ECONOMIC EFFICIENCY VS. POSITIVE AND NEGATIVE EXTERNALITIES

Alexandra-Ioana LAZĂR[1]

Abstract: *Positive/negative externalities are consequences of economic activities on independent third parties. They occur as third-party effects arising from the production or consumption of goods and services for which there is no adequate compensation and may cause market failure when social costs and benefits are not taken into account.*
Based on the theory of negative and positive externalities, economic efficiency can be analysed from an individual and social point of view, determining the negative/positive impact of a producer on the society.
Since the present actions do not seem to solve the problem of negative externalities in a satisfactory manner, it is the responsibility of companies that voluntarily decide to internalize external costs for sustainable development
Keywords: *negative externality, positive externality*
JEL Classification: *J21, J23, J4, J48, M51, M54, O0, O12, O15, O32*

1. Introduction

The paper aims to analyse the market mechanism of internalizing negative externalities. Internalization can be achieved by imposing government subsidies, property rights, taxes (on pollution).

The goal of internalization is to reduce the costs of negative externalities and to determine (as a by a public authority) the economic agents generating negative externalities, to pay.

Negative externalities are secondary effects that produce inefficiencies in resource allocation. Some come from consumption (waste), others from

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[1] PhD, School of Advanced Studies of the Romanian Academy (SCOSAAR), andra_purcarea@yahoo.com.

production (carbon emissions). They occur frequently when resource property rights are uncertain or non-existent, so negative externalities producers are not responsible for the external costs generated.

Establishing property rights is essential, as De Soto H. in *Hearing the Dog Bark*, highlighted the need to allocate these rights to allow the full development of economies.

The economist Arthur Cecil Pigou (1920) proposes to use fees as a tool to correct inefficiencies in the allocation of resources. *The Economics of Welfare* highlights programs that would lead to an optimal allocation of resources, the main role being played by the Government, which is also supported by William J. Baumol (1972) in *On taxation and the Control of Externalities*.

Also, Vassilis T. Rapanos (1992) demonstrates in *A note on externalities and taxation* the effectiveness of the tax on reducing the negative effect of externalities, but Ronald Coase (1960) rejects the Pigou Principle in *The Problem of Social Cost* and considers that the intervention Government to settle this litigation in the form of taxes and duties should not be considered an option.

Bas Jacobs, Ruud A. de Mooij (2015) in *Pigou meets Mirrlees: On the irrelevance of tax distortions for the second-best Pigouvian tax*, extend the revenue redistribution model with optimal remedial taxes for internalizing externalities. By analysing linear and non-linear taxes, the authors consider that the optimal tax on a good that generates externalities should not be corrected by the marginal cost of public funds.

2. Assessing economic efficiency by internalizing negative and positive externalities

We consider it is necessary to address the issue of externalities in the context in which environmental organizations draw attention to environmental issues.

So we propose to analyse economic efficiency through the theory of negative and positive externalities.

The internalization of negative externalities is the process or the economic-financial mechanism through which the *Marginal External Cost* (MEC) is introduced into the operating costs of the private producer with negative externalities, based on the so-called corrective tax or Pigouvian tax.

Negative externalities are economic and social damages caused by economic agents, third party natural and/or legal persons.

The most common example of this type of outsourcing is the pollution caused by companies during the production of goods. Pollution affects the entire population, but as long as companies do not respond directly, they are not ready to reduce the impact on the environment.

Another example is the oceans owned by the community. Ships can pollute the waters without the fear of responding in court; that is why we emphasize the importance of establishing property rights.

In economic theory, this is the *Marginal External Cost* (MEC) that an economic agent generates to third parties and for which no compensation is paid.

Gordon H. Scott (1998) states in *The Economic Theory of a Common-Property Research: The Fishery* that the property of all is in reality the property of nobody.

In order to understand the mechanism of producing negative externalities we use: *Private Marginal Cost* (PMC[2]), *Marginal External Cost* (MEC[3]), *Social Marginal Cost* (SMC[4]) and *Private Marginal Benefit* (PMB[5]).

The external cost, such as the cost of pollution from industrial production, makes SMC> PMC, but an activity is considered to reach its optimum point when Cost (C) is equal to Benefit (B) or SMC = SMB

The internalization of MEC or negative externalities is the economic and financial mechanism through which MEC is introduced into the manufacturer's operational costs based on a corrective duty.

According to Figure 1 point A represents the intersection between PMC and PMB and the point where PMC = PMB, defined as private optimum, and point B represents the intersection between SMC and PMB and the point where SMC = SMB, defined as social optimum. Area BC P_1P_2 = l*w = 0Q2*MEC and represents the volume of corrective taxes.

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[2] The cost at which a producer achieves its output, without having any interest in the adverse effects and the external marginal costs (damages) that it causes to third parties.

[3] The cost a polluting economic agent causes to third parties without paying the damages.

[4] PMC+MEC.

