Evaluating the Socio-Economic Efficiency of Sport Activities at Macro-Systemic Level in Romania

Sebastian Mădălin MUNTEANU[1]

ABSTRACT
The importance of sport activities for the sustainable developed of different nations is one topic of practical significance in nowadays life. In this line of thinking, trying to fill the gap in the specialized literature, the aim of this research is to present a specific methodology and a set of dedicated indicators for quantifying the macro-systemic efficiency of sport activities in Romania, considering the fundamental economic and social role that sports have. Therefore, the empirical analysis for evaluating the macro-systemic efficiency of sport activities in Romania is based on the following series of specific indicators: number of legitimated athletes to 100,000 inhabitants; GDP per athlete capita; elasticity of GDP according to the expenditures allocated for sport activities. (Munteanu, 2011) The links between these indicators and the corresponding implications are deeply analyzed in the paper.

KEYWORDS: *Elasticity coefficient, Legitimated athlete, Sport efficiency, Sport federation, State expenditure for sport.*

JEL CLASSIFICATION: *L83, D61*

INTRODUCTION

Using methods for quantifying the efforts and the effects, the efficiency is understood as a ratio between these two elements (Cicea, 2006b). In what concerns the sport events, efficiency should be approached from both perspectives: the economic one, referring to the investments made in order to achieve the proposed objective, and the classical one, considering that the efforts and the effects are diverse and difficult to be quantified, with vast implication in the social area and for infrastructure industries (Dobrea, Ciocoiu & Tipa, 2010). The choice of the option to be used should be the result of a well-established algorithm, based on rigorous criteria and calculus, taking into account the fact that the implementation of the objectives into practice may be achieved in multiple ways. The algorithm and the calculus should indicate the selection of the option with the highest advantages, in order to prove that the effort made is the best alternative. In a logical way, putting into practice an efficient activity is based on achieving the proposed objectives with a lower effort than the one that was initially proposed. The economic efficiency refers at obtaining profit by using human, financial and material resources in a sustainable way, with the help of thorough instrumental scientific methods and models.

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[1] Bucharest Academy of Economic Studies, Faculty of Management, Romania,
E-mail: sebastianmadalin@yahoo.com

In general terms, taking into account the level of the analysis, the types of efficiency relevant for the socio-economic study of the sport activities are the following:

- *The macro-systemic efficiency*, when the system is represented by the sum of all sport activities at national level;
- *The micro-systemic efficiency*, when the system is represented by a sport federation, which is the fundamental structure regarding the organization of the sport domain (Cicea, 2006a).

The objective of the following research is to present one of these two types of methodologies, that was applied using specific data for the sport sector in Romania. The Romanian case was particularly selected after a consistent review of the specialized literature, by taking into account the scarcity of research studies in sport area for our country and the lack of extensive research studies for evaluating the sport efficiency in Romania, an analysis of this type being highly important both for the administrative and private sectors because of its unique character and potential utility (Munteanu, 2011).

For evaluating the macro-systemic efficiency, a series of innovative indicators for quantifying the efforts and the effects were developed and presented in this study with the aim of measuring the efficiency in the sport field, their utility, relevance and feasibility were analyzed, the obtained results were interpreted and solutions or improvement methods for the strategies of evaluating and increasing the economic and social efficiency were proposed, by taking into account the considered socio-cultural area.

