

THE LINKAGE BETWEEN EXTERNALITIES AND THE INSTITUTIONS – THE VALUE AND PRICE

Koľveková Gabriela (Кольвекова Габрієла)

The main research question of the paper was stated in line with the research task in the project VEGA named „Economic tools applied in the environment protection of the market economy with the application in the Slovak republic“. The first stage of the research was analyzing the approaches of individual economic schools towards the problems of externalities.

The objectives were many fold: to discuss the value and price theory concerning the externalities and to show a linkage between externalities and the institutions using an example from Košice region. The case study of Bankov Mine was a small attempt for providing some empirical evidence on the issue of externalities and institutions.

Key words: externalities, institutions, price, value, evaluation

INTRODUCTION, OBJECTIVE AND METHOD

For there is a gap of overlapping articles on externalities and institutions in the respect to value and price from perspective of various economic schools the paper was depicting the linkage between externalities and the institutions as well as providing examples on that linkage. Particularly there is a lack of articles with empirical approaches, which was tried to be added here. The case study of Bankov Mine was a small attempt for providing some empirical evidence on the issue of externalities and institutions, habits and environment, interests of the owner and city authority interests and the values and prices that were being attached to that case study.

The objectives were many folds:

- First of all to prepare some material of a future textbook.
- Second discuss the value and price theory concerning the externalities in theoretical approaches of various economic schools,
- Third was to show a linkage between externalities and the institutions using an example from Košice region.

The main research question of the paper was stated in line with the research task in the project VEGA named „Economic tools applied in the environment protection of the market economy with the application in the Slovak republic“. The first stage of the research was analyzing the approaches of individual economic schools towards the problems of externalities i.e. mainly the negative consequences of the human activities upon the environment.

The aim of the paper was to describe the approaches of the economic schools – D, G and H at least according to selected criteria as provided by table 1. Methods were: observation, brief description and analysis. The schools A, B and H had already been analyzed in the paper by Koľveková [1].

OUTCOMES

Evolutionary economy

The evolutionary theory, environmental economy and bioeconomics apart from others are a subset of so-called heterodox economy. The start of the evolutionary economics can be stated as the middle of 20. century.

The environmental economy crux is the concept of market failure, the externalities. Those market failures occur in the system of economy, which may differ in its institutions. The research question can be more complicated considering the institutions to be a cause of the externalities, not simply a failure of a “untouchable” market. A suspect in the case of externalities is easier to comprehend in negative externalities, while in the positive ones. Furthermore the time and place is a must when looking for a suspect of externalities. One can suggest a very quick answer to this “detective story”, which is that the market itself is an institution created to help us to make a routine of the buy and sell process. The evolution is antonym to routine therefore the environmental or evolutionary economics concentrates its theories upon solving the externalities with help of “evolution”. For some this could mean to look for another routine to handle the negative externalities, but the problem is that they occur as a consequence of some innovations. Hence they are random and unpredictable and thus the evolutionary process is supposed to be continues over the time. Probably one is always looking for “patch for an old rag”, which as it is known would not help unless there is a new tissue. This brief introduction towards evolutionary economics is suitable to be concluded with Garrett Hardin’s essay [2], who contributed to this dispute with the so-called tragedy of commons.

Afore mentioned rather informal presentation of evolutionary economy was shifted towards formal and more explicit lettering of it from the perspective of divergence noticed in the research in the evolutionary economics. Silva and Teixeira [3] had done an extensive survey (bibliometric method) on evolutionary economics in terms of its research paths and contributions. Their outcomes can be summed up as follows:

Table 1 Economic schools and criteria of their analysis

Schools	Criteria
A. classical school	- epoch
B. neoclassical school	- two agents of individual schools
C. austrian school	- opinions about the externalities, values, price and scarcity
D. environmental economy	
E. bioeconomy,	- opinions on the costs and opportunities
F. ecological economy	- opinions about preferences
G. co evolutionary theory	
H. new institutional economy	
I. market environmentalism	- opinions differing particular schools

Source: own elaboration

Drawbacks:

- the scarcity of empirical research within the evolutionary economics due to ontological foundation of evolutionary thoughts
- the need to compromise the metaphysical and formal and game approaches with real-world economy
- there is no common framework or closed system approach of axioms

Advantages:

- the half of the evolutionary papers are published in the journals of high impact factor according to Silva and Teixeira (Ibid.) based on comparison under the criteria mentioned in the paper
- as for the themes – the “Development, Environment and Policy” theme was the third most frequent topic to be researched after the themes: “History of Economic Thought (HET) and Methodology” and “Games”.

