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How Do Inclusive Growth Practices Affect Financial Performance and the Value of Metallurgy Companies?

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Abstract

The article examines inclusive growth practices used in metallurgical companies and assesses their impact on financial results and value. An analysis of data from 102 of the largest companies in the metals industry between 2016 and 2021 showed that reducing greenhouse gas emissions, improving air quality, proper waste disposal, building an inclusive supply chain, respecting human rights and building community relations in the places where the company operates have a positive impact on its financial results and value. The results of the study can be used by top managers of metallurgical companies to formulate an inclusive growth strategy that meets the interests of all stakeholders, which will improve financial results and contribute to the growth of company value.

Keywords: sustainable development, inclusive growth, metallurgy, environmental practices, social practices, human capital practices, business model and innovation, management practices, financial results, company value

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Introduction

In recent decades companies have been paying increasing attention to ESG agenda (environment, social and governance factors), sustainable development and inclusive growth, which ensures an improvement of the quality of life and equal opportunities for all population groups. The investors heed attention to ESG ratings increasingly more frequently when making investment decisions, while ESG funding market grows annually [1]. According to McKinsey's research, the companies that improved their ESG ratings surpassed their competitors in *total shareholder return* (TSR) in 2017–2021 [2]. In this case, such companies have to focus not just on their ESG image, but also on the real benefit they provide to all their stakeholders. For this purpose, they have to determine the priority inclusive growth practices. A consistent implementation of such practices will improve the *total societal impact* (TSI) [3], generating value for the whole society instead of just stakeholders. We also are going to use *return on assets* (ROA), which shows the company's performance and relative TSR (RTSR) (hereinafter – PREMIUM), which is calculated as the deviation of the total shareholder return from the mean value (calculated in the same way and within the same period) for the industry.

In this research inclusive growth practices are considered using the metallurgical industry as an example that is, on the one hand, a driver for machine building and construction and, on the other hand, one of the main sectors that adversely affects the environment. Thus, in 2021 approximately 8% of the total greenhouse gas emissions accrued to metallurgy [4].

The research objective is to evaluate the influence of the effectiveness of various inclusive growth practices on financial performance and the value of metallurgical companies.

In order to achieve this objective, it is necessary to:

- define the inclusive growth practices that are prioritized by metallurgical companies;
- review the academic literature that examines the influence of the practices on financial performance and the value of companies;
- generate hypotheses about influence of inclusive growth practices on financial performance and company value on the basis of the academic literature review;
- assess the hypotheses about influence of the effectiveness of each priority practice on financial performance and company value;
- draw conclusions on the basis of the obtained results.

The *research object* is 102 largest metallurgical companies from different countries with publicly available non-financial information for the analyzed period (2016–2021).

The research subject is the influence of the effectiveness of inclusive growth practices of metallurgical companies.

The academic novelty of the research consists in the following:

- defining the inclusive growth practices for metallurgical companies and determining the indicators of their effectiveness that are constituent parts of TSI;
- use the economic profit spread (EPS, hereinafter – SPREAD) as the intrinsic value indicator, which is calculated as the difference between the return on invested capital and the weighted average capital cost, and PREMIUM – as the market value indicator. These indicators have not been used before in the studies that analyze the influence of certain inclusive growth practices on company value.

The research is *practically relevant* because its results may be used by top managers of metallurgical companies to develop an inclusive growth strategy which serves the interests of all stakeholders, by investors to make investment decisions and other company stakeholders to build relationships with them.

Influence of the Effectiveness of Various Inclusive Growth Practices on Financial Performance and the Value of Companies

According to the standards of the Sustainability Accounting Standards Board (SASB), inclusive growth practices are subdivided into five components: 1) environmental practices; 2) social practices; 3) human capital practices; 4) business model and innovation; 5) management practices.

Environmental Practices

In spite of an enormous number of publications, there is no consensus among the scientists concerning the interrelation between the environmental practice and corporate financial results [5].

The proponents of *trade-off theory*, for example, T. Levitt [6] and S. Feldman [7], asserted that environmental practices involved use of company resources, such as labour and capital, hence, they brought about lower financial results and erosion of competitiveness [8]. Thus, in their opinion, voluntary environmental impact mitigation is considered to be charity, which is against the profit maximization concept [9].

The defenders of another approach base their position upon the *win-win or mutually beneficial strategy*, in which environmental practices enable the company to enhance its competitiveness. Thus, Porter states that although environmental regulation may be associated with extra expenditures, it also provides an impetus to research and development and encourages application of new technology in order to boost profits [10]. The most important theoretical foundations of this strategy are the natural resource-based approach and the stakeholder theory.

