

# Modern Methodological Approaches to Assessment of Social Responsibility of Pharmaceutical Companies



Yuliya Bratishko, Olga Posylkina, Olga Gladkova,  
and Maksym Bezpartochnyi

**Abstract** This chapter addresses topical issues of social development of pharmaceutical companies in the context of introduction of quality management systems. It proves the need of development of the method of assessment of social responsibility of pharmaceutical business that will be consistent with economic situation at any given point in time, and with due regard to the industry specifics. It further defines the essence and importance of social responsibility of pharmaceutical business. The suggested methods of assessment of social responsibility of pharmaceutical business are based on application of methods and techniques of mathematical modeling in economics and the latest information technologies. Introduction of the suggested assessment method would promote identification and assessment of problems in the sphere of social responsibility, laying down the groundwork for the creation of the efficient quality management, and developing the efficient management system in the context of socially responsible business.

**Keywords** Social responsibility · Social responsibility of pharmaceutical business · Assessment · Assessment results · Development · Pharmaceutical factory

## 1 Introduction

Social responsibility of business is one of the five basic prerequisites for the successful future business formulated in the course of a global study by IBM [1].

According to ISO 26000, “Social Responsibility Guidance Standard,” social responsibility means responsibility for decisions affecting the society and envi-

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Y. Bratishko · O. Posylkina · O. Gladkova  
Department of Management and Economics of Enterprise, National University of Pharmacy,  
Kharkiv, Ukraine

M. Bezpartochnyi (✉)  
Department of Economics and Marketing, National Aerospace University N. Zhukovsky  
“Kharkiv Aviation Institute”, Kharkiv, Ukraine

ronment, a standard that encourages companies to act in a transparent and ethical manner contributing to sustainable development, including public health and well-being, consistent with applicable laws and international standards, integrated in and practiced by the organization in its relationships [2].

From this perspective, the meaning of “social responsibility of company” today expands far beyond the boundaries of philanthropy and charity and implies implementation of long-term social projects, investment in human capital development and environmental projects, introduction or resource and energy saving technologies. Corporate CEOs are becoming increasingly aware that socially responsible activities are not only about the additional expenditures but rather about considerable benefits resulting from the increased loyalty of customers, business partners and corporate staff, as well as enhanced investment attractiveness, establishment of long-term partnership with stakeholders, etc.

## 2 Literature Review

Many scholars address the problem of assessment and introduction of socially responsible management in the businesses. Over the years, the problems of SR and its assessment were studied by H. Bowen [3], A. Carroll [4, 5], K. Davis [6, 7], P.E. Druker [8], M. Friedman [9, 10], N. Haines, S. Rossi Alice, M. Schwartz [11], and many other scholars. In Ukraine, assessment and management of socially responsible business and sustainable social and economic development of enterprises were addressed in the studies of M.O. Kyzym, A.M. Kolot A.M [12], O.F. Novikova [13], N.M. Ushakova, etc. In pharmaceutical studies, certain aspects of assessment and management of sustainable social and economic development of the Ukrainian pharmaceutical companies and their social responsibility were addressed in the studies of A.A. Kotvitska [14], N.O. Tkachenko [15], B.P. Gromovyk [16], and other scholars. However, despite considerable scientific advancement, issues of social responsibility and sustainable development of pharmaceutical companies remain underexplored, especially when it comes to assessment of social responsibility with the help of modern economic and mathematical methods and information technologies, which proves the need to continue studies of this scientific problem.

Considering the specifics of pharmaceutical industry, the SRPhB shall be construed to mean the PhC activities aiming to provide quality, efficient, safe, and affordable medicines to the public; creating conditions for the development of professional competencies of employees in accordance with applicable social norms; as well as creation of conditions for efficient social benefits and protection of personnel; promoting the environmentally clean pharmaceutical production and facilitating the environmental improvements in the areas of presence of the PhC production facilities; participation in regional social programs for the development of communities, implementation of its own social projects, etc.

### 3 Research

In order to study contemporary tendencies in the context of social responsibility of companies and their sustainable growth, we analyzed the Reputation Institute studies involving 55,000 respondents. Top-10 companies in terms of corporate social responsibility in 2010–2018 are presented in Table 1.