EMPIRICAL ANALYSIS FOR EVALUATING THE MACRO-SYSTEMIC EFFICIENCY OF SPORT ACTIVITIES IN ROMANIA

The inputs in the sport macro-system almost exclusively refer at the expenditures of the organization for developing and managing different activities in the sport area. These expenses are easy to evaluate, being usually associated with the state expenditures on sport. This indicator, expressed in absolute terms, but especially in relative terms (percentage of the GDP), is fairly relevant for the development level of sport activities in a certain country. *Figure 1* presents the situation in Romania of the above mentioned indicator during 2005-2009 period.
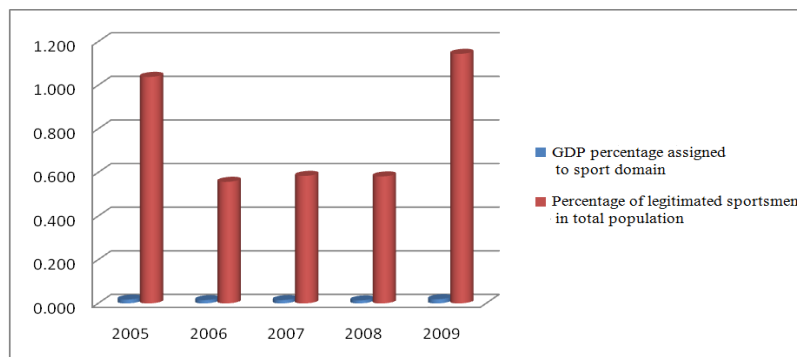

Figure 1. The percentage of legitimated sportsmen in total population and the GDP percentage assigned to sport domain in Romania
Source*: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, 2009; *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

In most of the European countries, the affiliation to sport federations is about 20-25% of the total population, meanwhile in Romania it could be noticed that this percentage varied between 1.038% in 2005 and 1.144% in 2009 (Munteanu, 2011). Besides this type of inputs in the selected system, there are also the individual efforts made by each active person one way or another in the sport area, ranging from efforts in monetary terms (all types of private expenses beard by individuals in order to be able to practice a specific sport) to efforts in non-monetary terms, represented by the efforts of the volunteers in organizing different contests, events etc.

In what concerns the outputs or the effects of the sport activities at national level, these could be quantifiable or unquantifiable. In the second category, there are a series of results like: improvement of the general health and well-being of the population and, implicitly, increase of the average life expectancy at national level; promotion of Romania's image abroad through the achievement of very good results in international contests; enhancement of performance culture for the citizens by offering a series of models to be followed, especially for the young population in the disadvantaged environments; increase of the standard of living and civilization, significantly focused in the dictum "mens sana in corpore sano"(Dinu & Ciora, 2012). Although the personal efforts for keeping a vivid mental health cannot stop each and every cognitive decline, a strong connection between physical effort and mental freshness leads surprisingly to the achievement of a better tonus and a more robust cognition (Wen-Jhan, Wei-Hsin & Yi-Hsiue, 2010). Sport is also a way of communication and this takes place within the participants' relationship. So we can say that sport influences the relationship between people (Marin, 2011). At the same time, it should be emphasized that all these macroeconomic effects are not the exclusive result of the sport activities, but there are also other factors (e.g. historical, geographical, demographical factors) contributing to the achievement of the respective outputs and it is almost impossible to precisely identify the contribution of the sports domain to the attainment of the above mentioned effects.

In this sense, a series of specific indicators and coefficients are going to be used in order to emphasize the relationship between the inputs and the outputs of the sports macro-system:

1. Number of legitimated athletes to 100,000 inhabitants;
2. Gross domestic product (GDP) per athlete capita;
3. Elasticity of GDP according to the expenditures allocated for sport activities.

1. Number of legitimated athletes to 100,000 inhabitants:

This is a structure indicator assimilated to the ones of efficiency. The calculation formula is the following:

$$A = \frac{NA}{N} * 100{,}000$$

(1)

where:

A   - the number of legitimated athletes to 100,000 inhabitants;
NA   - the number of legitimated athletes;
N   - the total number of population.

Figure 2 presents the evolution of total number of athletes to 100,000 inhabitants in Romania during 2005-2009 period.
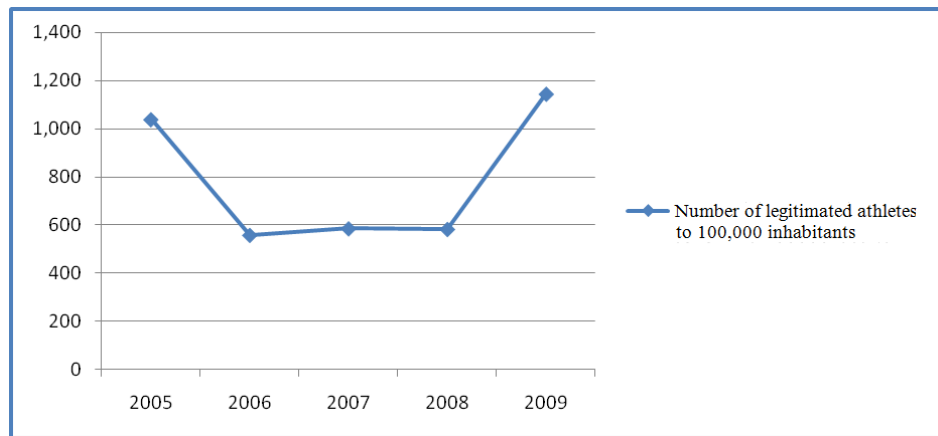
Figure 2. Number of legitimated athletes to 100,000 inhabitants in Romania
Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