According to the *natural resource-based approach* introduced by S. Hart [11] a reduction in the company's environmental impact promotes the development of rare and

unique organizational resources and capabilities, and this entails a competitive advantage and better financial results [12].

The *stakeholder theory* [13] also explains the positive relationship between environmental practices, financial results and company value. Meeting the requirements of stakeholders, the company may gain such competitive advantages as better reputation, building long-term relationships with customers, suppliers, employees and other stakeholders [5]. Also, the company may improve its relations with investors, mitigating market risks and increasing capital value [14].

The *environmental practices of inclusive growth for metallurgical companies* are as follows: reducing greenhouse gas emissions and air pollution; efficient energy utilization; water resources management; waste management; influence on biodiversity and land resources.

Social Practices

In most cases in academic literature *social practices and practices of respecting human rights* are considered as a component of *corporate social responsibility* (CSR). The fundamental research project dedicated to CSR [15] asserts that it comprises economic, legal, ethical and philanthropic expectations that any society has in relation to any business. M. Porter and M. Kramer in 2011 stated the “shared value” concept [16], which is defined as the “policies and operating practices that enhance the competitiveness of a company while simultaneously advancing social and economic conditions in the communities in which it operates”. The conventional view is that CSR is expensive because social responsibility entails extra expenditures and results in the deterioration of competitiveness [17].

There are several theories that explain a positive relationship between CSR and corporate financial results.

According to *stakeholder theory*, in order to operate efficiently a company has to meet not just the requirements of its shareholders, but also those of other important stakeholders [18; 19].

In conformance with the *resource-based approach*, meeting the requirements of stakeholders is considered a strategic initiative [20]. As a result, companies develop valuable, rare and irreplaceable assets, such as leadership and positive social reputation.

From the point of view of the *transaction costs economics*, one may assert that companies try to satisfy the requirements of stakeholders in order to minimize potential transaction costs [21–23].

A generally recognized reason for the varied and contradictory results of the search for the relationship between CSR and financial results is the measurement problem [24]. There are four main methods of CSR measurement.

The first and most widespread method is compiling CSR ratings [25] including the Dow Jones Sustainability Index (DJSI) established by Standard and Poor’s in 1999, MSCI KLD, ratings made by analytical agencies Bloomberg and Refinitiv. The second, also widespread method of CSR measurement, is the content analysis of corporate commu-

nication of a company with stakeholders. The third method involves polling. The fourth method of CSR measurement consists in applying one-dimensional indicators that focus on only one indicator, for example, charity [24].

Human Capital Practices

According to SASB, *the share of employees who are members of independent trade union organizations and signatories to collective employment agreements* is an important indicator for metallurgical and mining companies.

There are two contradictory approaches to explaining the influence of trade unions on companies’ performance in academic literature. One group of scientists – proponents of *conventional theory* – thinks that an increase in salaries, improvement of working conditions, enhancement of occupational safety involve extra expenditures of companies, thus, a decrease in corporate financial results [26; 27]. The other group of scientists – defendants of the *collective voice and institutional response theories* – believe that serving the interests of employees may have a positive impact on labour efficiency, thus, improve financial results [28].

Apart from trade unions, an important practice for the metallurgical industry is *work conditions safety*. Obviously, any personnel injury or death incident has a negative impact on corporate financial results. Moreover, the company is obliged by the government to ensure safe work conditions.

Another inclusive practice important for metallurgical companies is the narrowing of the gap between the *top management’s salaries and the average employee salary*. E. Lazear and S. Rosen proposed the *tournament theory*, which stated that employees may be remunerated for their rank in the organization because they had applied more efforts for their career progress [29].

But some scientists support the *behaviour theory*, also known as *social comparison theory*, which holds that for self-evaluation in the absence of objective criteria people compare themselves with others. As a consequence, a serious gap between employee salaries may produce a negative effect on their motivation [30].

The last important practice of human capital development for the metallurgical industry is *personnel training*. It enables the employees to adapt to new technology, enhance efficiency and productivity. The organizations that invest in the effective training and development of human resources, as a rule, gain both short-term and long-term benefits [31; 32].

Business Model Practices

According to SASB, *supply chain management* is an important practice for mining companies out of the *practices of business model and innovation management*. The standards state that these practices comprise verification, selection, monitoring and interaction with suppliers in relation to their impact on the environment and social sphere, environmental responsibility, human rights, working practice, ethics, corrupt practices etc.