It should be noted that medicine and pharmacy traditionally are socially conscious and responsible industries, and the same conclusion follows from the Industry Global CSR Index [17]. However, not a single pharmaceutical company made it to the Top-10 Global CSR RepTrak until 2018. Over the 9 years of studies, Novo Nordisk was the first pharmaceutical company to take No. 5 position in 2018.

Meanwhile, according to 2016 Global Pharma RepTrak® [17], perception of socially responsible behavior of pharmaceutical companies (PhC) has been growing steadily worldwide. For example, reputation of PhC in the UK, USA, Australia, Brazil, Germany, and Russia has grown over the last few years, reaching the index of 70 and higher. The leaders in terms of social responsibility are Novo Nordisk, Abbott Laboratories, Roche, Merck, Sanofi, Allergan, AstraZeneca, Eli Lilly, AbbVie, GSK, Novartis, Bristol-Myers Squibb, and Pfizer—pharmaceutical companies with reputation index varying from 65.9 to 68.7 (2016).

According to our studies, 63% of the Ukrainian PhCs build their governance pattern with the focus on economic effectiveness while acting in accordance with applicable laws, which is enough only for basic level of social responsibility (SR). And only 11% PhCs covered by our studies mastered the art of implementing the personnel, environmental, cultural, and social programs, aiming to strengthen their business reputation, image, and corporate culture. Curiously, the Ukrainian pharmaceutical companies demonstrate higher social responsibility internationally rather than domestically.

As far as smaller pharmaceutical companies are concerned, slightly over a third (34%) have social programs. As regards medium-sized companies, over 50% of employers (55%) have social programs. The index goes even higher (up to 62%) in companies with the staff exceeding 200 persons. Small- and medium-sized pharmaceutical companies are normally more inclined to charity, while the big companies are more focused on systemic projects that contribute to the development of social infrastructure and to the improvement of environmental situation. However, according to our studies, most of the Ukrainian pharmaceutical companies have SR programs of a rather spontaneous variety. Specifically, for 16% of Ukrainian PhC, social programs are just non-recurring, random projects. However, we also observed that the bigger and financially stronger companies tend to be more committed to development of a clear social responsibility strategy. About 60% of big PhC approach to this matter in a systemic manner, so unlike the small- and medium-sized companies (30–40%). In 47% of cases, the company itself covers the expenditures on social projects. Another 25% of companies rely on their employees' help whenever possible (the most frequently observed format of charity projects); 17% of companies implement their social projects through charitable

**Table 1** Rating dynamics of the most socially responsible companies worldwide [17]

Company rating	Company/year									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	
1	Google	LEGO Group	Google	Google	Google	Microsoft	Microsoft	Google	Google	
2	The Walt Disney Company	Microsoft	Microsoft	BMW AG	Microsoft	The Walt Disney Company	Google	Apple Inc.	Vodafone Group plc	
3	LEGO Group	Google	The Walt Disney Company	The Walt Disney Company	The Walt Disney Company	Google	The Walt Disney Company	The Walt Disney Company	Microsoft	
4	Natura	The Walt Disney Company	BMW AG	Microsoft	BMW AG	BMW AG	BMW AG	Microsoft	Apple Inc.	
5	Novo Nordisk	BMW Group	LEGO	Daimler	Apple Inc.	Daimler	Apple Inc.	Daimler	BMW AG	
6	Microsoft	Intel Corporation	Daimler	LEGO	LEGO	SONY	Daimler	SONY	SONY	
7	Robert Bosch	Robert Bosch	Apple Inc.	Apple Inc.	Volkswagen	Intel Corporation	Volkswagen	LEGO	IKEA	
8	Canon	Cisco Systems	Rolls-Royce Aerospace	Intel Corporation	Intel Corporation	Volkswagen	SONY	BMW AG	Volkswagen	
9	Michelin	Rolls-Royce Aerospace	Rolex	Rolls-Royce Aerospace	Rolex	Apple Inc.	Colgate-Palmolive	Volkswagen	United Parcel Service, Inc.	
10	IKEA	Colgate-Palmolive	Intel Corporation	Rolex	Daimler	Nestle	LEGO	Intel Corporation	Intel Corporation	

organizations, public authorities, and local self-government bodies. And about 10% of companies appear to be aware that one may be useful without even making monetary donations, resorting rather to volunteering services or, for example, by providing the information support.