Analyzing this indicator, a unique situation could be observed. For 2005 and 2009, the number of legitimated athletes to 100,000 inhabitants is relatively similar, with values ranging between 1,000 and 1,200, but between these two years, the indicator registered a constant value of approximately 600 athletes. One possible explanation for this halving of the value of the indicator between 2005-2006 could be due to the new legislation of the European Union imposed for the sports sector in our country in order to comply with the requirements of the adherence. Many sports organizations in our country were not complying the demanding required criteria and, as such, they were not able to continue with their activity. The 2009 overcoming of the value registered in 2005 is due to the correction of the existent situation through the adjustment of the sports clubs and federations to the new EU regulations or through the transfer of the athletes to other sports organizations and their re-entering in the competitive flow (Munteanu, 2011).

     2. Gross domestic product (GDP) per athlete capita:
This is the second indicator for evaluating the macro-systemic efficiency in sport, establishing a connection between the wealth and civilization degree of a certain community (as an effect indicator) and its general propensity to sports (as an effort indicator):

$$B = \frac{GDP}{NA}$$
(2)

Where:
       B   - the gross domestic product per legitimated athlete capita;
       GDP   - the gross domestic product;
       NA   - the number of legitimated athletes.

At the same time, if the numerator and the denominator of the fraction are divided with the total number of population in one country, another form of expressing the indicator is obtained:

$$C = \frac{B}{S}$$

(3)

Where:

      C   - the macro-systemic efficiency of sports;

      B   - the gross domestic product per legitimated athlete capita;

      S   - the percentage of legitimated athletes in total population.

Figure 3 presents the evolution of gross domestic product per legitimated athlete capita for 2005-2009 period.
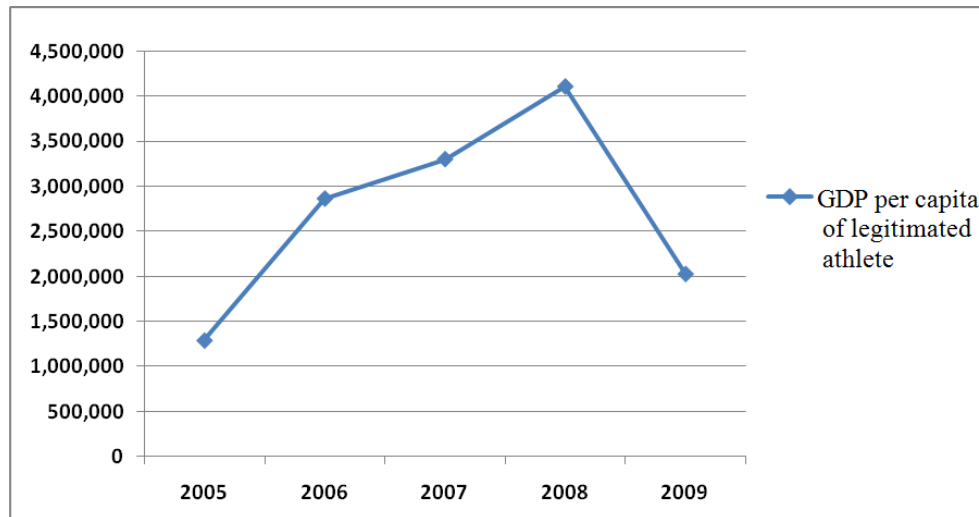

Figure 3. GDP per legitimated athlete capita
Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

