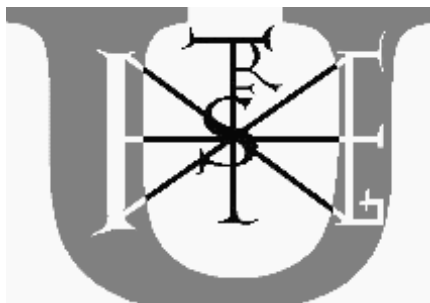


**GÖDÖLLŐ
SZENT ISTVÁN UNIVERSITY**



A THESIS FOR PhD DEGREE

**EFFICIENCY ANALYSIS IN THE FIELD OF ENVIROMENT
PROTECTION TAXES AND MEANS OF GENERAL ECONOMIC
POLICY TAKEN AS A FUNCTION OF THE SENSITIVENESS IN THE
ECONOMIC PROGRESS**

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1. THE IMPORTANCE, THE ACTUALITY OF THE TOPIC

The requirement of joining the European Union is the approach to the law that is the joining country has to adapt its own law to the EU lawsystem. During the preparation of the joining the Hungarian Government considered the field of environmentprotection as a priority, adapting the statutory provision of the enviromentalprotection in the EU. All the directives and the subsidiary principle laid down in the Maastrich Treaty could ensure the necessary flexibility, and could provide possibility to the legislation of certain countries considering the local specialities, the actual direction however works on to integrate the regulation. During the negotiations about the joining the justification of the unified regulation was not questioned. During the debates it arose hardly any times, that the certain states, or even certain regions in them can also apply differentiated enviromentprotectional requirements depending on the natural, environmental conditions or the state of development in the economy and infrastructure. You must not leave out of consideration the basic state of the environment and the most appropriate means should be determined only after this. In the globalizing world, it can be expected, to have the countries and the regions the same chances to achieve a good environmental state, but the common goal should not be reached by the same means. While collecting datas for my dissertation I have found the following problems, which made my work rather difficult:

- In Hungary a lot of emotion and temper on the side of the movements, which does not often enable to give objective opinions, embraces the topic of enviromentprotection.
- The use of enviromentpolitical tools is often not according to professional reasonings but political and lobby interest. The professional analyses can influence the content of the statutory provision plans only very little.
- For the business sphere, the environment protection is a fact that can influence the market significantly, so the voluntary data serving is restricted.

The means of environment politics cannot be interpreted without the state of the environment, but examining their effect the social and welfare effects must not be left out of consideration. A number of foreign and national publications focus on this interdisciplinary and very complicated, complex question. This also emphasizes the actuality of the topic. An extensive survey of the environmental questions has been taken in view of joining the EU, however the literature does not

use the systematically approach except when working up the certain parts. Above all, it does not care much about the analysis of the connection between the environmental state and means of economics. The special situation of the countries in Visegrad is not analyzed, which could however be extraordinary important because of the Joining if we consider the cooperation possibilities and the common interests.

2. GOALS, HYPOTHESES

The basic hypothesis of my work was to show that there is a context between the environmental consciousness and the frame of the tax system. During the examinations, I did my best to clear up the connection system between the certain facts.

My basic assumptions were as follows:

- The state of the environment is in a more advantageous state in countries with more environment consciousness.
- In case of those countries with more environment consciousness in comparison with the other countries the rate of environmental tax revenues are higher in the structure of tax system.
- The means of the environment politics can be realized with systematically approach.

The subject of my dissertation is the studying of the general means of economic policy and the environment protectional taxes. The detailed analysis of the above mentioned topic exceeds the frame of a discourse significantly, so I have tried to find my goals according to this trouble and my own possibilities, which can be summarized as follows:

As a basic aim, I have tried to investigate in the possibilities of economic means in their use and in the barrier of their appliance. In the above mentioned goals, I had the following partial ones:

- 1) In the literary survey of my discourse, I have cleared up the interrelation of the dominant economic tendencies and environmentpolitics. I try to find the answer: what kind of roles the economic means of the environment politics may fulfill, what kind of problems they can and what cannot solve. Beside the analysis of the certain means I wished to examine the possible systems.
- 2) My aim is the comparison of the 15 EU members and the so called 'Visegrad' countries - among them Hungary - which joined the Union right before according to two aspects. These aspects are as follows:
 - a) Environmental state (based on certain features given by literature) in a case I have not aimed to supervise critically the content of certain indexes, as it would require another type of environment scientific analysis.