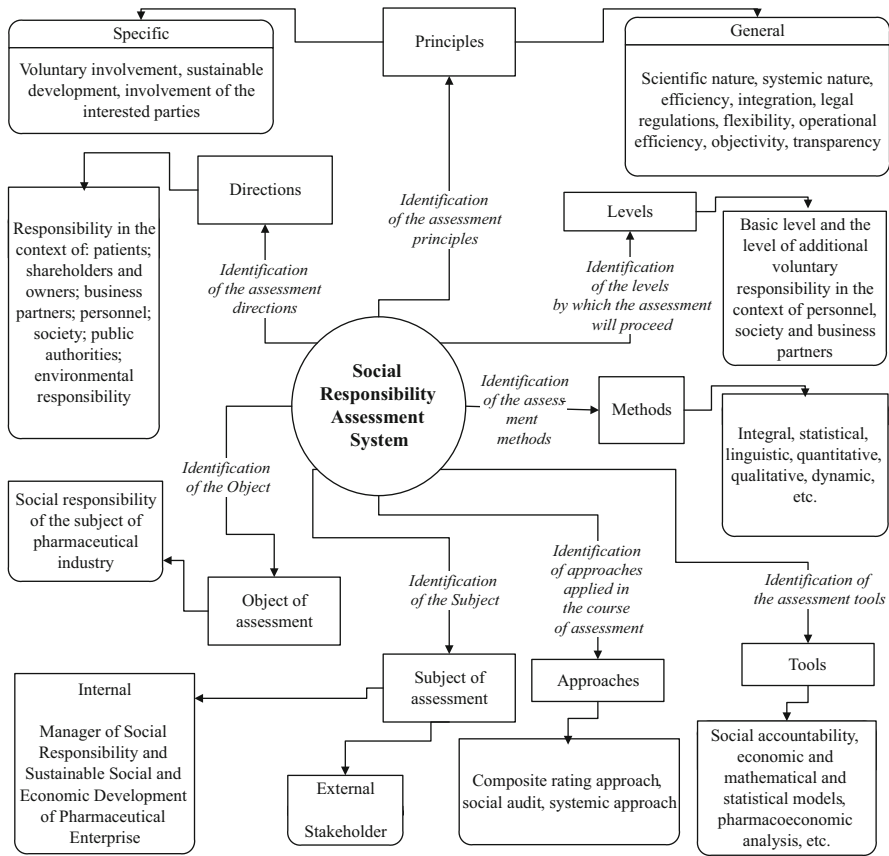
Therefore, our study helped uncover certain drawbacks in SR management in PhC. This calls for improvement of the existing theoretical framework for management of social responsibility of pharmaceutical businesses (SRPhB) and development of industry-specific methods for the assessment of social responsibility of companies.

## 4 Methodology and Result

According to the studies, practical assessment of social responsibility mostly focuses on identification of the PhC ratings, which is truly important and encourages the companies to develop their own SR systems. However, no matter how important these ratings may be, they would not help assess the SR development potential, their results are fairly subjective and limited to information that is only available to the experts whose opinions shape up the ratings. To promote better transparency, objectivity, and assessment of the SR level, and to provide tools to the PhC for the efficient control of the socially responsible development reserves, we suggest methodological approaches to the SRPhB assessment based on the economic and mathematical approaches and information technologies. What makes the suggested SRPhB assessment methodology unique is that it takes into account specifics of the PhC business and international standards regulating the performance of pharmaceutical companies. Figure 1 shows the SRPhB assessment system suggested by the authors.

