

Study of Effects of Tax on Vehicle on Reducing Tehran Air Pollutants from Viewpoint of Urban Management

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ABSTRACT

Based on a report by The Organization for Economic Co-operation and Development (2001), approximately all environmental components are influenced by human activities. In fact, human activities cause undesirable effects on climate changes, weather and earth. The present paper aims to study effect of environmental tax on vehicle on reducing Tehran air pollutants from viewpoint of urban management. In perspective of this purpose, this paper is applicable, in terms of data collecting, this paper is descriptive. Statistical population of this paper includes people who had gone to centers of car technical examination at the last three months of 2011, sample size in accordance with statistical pollution and Morgan table has been determined 576, however, this number increased to 586 cases in this research. Moreover, Chi- square test one variable type and one way analysis of variance are tests used in this research. Findings show that individuals participating in this research – without considering their age, education, gender, social and financial class- all emphasize the role of environmental tax in reducing Tehran air pollutants. Moreover, making a proper culture and informing people about advantages of making environmental tax and its effect on reducing Tehran air pollutants have been effective as well.

KEY WORDS: tax, environmental tax, vehicle tax, air pollutants, urban management .

INTRODUCTION

Environmental pollutants are one of the main causes of death in the world. Every year, approximately 3 million people living in large cities in the world die as a result of air pollution. (Dr. Ijadi, ecologist, 2006)

Today, more than fifty percent of world population lives in cities and in 2025 this amount will increase up to sixty two percent. Death rate resulted from air pollution is roughly 4 times more than death resulted from AIDS, 6/2 times more than death resulted from blood cancer, 5/1 times more than death resulted from driving accidents .American researchers have estimated that 10 microgram increase of pollutants in per square meter in Chicago air has led to increase of patients suffering from long cancer. In Tehran, as a result of population concentration in a limited expansion (8 million people in 700 square meter), environmental pollutants has made undesirable changes on climate, water and earth. Tehran air pollution is 2/8 times more than world standard, moreover, metal particles from pollution such as cadmium, nickel, arsenic, sulfate and nitrate ions and hydro carbonates cause disadvantages such as hepatic issues, shortness of breath, IQ problems, and mental problems via being emitted into the air. Based on regional studies, annually 4000 people die in Tehran as a result of air pollution or better to say as a result of presence of 1200 tons of pollutants in the air every day. Moreover, Co2 emission annual growth has been estimated about 20 percent.

Urban and governmental managers need to consider future goals such as constant development, increase of social welfare, decrease of financial instability as well as providing better environmental condition for Iranian civilians.

Based on united nations framework convention on climate change (1992), the aim is to decrease greenhouse gases leading to climate change in the world. This convention took an importance step for considering the issue of global warming. With the increase of greenhouse gases emission in the air, it was proved that the only way to convince companies, societies and individuals to fight against the phenomenon of climate change was to ask developed countries to decrease releasing these gases into the atmosphere.

Pollution emission was studied in 60th decade and up to 90th decade many taxes were represented for it. Here, different kinds of taxes are introduced:

Co2 emission tax, energy consumption tax, environmental tax, polluting industries tax and green tax, therefore, the main issue is that how urban management in Tehran could use different kinds of taxes especially environmental tax in order to adjust environmental condition for civilians and for urban economy.

Deihim in his article titled “financial methods of fighting against Tehran air pollution” suggested that it is better to use different ways such as tax deduction, bank facilitation, tax system, fines, and costs of lack of

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cooperation and so forth to decrease stable sources pollutants. Moreover, he declared that technology change is also needed to control pollution in mobile sources. First, he studied the condition of Tehran air and then he divided the policy of fighting against it into four groups. (Dehim, 1990)

1. Encouraging people
2. Direct intervention of environmental protection organization
3. Creating financial motivations
4. A study done by Pagouhan and Amin Rashti

In 2009, Doctor Mehrnoush Abdollah Milani- assistant professor of economy faculty of Alameh Tabatabaai university- in an article titled “tax on vehicle” studied tax classification of vehicle. To her, tax on products with negative external consequence was suitable for optimizing consumption and finally she studied vehicle tax in some countries.

In 2009, in economy faculty of Cambridge university a research by Locus W. Davis and Lutz Kilian was done, it was titled “estimation of effect of gasoline tax on amount of Co2 emission”. They studied effect of tax on gasoline and its effect on decreasing amount of Co2 emission. In 2008, in the mentioned faculty, an article titled “tax on Co2 design for decreasing amount of greenhouse gases emission in America” was done by Gilbert Metcalf. In this research, the effect of tax on Co2 on decreasing amount of greenhouse gases in comparison with other air pollutant gases was studied.