- b) The structure of the tax-system, which gives information on the appliance of the general economic policy's means and the contribution of the environment taxes in the whole tax-system.
- 3) I try to find the answer to the question, whether there is a connection between the structure of the tax – system and the state of the environment.
- 4) On the ground of this, I make a suggestion on the regionally different and global appliance of the environmental means. I think it is extraordinarily important to know which environmental problems can be solved by the economic growth and which are the factors that become worse as the GDP is growing.
- 5) In the Hungarian environmental ruling I study the construction of the environmental taxes, the applying possibilities of certain means and the barriers of them
- 6) I wish to examine the general means of the Hungarian economic policy through the construction of the budget and would like to know if there has been a tax reform in the ecology in Hungary.
- 7) In the Hungarian economic regulation, I go on searching the further possibilities of the development, which does not necessarily mean the mechanical copying of the EU regulation.

3. MATERIAL AND METHOD

The complicity of the topic demands the applying of manifold methods in the analyses.

According to this, the main methods of the research are as follows:

- Working up the international and national literature
- Statistical analyse , variance –analysis with a manifold mathematical method and concordance – coefficient calculation
- Theoretical analyses, which aim the systematization and analyzation of the above, mentioned information, showing their consequences.
- Delivering scientific lectures, which focus on certain new problems differently, showing the necessity of certain missing topics needed to be researched

The completed analyse can be divided in two groups:

1. Studying the environmental state first, I tried to analyse the changing of certain features and their connection with the GDP with the help of a polynomial trend. As the received results were not, definite enough I went on with main component analysis and to be able to determine the area definiteness I also used variance –analysis. The statistical datas used for the examination come from the report of the World Bank called Development and environment made in 1992 and derives from the databank of the OECD. The studied features are the following:
 - SO_2 ,
 - NO_2 ,
 - CO_2 ,
 - concentration of the dust,
 - the distribution of the inhabitants joined the sewage shown in percentage,
 - The quantity of the settlement litter per head during a year.
2. I studied the construction of the tax system with the help of a concordance– coefficient calculation and I compared the results with that of the principal component- analysis. I made an extra examination on the means of the general economic policy and the

environmental taxes on the ground of the datas given by the EU and the 4 V countries and I emphasized the Hungarian relations. I studied the environmental taxes according to three aspects in the EU and the 4 V countries. (Using the OECD definitions under environmental tax, I understood such central taxes, which are in close connection with the environment protection, but it is not contained necessarily in their name.)

- Environmental taxes per capita (\$ /capita),
- Based on the environmental tax shares (%). In this case, I used two bases in the comparison, one is GDP and one base is the whole tax revenue. The database was that of OECD.

I compared the construction of the tax system with the HDI value because of the contradiction.

3. In the further examinations, I examined the Hungarian environmental tax system using secondary probative datas. I put together the means of system according to four aspects:

- a) On the ground of the pollution chain,**
- b) According to the production process,**
- c) In the aspect of the own price flexibility**

The elasticity is generally negative due to the law of the demand. The consumers react to the price increase with the reduction of the demanded quantity that is why the absolute value of the elasticity is examined in case of the group creation.

- The paradox price effect means an exemption, which contradicts apparently the law of demand, so the consumer reacts with the increase of the demanded quantity. The reason for this phenomenon is that one component of the whole price effect i.e. the yield effect overcompensates the substitutional effect.
- The other group of the exemptions consists of the extern consumption effects (Snob- and Veblen effect). In case of the snob effect when it is about price reduction the consumers react with reduced demand, while in case of the Veblen-effect as to quality the conclusion is drawn from the price, so the reaction to the price increase is the increase in the demand.

- d) On the base of the relative incline of the social marginalcost function (MEC) and the social marginal income function (MNPB).**

It is obvious that due to the strengthening of the effect, the MEC function can be approached more carefully and punctually with an exponential correlation not with a linear one.