Objectivity of the results of the SRPhC assessment largely depends on validity of the selected indicators (key values) on the basis of which the assessment proceeds. For the assessment of the SRPhB, we substantiated the requirements to indicators which will be used in calculations: (1) suitability; (2) correct assessment of the status of the object; (3) precision; (4) reliability; (5) completeness and entirety; (6) uniqueness; (7) simplicity yet substantivity; (8) the indicators may be quantitative; (9) the indicators shall be consistent with requirements of the assessment and provide the required correlation with indicators of production and economic activities of the PhC; and (10) comparability. Taking into account these requirements, we have formed a totality of local indicators characterizing the SRPhB by each specific component.

Local indicators of the SRPhB assessment were selected in Stage 1 by way of the expert-based method. The experts were represented by CEOs of the PhC, executive officers and employees of the HR, strategic planning and marketing services/departments, and scholars. Total experts count is 130 persons. Stage 2 involved checking the level of correlation between the local indicators of the SRPhB assessment in order to exclude highly interrelated indicators. If the pair



**Fig. 1** Assessment of social responsibility of pharmaceutical business

correlation ratio exceeds 0.8, according to the Chaddock scale, the values are extremely interrelated, and it would be unreasonable to use both of them at a time, i.e., one indicator shall be removed from the totality. Out of any such pair, we would pick the indicator that had the least or no values of high correlation with other indicators comprising the totality following these calculations, we have selected 46 local indicators for the SRPhB assessment (Fig. 2).

Our SRPhB assessment method is based on the integral approach and taxonomic analysis. Therefore, SRPhB assessment may proceed as follows:

$$I_{SRPhB} = f(k_{YakLZ}; k_{NT}; k_{EK}; k_{STr}; k_{AKC}; k_{Bz};) \tag{1}$$

where  $I_{SRPhB}$  is the integral value of the SRPhB;  $K_{YakLZ}$  is the composite index of responsibility for the timely provision of quality, safe and affordable medicines (LZ) to the public;  $K_{NT}$  is composite index of responsibility for policy-making

