UDC 331.101.37

https://doi.org/10.33271/nvngu/2021-5/147

A. Tkachenko[1],
orcid.org/0000-0002-1843-2579,
N. Levchenko[1],
orcid.org/0000-0002-3283-6924,
G. Shyshkanova[1],
orcid.org/0000-0002-0336-2803,
V. Shvets[2],
orcid.org/0000-0001-7261-5993,
M. Ivanova[2],
orcid.org/0000-0002-1130-0186

1 – National University "Zaporizhzhia Polytechnic", Zaporizhzhia, Ukraine, e-mail: alla0676128584@gmail.com
2 – Dnipro University of Technology, Dnipro, Ukraine

EVALUATION OF THE EFFICIENCY OF SOCIAL INVESTMENTS OF METALLURGICAL ENTERPRISES ACCORDING TO THE DECOUPLING APPROACH

Purpose. To develop a comprehensive methodology for assessing the effectiveness of social investment of metallurgical enterprises by a decoupling approach, which facilitates to form a clear idea of the investor's intentions to support socially important initiatives and to make a realistic portfolio in terms of achieving the impact goals.

Methodology. During the present research, the statistical methods of time series processing and correlation-regressive analysis are used in determining the dependence of the Decoupling Factor of social values on the amount of capital investment to create them. Decoupling analysis is applied in assessing the effectiveness of social investments of Metinvest Holding and the formation of its portfolio in terms of achieving impact goals. Strategic analysis is put to use in forecasting the effectiveness of social investment Metinvest Holding on the medium perspective.

Findings. It is stated that the strategic orientation of transformational changes in the economy is currently the sustainable development of industrial enterprises, the achievement of which, in particular, is possible with the consistent application of the arsenal of fair working conditions, professional growth and welfare of employees, among which social investment has become widespread in foreign practice. The international standards on corporate social responsibility of companies are analyzed and the content component of the concept of "social investment" is revealed according to the functional approach. Emphasis is placed on the need to assess the effectiveness of social investment by the decoupling approach. The essence of the decoupling and its significance in the process of social investment are revealed. The authors' method for evaluating the effectiveness of social investment by the decoupling approach is proposed. The classification of decoupling effect types according to P. Tapio has been modified by distinguishing types of social-decoupling effect. The expediency of supplementing GRI 400 "Social Standards" with the group of indicators GRI-420 "Efficiency of Social Investments" is substantiated.

Originality. The theoretical and methodological provisions in the field of social investment are deepened by developing an authors' methodology for assessing the effectiveness of social investment by decoupling approach. In contrast to the existing transformational changes in the economy, the methodology helps to make a clear understanding about the investor's intentions and his/her realistic portfolio in terms of achieving the set impact goals. Taking into account the requirements of the UN Resolution "Transforming our world: the 2030 Agenda for Sustainable Development", the ISO 26000 Social Responsibility Guide (2010) and the AA1000 AS Social Reporting Standard, it is proposed to supplement GRI-400 "Social Standards" with a group of indicators for assessing the effectiveness of social investment by the decoupling approach.

Practical value. The scientific results on assessing the effectiveness of social investment of industrial enterprises by the decoupling approach should be used in making management decisions to invest capital in improving the working conditions of employees.

Keywords: *decoupling, social investments, efficiency of social investments, sustainable development, metallurgical enterprises*

Introduction. One of the most important challenges facing Ukraine and business today is the transition from formal declarations on the implementation of international commitments on sustainable development to their direct implementation [1]. And, first of all, to fulfill the obligations of economic growth, environmental protection, ensuring full productive employment and decent work (the eights goal of sustainable development) [2], i. e. to fulfill the obligations of corporate social responsibility.

Nowadays, the state is unable to provide an acceptable level of full productive employment and decent work because of a number of reasons. Thus, the development of society requires business attention to social investment as a purposeful investment of resources in the development of the social sphere where human, intellectual and social capital is formed and increased to obtain a beneficial effect in the future for business and society [3].

Based on this, the issues of developing effective tools for making management decisions on investing capital in social values are extremely important. In our opinion, one of such tools should be the assessment of the effectiveness of social investment by the decoupling effect.

Literature review. Analysis of recent research studies and publications shows that the issues of decoupling effect in recent years are quite actively studied by such scientists as L. Kulyk [1], L. Melnychuk [3], Z. Arsakhanova and Z. Khazhmuradov [4], H. Eliseeva [5], S. Faizova [6], N. Chuprina [7], and others.

In their works, scientists emphasize the importance of the decoupling effect in the process of investing in the sustainable ecological and economic functioning of the "nature-society" system and the methodological foundations of its definition. However, the question of assessing the decoupling effect of investing capital in the social values of domestic stakeholders is still insufficiently studied.

Instead, with the adoption of the Resolution by the UN General Assembly "Transforming Our World: An Agenda for Sustainable Development to 2030" (hereinafter – the Agenda) in 2015 [2], which operates in almost 170 countries and territories, and which demonstrates the scale and the ambition of the new Agenda for the protection of human rights, corporate so-

cial responsibility and the promotion of social values, environmental protection, and so on, there is a need for further research on this topic. In addition, Ukraine, like other UN member states, has joined the global process of sustainable economic growth. Therefore, at present, the goals of domestic business must be formed in symbiosis with the goals of sustainable development. Measuring their achievement, in particular, in terms of creating social values for internal stakeholders of enterprises, is what is needed to assess the effectiveness of social investment.