An economic analysis of the relationship between sports and economic development leads undoubtedly to the conclusion that in a less developed country, with a lower GDP, the population is less inclined to practice sports, because the necessary financial resources and the corresponding sport facilities are nonexistent. In this context, the vast majority of the less developed countries and an important part of the developing or emerging countries, one of them being also Romania, are partially dependent of foreign support, multinational sponsors and import of sports equipment, a "sporting talents drain" – similar to a "brain drain" – to the more economically developed countries being a extremely common phenomena (Andreff & Szymanski, 2006). An analysis of *Figure 3* reveals that the value of the indicator increased constantly from 2005 to 2008, the year of the economic crisis, and then the value decreased in 2009 to the current level of 2½ years ago.

In order to reveal the intensity degree between the GDP and the number of legitimated athletes, the correlation coefficient between the two variables will be used:

$$r = \frac{\sum(X - \overline{X}) * (Y - \overline{Y})}{\sqrt{\sum(X - \overline{X})^2} * \sqrt{\sum(Y - \overline{Y})^2}}$$

(4)

Where:

     r   - the correlation coefficient between GDP and number of legitimated athletes;
     X   - the statistical series of number of legitimated athletes;
     Y   - the statistical series of GDP;
     $\overline{X}, \overline{Y}$ - the average values of the two series.

The situation for Romania during 2005-2009 period is presented in *Table 1*.

Table 1. Elasticity coefficient between GDP and number of legitimated athletes

Year	Legitim ated athletes (X)	GDP (mill. RON) (Y)	$(X - \overline{X})$	$(Y - \overline{Y})$	$(X - \overline{X}) * (Y - \overline{Y})$	$(X - \overline{X})^2$	$(Y - \overline{Y})^2$
2005	224305	288955	56061	-123509	-6924049261	3142835721	15254522485
2006	120267	344651	-47977	-67813	3253473896	2301792529	4598630094
2007	125882	416007	-42362	3543	-150080094	1794539044	12551432
2008	125176	514700	-43068	102236	4403091434	1854852624	10452158802
2009	245590	498008	77346	85544	6616470755	5982403716	7317741718
Total	841220	2062321	0	0	-1607276138	15076423634	37635604531

Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

Where:

$$\overline{X} = \frac{841,220}{5} = 168,244$$

(5)

$$\overline{Y} = \frac{2,062,321}{5} = 412,464.2$$

(6)

Using the data in *Table 1*, the elasticity coefficient between GDP and number of legitimated athletes was determined. As such, r = -0.067.

In general terms, the correlation coefficient could be between -1 and +1. If r >0, there is a direct correlation, and if r < 0, there is an opposite correlation between the two variables. The closer r is to ± 1, the stronger the relationship between variables. If r = 1, then a direct functional correlation exists between the two variables, and if r = -1, there is an opposite functional correlation between the two variables. A value closer to 0 indicates a lack of correlation between the two variables. In the presented case, the correlation coefficient between GDP and number of legitimated athletes reveals almost a lack of connection between the two analysed variables, which is a paradoxical situation taking into account the fact that the similar indicators determined for other economic and social sectors usually indicate an almost always strong connection between the GDP level and the values of the relevant indicators in the respective domain (Crețu, 2012; Dinu & Curea, 2008). In the

context of a high number of research studies and empirical data certainly proving a strong connection between the wealth of a nation and its performances in the sports arena, the current surprising result is due to the very high fluctuation in the number of legitimated athletes at the beginning and the end of the analysed time interval. In the present analysis, considering the achieved results, Y statistical series relative to GDP will be replaced with the effective expenditures allocated to sports in GDP, meaning that Y will become the financial resources dedicated to sports activities (Munteanu, 2011). In this case, the data presented in *Table 2* were registered, showing the elasticity coefficient between state expenditures for sport and number of legitimated athletes.