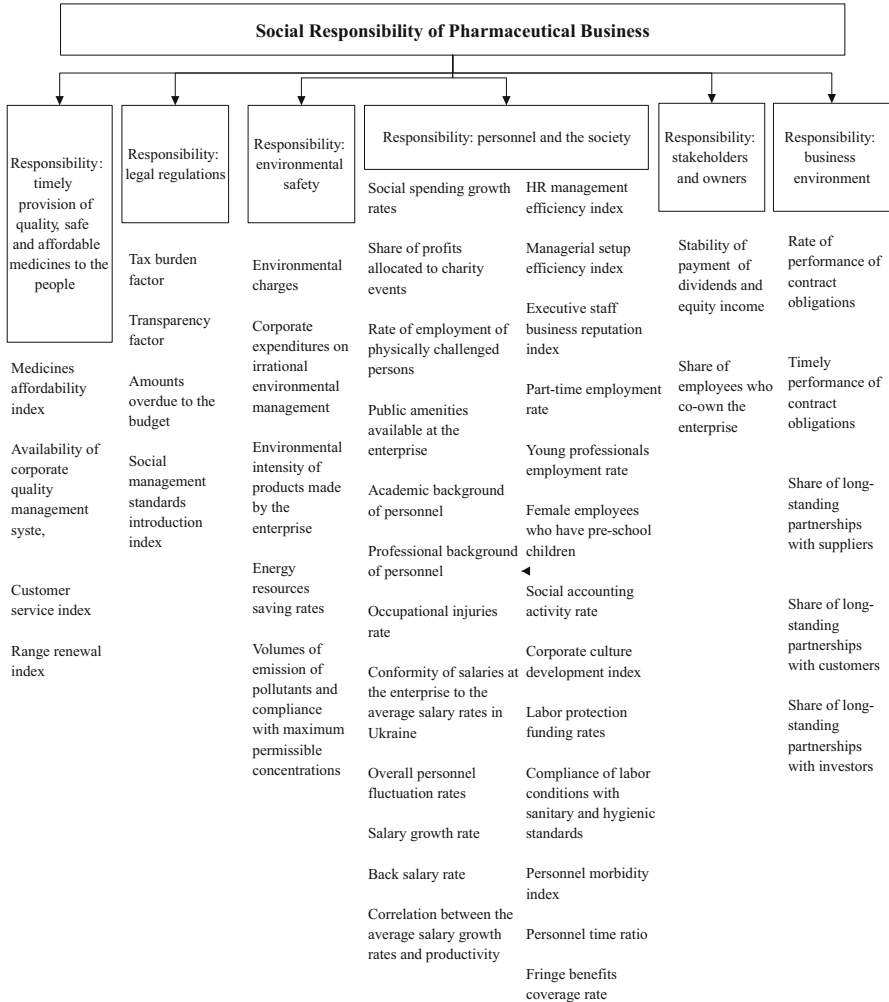


Fig. 2 Suggested system of indicators of the SRPhB assessment

and promotion of vocational and higher education;  $K_{Ek}$  is the composite index of responsibility for environmental safety;  $K_{STr}$  is the composite index of responsibility before the personnel and the public;  $K_{Akc}$  is the composite index of responsibility before shareholders and owners;  $K_{Bz}$  is the composite index of responsibility before business environment.

The abovementioned composite indices covering every SRPhB component are calculated on the basis of local indices set forth in Fig. 2. The suggested SRPhB assessment methodology has been tested on a number of pharmaceutical companies. The estimates are set forth in Table 2. The same SRPhB assessment methodology is complemented by the assessment of the synergic effect resulting from balanced

**Table 2** 2018 SRPhB assessment results for the studied Ukrainian PhC

Pharmaceutical enterprise	Integral SRPhB index	Synergetic factor	Cluster number	Rating (within a group, considering the synergetic factor)
<b>Manufacturers</b>				
PAT Farmak	0.78	1.17	1	4
Arterium Corporation	0.85	2.08	1	3
PAT NPC Borshchahivskiy Ch&Ph	0.63	–	2	7
FF Darnytsya	0.74	1.45	1	5
TOV FK Zdorovya	0.64	1.15	2	6
PAT Kyivskiy Vitaminny Zavod	0.53	–	2	10
TOV Micropharm	0.27	–	4	12
TOV Ternopharm	0.26	–	4	13
PrAT Lekhim-Kharkiv	0.48	–	3	11
PAT Pharmstandard-Biolik Corporation “Yuriya-Pharm”	0.49	–	3	9
TOV Takeda Ukraine	0.63	–	2	8
TOV Teva Ukraine	0.86	1.18	1	1
TOV Teva Ukraine	0.87	1.61	1	2
<b>Distributors</b>				
TOV BaDM	0.62	1.22	2	2
JV Optima-Pharm Ltd.	0.43	–	3	4
<b>Pharmacy chains</b>				
“Med Service Group”	0.71	–	2	3
“Gamma-55”	0.61	–	2	5
“Apteka Nyzkykh Tsin”	0.72	2.16	1	1
“Leda”	0.51	–	2	7
“9-1-1”	0.54	–	2	6
“Apteka Dobroho Dnya”	0.66	–	2	4



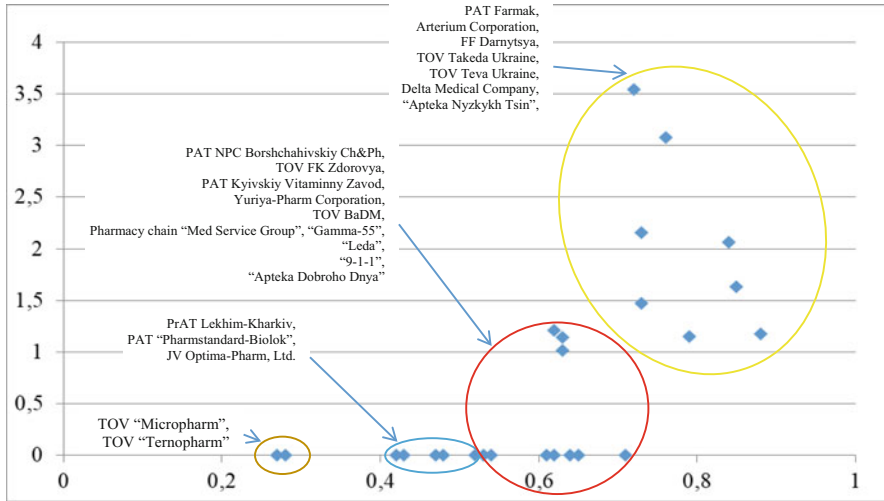


Fig. 3 Pharmaceutical companies clustered by the SRPhB level

management of every social responsibility component of PhC and is estimated with the help of the index that is calculated in accordance with the method described in our earlier studies [18].