In academic literature supply chains are subdivided into *green*, *sustainable* and *social* ones. In general, the logic of the influence of the green and sustainable supply chain management on corporate financial results is similar to the logic of influence of environmental practices. However, an enhancement of companies' performance may also be achieved by means of improving cooperation between suppliers [33] and development of new opportunities within green supply chains [34]. Social responsibility practices also lead to the enhancement of corporate performance due to risk mitigation along the whole supply chain and more active participation of stakeholders [35].

Management Practices

Adherence to *business ethics* and *risk management* are *management practices* important for the metallurgical industry. Unethical behaviour has a negative influence on reputation and, ultimately, on company value [36]. Such influence is due to the effect of the legitimacy theory, according to which the management tries to control people's perception, creating a good reputation or corporate image [37].

Influence of corrupt practices on financial results and company value should be considered separately. Thus, R.J. Fisman et al. used a sample of 88,000 companies in 141 countries in 2006–2020 and discovered that companies that do not make non-official payments, as a rule, grow slower

than the ones that hand out bribes [38]. At the same time, influence of corrupt practices is stronger (weaker) in the countries with a stronger (weaker) defense provided for shareholders.

The last practice is *risk management*, which is considered to be one of the key mechanisms that assist companies in attainment of their goals, improvement of their financial reports and protection of their reputation [39]. Absence of information on risk management may mislead investors when they make investment decisions.

Research Hypotheses Advancement

On the basis of the analysis of literature dedicated to the assessment of the influence of the inclusive growth practices on financial results and company value we may advance the research hypotheses.

The first hypothesis is related to environmental practices:

H1: *Effectiveness of environmental practices of inclusive growth has a positive influence on financial results and company value.*

Since the metallurgical industry influences the environment in several ways, the effectiveness of environmental practices should be measured by several indicators. For this reason, we have to generate a hypothesis for each indicator individually (Table 1).

Table 1. Hypotheses of effectiveness of environmental practices

Hypotheses	ROA	SPREAD	PREMIUM
Reducing greenhouse gas emissions	H.1.1.1	H.1.1.2	H.1.1.3
Reducing emissions of the nitrogen oxide group	H.1.2.1	H.1.2.2	H.1.2.3
Reducing emissions of the sulphur oxide group	H.1.3.1	H.1.3.2	H.1.3.3
Consumption of renewable energy	H.1.4.1	H.1.4.2	H.1.4.3
Reducing water intake from water bodies	H.1.5.1	H.1.5.2	H.1.5.3
Reducing waste generation	H.1.6.1	H.1.6.2	H.1.6.3
Reducing hazardous waste generation	H.1.7.1	H.1.7.2	H.1.7.3
Growth of the waste recycling coefficient	H.1.8.1	H.1.8.2	H.1.8.3
Initiatives of reducing influence on land resources	H.1.9.1	H.1.9.2	H.1.9.3

Source: compiled by the author.

Then we have to generate the hypotheses on the effectiveness of social practices:

H2: *Effectiveness of social practices of inclusive growth has a positive influence on financial results and company value.*

Since the effectiveness of social practices and effectiveness of corporate operations are measured by several indicators, we have to generate a hypothesis for each indicator individually. We are going to use the indicator of awards for social/public activities (AWARD) and ESG-ratings: ESG Community Score and ESG Human Rights Score (Table 2).

Table 2. Hypotheses on effectiveness of social practices

Hypotheses	ROA	SPREAD	PREMIUM
AWARD	Hypothesis H.2.1.1	Hypothesis H.2.1.2	Hypothesis H.2.1.3
ESG Community Score	Hypothesis H.2.2.1	Hypothesis H.2.2.2	Hypothesis H.2.2.3
ESG Human Rights Score	Hypothesis H.2.3.1	Hypothesis H.2.3.2	Hypothesis H.2.3.3

Source: compiled by the author.

The next practice is the one related to human capital. The first important indicator of this practice is trade union activity in the company. On the basis of collective voice and institutional response theories, we consider the following hypotheses:

H3.1.1: Representation of employees' interests by trade unions produces a positive influence on ROA.

H3.1.2: Representation of employees' interests by trade unions produces a positive influence on SPREAD.

H3.1.3: Representation of employees' interests by trade unions produces a positive influence on PREMIUM.

The second important indicator of this practice is the relationship between the traumatism, financial results and company value.

H.3.2.1: Reduction in the general traumatism ratio has a positive influence on ROA.

H.3.2.2: Reduction in the general traumatism ratio has a positive influence on SPREAD.

H.3.2.3: Reduction in the general traumatism ratio has a positive influence on PREMIUM.