The importance of addressing the issues of evaluating the effectiveness of social investments is evidenced by repeated attempts to address them at the level of international standards. In particular, the Standard of corporate social responsibility SA8000 [8], developed by Social Accountability International in 1997, provides a methodology and indicators for assessing the social performance of companies. However, this method has not become widespread due to its narrow focus – focusing only on the observance of human rights by employers and improving the working conditions of employees. Instead, the AA1000 AS Social Reporting Standard [9], developed in 1999 by the British Institute of Social and Ethical Accountability, defines the sequence, criteria and, accordingly, the indicators of the social audit of enterprises. According to experts, its main drawback was the need to introduce a system of constant dialogue with stakeholders in the daily practice of companies.

The ISO 26000 Social Responsibility Guide (2010) [10], developed by the International Organization for Standardization (ISO), focuses on corporate social responsibility requirements. Unfortunately, the indicators of the social audit were ignored. However, this is not the only disadvantage of ISO 26000. According to most practitioners, ISO 26000, in fact, isolates companies from real social problems and "decontextualizes" their socially responsible activities. Guidelines for reporting on sustainable development GRI (The Global Reporting Initiative) – Global Initiative for reporting (2015), namely a series GRI-400 "Social standards" (hereinafter – GRI-400) [11] provided a list of specific indicators on social corporate responsibility of enterprises. Most foreign and domestic enterprises prefer this standard. However, in our view, the GRI-400, like the other standards listed above, does not provide a realistic assessment of the effectiveness of social investment and, consequently, a realistic assessment of business's commitment to sustainable development.

Unsolved aspects of the problem. Methods for assessing the effectiveness of social investment, provided by international standards and currently proposed by scientists, unfortunately, are unable to assess the close relationship between social investment and social performance of enterprises, which, above all, significantly complicates the assessment of their compliance with sustainable development.

Purpose. The aim of the paper is development of a comprehensive methodology for evaluating the effectiveness of social investment of metallurgical enterprises by the decoupling approach, which facilitates formation of a clear idea of the investor's intentions to support socially important initiatives and to make a realistic portfolio in terms of achieving the impact goals.

Methods. The study is based on the following methods: statistical methods of processing time series of observation and correlation-regression analysis, which allowed determining the multifactorial nonlinear dependence of the Decoupling Factor of social values on the amount of capital investment to create them; method of the decoupling analysis for assessing the effectiveness of social investments of Metinvest Holding and the formation of its portfolio in terms of achieving impact goals; strategic analysis for evaluating the effectiveness of social investment of Metinvest Holding on the forecasted volume of investment and expected consolidated revenue; abstract-logical method for the generalization of research results and the formation of conclusions.

Results. The strategic direction of transformational changes in the economy is currently the sustainable development of industrial enterprises, which, from world experience, is possible, in particular, provided the consistent use of the arsenal of economic growth, environmental protection, guaranteeing full productive employment and decent work [5].

Therefore, domestic industrial enterprises, in particular, metallurgy, are trying to invest more and more capital in the social values of domestic stakeholders. However, the usefulness of this capital could be evaluated only if the effectiveness of such investments were assessed [6].

Among the above standards, like most companies, we prefer GRI, namely GRI 400 "Social Standards" [11]. Instead, we consider it appropriate to supplement it with a group of indicators GRI-417 "Efficiency of social investments", which provide indicators for assessing the effectiveness of social investment on the decoupling approach.

The concept of "decoupling" has not yet been widely used in domestic practice. Interpretations of its substantive component are mainly based on the etymology of the borrowed English term [12]. In particular, on the submission of its content in the Millennium Declaration, approved by the UN General Assembly Resolution of 08.09.2000 on No. 5/2 [12], in The European Commission proposed a Strategy on the Sustainable Use of Natural Resources used in Europe of 25.12.2005 [13], as well as in The Roadmap to a Resource Efficient Europe (2011) [14], where decoupling is seen as a break between the "negative environmental impact" and "economic benefits". Instead, with the formation of the Assessment of resource efficiency indicators and targets (Final report – 2012) and with the beginning of the UNEP report Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, the concept of "decoupling" has become more broadly interpreted, namely as a key principle related processes of economic growth, natural resources consumed and environmental pollution, which provides for the growing needs of society while minimizing the consumption of natural capital [7].

Since we are talking about assessing the effectiveness of social investment, we consider it necessary to modify the OECD methodology for assessing the phenomenon of decoupling, by making adjustments to the methodology for determining Decoupling Index (hereinafter – *DecIndex*) and Decoupling Factor (hereinafter – *DecFactor*)

$$DecIndex = \frac{\left(\frac{EP}{DF}\right)_{ending}}{\left(\frac{EP}{DF}\right)_{beginning}}; \quad (1)$$

$$DecFactor = 1 - DecIndex, \quad (2)$$

where *EP (environmental pressure)* stands for indicators of negative impact on the creation of social values for internal stakeholders (ensuring fair working conditions, professional growth and well-being of employees); *DF (driving force)* – indicators of economic growth of enterprises.

