Assessment of Sustainable Development of Enterprises

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Abstract: The term ‘sustainable development’ has got autonomous theoretical status in 1987 and since then it has been arousing stable interest of researchers and at the same time problem of its measuring is among problems under discussion. At present, two main approaches to measuring of sustainable development have shaped: based on designing of the system of indicators and based on integral indices. All listed above measurers reflect the state of economic, ecological and social spheres of life in a particular period of time. However, sustainable development, in fact, is dynamic process, consequently, it is necessary to work out a system of flow figures, considering not only balanced state of economic, ecological and social spheres in their static condition, but allowing to reflect positive changes, taking place while the process of development. For this purpose, the authors suggest using growth rates of key parameters of activity of an enterprise, grouped by three directions: social, economic and ecological. A distinguishing feature of suggested system of measurers is the opportunity of reflecting both changes in every sphere of sustainable development and observance of interdependence of their speed ‘horizontally’ and equilibration ‘vertically’.

Key words: Measuring of sustainable development · Indicators of sustainable development · Indices of sustainable development · Growth rates · Equilibration

INTRODUCTION

The term ‘sustainable development’ was specifically introduced by the United Nations World Commission on Environment and Development in 1987 for naming such development by which “satisfaction of present needs doesn’t undermine possibility of the next generation to satisfy their own needs”[4]. Since then it has been arousing intense interest of researchers and at the same time problem of sustainable development measuring is among problems under discussion in this sphere. Both the problems of the very possibility of such measuring and usable for these goals tool-set: a set of quantitative and qualitative indicators. Nowadays hundreds of indicators, policies and measurers of sustainable development, which have their advantages and disadvantages and accomplish different goals, are the subject of discussion, but none of them can be called universal and comprehensive. It is difficult to assume that such a measurer exists or can be created, but the attempt of its creation is, obviously, actual.

Materials and Methods of Scientific Research: First systematic researches were conducted by G. Forrester (1970), who had built first global model of world dynamic. Five main interdependent variables - population size of the Earth, capital investment (funds characterizing level of economy development, transforming natural resources), using of nonrenewable resources, environmental pollution (wastes of human life activity, which cannot be overwork by the nature) and food production - are set as the basis. Subsequently, on the basis of this model D. Meadows made projections, according to which in 75 years raw materials resources of the planet would appear to be depleted and the lack of food would be catastrophic, if the population growth was not brought under tight control.

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The model was made specifically for examination five main global tendencies: acceleration of industrialization, population growth, increasing lack of food, depletion of nonrenewable resources and degradation of environment.

This model permitted to examine not as much the logic of existing processes, as the logic of solving the problems, not including a quantity of other factors, which could have a substantial impact on the ultimate result. Absence of bias and narrowness elements, which are, usually, inherent to logical argumentation can relate to the advantages of the model [9].

At present, two main approaches to measuring of sustainable development have formed [3]:

- Based on building of system of indicators, each of them reflect individual aspects of sustainable development, within the frameworks of economic, ecological, social and institutional subsystems;
- Based on aggregated (integral) index, allowing appreciating the extent of stability of social-economic development, within the frameworks of economic, ecological and social components.

The first approach assumes different variants of building of system of sustainable development indicators, which are defined as indicators deduced from primary information and allowing to judge about the state and/or changes of attributes of sustainable development (economic, ecological, social) [7].

For the first time, the necessity to work out the indicators of sustainable development was noted in the Agenda 21, adopted by the UN Conference on Environment and Development in Rio-de-Janeiro (1992). In 1992 the UN Commission on Sustainable Development, aiming at the contents of the Agenda 21 and relying on big amount of international initiatives, adopted work program, including a list of rates of sustainable development and so called methodological list on each of them [5].

The Millennium Declaration, adopted in 2000 by the UN, exemplifies systematic monitoring of the processes of sustainable development. Its structure assumes definition of targets, corresponding problems and indicators for monitoring the processes which can be evaluated in a quantitative way.

The system of indicators of sustainable development, suggested by the World Bank – the leader in the sphere of collecting, systematization, comparison and studying of country development indicators of the world is worth noting. The Annual Report of the World Bank ‘The World Development Indicators’ includes information about more than 2000 indicators of world development in 214 countries of the world [1].

Sustainable development Indicators (SDIs) are also used by the European Council for monitoring sustainable development strategies of the countries of EC (EC SDS).

Along with the system of indicators sustainable development indices - complex quotients, obtained by aggregating of some indicators with each other or with other data, are used [7]. Thereby, the second approach to measuring of sustainable development is realized.

Human Development Index (HDI), formed in the second half of 1980-s, can be regarded as the most common and theoretically studied index. It is a composite measurer, based on the statistic income data average for the countries, defined by Gross Domestic Product (GDP) rate at Purchasing Power Parity (PPP), evaluated in US dollars; level of education, defined by literacy rates (with share 2/3) and the share of students among children and youths aged 7-24 (with share 1/3); longevity rate, defined as life expectancy at birth (life expectancy).