Based on the calculations, we operated Statistica 12.0 and Grafikus to conduct cluster analysis of pharmaceutical companies by the level of SRPhB. Based on the results of the analysis, the studied PhC have been grouped into four clusters (Fig. 3). Each PhC cluster shall have an individual SRPhB strategy with implementation procedures outlined. Introduction of the suggested SRPhB assessment methodology will help identify bottlenecks in SRPhB governance, define the resource pool which the PhC will be able to apply for the promotion of its socially responsible activities, develop a package of measures to promote the effective SR management, contribute to the establishment of partnership with stakeholders, introduce principles of social responsibility in pharmaceutical industry, and promote the practice of open rating of the national PhC by the SRPhB, which will be an important step toward enhancement of investment attractiveness of the PhC and boosting the consumer loyalty.

Our study then proceeded to the next stage to establish correlation between the SRPhB and the sustainable development index of pharmaceutical companies. For purposes herein, the sustainable development means the advancement that is based on the balance between meeting the contemporary needs of the public and protecting the interests of future generations, including their need for higher quality of life, factoring in such aspects as health, safety, and clean environment. We have suggested the index system for the assessment of sustainable social and economic development of pharmaceutical companies in our earlier works [9, 22]. Under this approach, the sustainable social and economic development of pharmaceutical companies can be assessed as follows:

$$Y_{CCEP} = f(I_{EP}; I_{CP}; ), \quad (2)$$

where  $Y_{CCEP}$  is the summarizing taxonomic indicator of sustainable social and economic development of pharmaceutical companies;  $I_{EP}$  is the integral indicator of economic development of the PhC;  $I_{CP}$  is the integral indicator of social development of the PhC.

In turn, formalized calculation of the integral indicator of economic development ( $I_{EP}$ ) and integral indicator of social development ( $I_{CP}$ ) of the PhC can be described in formulations (3) and (4):

$$I_{EP} = f(Bm_K; F_K; M_K; Y_K; Ii_K; ), \quad (3)$$

where  $Bm_K$  is the composite index of the production and technological component of economic development of the PhC;  $F_K$  is the composite index of financial component of economic development of the PhC;  $M_K$  is the composite index of marketing component of economic development of the PhC;  $Y_K$  is the composite index of management component of economic development of the PhC;  $Ii_K$  is the composite index of innovative investment component of economic development of the PhC.

$$I_{CP} = f(K_K; C3_k; Mm_k; Ti_K), \quad (4)$$

where  $K_K$  is the composite index of the HR component of social development of the PhC;  $C3_K$  is the composite index of the social welfare and security component of the PhC personnel;  $O_K$  is the composite index of the PhC labor management component;  $MT_K$  is the composite index of the motivational component in the PhC development;  $Ti_K$  is the composite index of the creative and intellectual component in the PhC development.

Table 3 summarizes the results of assessment of the level of development of the studied pharmaceutical companies.

Seeking to provide PhC with a package of effective tools to diagnose the reserves for improvement of socially responsible management, we suggest the Grafikus-based 3D graphic model. Figures 4, 5, and 6 are examples of how to build the abovementioned models for the studied PhC distributed in various clusters by the level of their social responsibility. On the graphic models, one may notice that the yellower area of the surface representing the development of a pharmaceutical enterprise stands for the higher level of development thereof, while the greater radius of the surface stands for the poorer development of the PhC. The study of social and economic performance of the Ukrainian pharmaceutical companies defines five levels of development (sustainable, high, medium, below medium, and low). For each level of the PhC development, we suggested key tasks for the improvement of sustainable development management system and developed the operational guidelines for the application of the social and economic control tools.