In order to substantiate the feasibility of making additions to the GRI 400 "Social Standards" [11] to assess the effectiveness of social investment by the decoupling approach, we will conduct a study according to Metinvest Holding Group (Table 1), introducing the following indicators of social and economic growth, and namely GRI 401–403 indicators selected for the study and consolidated revenue:

Ec_1 – staff turnover rate;

Ec_2 – rate of lost days;

Ec_3 – indicator of occupational diseases;

Ec_4 – LTIFR (Lost Time Injury Frequency Rate, the number of lost time injuries occurring in a workplace per 1 million hours worked);

Ec_5 – FIFR (Fatal-Injury Frequency Rate);

Table 1

Dynamics of indicators of the Report on Sustainable Development of Metinvest Holding Group Enterprises according to GRI 401–403, for the period 2009–2019 [15–20]

Indicators	Years										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Consolidated revenues, UAH million, V	48 117.6	74 499.0	113 355.9	100 432.0	102 366.4	166 599.5	163 974.8	169 209.6	250 666.4	328 933.4	296 355.4
Staff turnover rate, Ec_1	16	14	11	12	11	10	9	8	12	11	11
Lost day rate, Ec_2	17.27	16.62	13.69	11.44	8.86	8.21	10.1	12.9	20.8	25.55	21.78
Workplace illnesses frequency rate, Ec_3	0.19	0.18	0.16	0.17	0.19	0.15	0.14	0.19	0.15	0.13	0.12
LTIFR, Ec_4	2	1.77	1.35	1	0.97	0.89	0.746	0.829	0.857	0.802	0.79
FIFR, Ec_5	0.1	0.08	0.16	0.11	0.07	0.05	0.064	0.054	0.027	0.099	0.053

V – consolidated revenue, UAH million.

Therefore, the formula (1) for calculating *DecIndex* using the GRI 401–403 indicators selected for the study, can be written in next form

$$DecIndex(Ec_{it}, V_t) = Kc_{it}/K_{Vt}, \quad (3)$$

where K_t is chain growth rates of the corresponding indicator GRI 401–403, selected for the study, %; t is year; i is the number of the corresponding indicator GRI 401–403, selected for the study, which characterizes the social activities of the enterprise, $I = \overline{1.5}$.

$$K_t = (T_t - 100), \quad (4)$$

where T_t is chain growth index of the corresponding indicator GRI 401–403, selected for the study, %

$$T_t = (y_t/y_{t-1})100, \quad (5)$$

where y_t is the level of the corresponding GRI 401–403 indicator selected for the study in the year under review; y_{t-1} is the level of the corresponding GRI 401–403 indicator, in the year that is previous to the one selected for the study.

According to formulas (2, 3), *DecFactor* is defined as

$$DecFactor = 1 - (Kc_i/K_V). \quad (6)$$

Fully supporting the classification of types of decoupling effect by P. Tapio [21], we modify it for the social activity of enterprises (Fig. 1).

We consider it appropriate to distinguish the following types of decoupling effect, depending on the level of the relationship between economic growth and the negative impact on social activities of enterprises, similarly to P. Tapio, in particular:

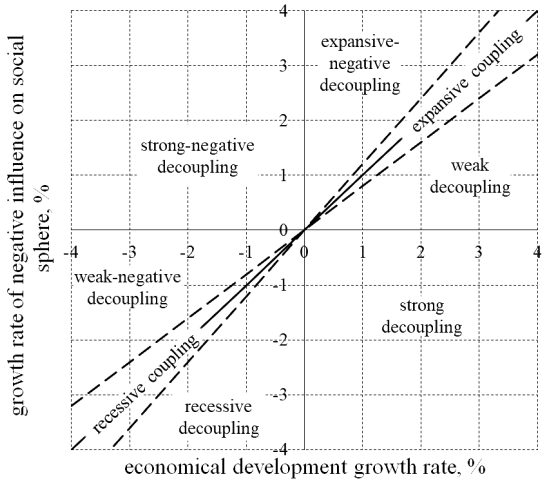

Fig. 1. Types of the decoupling effect

1) ***coupling*** is provided when the rate of economic growth is approaching the rate of negative impact on the social activities of the enterprise.

The coupling can be:

a) ***expansive coupling***, if the rate of economic growth and the rate of negative impact on the social activities of the enterprise increase simultaneously;

b) ***recessive-coupling*** – if the rate of economic growth and the rate of negative impact on the social activities of the enterprise decline simultaneously.