METHODOLOGY

Analysis of this research data are done based on descriptive and deductive statistics. In descriptive level, via statistical features such as frequency, percentage, mean and standard deviation, data are analyzed. In deductive level, according to data assessment level and statistical hypotheses, following methods are used.

One way analysis of variance

Houman (1991) says whenever a dependent variable has two levels or more than two levels, analysis of variance is used to compare means of these levels, and then based on it, it is possible to determine whether observed differences are results of chance or experimental acts. This method is used to compare respondents’ opinions mean regarding different educational and service background related to main questions of the research.

Chi – square test (one variable)

The aim of chi – square test is to determine whether variable being studied in the paper are independent from each other or not, for participants, three main questions are provided in the questionnaire:

1. What is the use of environmental tax in decreasing Tehran pollutants especially pollutants produced by personal cars.
2. What is the reaction of social classes regarding specification of environmental taxes on personal cars?
3. What is the effect of management on organizing rules in accordance with environmental tax?

Main body

Statistical information shows that during days that Tehran air is very polluted, number of respiratory patients increases up to 60 percent. The most common cause of increasing amount of cardiovascular and pulmonary systems problems refers to sulphur dioxide and carbon monoxide increase. In fact, air pollution in Tehran decreases civilians’ life period up to five years. (Keyvani and Hamkaran, 2004)

According to some environment experts’ opinion, Tehran air pollution turned into a national crisis in 1995. At that time, approximately 100 environment experts, geological teachers and urban engineers made an assembly in Tehran and manifested “ Tehran air in 1995” declaration., in that assembly Tehran polluted air was introduced as a national crisis that needed national will to be solved. In the next years, some contracts were made between Tehran and (JICA) Japanese agency in order to improve air condition of Tehran. Based on researches every day more than one thousand and one hundred and ninety two tons of pollutants enter Tehran air. Majority of these pollutants are related to sulphur dioxide and then, nitrogen oxides, carbon monoxide, and not burnt hydrocarbons.

Table- 1: frequency distribution and percentage of statistical sample based on gender classification

Percent	Frequency	Gender
62	355	Male
38	218	Female
100	573	Total

This table shows that 62 percent of studied sample is made up of men, while 38 percent of it is made up of women.

Table- 2: one of the ways of using personal cars is to determine vehicle tax in accordance with model of it leading to decrease of air pollution

Difference	Expected case	The observed	Agreement state
-50.2	117,2	67	I absolutely agree
69.8	117,2	187	I agree
-44.2	117,2	73	I disagree
49.8	117,2	167	I absolutely disagree
-25.20	117,2	92	I have no idea
		586	Total

Since chi – square gained 106,32 with degree of freedom 4 at level 0/001 is significant, it seems that majority of people agree with “one of the ways of using personal cars to determine vehicle tax in accordance with model of it leading to decrease of air pollution” and believe that it is an effective way to decrease Tehran air pollution.

Table- 3: taxes on cars should be determined at the time of production and for companies producing them

Difference	Expected case	The observed	Agreement state
-3.79	115,8	112	I absolutely agree
130.2	115,8	246	I agree
-7.79	115,8	108	I disagree
-29.79	115,8	86	I absolutely disagree
-88.8	115,8	27	I have no idea
		579	Total

Government intervention in economy has three categories based on different economic reasons. Moreover, unsuitable income distribution in a society and existence of poverty leads to decrease of welfare. Therefore, society accepts government intervening policies in order to improve income. Policies and activities in this field is called “distribution task” of it. Economic instability, unemployment, inflation, and decrease of economic growth rate in each period leads to a society’s decrease of potential production, this condition brings about decrease of a society’s welfare. (Milani, 2009, tax on vehicle) Moreover, government interventions in order to create economic stability are called “stabilization task “of it. Other activities of government are justifiable based on the fact that whether they are economically efficient or not. Since individuals’ and entities’ functions in a society with following economic goals does not lead to that society’s accessing maximum welfare, government intervenes help the society to achieve this purpose. Its activities include producing general goods, preventing commodity markets monopoly with economic external consequences and so forth.

Vehicle tax from view point of urban management

Today, more than half of the world population lives in cities. According to world cities organization report, urban economic activities make 55 percent of gross national product in less developed countries, 73 percent in partially developed countries, 85 percent in developed countries. (Sukhdev, 2009) in Iran, approximately 70 percent of population lives in cities. (Statistical information, 2011) According to statistics, 40 percent of Iran population lives in big cities. In 2005, Tehran gross national product was about 88 milliard dollars, while up to 2020, this amount will go beyond 172 milliard dollars. (Mohammadpour Zarandi, Hosein, 2011, city economy magazine) these numbers show development of activities in cities, and then air pollution would increase as its consequence. Therefore, in order to provide a desirable environmental condition in Tehran, a constant income supported by Tehran municipality is needed.