The third important indicator of this practice is the influence of the gap between the top management's salaries and the average employee salary on financial results and company value.

H.3.3.1: Reduction in the ratio of the salary gap produces a positive influence on ROA.

H.3.3.2: Reduction in the ratio of the salary gap produces a positive influence on SPREAD.

H.3.3.3: Reduction in the ratio of the salary gap produces a positive influence on PREMIUM.

The fourth important indicator of this practice is training of employees. Hypotheses on the influence of training are as follows:

H.3.4.1: Training of employees has a positive influence on ROA.

H.3.4.2: Training of employees has a positive influence on SPREAD.

H.3.4.3: Training of employees has a positive influence on PREMIUM.

The next practice is related to business model and innovation. Within this practice the supply chain management practice is the priority for metallurgical companies. The hypotheses on supply chain management are as follows:

H.4.1: Management of an inclusive supply chain exerts a positive influence on ROA.

H.4.2: Management of an inclusive supply chain exerts a positive influence on SPREAD.

H.4.3: Management of an inclusive supply chain exerts a positive influence on PREMIUM.

The last practice that we consider is the management practice that comprises adherence to business ethics and risk management. In relation to the influence of business ethics we set forth the following hypotheses:

H.5.1.1: Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on ROA.

H.5.1.2: Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on SPREAD.

H.5.1.3: Disputes over business ethics, tax fraud, anticompetitive behaviour have a negative influence on PREMIUM.

An efficient system of risk management is considered to be one of the key mechanisms that assist companies to achieve their goals, improve their financial reports and protect their reputation. The hypotheses on the effectiveness of risk management are as follows:

H.5.2.1: Efficient risk management has a positive influence on ROA.

H.5.2.2: Efficient risk management has a positive influence on SPREAD.

H.5.2.3: Efficient risk management has a positive influence on PREMIUM.

The Research Models and Description of Variables

The indicators of effectiveness, the intrinsic and market value of a company will be *dependent variables* in this research:

- ROA – as an indicator of effectiveness because the metallurgical industry is capital-intensive.
- SPREAD – as an indicator of the intrinsic value of the company. It allows to take into consideration alternative costs related to the invested capital risk.
- PREMIUM – as an indicator of the market value. We took the S&P Metals&Mining Select Industry Index as the industry average total shareholder return. It determines the total shareholder return for the companies that industry classifier GICS assigns to Metals&Mining.

Now we are going to consider *independent variables*. The *greenhouse gas emission factor* (GHG) shows the effectiveness of the practice for the reduction of greenhouse gas emissions. There is no point in using the absolute value of greenhouse gas emissions because the company may ramp up production and absolute emissions will grow, while emissions per a unit of manufactured products will decrease. It is more reasonable to consider the amount of emissions normalized by revenue.

According to the 1997 Kyoto Protocol, six categories of emissions are considered greenhouse gases in corporate reports: CO₂ (carbon dioxide), CH₄ (methane), N₂O (nitrous oxide), HFCS (fluorohydrocarbons), PFCS (perfluorohydrocarbon), SF₆ (sulfur fluoride) [40]. In the current research, greenhouse gas emissions take into consideration the first scope of emissions (Scope 1), which comprises direct emissions from the sources owned or controlled by the company and the second scope of emissions (Scope 2), which comprises indirect emissions from consumption of purchased electric power, heat or vapour that occur at the facility where the electric power, vapour or heat are produced.

Just like greenhouse gas emissions, the rest of the indicators of environmental effectiveness will be normalized by revenue. The emissions of the nitrogen oxide group (NOX) and the sulphur oxide group (SOX) are used as the air quality indicators. According to SASB, the nitrogen oxide group (NOX) comprises the following gases: NO_x (nitrogen oxide), including NO (nitrogen oxide) and NO₂ (nitrogen dioxide); the sulphur oxide group (SOX) comprises: SO₂ (sulphur dioxide), SO (sulphur monoxide), SO₃ (sulfur trioxide).

Since energy consumption from unrenewable sources is the main reason for greenhouse gas emissions, it is pointless to add this indicator to the list of variables. Apart from that, an important aspect in the energy management practice is its consumption from renewable energy sources. However, the number of observations concerning the amount of the energy consumed from renewable energy sources is small in the analyzed sample, which is why we will use RENEW, a dummy indicator of energy consumption from renewable sources, in the analysis.

The effectiveness of the water resources' management practice is measured by the specific sweet water intake (WATER) instead of its general consumption. Since companies may reuse water in manufacturing cycles, the reduction in water intake from sweet water sources is an inclusive practice.