In both cases, the coupling effect is present only if the value of *DecIndex* is in the range of $0.8 < DecIndex < 1.2$;

2) ***decoupling*** is provided when the positive gap exists between the rate of economic growth and the rate of negative impact on the social activities of enterprises. The decoupling effect can be of three levels:

a) ***weak-decoupling***, if the growth rate of economic growth at the same time with the rate of negative impact on social activity tend to increase, but the growth rate of economic indicators is higher than the growth rate of the latter, i. e. if the value of *DecIndex* is in the range $0 < DecIndex < 0.8$;

b) ***strong-decoupling***, if the rate of economic growth is tendentious to growth, and the rate of negative impact on social activity tends to decline, on the contrary, i. e. if the value of *DecIndex* is in the range of $DecIndex < 0$;

c) ***recessive decoupling***, if the rate of economic growth at the same time with the rate of negative impact on social activity tends to decline, but the rate of decline of economic indicators is lower than the rate of decline of the latter, i. e. if the value of *DecIndex* is in the range of $DecIndex > 1.2$;

3) ***negative decoupling*** is provided when the gap is negative between the rate of economic growth and the rate of negative impact on social activities. The negative decoupling effect can also be of three levels:

a) ***weak-negative*** *decoupling*, if the rate of economic growth at the same time with the rate of negative impact on social activity tends to decline, but the rate of change in economic indicators is higher than the rate of change in the latter, i. e. if *DecIndex* is in the range $0 < DecIndex < 0.8$;

b) ***strong-negative decoupling***, if the rate of economic growth tends to decline, and the rate of negative impact on social activity tends to increase, on the contrary, i. e. if *DecIndex* is in the range of $DecIndex < 0$;

c) ***expansive negative decoupling***, if the rate of economic growth at the same time with the rate of negative impact on social activity tends to increase, but the growth rate of economic indicators is lower than the growth rate of the latter, i. e. if the value of *DecIndex* is in the range of $DecIndex > 1.2$.

Therefore, the decoupling effect is shown in Figs. 2, *a–e* for each of GRI 401–403 indicators selected for the study, and it was calculated using the data from Table 1.

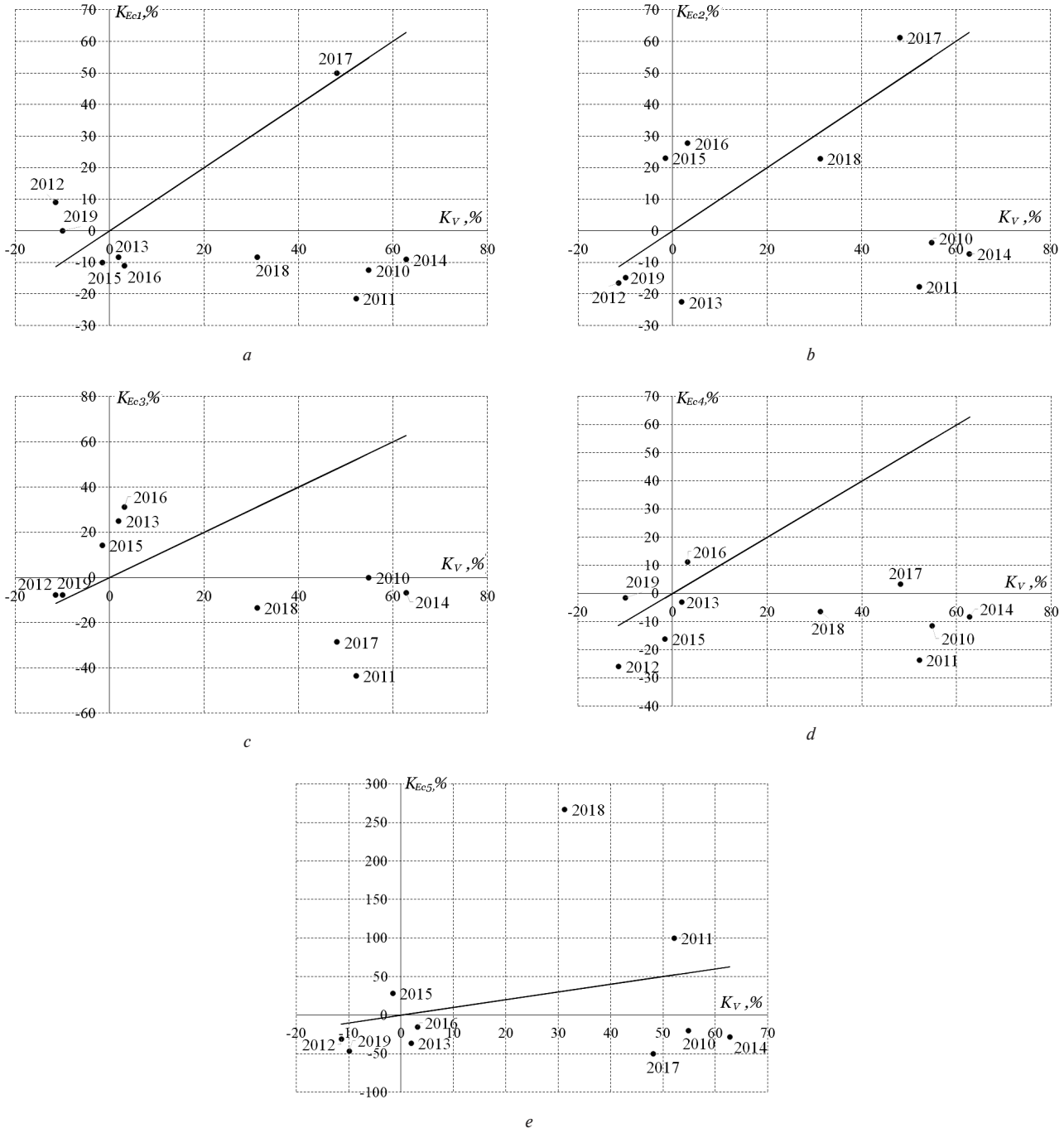

Fig. 2. Dynamics of the ratio of the growth of consolidated revenue to the growth of the corresponding ratio (*staff turnover – a; lost days – b; occupational diseases – c; LTIFR – d; FIFR – e*)

In particular, the data of Fig. 2, *a* give grounds to state that during 2010–2014 (except 2012) the economic growth of the enterprises of Metinvest Holding Group is accompanied by a strong positive decoupling effect.