I have studied the effect of the means, the relationship of the system and the environment according to the following aspects:

- The environmental effect – system reaction: the base of the interaction between the system and its environment is the effect of the environment on the system.
- Sensibility – insensibility: it is the superstructure of the system, its size and its structure, which determine which environmental effect it reacts. The acceptable strength of the environmental effect is the one, on which the system reacts with the required degree.
- Balance and lack of balance: connection of the effect on the system made by the environment and that of the contra-effect as an answer.
- Flexibility – and rigidity: it means the feature how the system reacts the significant changes.
- Activity- passivity: it turns out in the reaction of those who make the decisions.
- Stability – instability: it means the capability, whether it can keep its balance for long time (Szakál 1993).

According to features of macroeconomical researches, the dissertation is based on secondary researches.

This seconder information is based on national and international literature, which is necessary to realize the goals of the discourse. Among these, the OECD publications are of great importance.

Taking into consideration that the pile of data I have worked up is huge, I have often shown the results in charts and graphically.

4. RESULTS

The state of the environment

On the ground of the literature it is obvious that there are rates for showing the exact determination / expression of the country's welfare (NEW, ISEW) these however do not ensure the commensurability, so the use of GDP is not avoidable. The change- tendency of the examined factors is not definite, so I continued the examination with a principal component analysis. According to the literature, the most conscious countries are in the optimal zone or they are at least near it. Those countries, which find the environmental state less important, get into a more in advantageous zone, or somewhere near it. Among the four states, which have just joined the EU. Bohemia is in the most advantageous zone and Hungary in the less advantageous one. To determine the definiteness of the certain factors I have completed H^2 examination. On the ground of this it can be stated, the fact that certain country joined the EU long time before or now - has an 85% influence on the establishment of the sewerage and the development of the infrastructure. While the fact which group of countries you belong to it does not mean any effect on the changes of the CO_2 concentration. The level of the sewer network's building up can be explained in 2,33%, on which area it is, i.e. on which side of the border it can be found. The present analysis examines the average of the counties and does not take care about the difference (sometimes it is quite significant) which can be seen between the countries. The aim of the No.5 Development Priority and the No.1 Measurements in the PHARE CBC Common Programming Document is the support of the environment protectional investments among others the sewage – water and waste – handling measurements (e.g. establishing common sewage-water- and waste handling systems). Hungary's handicap is significant if you consider it according to the joining the SZVTT (sewage). Its reason is that more than 50% of the inhabitants.

Did not joined the common sewer-system. The other problem is that even those who joined it, only few can have it with real sewage - cleaning (54 %) In this percentage, however 88 % is convenient sewage – cleaning. This is however only 23 % of the whole population. The aimed developments between 1996-2015 (piece- level according to 1999) require HUF 850 billion for a sewer system which is ready in 68 %. The basic requirements stipulate an II. level biological cleaning, if however the EU finds the whole bed of the Danube as a sensitive area, the III. level should be introduced causing an extra cost of HUF 43 billion (Kerekes 2003). The rate of joining is rather low in the areas with little income and in the villages. It can be clearly seen, that the areas with low per head income also the rate of joining is lower. The worst situation is in the south region of the Great Hungarian Plain, especially the villages. It means also a problem, that on the ground of the examinations, the efficiency of the sewerage activity is worse and worse, i.e. there is less and less

joining the built up system. The realized improvements are often too big and spender. According to the literature, the traditional systems could be exchanged by root zone sewage – handling, but the environment protectional authorities did not allow these. (Kiss 2004)

General means of economic policy

While analysing the taxes on income and consumption the concordance-coefficient calculation confirms that, the advantageous structure of the tax-system does not refer to the environment awareness and to the favourable environmental state. The high rate of the taxes on income in the tax system is in connection with the high value of the HDI, so it is in connection with the living standard. The values of HDI are influenced by the facts of the education, which has a so-called retroact to the quality of the environment. It dissolves the contradiction, which exists between the unfavourable construction of the tax system and the environmental consciousness.

Environment protectional taxes

The analysis of the environment protectional taxes I have made with the help of concordance-coefficient calculation, on the ground of this among the most conscious 5 countries (Germany, Netherlands, Sweden, Austria and Finland). 4 ones are lower ranged i.e. they are more advantageous than the others while among the other 5 countries which are less conscious as to the environmental aspect (Greece, Portugal, Spain, Belgium, Ireland) 4 ones are higher ranged i.e. they are less advantageous than the average. The V4 countries have higher ranged numbers than the average, among these, Bohemia has the most advantageous datas and Hungary has the least advantageous ones.