The effectiveness of the waste management practice is measured by the specific indicators of total waste (WASTE)

and hazardous waste (HWASTE), waste recycling ratio (WASTERR).

Since there is no clear indicator that would be indicative of a reduction in a company's impact on biodiversity and land resources, a dummy indicator of initiatives for the reduction of impact on land resources – LAND – is used in the paper. It shows the fact of disclosure in the company's reports of information on land recultivation.

As previously mentioned, several indicators are used to evaluate the effectiveness of social practices. The first one is awards for social/public activities (AWARD). However, awards for social and public activities do not sufficiently describe a company's efforts in terms of respect for human rights and building relations with the society because it is a one-dimensional indicator [24]. Therefore, additional variables in this practice are ESG ratings calculated by Refinitiv, in particular: the ESG Community Score, which measures the effectiveness of the company in building relationships with the society and the ESG Human Rights Score, which measures the effectiveness of the company concerning compliance with the main human rights conventions.

The *inclusive growth practices related to human capital* are represented by the following indicators:

- the share of employees who are members of independent trade unions or signatories to collective employment agreements (UNION);
- the total salary of the top management (or the highest salary) divided by the average salary and allowances (SALARYGAP);
- expenditures for training per one employee in US dollars (TRAINING). In this case it is most reasonable to use the specific indicator in order to take company size into account;
- the total number of injuries and deaths, including injuries without lost working days relative to one million of hours worked (TIR).

In order to assess the *effectiveness of supply chain management*, we compiled the management index (INCLUSIVE_INDEX) which, apart from the principal indicators, comprises such additional practices as rights and health of suppliers' employees. The initiatives and policies used to build the index are presented in Table 3.

The index is a sum of dummies for 10 presented policies. It measures the extent of inclusivity of the supply chain from 0 (weak) to 10 (strong).

Table 3. The constituent elements of the index of the inclusive supply chain management

Indicator	Indicator description	Value
Policy of environmentally sound supply chain	Does the company have the policy of adding the supply chain to the corporate efforts aimed at decrease of the total impact on the environment?	1 – yes; 0 – no

Indicator	Indicator description	Value
Environmentally sound management of supply chains	Does the company use environmental criteria when choosing its suppliers or partners for supply?	1 – yes; 0 – no
Environmental monitoring of the supply chain	Does the company conduct studies of its suppliers' environmental indicators?	1 – yes; 0 – no
Termination of partnership in the supply chain	Does the company inform or show that it is ready to terminate cooperation with a partner if environmental criteria are not met?	1 – yes; 0 – no
Teaching ESG factors to suppliers	Does the company provide training on ESG factors to its suppliers?	1 – yes; 0 – no
Health and safety policy in the supply chain	Does the company have the policy of employees' health and safety improvement in the supply chain?	1 – yes; 0 – no
Occupational health and safety training in the supply chain	Does the company train its managers or key employees in employees' health and safety issues in the supply chain?	1 – yes; 0 – no
Improvement of health and safety in the supply chain	Does the company use polling or measurements to show that it enhances the employees' health and safety in its supply chain?	1 – yes; 0 – no
Respecting human rights	Does the company inform about or show that it applies the human rights criteria when choosing or monitoring its suppliers or partners in looking for suppliers?	1 – yes; 0 – no
Human rights violations	Does the company inform about or show that it is ready to terminate cooperation with a partner-supplier if human rights criteria are not met?	1 – yes; 0 – no

Source: Refinitiv agency.

The indicators of effectiveness of a management practice are as follows:

the number of disputes over business ethics, tax fraud, anticompetitive behaviour (CONTR);

risk management system in place (CRIMGT).

In the research we use the following *control variables*:

Company size (SIZE). Large companies may produce a positive impact on their financial results and value due to the scale effect. The sign of the variable may be positive or negative.

Growth (GROWTH). Growth opportunities may generate additional revenue from getting into new markets or implementation of products. A positive influence on financial indicators and company value is expected.

EBITDA margin (EBITDA_MARGIN). EBITDA is earnings before interest, taxes, depreciation and amortization. EBITDA is a proxy of the cash flow indicator. A positive influence of the EBITDA margin on financial results and company value is expected.

Leverage (LEVERAGE). A significant leverage may be indicative of a company's high risks. A negative influence on financial results and company value is expected.

Capital intensity (CAPEX). Previous empirical studies asserted that capital intensity was an important determinant

of financial indicators and company value. However, the ratio sign may be positive or negative.

