

Introduction: The environmental issues have been considered in all development plans of Iran. For example, the forty-fifth, forty-seventh, and fiftieth principles of "Iran Constitution" directly refer to environmental issues. According to the future outlook of the Islamic Republic of Iran "having the favorable living environment" is regarded as the characteristics of the Iranian society in the horizon of the next two decades. The environmental issues have also been considered in the economic development plans of Iran. In the thirteenth waver of the First Development Plan Act, factories and workshops are required to provide the necessary equipments and facilities to prevent the environmental pollution. In the Second Development Plan Act, the eighty-one, eighty-two, and eighty-three wavers are explicitly dedicated to environmental issues. The Third Development Plan Act has a new approach to the environmental issues. This Act can be considered as a turning point in the environmental policy because in this plan a separate section is allocated to the environmental issues. Also, the second part of the Fourth Development Plan Act is allocated to the environment issues which include four articles. In the Fifth Development Plan Act, a separate part is allocated to the environment which includes seven articles. Summily, the importance of environmental issues has increased in documents and laws of Iran. Despite the importance of the environment in the documents and laws of the Islamic Republic of Iran, emphasis on the production and creating the added value is considered in the first place but, the effect of additional products or added value on the environment is a factor that has been almost forgotten. The expansion of pollution in the industrial areas is important evidence to this claim. In fact, the added value resulted in pollution due to increased industrial production cannot be considered as a true value because the share of the imposed costs to the environment due to the created value added is ignored. Accordingly, the employment, added value and profitability alone are not a factor for determining investment priorities. Therefore, it is also necessary to consider the costs of environmental degradation in the industrial planning and to obtain green tax for reconstruction of environment. Accordingly, this paper attempts to examine the relationship between profitability and industrial air pollution in Iran to introduce a tax base for environmental taxes.

Materials and methods: To determine the relationship between emissions and profitability of manufacturing industries we used two different methods. In the first approach, the industrial pollution and profitability are calculated. To calculate the industrial pollution, the data on six fuels consumption in the industrial sector include Kerosene, Natural Gas, Liquid Petroleum Gas (LPG), Diesel, Gasoline and Fuel Oil. Data for this consumption were collected from the statistical center of Iran for 2005. The results of the calculation showed that the highest consumption of fossil fuels in Iranian manufacturing industries was related to Natural Gas, Fuel Oil, and Gasoline, in order. Then, the emission coefficients for these three major pollutant fuels were obtained from the Iranian Department of Environment. Emission coefficients are collected based on six pollutants caused by combustion of fossil fuels. These are including Sulfur oxides (SOx), nitrogen oxides (NOx), carbon monoxide (CO), carbon dioxide (CO₂), suspended particulate materials (SPM), and hydrocarbons (HC). Thus, the emissions from fossil fuels have been calculated using the amount of consumptions and emission coefficients of the fossil fuels. To determine the profitability of manufacturing industries, many indices were introduced in the literature in this area. In this study, the price cost margin index is used to calculate profitability. After evaluation of industrial pollution and profitability, the manufacturing industries are ranked into two groups using numerical taxonomy method and based on the degree of emission: clean, highly clean and, highly polluting and polluting groups. Then, the average profitability for each group is calculated separately. According to the second approach, the relationship between industrial pollution and the profitability will be examined using panel data regression model. Therefore, the following equation is used to investigate the relationship between air pollution and profitability:

$$PCMi,t = \alpha_i + \beta \text{Polli},t + \epsilon_{i,t}$$

where, i and t represent the number of industries and the research period (2000-2005), respectively. α_i is intercept, β indicates model coefficient and $\epsilon_{i,t}$ is residual term.

Results: In the first stage, the industries were divided into two groups. Hence, the average of profitability was calculated for each group. The results show that there is a significant difference between the levels of pollution and profitability between the two groups, so that these differences are more apparent in the final years of the period. According to the second approach, there is a significant positive relationship between the amounts of industrial pollutions and profitability of manufacturing industries during 2000-2005.

Conclusions: The environmental protection, especially in the recent decades has been considered as an important issue. The green tax can be used as a control instrument by governments to perform this task. Thus introducing a tax base is important for green tax. This study attempts to identify the relationship between industrial pollution and profitability of manufacturing industries to provide a basis for determining green tax. To do this, two approaches were used. In the first approach to determine the relationship between air pollution and profitability of manufacturing industries, the levels of pollution were calculated based on the emission coefficients of three major industrial pollutant fuels. Then, the industries were ranked into highly clean-clean and highly polluting-polluting groups using numerical taxonomy method. Then, the profitability of manufacturing industries was evaluated using the PCM index. The average of profitability was also determined for each group. The results show that there are significant differences of profitability between the two groups, so the average profitability for highly polluting and polluting group is more than that in the other group. The second approach is based on the relationship between industrial air pollution and profitability using panel data method. This confirms the results of the first approach. The results show that there is a significant positive relationship between the degree of polluting and profitability, the coefficient model is equal to 0.0638. It means that one percent increase in industrial pollution leads to increase in the profitability by 6.38 percent. Therefore, the results of the two approaches confirm the existence of a positive relationship between profitability and industrial pollution during 2000-2005. Hence, it can be expected that a portion of the profitability is achieved by more pollution, not due to better performance of the industries. Therefore, according to the results of this study, the profitability of manufacturing industries can be considered as a basis to determine the green tax rate. The results of this study can also be used as a key issue for future studies.

Keywords: environment, green tax, industrial emission, Iranian manufacturing industries