Finally, in order to introduce the evolutionary economy in more detail in this paper, the two authors were chosen to shed a light on some research topics of evolutionary economics: **Faber and Krenken** as co-authors and Hodgson.

The evolutionary economics is based on environmental innovation as a maximization problem. Innovation is supposed - because the technological innovation is intended, it is not random - to be the evolutionary badge of the economics. “Routines enable organizations, in particular firms, to produce particular technological artefacts at a certain level of economic efficiency.” [4] The innovations obtained by investments in Research and Development (R&D) are increasing the value-for-money; they create new routines and thus reduce the costs in the processes. So-called routinised regime (Winter, 1989 In: [4]) is being replaced for entrepreneurial one in case of R&D. The routinised regime is typical for the imperfect (oligopolistic) competition while entrepreneurial is typical for the monopolistic or perfect competition.

Hodgson (1999 In: [4]) has set the connection of the notion evolutionary with several economic schools i.e. institutionalists, Schumpeter’s followers, the Austrian School, the work of various writers such as A. Smith, K. Marx and A. Marshall, mathematical economics and game theory, chaos theory. This depicts a fact of overlaps among several economic schools and the evolutionary approach.

Hodgson was evaluated in the survey of Silva and Teixeira [4] as the top author on the evolutionary economics having published a book titled as “Evolution and Institutions” in 1999, which accounts for another overlap of the evolutionary economics and institutional economics. This connection of evolution and institutions may seem to be extending the ideas of Veblen described in the next part of the paper.

New institutional economy in the context of value and price theory and practice

“Hawthorns experiments are the starting point of further evolution in personal management that has meant the transition from classical approach based on the rigid administration of work and prevailing economic stimulation, towards the theory of human relations with adequate rules of organization and management of work and the corresponding motivation.” [5]

Motivation for human activity and work from afore mentioned quote was considered an important factor in the practice of dealing with externalities. Also the economic stimulation is important. Thus the motivation combined with values and price can give an outcome of helping the environment to be preserved for future generations without sacrificing too much (which itself is questionable).

Veblen as an impersonator of institutional economy wrote an article on the question „Why is economics not an evolutionary science?“ [6] Veblen argues that economics had fallen short to be an evolutionary science. The paper explains the development of economic thoughts and points out the fallacies concerning the evolutionary character of the scientific approaches used in over the centuries. For instance the criticism of physiocrats and their natural order or the work of classical economists such as J.S. Mill, who was quoted “Happily, there is nothing in the laws of Value which remains for the present or any future writer to clear up, the theory of the subject is complete.” (Mill In: [6])

The criticism was broadening by analysing the work of Cairnes^[1] for a economist, who was working out more taxonomy and thus petrified the science more.

In conclusion he suggested: "Economic action must be subject matter of the science if the science is to fall into line as an evolutionary science." [6]) This was supported by the fact that economic life process the economics is concerned about is "the human material of the industrial community." (Ibid.)

His definition of the evolutionary economics was:

"... an evolutionary economics must be the theory of a process of cultural growth as determined by the economic interest, a theory of a cumulative sequence of economic institutions stated in terms of the process itself." (Ibid.)

Finally Veblen asks that the science follows the modern technological exigencies and keeps pace with the drift of innovations, which are continues and evolutionary in their substance.

Thus the bridge between economics as evolutionary and non-evolutionary science is the learning process itself. **Boyd and Richerson** [7] had offered useful concept - the concept of „A simple model of learning“, which was described also for the purpose of environmental examples mentioned later. Organisms (actors in the economy) are in the interaction with the environment and they try to adjust their behavior accordingly. It is the learning process that can be formulated in line with Boyd and Richerson [7] as follows:

$$Y = \frac{V_e X + L(\Gamma(H) + \epsilon)}{L + V_e} = aX + (1-a)(\Gamma(H) + \epsilon) \quad (3.1)$$

“where L is a parameter which measures the propensity of an individual to rely on individual learning, $\Gamma(H)$ is the objective (or goal) of the learning rule in environment H (for habitat), and ϵ is a normally distributed random variable that represents the effect of errors made during the learning process. We assume that ϵ has a mean of zero and variance V_e . In general, we expect learning to improve the fit of the mature phenotype to the environment. ... The parameter $a = V_e / (V_e + L)$, gives the fractional importance of cultural transmission in determining mature phenotype. Notice that the relative importance of individual learning depends on both an individual's propensity to rely on individual learning (measured by L) and the accuracy of the learning process) measured by V_e .” One could find modifications of this learning rule for the constant environment or heterogeneous environments. Also the learning costs can be studied as well. To conclude the contribution of the Boyd and Richerson was in summarizing the perplexity of the cultural transmission and the whole evolutionary process in coherent way. This can be useful for the study of institutions and externalities as well.