In order to verify the hypotheses, three models will be built for each independent variable in this research. The first model will comprise only the dependent variables related to environmental practices, the second one – social practices and the practices associated with human capital, the third one – management practices and the practices associated with business model.

Formulas of research regression models are as follows:

$$CFP_t = \alpha_0 + \sum_{i=1}^N Metric_{t\ environmental} + \sum_{k=1}^K FCV_t + \hat{a}_t; \quad (1)$$

$$CFP_t = \alpha_0 + \sum_{i=1}^N Metric_{t\ social} + \sum_{i=1}^N Metric_{t\ human} + \sum_{k=1}^K FCV_t + \hat{a}_t; \quad (2)$$

$$CFP_t = \alpha_0 + \sum_{i=1}^N Metric_{t\ businessmodel} + \sum_{i=1}^N Metric_{t\ governmental} + \sum_{k=1}^K FCV_t + \hat{a}_t, \quad (3)$$

where CFP are dependent variables of the research; $Metric_{t\ environmental}$ are independent variables of the envi-

ronmental practices; $Metric_{t, social}$ are independent variables of the social practices; $Metric_{t, human}$ are independent variables of the inclusive growth practices related to human capital; $Metric_{t, businessmodel}$ are independent variables of the inclusive growth practices related to business model; $Metric_{t, governmental}$ are independent variables of the management practices; FCV are financial control variables.

The studied sample consists of 602 observations on 102 largest companies of the Metals&Mining industry in 2016–2021. The source of the extensive financial information on international companies taking into consideration the preset parameters necessary for a complete analysis is the Refinitiv agency. It also compiles its own ESG rating on the basis of over 630 companies' publicly available non-financial indicators [41].

The sample has a panel data structure because such structure can take into consideration the individual effects of each observation taking into account change over time.

The sample comprises the data on companies from 29 countries. Besides, 17 countries are developed economies and 11 countries are emerging ones. Over 50% of companies of the analyzed sample pertain to the following five countries: China, Australia, Canada, Russia and Republic of South Africa. All financial data is expressed in US dollars. The time interval of 2016–2021 was chosen as the research period.

Further we are going to consider the descriptive statistics of the sample (Table 4), calculate the coefficient of variation, which indicates heterogeneity for each variable. The most heterogeneous indicator in the sample is PREMIUM. Also, gas emissions of the sulphur oxide and nitrogen oxide groups, waste generation are heterogeneous indicators. The coefficient of variation is also rather high for the CONTR indicator (number of disputes over business ethics, tax fraud, anticompetitive behaviour). In general, the sample is balanced, the indicators are rather uniform.

Table 4. Descriptive statistics

Variable	Number of observations	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
GHG	612	1.2342	1.4714	1.1922	0.0012	9.7318
NOX	612	0.0038	0.0241	6.3302	0.0000	0.3297
SOX	612	0.0036	0.0176	4.8538	0.0000	0.2484
RENEW	612	0.7565	0.4295	0.5678	0.0000	1.0000
WATER	612	15.4835	19.0237	1.2286	0.0014	174.8304
HWASTE	612	1.1829	4.0241	3.4020	0.0000	29.1705
WASTERR	612	22.3339	33.6645	1.5073	0.0000	99.9230
WASTE	612	25.4730	47.3159	1.8575	0.0003	368.6643
LAND	612	0.6503	0.4773	0.7339	0.0000	1.0000
AWARD	612	0.5131	0.5002	0.9750	0.0000	1.0000
ESG Community Score	612	63.6418	28.4230	0.4466	3.5000	99.9022
ESG Human Rights Score	612	58.0771	28.3735	0.4885	2.0642	97.3684
UNION	612	68.2770	29.1674	0.4272	0.0000	100.0000
SALARYGAP	612	124.5127	296.1682	2.3786	0.0824	931.6400
TRAINING	612	250.9382	530.4904	2.1140	0.0000	3659.6900
TIR	612	4.7486	4.3375	0.9134	0.0270	37.9100
INCLISIVE_INDEX	612	4.2157	2.9205	0.6928	0.0000	10.0000
CRIMGT	612	0.6520	0.4767	0.7312	0.0000	1.0000
CONTR	612	0.2402	0.9311	3.8764	0.0000	10.0000
ROA	612	0.0590	0.0854	1.4482	-0.1859	0.5072

Variable	Number of observations	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
SPEAD	612	0.0950	0.1575	1.6585	-0.2106	0.5860
PREMIUM	612	0.0561	0.5430	9.6839	-1.4904	3.1842
SIZE	612	22.9142	1.1455	0.0500	18.9083	25.6329
GROWTH	612	0.1445	0.2675	1.8517	-0.4756	1.6014
EBITDA_MARGIN	612	0.3120	0.1965	0.6300	0.0140	0.7980
LEVERAGE	612	0.1979	0.1512	0.7637	0.0000	0.9051
CAPEX	612	0.0575	0.0431	0.7485	0.0000	0.2694

Source: compiled by the author.