The reason for this was the growth of consolidated revenues while reducing the staff turnover rate.

The decline in prices on the world market of metal products in 2012 and increased competition due to the Asian-Chinese "expansion" contributed to a decrease in consolidated revenues compared to the above years. Staff turnover also decreased, but at a faster rate than consolidated revenue, which led to a change in the decoupling effect to a recessive one.

Instead, the increase in the debt burden on the enterprises of the Metinvest Holding Group in the coming years as a result of their borrowing during 2008–2013 of borrowed capital for the modernization of equipment in the amount of 4.4 billion dollars caused the default of the Group and, consequently, the outflow of personnel. Therefore, the economic growth of Metinvest Holding Group enterprises during 2015–2017 was accompanied by expansive negative decoupling.

And only in 2018, with a significant increase in sales of metal products and, accordingly, consolidated revenue while reducing staff turnover, economic growth of Metinvest Holding Group enterprises years has been characterized by weak positive decoupling for the first time in recent.

Analysing Figs. 2, *b–e,* we observe almost a similar situation for each of the other indicators of GRI 401–403 selected for the study.

However, the study on the decoupling effect for each of the individual indicators does not allow forming a full idea of the effectiveness of social investment, and therefore does not allow achieving this goal. In order to achieve it, we consider it expedient to turn to the method of integrated assessment and

apply the integrated indicator *EcIntegt*, defined as the geometric mean of their growth indices calculated by (5)

$$T_{Integt} = \sqrt[5]{T_1 \cdot T_2 \cdot T_3 \cdot T_4 \cdot T_5}. \quad (7)$$

The calculation of K_{Integt} is similar to (4) and has the following form, %

$$K_{Integt} = (T_{Integt} - 100). \quad (8)$$

Therefore, the calculation of $DecFactor_{Integ}$ should be carried out according to the following formula similarly to (6) and taking into account (7, 8)

$$DecFactor_{Integt} = 1 - (K_{Integt}/K_{Vt}). \quad (9)$$

The results of the calculation of $DecFactor_{Integ}$, based on (9), carried out by comparing the dynamics of the integrated growth rate K_{Integt}, % to the growth rate of consolidated revenue, K_V, % are given in Table 2 and in Fig. 3.

According to Fig. 3 during 2010–2014 (except 2012), the economic growth of Metinvest Holding Group of enterprises was accompanied by a strong positive decoupling effect. However, the unprecedented growth of metal production against the background of a constant surplus on the world market of metal products has led to a change in Metinvest's position in the ranking of global metal exporters from *25th* in 2010 to *42nd* position in 2013.

Significant dependence on the situation on the global metal products market, which in the last decade is characterized by fierce competition due to the constant growth of new production capacity in the world has led to a decline in prices for most products from the range of domestic metallurgy (in 2012 prices decreased by 3–10 % compared to previous years) in 2013 already amounted to 15–25 %), and in accordance with the reduction of consolidated revenue.

Anti-dumping and safeguard measures applied to metal products on the world market should be considered equally influential. In particular, the introduction of a US safeguard measure in the form of a duty on imports of metal products at a rate of 25 % and the decision of the European Commission to introduce a common quota for all countries with its distribution on a first come-first served basis. This caused Metinvest to lose a number of markets and, consequently, to slow down the Group's economic growth.

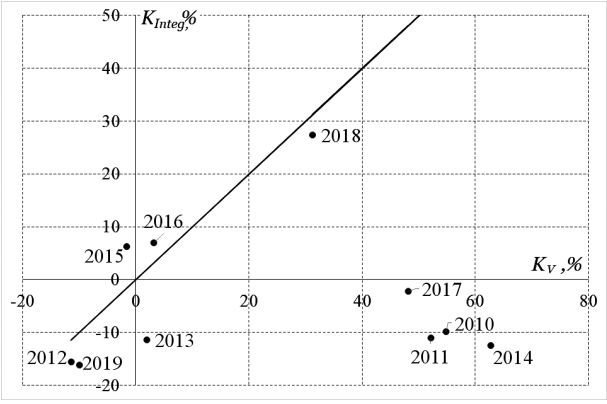

Fig. 3. Dynamics of the ratio of the growth of consolidated revenue to the growth of integrated indicator during 2010–2019

We cannot fail to mention the protective policy of metallurgical enterprises. It is still characterized as ineffective. Due to the imperfection of its mechanisms and tools to protect the domestic market from the pressure of third country producers (in particular, China, Turkey, India, South Korea, and so on), the economic growth of Metinvest Holding Group enterprises is significantly hampered.