**Table 3** 2018 Indices of sustainable social and economic development of pharmaceutical companies in Ukraine

Pharmaceutical enterprise	Summarizing indicator of sustainable social and economic development (on a scale of 0–1)	Synergetic factor (if < 1—no synergetic effect is present)	Level of social and economic development	Cluster No.	Rating among the studied PhC (within the group)
<b>Manufacturers</b>					
PAT Farmak	0.69	No synergetic effect	Medium	3	5
Arterium Corporation	0.74	2.06	High	2	3
PAT NPC Borschahivskiy Ch&Ph	0.64	No synergetic effect	Medium	3	7
FF Darnytsya	0.71	1.47	High	2	4
TOV FK Zdorovya	0.63	1.14	Medium	3	6
PAT Kyivskiy Vitaminy Zavod	0.54	No synergetic effect	Medium	3	10
TOV Micropharm	0.28	No synergetic effect	Low	5	12
TOV Ternopharm	0.48	No synergetic effect	Below medium	4	11
PrAT Lekhim-Kharkiv	0.56	No synergetic effect	Medium	4	9
PAT Pharmstandard-Biolik Corporation	0.61	No synergetic effect	Medium	3	8
“Yuriya-Pharm”	0.78	1.18	High	2	1
TOV Takeda Ukraine	0.73	1.63	High	2	2
TOV Teva Ukraine	0.67	1.63	High	2	2
<b>Distributors</b>					
TOV Arthur-K	0.63	No synergetic effect	Medium	4	3
TOV BaDM	0.63	1.21	Medium	3	2
<b>Pharmacy Chains</b>					
“Med Service Group”	0.71	No synergetic effect	Medium	3	3
“Gamma-55”	0.62	No synergetic effect	Medium	3	5
“Apteka Nyzkykh Tsin”	0.73	2.16	High	2	1
“Leda”	0.52	No synergetic effect	Medium	3	7
“9.-1-1”	0.53	No synergetic effect	Medium	3	6
“Apteka Dobroho Dnya”	0.65	No synergetic effect	Medium	3	4