In 2010 the totality of indicators, measuring human development, was extended and the Index itself was essentially corrected. In addition to existing HDI there were introduced three new indicators: inequality-adjusted Human Development Index (IHDI), the Gender Inequality Index and Multidimensional Poverty Index [9].

Another approach to building of integral indicators is the System for Integrated Environmental and Economic Accounting, suggested by United Nations Statistics Division in 1993 [6]. Given system, describing interconnection between the state of environment and economy of the country, is directed to recording of the ecological factor in national statistics. The interconnection is expressed by coordination of the System of National Accounts adopted by UN with taking ecological factors and nature resources into account.

The Genuine Savings Index calculated by specialists of the World Bank as no less effective integral indicator of sustainable development. Genuine Savings is a real rate of accumulation of national savings after appropriate calculation of depletion of the natural resources and damage of environmental pollution [7].

The examples of integral indicators of development based on ecological parameters are: ‘Living Planet’ Index, ‘ecological footprint’, ‘water footprint’, ‘carbon footprint’, population health indicator, ‘Happy Planet’ Index, Real Progress Index, etc.
All indices listed above reflect the state of economic, ecological and social spheres of life in particular period of time. However, sustainable development, in fact, is dynamic process, including in our opinion “… the totality of processes of positive changes, technologies representing them, directing to harmonization of the relations between economic, ecological and social spheres for satisfaction of social-economic system needs in a long-term existence” [2], consequently, it is necessary to work out a system of flow figures, considering not only balanced state of economic, ecological and social spheres in their static condition, but allowing to reflect positive changes, taking place while the process of development. It is worth noting, that in every single area such measurers already exist, e.g. in the work by G.R. Jarrulina [8] a dynamic model of sustainable economic development monitoring of industrial enterprise was offered, which is based on the detection of essential quotients-indicators of its economical activity efficiency on the basis of sustainable growth rate (SGR) calculating.

Rating Agency ‘Reputazia’ performs an annual Corporate Social Performance (CSP) evaluation and its changes (ΔCSP) according to the formula:

$$\Delta CSP = \sum_{j=1}^{t} W_j (a_j - b_j)$$  \hspace{1cm} (1)

Where:
- $a$ - corporate social performance in $j$-th area in period of time $t$;
- $b$ = Evaluation of social performance in $j$-th area in period of time $t+1$;
- $W$ = Combined weights, appropriating to corresponding $j$ areas.

There are the areas of activity which can be marked out:

- Responsibility for provided production (deliverance of the production of high quality, not spreading of production, which can cause harm to consumers).
- Public relations (charity, supporting of economically unprotected population groups).
- Environmental protection (designing, producing and using of goods and services with minimal environmental damage).
- Problems of working women and minors (corporate system of employment, promotions up the career ladder, supporting of disabled members of the family).
- Relations with the company’s personnel (structural interaction with trade unions, no staff reduction plans, possibility of career development for people with restricted abilities).
- Problems of using of the atomic energy (its current usage).
- Contracts on production of military equipment (the company’s incomes from its manufacturing).
- Presence in the countries with violations of human rights.

Given quotients are capable to reflect changes, occurring in economic, ecological and social spheres of activity, but without calculation of their interconnection and equilibration. Reasoning from above-stated, another approach to measuring of sustainable development is needed.

**Results Obtained by the Author:** For the purpose of measuring of sustainable development we suggest using of such dynamical quotients as growth rates of key indicators of enterprise activity, grouped by three directions: social, economic and ecological. A distinguishing feature of the system of measurers we suggest is the opportunity to reflect as well as changes in every sphere of sustainable development and their interaction between each other (Figure 1).

As the figure shows, the main social quotients, in our opinion, are social investment growth rate, employee turnover growth rate, industrial injuries and occupational diseases growth rate.

The key ecological quotients are ecological investment growth rate, resoil growth rate, water consumption growth rate, energy consumption growth rate and pollutant emissions growth rate.

The main economic quotients are average wages growth rate, labour productivity growth rate, pre-tax profit growth rate, output growth rate, assets growth rate, innovation production share growth rate, innovating production growth rate. At the same time observance of interdependence of their speed ‘horizontally’ is provided. For example, GR_\text{w} > 100\% > GR_\text{p} > GR_\text{d} or 100\% > GR_\text{w} > GR_\text{p}. Furthermore, the condition of their equilibration ‘vertically’ should be provided, at which, e.g. output growth rate should correlate with innovation production share and labour productivity growth rates [10].

Suggested system of measuring of sustainable development allows not only to evaluate and control the state of economic, ecological and social spheres of activity of enterprises, but also to rule aiming for achieving of their equilibration.
Fig. 1: Quotients of sustainable development: GRw – average wages growth rate; GRp - labour productivity growth rate; GRmp - pre-tax profit growth rate; GRo – output growth rate; GRa – assets growth rate; GRap – innovation production share growth rate; GRi – innovating investment growth rate; GRs – social investment growth rate; GrSi – employee turnover growth rate; GRind – industrial injuries and occupational diseases growth rate; GRe – ecological investment growth rate; GRr – resoil growth rate; GRwc – water consumption growth rate; GRc – energy consumption growth rate; GRpe - pollutant emissions growth rate.

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