The military and political conflict in Eastern Ukraine also hindered Metinvest's support of economic growth. However, despite all the existing obstacles, Metinvest managed to increase production and, consequently, economic growth, which in 2018 is accompanied by a weak but positive decoupling effect, by investing capital in modernizing equipment and improving working conditions. In 2019, the trend of improving working conditions continues, but there is a slight decline in economic growth, characterized by a weak negative decoupling effect.

To establish the impact of social investment I and consolidated revenue V on the decoupling effect, namely on $DecFactor_{Integ}$, we find a multifactor nonlinear relationship: $DecFactor_{Integt} = f(I, V)$

The results of correlation and regression analysis of the data of Table 1 and their smoothing allowed determining the model of $DecFactor_{Integ}$ dependence on the indicated factors

$$DecFactor_{Integt} = a_0 + a_1 \cdot V^{0.2} + a_2 \cdot I^{0.7}. \quad (10)$$

Dependence is polynomial with fractional (less than one) degrees, which means that the increase in social investment is accompanied by an increase in consolidated revenue and leads to a convex increase in the decoupling effect, or, in other words, to widening the gap between economic growth and social values of stakeholders enterprises.

It is established that social investments with 0.7 degree dependence are more influential on velocity change in this process than consolidated revenue with 0.2 degree dependence.

The coefficients of multiple nonlinear regression found after the initial linearization using the generalized least squares method in matrix form, and the dependence (10) of the integrated decoupling factor on the volume of social investment and consolidated revenue took the following form

$$DecFactor_{Integt} = -3.9936 + 0.4605 \cdot V^{0.2} + 0.0037 \cdot I^{0.7}. \quad (11)$$

The graph of the dependence (11) is given in Fig.4.

The obtained coefficient of determination for the linearized model is $R^2 = 0.51$.

According to the Chaddock scale [22], which establishes the degree of density of the selected dependence on the basis of correlation and determination coefficients in economic and statistical studies, when $\sqrt{R^2}$ belongs to the interval (0.5; 0.7),

Table 2

Dynamics of *DecFactor* indicators of Metinvest Holding Group enterprises during 2010–2019

Indicators	Years									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
$DecFactor_1$	1.23	1.41	1.80	5.33	1.14	–5.35	4.48	–0.04	1.27	1.00
$DecFactor_2$	1.07	1.34	–0.44	12.71	1.12	15.61	–7.68	–0.27	0.27	–0.49
$DecFactor_3$	1.00	1.83	0.33	–11.98	1.11	10.07	–8.79	1.59	1.43	0.22
$DecFactor_4$	1.21	1.45	–1.27	2.56	1.13	–9.27	–2.49	0.93	1.21	0.85
$DecFactor_5$	1.36	–0.92	–1.74	19.88	1.46	18.77	5.89	2.04	–7.54	–3.69
$DecFactor_{Integ}$	1.18	1.21	–0.37	6.89	1.20	5.00	–1.17	1.05	0.12	–0.63

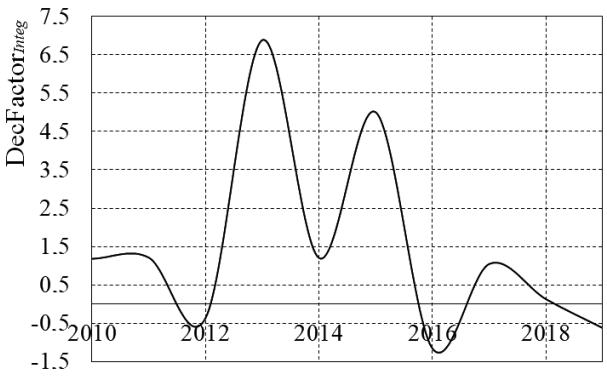

Fig. 4. Dynamics of the integrated indicator of the decoupling factor during 2010–2019

so the relationship is considered noticeable, and when [0.7; 0.9) – the relationship is considered strong enough, [0,9;1] – the bond is considered to be really high-strength in density. In this case, $\sqrt{R^2} = 0.71$, that is, using the Chaddock scale, the selected type of bond can be considered strong enough in density.

Estimated value of the Fisher coefficient according to the sample data $F = 3.12$, the critical value of the Fisher coefficient $F_{cr} = 2.52$ according to the degrees of freedom $k_1 = 7$, $k_2 = 2$, the level of significance $\alpha = 0.15$. Fisher's test, $F > F_{cr}$, showed that with a reliability of 85 % we can assume that the proposed economic and mathematical model (11) is adequate to the statistical data.

According to the forecast indicators of the Metinvest Holding Group's investment of capital in social values, amounting to UAH 3300 million and expected consolidated revenue V = 340 000 UAH million by the formula (11), the forecast value of the decoupling effect $DecFactor_{Integ} = 2.9745$ and its changes with capital investment in the amount of I = = 4500 UAH million was found with constant volumes of consolidated revenue: $DecFactor_{Integ} = 3.2379$, whose image is given in Fig. 5.

Thus, the results of the study prove that the proposed economic and mathematical model of the decoupling approach is suitable for assessing the effectiveness of social investment in metallurgical and other industrial enterprises.