The systematically approach

In the systematisation made in the aspect of the price flexibility, the level of the danger should be examined first. In case, the product, service, waste or technological course may endanger directly, seriously and in short time the health of the human being, the nature itself, one of the direct means should be used. In this case, no decision is possible; the damaging phenomenon must be decreased or put down with the help of authority means. If there is no danger for this, the action should be planned on the ground of the price flexibility of the demand. The advantageous of reactions on the means can be put into two groups:

- Activity, output, product, the abolishment decrease and modification of technology.
- The increase of the state income due to the effect of the economic tools and the assets sanctions (this is the main task of the economic means).

In case of price-flexible demand, the indirect means reduce the demand significantly with the price. Increase, the state cannot count with a big income. In case of inflexible demand, economic means should be applied if the increase of the income is aimed, but direct means are advisable if the aim.

Is the restriction of the activity? The use of the economic means does not generate the decrease of the output in this situation. In case of paradox price effect and extern consumer effects the economic means cannot be used, because as the effect of the tax increases, the price increase results an increase in the amount of the activity. For choosing the optimal means, the analysis of the MEC and MNPB functions is used. Two aspects must be considered while choosing means.

- The steepness of the two functions in comparison with each other.
- If the regulating authority is well informed.

If the authority is perfectly informed, both the direct and indirect means can be well applied. If the authority is not well informed, you should choose according to the steepness of the MEC curve from among the means. The steeper the MEC curve is, the more dangerous the phenomenon is, so if the situation is under-estimated, the damage could be bigger than that of the very strict restrictions. If the steepness of the MEC is smaller, the loss of the society is bigger, if the size of the activity is reduced under the necessary level. The steepness of the MEC functions does not influence the effect of the extensive technological development; however, it reduces the external costs. If it is about a MEC function with small steepness, the intense technological development decreases external costs; however, the MEC function with big steepness as a paradox effect can increase the external costs (Kocsis 1998). For a not perfectly informed authority, the extensive technological development means expectably less risk. In the governing-system, the extensive technological development should be encouraged with the direct means, and the intensive technological development should be forced with the modification of the tax-system.

5. NEW RESULTS

1. Examining the share of the environment consciousness and the environment taxes, it can be stated that there is a definite connection between the facts. In those countries where the environment-consciousness is more emphasized, the environment – taxes have a higher role in the tax – system. The advantageous structure of the tax-system (the taxes on low incomes have low rate) is not an acceptable index of the country's environment consciousness. In those countries, where there are more taxes on income, also the HDI value is high. The contradiction is dissolved by the fact, that the HDI retroact the environmental state and the environmental consciousness through the positive external effect of the education.
2. Applying the concordance – coefficient calculation in the analysis of the tax system structure and the shares of the environmental taxes.
3. Showing the importance of the supports (H^2 analysis) coming from abroad and the regionally different ruling in the development of the sewer network.
4. While determining the systems of the environmental taxes the necessity of the system approach (aspect) in the Hungarian environment- governing with the help of which the means can be used in a differentiated and suitable way. The steeper the MEC curve is, the more dangerous the phenomenon is, so if the situation is under-estimated, the damage could be bigger than that of the very strict restrictions.
5. In case of the paradox price-effect (Giffen effect) and the consumer extern effects (Veblen effect and snob effect), the environmental taxes cannot be applied, because in comparison with the basic state they effect environment destroy.

6. CONCLUSIONS, SUGGESTIONS

The development of the economy and the state of the environment

The development of the economy and the state of the environment are in a contradictory connection. Due to the relating literature and my own studies it can be stated, that with the increase of the income per capita certain environmental features vary into a more favourable direction while some others do so into a more disadvantageous direction. In general, the inverse U curve is not typical, as some environmental features (quantity of waste) are going to be worse with the increase of the GDP; it confirms the statement that the SNA indexes cannot be considered the objective measure of the welfare. First improvement can be realized in such cases, which can be originated in the technical and infrastructural factors. The countries joining at the present do not belong to the most unfavourable zone, more of their environmental indexes (waste per capita) are more advantageous, than that of most of the member states, and the fallback is due to the infrastructure. The V 4 member states form an individual group; they also differ from the 15 EU member states, which are in a less or more unfavourable environmental position. Bohemia is the closest one to the group with the most favourable environmental state and Hungary is the closest one to the most disadvantageous environmental state among the countries of the V4 member states. According to the examined environmental features the 15 member states of the EU are in a more favourable situation than the V4 countries if you consider the sewage-system, and this situation is due to the fact, that they belong to the EU for a longer time and their GDP per capita is higher. There are differences however not only between the countries, but also in Hungary itself. In terms of the sewage-system, a definite fallback can be observed in the regions with smaller income and according to the type of settlements in the villages. Also in this relation, it is true that the infrastructure of the sewage was better built up in the counties and towns with a higher income per capita.