Research Results

Panel analysis implies the construction of regression models using three main specifications: the pooled model of panel data (Pool), the fixed effects model (FE) and the random effects model (RE). In order to choose the most suitable model, the Wald test, the Breusch-Pagan test and the Hausman's test have been conducted.

The results for the environmental practices are presented in Table 5. According to the conducted tests, the fixed effects models are preferable for the models with the dependent variables ROA and SPREAD, while the pooled panel data model (Pool) is preferable for the model with the dependent variable PREMIUM.

Table 5. Regression analysis results for the environmental practices

	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
GHG	-0.0113**	-0.0057	0.0047	-0.0087	0.0006	-0.0148
NOX	-0.494**	-0.2000	-0.3130	-0.2220	1.5740	-1.0790
SOX	-0.4570	-0.3680	-2.025***	-0.3670	-1.6150	-1.2120
RENEW	-0.0054	-0.0091	0.0113	-0.0156	0.0067	-0.0553
WATER	-0.0002	-0.0002	-0.0006	-0.0004	0.00231**	-0.0012
HWASTE	-0.0009	-0.0008	0.0006	-0.0011	0.0017	-0.0053
WASTERR	0.00027***	-0.0001	0.0005	-0.0003	0.0001	-0.0007
WASTE	-0.0003	-0.0002	-0.000450*	-0.0002	-0.0004	-0.0006
LAND	0.0263	-0.0172	0.0271	-0.0185	-0.0304	-0.0537
SIZE	0.0298	-0.0244	-0.126***	-0.0276	-0.0384*	-0.0209
GROWTH	0.0619***	-0.0123	0.0558***	-0.0157	0.476***	-0.0836
EBITDA_MARGIN	0.0472	-0.0299	0.650***	-0.0671	0.517***	-0.1290
LEVERAGE	-0.322***	-0.0477	-0.285***	-0.0475	0.246*	-0.1440
CAPEX	0.0685	-0.0839	0.300***	-0.0884	-0.6190	-0.5310
2017.years			0.0032	-0.0067	0.489***	-0.0708

	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
2018.years			0.0023	-0.0073	0.375***	-0.0703
2019.years			0.0074	-0.0104	0.462***	-0.0700
2020.years			0.0590***	-0.0125	0.458***	-0.0715
2021.years			0.0400***	-0.0120	0.1250	-0.0777
Constant	-0.5780	-0.5560	2.784***	-0.6180	0.3590	-0.4710
Observations	612		612		612	
R-squared	0.381		0.589		0.206	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p <0.01; ** p <0.05; * p <0.1.

According to the obtained results, specific greenhouse gas emissions and specific gas emissions of the nitrogen oxide group have a negative impact on ROA at the 5% significance level. A reduced relationship between greenhouse gas emissions and revenue by one (1 ton/1 thousand US dollars) increases ROA by 1.13%, while a decrease in the relationship between emissions of the nitrogen oxide group and revenue by 0.1 (1 ton/1 thousand US dollars) increases ROA by 4.94%. There is no point in interpreting the decrease by one of specific emissions of the oxide group gases because their maximum value in the analyzed sample is - 0.3297. Thus, hypotheses H.1.1.1 and H.1.2.1 are confirmed. Also, the waste recycling ratio at the 1% significance level exerts a positive impact on ROA. The growth of the waste recycling ratio by 1% encourages growth of ROA by 0.027%. Hypothesis H.1.8.1 is confirmed. The rest of the environmental effectiveness indicators are statistically insignificant for ROA. Hypotheses H.1.3.1, H.1.4.1, H.1.5.1, H.1.6.1, H.1.7.1, H.1.9.1 are disproved.

The company size is statistically insignificant for ROA. The GROWTH control variable is statistically significant at the 1% level with the positive sign, as we have assumed in the research. EBITDA margin is statistically insignificant for ROA. LEVERAGE is statistically significant at the 1% level with the negative sign, as expected. The CAPEX control variable is statistically insignificant. Also, the conducted F-test for ROA with the independent variables that demonstrate the environmental practices effectiveness shows that it is pointless to add temporal effects to the model.