Table 2. Elasticity coefficient between state expenditures for sport and number of legitimated athletes

Year	Legitim ated athletes (X)	Budget for sports (mill. RON) (Y)	$(X - \bar{X})$	$(Y - \bar{Y})$	$(X - \bar{X})*$ $(Y - \bar{Y})$	$(X - \bar{X})^2$	$(Y - \bar{Y})^2$
2005	224305	50.61	56061	-15.65	-877423	3142835721	244.96
2006	120267	51.95	-47977	-14.31	686713	2301792529	204.87
2007	125882	62.90	-42362	-3.36	142480	1794539044	11.31
2008	125176	70.31	-43068	4.05	-174619	1854852624	16.44
2009	245590	95.53	77346	29.27	2264187	5982403716	856.94
Total	**841220**	**331.29**	**0**	**0**	**2041337**	**15076423634**	**1334.52**

Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

Where:

$$\bar{X} = \frac{841,220}{5} = 168,244 \tag{7}$$

$$\bar{Y} = \frac{331.29}{5} = 66.26 \tag{8}$$

As such, r = 0.455. This value indicates that there is a relatively medium correlation between the state budget for sports and the number of legitimated athletes in Romania during 2005-2009.

3. Elasticity of GDP according to the expenditures allocated for sport activities:
Another element that should be analysed when dealing with the macro-systemic efficiency of sports is the elasticity of GDP according to the state expenditures for sports. In economic terms, elasticity expresses the percentage iterative change of a variable by considering the percentage iterative change in another variable. In the present analysis, the elasticity will express the relative variation of GDP for one monetary unit (1 RON) of state expenditures in the sports domain. The calculus of the indicator is made according to the formula:

$$E = \frac{(X_1 - X_0)}{X_0} / \frac{(Y_1 - Y_0)}{Y_0} \tag{10}$$

Where:

    E - the elasticity coefficient of GDP according to the state expenditures for sports;

    X - the dependent variable (GDP);

    Y - the independent variable (state expenditures for sports);

    1 - the present period;

    0 - the previous period.

Table 3 reflects the situation for Romania for the above mentioned elasticity during 2005-2009 period.

Table 3. Elasticity of GDP according to state expenditures for sports

Year	GDP (mill. RON)	State expenditures for sports (mill. RON)	$\dfrac{(X_1 - X_0)}{X_0}$	$\dfrac{(Y_1 - Y_0)}{Y_0}$	E
2005	288955	50.61	-	-	-
2006	344651	51.95	0.19	0.03	7.28
2007	416007	62.9	0.21	0.21	0.98
2008	514700	70.31	0.24	0.12	2.01
2009	498008	95.53	-0.03	0.36	-0.09

Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

Analysing the values obtained for the elasticity coefficient, *Table 3* indicates that a clear relationship between the variation of GDP and the variation of state expenditures for sports is difficult to be established. In this way, in order to reflect the impact of the variation of the state expenditures for sports, the GDP will be replaced with an indicator for evaluating the performances in sport, namely the level of scores. If X represents the total annual level of the scores obtained by the sport federations, the following table (*Table 4*) is reflecting the new situation:

Table 4. Elasticity of scores obtained by athletes according to state expenditures for sports

Year	Scores	State expenditures for sports (mill. RON)	$\dfrac{(X_1 - X_0)}{X_0}$	$\dfrac{(Y_1 - Y_0)}{Y_0}$	E
2005	46282	50.61	-	-	-
2006	36542	51.95	-0.21	0.03	-7.95
2007	43084	62.9	0.18	0.21	0.85
2008	63549	70.31	0.48	0.12	4.03
2009	61844	95.53	-0.03	0.36	-0.07

Source: Author's conception and graphical representation using data from NAS, the National Agency for Sport, *The Year-Books of Sport 2005-2007*, Bucharest, and MYS, the Ministry of Youth and Sport, *The Year-Book of Sport 2008*, Bucharest, documents accessed in January 2010.

Analysing the values obtained in *Table 4*, the same conclusion appears again regarding the difficulty of establishing a clear relationship between the variation of the sport performances, represented by the level of scores, and the variation of the state expenditures for sports. This analysis of the macro-systemic efficiency of sports was done in order to reflect the relationship between the costs and the benefits (results) in social terms that the sport domain is generating at national level (Munteanu, 2011). In the end, the conclusion is that the problem of efficiency of the sport activities at macro-systemic level is a very complex one, especially because of the difficulty of quantifying the data, and taking into account that the effects registered at societal level – thorough improvement of health and physical tonus (Dawson & Dobson, 2002) or through promoting the national image abroad by means of the performance in sports etc. – are the results of common action of more than one system: economic, medical, political, cultural and historical systems.

