty industries in manufacturing industry in general is considered, it could be observed that the total share of chemical, petroleum, coal, rubber and plastic industries; basic metal industries; paper and paper products and publishing industries in total manufacturing industry has not changed dramatically in the period of 1980-2001.
Some pollution industries share in manufacturing industry was decreased from 40% in 1980 to 38% in 2001.

Table 4: Some Dirty Industries Shares in Total Manufacturing Industry (Value Added), 1980-2001

Years	Some Dirty Industries/Manucafturing Industry
1980	0.40
1981	0.43
1982	0.39
1983	0.41
1984	0.38
1985	0.38
1986	0.46
1987	0.38
1988	0.42
1989	0.43
1990	0.40
1991	0.38
1992	0.37
1993	0.37
1994	0.40
1995	0.40
1996	0.38
1997	0.40
1998	0.36
1999	0.39
2000	0.36
2001	0.38

Reference: Turkish Statistical Institute 2014: 250, 257,258, 260. (Calculations were carried out specifically for this study based on the statistics of Turkish Statistical Institute). Dirty industries consist of basic metal industries; chemical petroleum, coal, rubber and plastic products industries, paper and paper products, printing and publishing industries.

7. Conclusions

In this study, it could not be demonstrated that pollution has increased significantly as a result of the liberalization of trade in Turkey. Conversely, dirty industry imports rose higher than dirty industry exports in the period of 1996-2014. In other words, pollution in some trade partners of Turkey deteriorated in that period. Increased trade did not transform Turkey into a pollution haven. Moreover, it could not be argued that there was an increase in the share of dirty industries within the manufacturing industry in Turkey. The share of certain industries that cause pollution in manufacturing industry increased from 40% in 1980 to 46% in 1986. In the following years it has been in a decreasing trend and it was 36% in 2000 and 38% in 2001. Generally, Turkey did not become a pollution haven in manufacturing industry following the liberalization of trade.

Finally, globalization, as reflected in increased trade shares, did not have a significant negative impact on the environment in Turkey. However, the increase in the environmental pollution and destruction of natural resources resulted in considerable global environmental problems. At this point every country should act collectively to target sustainable economic development. Eventually, environmental development will not demand only from the developed countries but also from the developing countries to overcome its negative impacts on human beings. Moreover, human development and its most significant aspect, the quality of life could not be attained without environmental quality.

This study did not take the foreign direct investment perspective of globalization into consideration. It only focused on the impact of trade liberalization on the environment. However, pollution haven hypothesis could be evaluated with regard to not only the foreign trade but also foreign direct investment. Because, pollution haven hypothesis suggests that the pollution intensive industries have been relocated away from the developed countries towards the developing ones. It could be argued that the stringent environmental regulations in developed countries increased the cost of production in the dirty industries in these countries. The developing countries with their low wages and the lax environmental regulations have attracted foreign direct investment into these sectors. The impact of foreign direct investment on the environment is beyond the scope of this study. However, further studies could investigatethe effects of foreign direct investment flow on the environment in Turkey.

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