Conclusions. In the course of the research, it was stated that the strategic orientation of transformational changes in the economy is currently chosen to be sustainable development, the achievement of which, in particular, is possible under the condition of consistent increase in capital investment in social values of enterprises.

It was proven that social investments, like any other, needed to be evaluated for their effectiveness. Taking into account the requirements of the UN Resolution "Transforming our world: Agenda for sustainable development until 2030" [2], Guidelines for social responsibility of ISO 26000 (2010) [5] and the Standard for social reporting of companies AA1000 AS [4], proposed to make changes to the Global Reporting Initiative (2015) [6], which is currently being tested, namely the GRI-400 series "Social Standards" by supplementing the group of indicators for assessing the effectiveness of social investment with a decoupling approach.

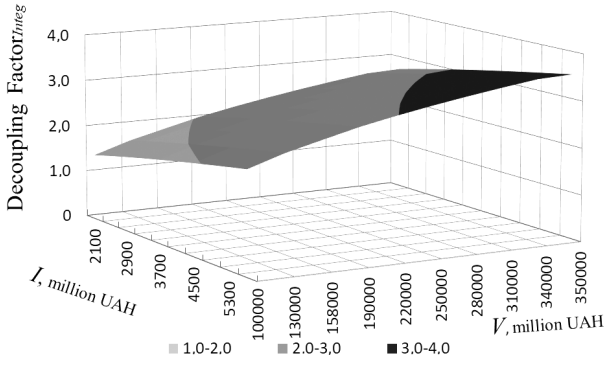

Fig. 5. The surface of $DecFactor_{Integ}$ dependence on investment and consolidated revenue

A new technique of assessing the effectiveness of social investment by the decoupling approach was developed. Unlike existing ones, it gave a clear idea of the investor's intentions to support socially important initiatives and his/her realistic portfolio in terms of achieving the set impact goals during transformational changes in the economy The expediency of introduction of the offered technique in domestic and world practice (subject to the proposed changes to the series GRI-400 "Social Standards") is substantiated.

It was demonstrated that the scientific methodology on assessing the effectiveness of social investment of enterprises by the decoupling approach is worth being applied in management decisions to invest capital in improving the social values.

References.

1. Kulyk, L. A., & Sotnyk, I. M. (2014). Decoupling analysis as a tool for achieving sustainable development of Ukraine. In Averkina, M. F., Andreieva, N. M., Baldzhi, M. D., & Veklych, O. O. (Eds.). *Sustainable development – 21st century: management, technologies, models: collective monograph*, (pp. 87-99). Cherkasy.

2. United Nations. (2015). Department of Economic and Social Affairs. *Transforming our world: the 2030 Agenda for Sustainable Development*. Retrieved from https://sdgs.un.org/2030agenda.

3. Melnychuk, L. S. (2016). The essence and importance of social investment. *Hlobalni ta natsionalni problemy ekonomiky,* (11), 434-437.

4. Arsakhanova, Z. D., Khazhmuradov, Z. A., & Khazhmuradova, S. D. (2019). Decoupling in economics – the essence, definition and types. *Gosudarstvennoe i municipal'noe upravlenie*, (4), 13-18.

5. Yelisieieva, H. Yu. (2014). Assessing the impact of green economy development through the study on decoupling processes. *Intelekt XXI stolittia*, (2), 127-135.

6. Ivanova, M., Varyanichenko, O., Sannikova, S., & Faizova, S. (2018). Assessment of the competitiveness of enterprises. *Economic Annals-XXI*, *173*(9-10), 26-31. https://doi.org/10.21003/ea.V173-04.

7. Tkachenko, A., Levchenko, N., Pozhuieva, T., & Chupryna, N. (2019). Innovative approach to evaluation of the decoupling phenomena in making decision on investment of agro-business. *International Journal of Recent Technology and Engineering, 8*(3C), 38-44.

8. Social Accountability International (2021). *SA 8000 Standard*. Retrieved from https://sa-intl.org/programs/sa8000/.

9. AccountAbility (2021). *AA 1000 Assurance Standard*. Retrieved from https://www.accountability.org/standards/aa1000-assurance-standard/.

10. International Organization for Standardization (2018). *Discovering ISO 26000:2010. Guidance on social responsibility*. Retrieved from https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100258.pdf.

11. Global Reporting Initiative (2021). *Social Information Disclosure*. Retrieved from https://www.globalreporting.org/.

12. UN General Assembly (2020). *United Nations Millennium Declaration, Resolution Adopted by the General Assembly*, 18 September 2000, A/RES/55/2. Retrieved from https://www.refworld.org/docid/3b00f4ea3.html.

13. European Commission (2005). *Strategy on the Sustainable Use of Natural Resources used in Europe*. Retrieved from https://ec.europa.eu/environment/archives/natres/index.htm.

14. European Commission (2011). *The Roadmap to a Resource Efficient Europe*. Retrieved from https://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm.

15. Metinvest (2011). *Social report 2009–2010: From the workplace to local communities*. Retrieved from https://metinvestholding.com/Content/Entities/Report/4/ua/Metinvest_CSR_Report_2009-2010.pdf.