All authors mentioned in this outcome part Faber, Krenken (2008), Hudgson (1999), Veblen (1898) and Boyd, Richerson (1985) had a feature of innovation and evolution and learning included in their papers or books.

Discussion about the linkage between externalities and the institutions – the value and the price

In Slovakia the evolutionary economics could be found under the landscape ecologic planning as shown for instance in the quote of Izakovičová (2006), who emphasized among other problems the following one.

“Absences of application of principles and criteria of the sustainable development when evaluating the building and activities - e.g. single-ended evaluation of buildings and activities based on social effects, preferences of economic utilities for the environmental and so forth. From this perspective it is a problem also the absence of economic evaluation of natural resources, which complicates the process of objective evaluation of economic efficiency of buildings and activities.” [8]

The evaluation methods were described as an extension of next externality and institution linkage example from Slovakia.

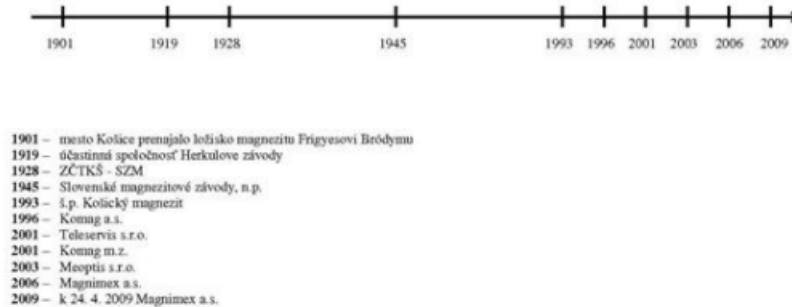
An Example of an linkage between externality and institutions

We can understand the environmental good as an example of externality. For instance the case study of “Bankov Mine”, located in Košice city - is a negative externality (in form of health diseases to be healed, dirt to be cleaned etc.) example due to the dustiness caused at the time of exploitation of magnesite. The consequences of previous excavation (since 1914) had remained. The mine areas become to be in the middle of residential area as the Košice city had grown and spread. The Košice already commenced the recovery of some parts of this brownfield. Nevertheless some issues are still persisting e.g. callus zone problem. Also the problem of property rights, which can be illustrated by naming the owners of the mine: in the time span of 92 years (1901-1993) there had been 5 owners, while in the time span of 16 years (1993-2009) again 5 owners (see Figure 1). Truly it also pictures the change of the economic system from planned economy towards the mixed one. On the other hand, this points out that the externality will exist, but the institutions have the power to internalize it or to lower the negative consequences of it, which in this case is rather postponed using the institutions (Mining Act and other Acts allowing the owners to behave as they do i.e. postponing their activities). On one hand the institution – norm of at will contract was flexible to form property rights among continuously changing “new” owners, on the other hand the institution – legal rules (mining act) enables rigid (rustiness) behavior of all actors: owners of the Bankov Mine, Mining Office Board and other authorities.

None the less, the Bankov Mine was included in the European Capital of Culture - ECOC plans [9] in terms of changing the crater on the panoramatic place of the Košice. The space was suggested to be turned into a several

possible facilities e.g. the open-air festivals, children city, restaurants etc. while having the exploitation of the magnesite. The institution of ECOC can be fruitful in motivating activities around the externality, hopefully bringing the social effects and economic utilities it promises for the future generation.

Figure 1 An overview of the companies, which had run the mine Bankov during 1901- 2009



Source: Bačová, M. 2008. Ekonomické inštitúcie na ochranu životného prostredia v trhovej ekonomike. Diplomová práca. Vedúci/a: Ing. Gabriela Kol'vecková, Ph.D. Košice: Katedra ekonomických teórií. Ekonomická fakulta TU. 104 s.