CONCLUSIONS

A first and foremost conclusion is the one that the sports domain is a sector with a high economic potential, that could have a significant contribution to the achievement of the objectives of the economic policy of the country. Therefore, through the valorisation of the tangible elements that are defining it (specific clothing items, entry fees, advertising, flags and more), the sport could generate consistent economic results, and, in social terms, it has a positive influence on the state of mind of participants and spectators, contributing this way to the improvement of the quality of life that relate to peoples' needs, expectations, levels of satisfactions and perceptions (Hotăran, 2012).

The present paper, developing a series of specific indicators and testing their utility for the sports domain, concludes that the evaluation of the economic and social efficiency in sport at macroeconomic level could be assessed using a methodology based on a system of specific coefficients and indicators, that allow the establishment of a set of connections between the inputs and the outputs of the system, like the following: state expenditures for sports, in absolute and relative forms, as a percentage of GDP; proportion of legitimated athletes in total population; number of legitimated athletes for 100,000 inhabitants; GDP per capita of legitimated athlete; elasticity coefficient between GDP and number of legitimated athletes; elasticity coefficient between state expenditures for sports and number of legitimated athletes; elasticity of GDP according to state expenditures for sports.

Considering the case of Romania, the state expenditures for sports represent almost exclusively the efforts of the society regarding the sports domain, and the analysis of available data revealed the relevance of this indicator for the degree of sport development at national level. In this way, comparing the proportion of legitimated athletes in total population with the percentage of GDP dedicated to sports in our country, a significant gap was noticed, with negative repercussions on the results of the contests and the health level of population in the last years. It should be also mentioned the difference between the percentage of individuals affiliated to a sportive federation in developed European countries (20-25%) versus its value in Romania (1.14%).

The sustainable development of the sports sector mandatory needs a more consistent state involvement at local and central level, both in financial terms – through the increase of the GDP percentage for sports, as well as in social terms – through the development of specific programs for promoting the physical activity. The economic analysis of the relationship

between sports and economic development revealed that the less developed a country is, so having a lower GDP, the less its population is inclined to practice sports, because the necessary financial resources and the corresponding facilities are scarce. On the other hand, the relationship between sports and sustainable development could also be supported by the private involvement of companies through corporate social responsibility (CSR), assuming a direct relationship between the level of CSR involvement and the economic development at micro and macro level, as well as a set of well-defined advantages that CSR could bring for the responsible companies (Iamandi & Constantin, 2012, p. 153).

After using the elasticity coefficient between GDP and the number of athletes, the intensity degree of the relationship between GDP and the number of legitimated athletes was determined. The calculus showed that the value for Romania is 0.067 and it indicates almost a lack of connection between the two analysed variables, a paradoxical situation taking into account that similar indicators determined for other economic and socio-cultural sectors almost always indicate a strong link between the level of GDP and the values of other relevant effort indicators in the respective domains. In order to capture the influence of sports on economic growth at national level, the elasticity of GDP according to the state expenditures for sports was determined. Analyzing the obtained values, a clear-cut link was impossible to be established between the two elements, and the results have a heterogeneous character over the five years that were taken into account. However, trying to highlight the influence of changes in expenditures allocated to sport, the GDP was replaced with an indicator for evaluating sport performances, namely the scores achieved by athletes in national and international competitions. The obtained values lead to the same conclusion: failure to establish a clear link between the two elements.

The issue of measuring the efficiency in sports at macro-systemic level is a very complex one, particularly because of the difficulty of quantifying the data and especially since the effects noticed at the level of the society, by improving health and physical tonus and by promoting national image abroad through sport performance, are the result of combined action of several systems, such as economic, medical, political, cultural or historical(Năftănăilă & Cioană, 2010). Nevertheless, exactly like in the case of CSR that can contribute to a number of economic, social and environmental objectives for the responsible company and for the community it is acting on (Iamandi, 2011, p. 180), sports have the potential to contribute to the well-being of the practicing individuals, as well as the society as a whole.

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