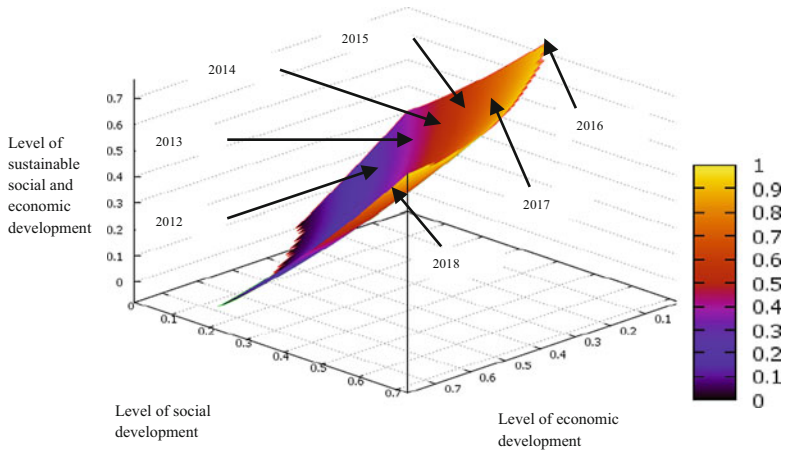


Fig. 4 Graphic model of PAT Farmak development

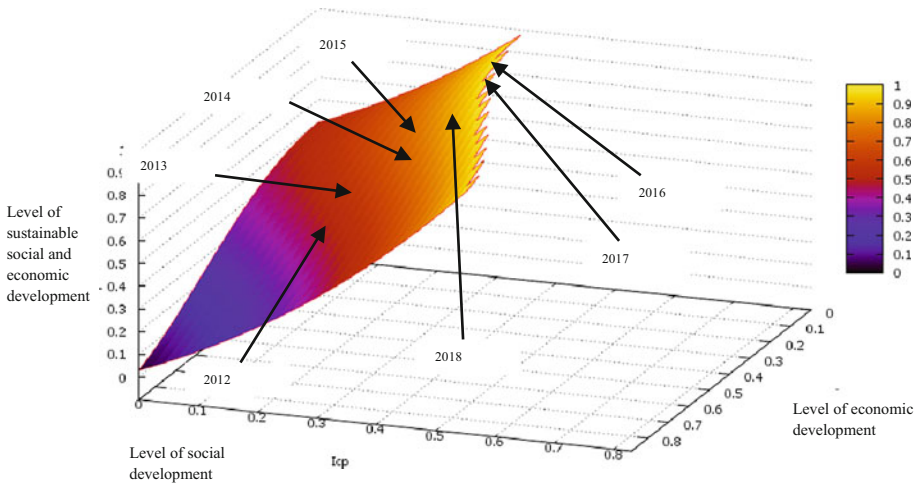


Fig. 5 Graphic model of Arterium Corporation development

In order to complete the tasks at hand, the PhC with sustainable and high level of social and economic development are recommended to focus on strengthening of the social responsibility system and on control of market forces while making their management arrangements; pharmaceutical companies with medium level of development should also activate the economic tools to control their interaction. When the level of development is below medium or low, one should apply all components of social and economic controls.

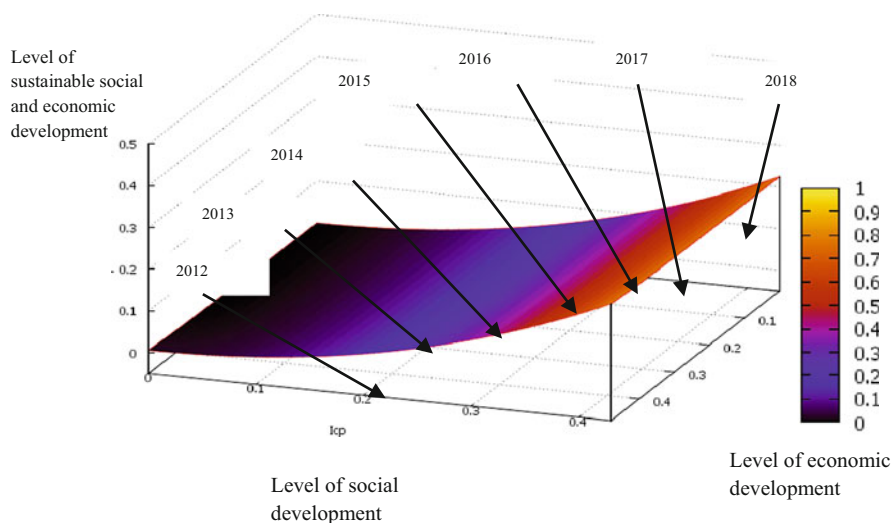


Fig. 6 Graphic model of TOV Micropharm development

## 5 Conclusions

Ratings of the most socially responsible international companies have been studied in real-time mode. Social responsibility management is proven to be topical for the promotion of sustainable social and economic development and attainment of strategic competitive edge by the companies.

Even though medicine and pharmacy are socially responsible industries, only one pharmaceutical company made it to top-10 of the most socially responsible companies worldwide over the last 10 years.

It has been established that 63% of the Ukrainian pharmaceutical companies covered by this study maintain their social responsibility only at the basic level. Notably enough, the Ukrainian pharmaceutical companies appear to be more socially responsible worldwide than domestically.

This study has defined the essence and the components of socially responsible pharmaceutical business (SRPhB).

We have suggested methodological approaches to the SRPhB assessment based on the economic and mathematical methods and information technologies. The suggested methodology was used for the assessment of social responsibility of more than 20 Ukrainian pharmaceutical companies with application of taxonomic analysis and clustering of the said PhC by the level of their social responsibility.

It has been established that the SR level and the level of sustainable social and economic development correlate, however, subject to balanced management.

For diagnosing of the reserves for improvement of socially responsible management, we have suggested the 3D graphic model based on the Grafikus service.

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