The problems obvious when researching this case study were issues of institutional economy i.e. of property rights of the owner, the taxation and interests of the city authorities (willing to have more attractive city due ECOC plans), apart from others. This shows a clear linkage between externalities and the institutions in very simple manner (can be explained more via the history of the Bankov Mine - see [10]). The depiction of case study was very modest therefore we extend it with the suggestion of the methods used for future evaluation (as mentioned before by Izakovičová, [8], used to be absent), when the interest of owner and the city authority need to be balanced, argued and bargained in the process of learning. Let us conclude the example with Sucháček [11] "While the matured economies in the course of their development had firmed both formal and informal institutions, in the transitive economies, which are overcoming lots of development discontinuities and their afflictions of environment negatively influencing both types of institutions especially during the transformation years, when the informal institutions muddled through markedly."

The extension of an example for the issue of value and price

Starting from the definitions:

- Value of environmental goods – includes especially the community preferences in sense of utility of the environmental good.
- Price of environmental goods – is being derived in various settings by using hedonic assessment or eventual related assessment.

When explaining the value and price the cost had to be included as well. For the environmental goods the social costs are somewhat the key issue. These social costs of natural goods include environmental values split for:

- non-use values – existence and bequest values (symbolic, historic, ritual value)
- use values
 - o direct use values (hunting, fishing, timber...)
 - o indirect use values (ecosystem services, flood control, water purification ...)
 - o option value (future use due to demand or information changes)

The tricky issue is the measurement of these values in real-life examples, where one has to select the methods. Professor Ahlheim explains that to non-use values the direct methods of welfare measurement are applicable. While to the later ones the indirect methods of welfare measurement are assigned (Travel Cost Method, Averting Behavior Method, Hedonic Price Method) [12] Further methods were described and shown their applicability by James [13]:

- The productivity Changes Approach
- The Loss of Earnings Approach
- The Replacement/Repair Cost Approach
- The Shadow Project Approach

- The Relocation Cost Approach
- The Defensive Expenditures Approach
- The Travel Cost Method
- The Property Value Approach
- Contingent Valuation Methods
- Cost-Effectiveness Analysis
- Cost Tradeoff Analysis
- Threshold Analysis

When preparing some recommendations for environmental issues, one needs to use several of the methods mentioned above. It is so because of the complexity of environmental problems.

Also the method to use in measuring value of the environmental goods is Benefit – Cost Analysis (CBA). This method was also applied in the example of Mine Bankov. Based on the Pareto Potential Welfare Criterion the marginal utility and total utility could be sketched. Resulting from that one obtains the willingness to pay for the utility or willingness to accept a monetary compensation for the disutility (e.g. for pollution). The CBA divides for the assessment of the “on site and off-site effects i.e. externalities and “with or without-project” situations. Still the naming of the methods was not finished, to apply one of them for the case study remains the task for the future research activities.

CONCLUSION

The linkage between externalities and institutions was looked for in the framework of two economic schools: evolutionary economics and the institutional economics. There exist good overlaps between these two schools. Innovation was seen as a subject of evolution and that causes a problem of externalities at the same time. The externality issue leads men's behavior to another innovation and this makes it eclectic. Eclectic character was also present in the model of learning. The learning process was observed when gathering the data on the case study „Bankov“ in the Košice region. The study itself was described very modestly. The two conclusions were made: the naming of the linkage issues between the externalities and the institutions and later the suggestion to use evaluation methods for future recovery of the brownfield such as: Market Price Method, Productivity Method, Hedonic Pricing Method, Travel Cost Method, Damage Cost Avoided, Replacement Cost, and Substitute Cost Methods, Contingent Valuation Method, Contingent Choice Method, Benefit Transfer Method.

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Koľveková Gabriela, assistant profesor, Technical University of Košice, Faculty of Economics, Němcovej 32, 040 01

Košice, Slovak Republic, e-mail: gabriela.kolvekova@tuke.sk

[1] ____, Cairnes, John, Elliot (1823–75), an Irish economist, a follower of John Stuart Mill. He has written about noncompeting groups in the labor market and is known for his distrust of mathematical economics. Among his works are *The Character and Logical Method of Political Economy* (1857) and *Some Leading Principles of Political Economy Newly Expounded* (1874).“ According to *Questia*. The Columbia Encyclopedia, Sixth Edition Copyright© 2004, Columbia University Press. Licensed from Lernout & Hauspie Speech Products N.V. [online] Published 2004. [14. .3. 2009]. Available at < <http://www.questia.com/library/encyclopedia/cairnes-john-elliott.jsp>>.