[5] The individual benefit that an economic operator obtains out in the competitive market, without being interested in the possible externalities it causes to third parties.
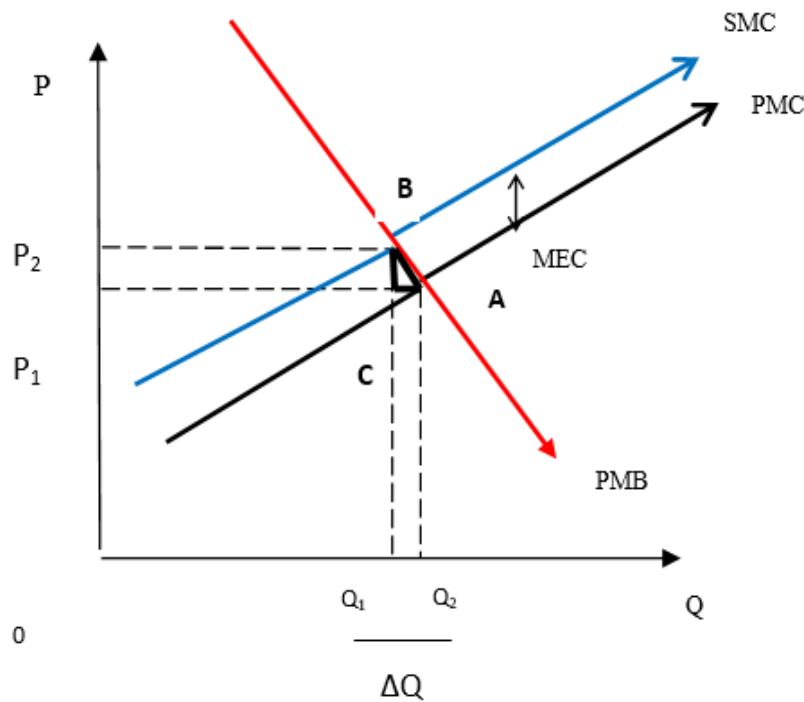
Figure 1 - Internalization of negative externalities

The amount of corrective taxes (V_t) that the state imposes on the polluter agent will be equal to the product of socially optimal production and negative externalities or MEC.

The area of the triangle ABC = B*h/2 = MEC*ΔQ/2

In this context, the surface of the ABC triangle is the *Social Net Benefit* (SNB), i.e. the payment of taxes.

Thus, if SNB = MEC*ΔQ/2 then MEC = 2*SNB/ΔQ and ΔQ = 2*SNB/MEC.

Positive externalities are external marginal benefits or benefits to third parties for which they do not pay.

An example could be an orchard near a hive. In this situation, both the farmer and the beekeeper will benefit each other, although none of them has economically taken into account the needs of the other.

To understand the internalization mechanism of positive externalities we use: *Private Marginal Benefit* (PMB[6]), *Marginal External Benefit* (MEB[7]) and *Marginal Social Benefit* (MSB[8]).

The internalization of positive externalities is achieved through the mechanism of the so-called *corrective subsidies* (amounts that the state allocates to producers with positive externalities) generating the Social Net Benefit (SNB) as a result of favourable effects propagated to the favourable demand.

According to Figure 2 area BC P_1P_2 = l*w = 0Q2*MEB and is the *social net benefit* (V_{SNB}). Thus, if V_{SNB} = 0Q2*MEB, Q2 = V_{SNB} /MEB and MEB = V_{SNB}/Q2.
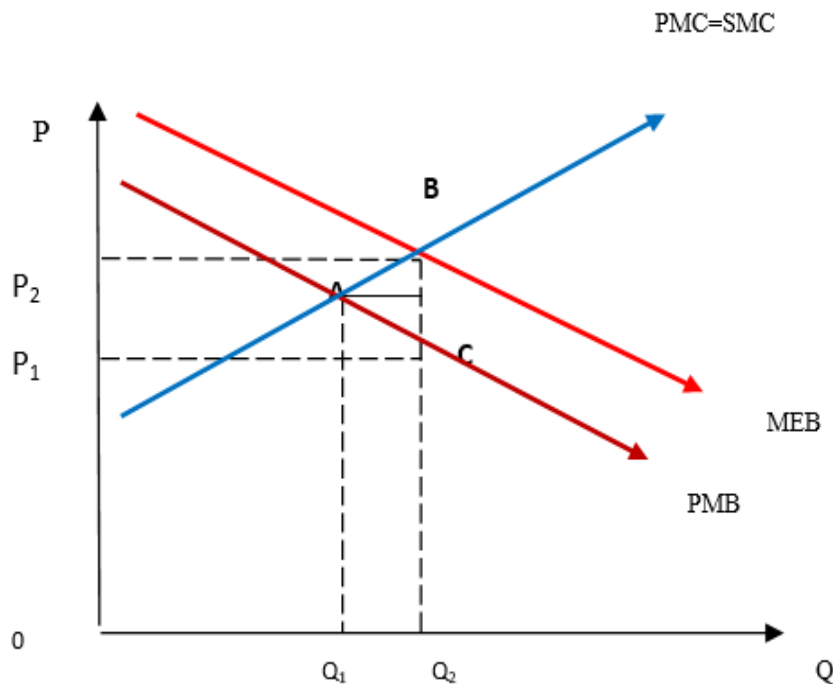

Figure 2 - Internalization of positive externalities

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[6] It is the benefit that an economic agent derives without taking into account the benefits it brings to third parties.

[7] It represent benefits to third parties for which they do not pay.

[8] It is the sum of the marginal private benefit and the marginal external benefit.

3. Conclusions

Many socio-ecological problems arise from negative externalities and, in order to reduce these problems, external costs need to be internalized either through government action or through the market.

An important role in promoting positive externalities is played by the Government. Government subsidies and those granted to producers of goods / services generating external benefits will reduce production costs and encourage higher supply.

If property rights cannot be established (e.g. air, oceans, roads, etc.) then the only options are to learn to live with externalities or, otherwise, the Government intervenes.

The government can intervene through taxation and through direct control and regulations.

Taxes aim to make consumers/producers pay the total cost of the asset. This would reduce consumption and create a socially effective result.

The regulation requires the state to force the polluter to reduce the level of pollution by establishing allowable levels.

However, we consider sustainable business models for companies to voluntarily decide on the internalisation of external costs.

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