The global and regionally different regulation

In the development of the infrastructure both the direct and indirect means can be used to realize the extensive development characteristically. In case of investments it is especially important to take into consideration the differences of areas when the development of the infrastructure is aimed at. A standardized ruling is not purposive at the level of the EU, because it can make the differences even deeper and deeper. Practically the outlet of the carbon dioxide can be considered independent from the areal situation, so in this case the introduction of the global ruling and the adapting of the ETS system can be reasonable. The characteristically intensive development in the field of the air protection can establish the trade of the pollution rights.

The connection of the environmental state, the structure of the tax- system and the environment consciousness

As to the environmental state the EU member states are fairly scattered, which question the *raison d'être* of the standardized regulation. There can be observed a connection between the environment consciousness of certain states and the examined factors, which characterize the environmental state. The environmental state of those countries is the most advantageous which are hold the most conscious by the literature. There is a connection between the percental rate of the environmental tax revenue and the environmental consciousness of the member states. In the more environmental conscious memberstates, there is a bigger amount of tax revenue than in the V4 states or in the member states, which are less environmental conscious. While examining the tax revenue coming from the environment taxes according to three different relation- base, a large similarity can be observed in the order of the countries. Among the 4V countries, the highest rate of the environmental tax revenue is in Bohemia, which is in the most advantageous situation in the terms of environment and the least advantageous situation is in Hungary, where this tax revenue is the lowest. In the Hungarian tax system, the rate of the environmental taxes is low; it is significantly below the value, which can be observed in the EU15 and in the V4 countries. In the tax system, the taxes levying the income both in the EU 15 and in the V4 countries are higher than those levying the consumption are. The construction of the tax system has effects on the way of life in a much larger scale than on the environmental state. In Hungary, the significant part of the central budget's income derives from the taxes levying the consumption, which refers to the favourable construction of the tax system. Examining the time period between 1992 – 2002 an unfavourable direction can be noticed: the increase of the personal tax revenue exceeds that of the taxes levying the consumption. However this will be advantageous in the view of building up the welfare systems. Examining the rate of taxes levying the income and the consumption the concordance coefficient calculation confirmed that the favourable construction of the tax system does not refer to environmental consciousness and advantageous environmental state. The high rate of the taxes on income in the tax system is in close connection with the high HDI values, so with the standard of life. The educational factors influence the HDI value gradually, which react to the quality of the environment through its external effects release the contradiction between the unfavourable construction of the tax system and the environmental consciousness.

Analysis based on systematical approach

In the building-up of the system the availing incident is a missing element whose principal possibility is provided by the law but detailed measures has not been accepted yet. In case of applying the environment ruling means there could be a large danger if the regulating authorities are informed in are stricted, which could cause problems especially in case of using the economic means. It is of significant importance, that creating the environmental regulations system the regulating authority should know its scale information. For the less informed authority, the applying of the direct means is with less risk. The price flexibility analyse are definitely necessary to use the environmental taxes, because in case of their lack the expected result cannot be assured.

Suggestions for theoretical and practical appliance:

- It can enlighten the creating and choosing of the projects in case of sponsorships entering the border.
- The examining the means of the environment policy in a systematically approach can lend a hand to those making decisions so as to be able to chose means which is most appropriate for their aims.
- The connections results presented in the dissertation can be used during the education of the subject called environment economy.

Further researching directions:

- The exceeding of the examination onto the 25 member states of the EU
- The examination of building up the sewage system on the border of an EU 15 and a V4 member state.
- Examining the changes of the tax system in time, which informs us about the tendency of the change?
- In the tax – system of Hungary the examination of the taxes on the consumption, which offers more precise information about the ecological tax reform?
- Tax preferences, supports, as negative taxes in the examination of the tax- system.

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