DISCUSSION AND RESULTS

Hypothesis: there is a relation between Tehran management components and urban pollutants.

Table- 4

Level of significance	Degree of freedom	Chi- square	Question	Component
0/001	4	439/68	With making a suitable culture for determining environmental taxes, it is possible to expect people follow this plan and help decrease of air pollution	Managing
0/001	4	406/84	The functional methods of urban and governmental management could be efficient in determining this sort of taxes and decreasing air pollution	Managing

According to information of the above table, participants of the research believe that managers’ strategy of management affects controlling air pollution. In fact, managers need to make effective managing methods for taxes on vehicles in order to help decreasing air pollution in Tehran. Moreover, there is a significant relation between management component in Tehran and urban pollutants.

Hypothesis 2: there is a significant relation between Tehran social classes and decrease of urban air pollutants. To prove or reject this hypothesis, there are some questions need to be answered.

- Is there any difference among peoples' ideas living in different regions of Tehran toward efficiency of determining environmental tax in decreasing Tehran pollutants?

Table- 5

Standard deviation	Mean	Number	Regions
11/51	49/40	125	North of country
9/31	48/01	72	South of country
11/56	47/29	197	East of country
11/70	49/29	85	West of country
10/52	48/56	55	Center of country

Moreover, in order to determine difference among opinions of people living in different regions about efficiency of specifying taxes in order to decrease Tehran pollutants, following multivariate analysis of variance have been used as well.

Table- 6

Level of significance	F statistic	Squares men	Degree of freedom	Squares summation	Dependent variables
0,47	0,8	110,91	4	443,64	Among groups
		125,37	529	66,32	Within the group
			533	66,76	Total
				9,32	

According to results of test among groups, it has been understood that people in different regions do not show significant difference in their opinion toward efficiency of determining environmental tax and decrease of Tehran air pollutants.

- The next question is whether there is a difference among peoples' opinion toward efficiency of determining environmental tax in decreasing Tehran air pollutants regarding average price of vehicle or not.

Table -7

Standard deviation	Mean	Number	Vehicle price
0,84	47,38	298	Up to 10 million tumans
1,27	48,87	181	11 to 20 million tumans
2,27	51,76	34	21 to 30 million tumans
9,61	48,19	20	More than 31 million tumans

In order to show difference among peoples' opinions toward efficiency of determining tax on vehicle in reducing Tehran air pollutants regarding average price of vehicle, multivariate analysis of variance has been used.

Table- 8

Level significance	of	F statistic	Squares mean	Degree of freedom	Squares summation	Dependent variable
0,12		1,95	238,16	3	714,48	Among groups
			121,99	529	64535,03	Within group
				532	65249,51	Total

According to results of test among groups, it has been understood that people do not show significant difference in their opinion toward efficiency of determining environmental tax in reducing Tehran air pollutants.

Furthermore, more questions have been presented in order to determine results of the questionnaire.

Question 1: what factor is the main factor of air pollution in Tehran (high number of personal cars, weakness of public transportation system, factories pollution, and wrong cultural and behavioral criteria)?

The answers were different among participants, however, workers of governmental offices believed that the main factor for producing pollution refer to first factor up to 18 percent, second factor up to 16 percent and third factor up to 15 percent.

Question 2: do people believe in this issue that type of vehicle has anything to do with relation between environmental tax and decrease of air pollution in Tehran?

The answers to this question are summarized here:

- Tax on vehicle must be in accordance with the type of pollution standard (euro 1, euro 2, euro 3, euro 4) used by each car.
- Taxes must be determined regarding type of car, for instance whether it is a business car, private car...
- According to management background and function of previous managers in relation with efficient managing strategies, it is possible to determine taxes on vehicle as a helpful way of controlling Tehran air pollution.

- There is a significant relation between number of private cars in Tehran and air pollution.

There is a difference between men's opinions and women's opinions toward the four answers, however, men agreed more with this matter than women. Respectively, agreement coefficients for the answers are 14, 14, 15 and 13 percent.

Conclusion

According to this research results, all participants agree that environmental tax could affect Tehran air pollution. Moreover, results show that if managers make useful managing strategies, they will be able to use method of tax on vehicle in order to control air pollution crisis. Since Tehran air pollution is a crisis, it brings about problems for all social classes without considering their location or financial situation.

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