16. Metinvest (2013). *Social report 2011–2012: Metal for life*. Retrieved from https://metinvestholding.com/Content/Entities/Report/3/en/Metinvest_CSR_Report_2011-2012_eng.pdf.

17. Metinvest (2015). *Social report 2013–2014: Stronger than steel*. Retrieved from https://metinvestholding.com/Content/Entities/Report/1/ua/Social_Report_Metinvest_2013-2014.pdf .

18. Metinvest (2017). *Social report 2015–2016: More than steel*. Retrieved from https://metinvestholding.com/Content/Entities/Report/22/en/%20Report_2015-2016.pdf.
19. Metinvest (2019). *Sustainability report 2017–2018: Human and steel*. Retrieved from https://metinvestholding.com/Content/Entities/Report/24/en/Metinvest_social_2019.pdf.
20. Metinvest (2019). *Sustainability report 2019*. Retrieved from https://metinvestholding.com/Content/Entities/Report/26/en/report-2019.pdf.
21. Finel, N., & Tapio, P. (2012). *Decoupling transport CO_2 from GDP*. Finland Futures Research Centre. Retrieved from https://www.utupub.fi/bitstream/handle/10024/147511/eBook_2012-1.pdf?sequence=1&isAllowed=y.
22. Greene, W.H. (2018). *Econometric Analysis: Global Edition*, (*8th* ed.). Stern School of Business, NY University.

Оцінювання ефективності соціальних інвестицій металургійних підприємств за декаплінг-підходом

А. М. Ткаченко[1], *Н. М. Левченко*[1], *Г. А. Шишканова*[1], *В. Я. Швець*[2], *М. І. Іванова*[2]

1 – Національний університет «Запорізька політехніка», м. Запоріжжя, Україна, e-mail:alla0676128584@gmail.com
2 – Національний технічний університет «Дніпровська політехніка», м. Дніпро, Україна

Мета. Розробка комплексної методики оцінювання ефективності соціальних інвестицій металургійних підприємств за декаплінг-підходом, що сприятиме формуванню чіткого уявлення щодо їх портфоліо в частині досягнення імпакт-цілей і подальших намірів підтримки соціально важливих ініціатив.

Методика. У процесі дослідження використані: статистичні методи обробки динамічних рядів спостереження й кореляційно-регресивного аналізу – при визначенні залежності Decoupling Factor соціальних цінностей від обсягів інвестування капіталу на їх створення; декаплінг-аналізу – при оцінюванні ефективності соціальних інвестицій Метінвест Холдингу й формуванні його портфоліо в частині досягнення імпакт-цілей; стратегічного аналізу – при прогнозуванні ефективності соціального інвестування Метінвест Холдингу на середньострокову перспективу.

Результати. Констатовано, що стратегічним орієнтиром трансформаційних змін в економіці наразі обрано сталий розвиток промислових підприємств, досягнення якого, зокрема, можливе за умови послідовного застосування прийомів забезпечення умов праці, професійного зростання й добробуту працівників підприємств, серед яких у зарубіжній практиці широкого поширення набуло соціальне інвестування. Проаналізовані міжнародні стандарти із соціальної відповідальності компаній та розкрите за функціональним підходом змістовне складове поняття «соціальне інвестування». Наголошено на необхідності оцінювання ефективності соціального інвестування за декаплінг-підходом. Розкрита сутність декаплінгу та його значимість у процесі соціального інвестування. Запропонована авторська методика оцінювання ефективності соціального інвестування за декаплінг-підходом. Модифікована класифікація типів декаплінг ефекту за П. Тапіо шляхом виокремлення типів соціал-декаплінг ефекту. Обґрунтована доцільність доповнення GRI 400 «Соціальні стандарти» групою показників GRI-420 «Ефективність соціальних інвестицій».

Наукова новизна. Полягає в поглибленні теоретико-методологічних положень у сфері соціального інвестування шляхом розробки авторської методики оцінювання ефективності соціальних інвестицій за декаплінг-підходом, що, на відміну від існуючих, в умовах трансформаційних змін в економіці сприятиме формуванню чіткого уявлення про наміри інвестора підтримувати соціально важливі ініціативи та його реалістичне портфоліо в частині досягнення поставлених імпакт-цілей. З урахуванням вимог Резолюції ООН «Перетворення нашого світу: Порядок денний у сфері сталого розвитку до 2030 року», Керівництва із соціальної відповідальності ISO 26000 (2010 р.) та Стандарту соціальної звітності компаній AA1000 AS, запропоновано доповнити GRI-400 «Соціальні стандарти» групою показників з оцінювання ефективності соціального інвестування за декаплінг-підходом.

Практична значимість. Науковий доробок з оцінювання ефективності соціальних інвестицій промислових підприємств за декаплінг-підходом вартий до застосування при прийнятті управлінських рішень щодо інвестування капіталу в покращення умов праці найманих працівників.

Ключові слова: *декаплінг, соціальні інвестиції, ефективність інвестицій, сталий розвиток, металургійні підприємства*

Recommended for publication by A. V. Karpenko, Doctor of Economic Sciences. The manuscript was submitted 15.03.21.