At the 1% significance level the specific emissions of the sulphur oxide group gases have a negative impact on SPREAD. It means that a reduction in the relationship between the sulphur oxide gas emissions and revenue by 0.01

(1 ton/1 thousand US dollars) improves SPREAD by 2.03%. Hypothesis H.1.3.2 is confirmed. Also, specific waste generation at the 10% significance level has a negative impact on SPREAD. It means that a reduction in the relationship between the waste generation amount and revenue by one (1 ton/1 thousand US dollars) improves SPREAD by 0.045%. Hypothesis H.1.7.2 is validated. The rest of the environmental effectiveness indicators are statistically insignificant for SPREAD. Hypotheses H.1.1.2, H.1.2.2, H.1.4.2, H.1.5.2, H.1.6.2, H.1.8.2, H.1.9.2 are rejected.

For the dependent variable SPREAD, all control variables are significant at the 1% level, the signs match the expected signs. According to the conducted F-test, the temporal effects should be included in the regression; 2020 and 2021 are significant at the 1% level. For the global community these years are related to the COVID-19 pandemic, but they showed a positive impact on SPREAD and other indicators of metallurgical companies. So, in comparison to 2019, the net profit in 2020 increased by 15%, the cash on hand - by 40%, while market capitalization grew almost by two-thirds [42]. According to the Statista information base, the average multiplier of EV/EBITDA for the Metals&Mining industry in 2019 amounted to 6.03, in 2020 - to 7.57, in 2021 - to 10.2 [43].

The variables of the environmental practices effectiveness are insignificant for PREMIUM, except for the specific sweet water intake (WATER). However, the sign of this variable does not meet expectations. Hypotheses H.1.1.3-H.1.9.3 are disproved. This result may indicate that the environmental practices effectiveness does not assist companies in surpassing their competitors in value creation for shareholders. The control variables GROWTH and EBITDA_MARGIN are statistically significant at the

1% level with the signs matching the expected ones and the control variable SIZE is significant at the 10% level with the sign matching the expected one. The variable LEVERAGE is significant at the 5% level with the positive sign. In numerous cases debt financing may decrease the cost of company's capital. An increase in debt financing may have a positive impact on the creation of shareholder return. CAPEX is insignificant. Temporal effects were added to the regression based on the results of the F-test.

Thus, the environmental practices' effectiveness may produce a positive impact on financial results and company value. At the same time, trade-off theory about the negative influence of environmental practices on financial results and company value is not confirmed. In other words, the general hypothesis for environmental practices H1 is confirmed partially.

The results of regression analysis for social practices and practices related to human capital are presented in Table 6.

Table 6. Results of regression analysis for social practices and practices related to human capital

Indicators	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
AWARD	0.0038	-0.0110	-0.0143	-0.0126	0.124***	-0.0443
ESG Community Score	0.0000	-0.0003	0.0000	-0.0003	-0.0005	-0.0009
ESG Human Rights Score	0.0000	-0.0003	0.0003	-0.0003	0.00152*	-0.0008
UNION	0.0002	-0.0003	-0.0005	-0.0004	0.0003	-0.0007
SALARYGAP	0.00003***	0.0000	0.0000	0.0000	0.0000	-0.0001
TRAINING	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
TIR	0.0027	-0.0021	0.0013	-0.0013	0.0013	-0.0050
SIZE	0.0232	-0.0255	-0.114***	-0.0262	-0.0464**	-0.0207
GROWTH	0.0692***	-0.0135	0.0590***	-0.0148	0.480***	-0.0827
EBITDA_MARGIN	0.0359	-0.0284	0.649***	-0.0689	0.479***	-0.1170
LEVERAGE	-0.321***	-0.0536	-0.303***	-0.0464	0.294**	-0.1400
CAPEX	0.0157	-0.0744	0.305***	-0.0872	-1.085**	-0.5330
2017.years	-0.0013	-0.0076	0.0057	-0.0066	0.478***	-0.0705
2018.years	0.0115*	-0.0067	0.0102	-0.0087	0.364***	-0.0700
2019.years	0.0116	-0.0080	0.0178	-0.0110	0.448***	-0.0695
2020.years	0.0190**	-0.0083	0.0741***	-0.0148	0.437***	-0.0699
2021.years	0.0278**	-0.0133	0.0591***	-0.0177	0.0920	-0.0767
Constant	-0.4760	-0.5830	2.533***	-0.5950	0.4460	-0.4780
Observations	612		612		612	
R-squared	0.381		0.57		0.212	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p < 0.01; ** p < 0.05; * p < 0.1.

The variable AWARD is statistically significant at the 1% level only for PREMIUM; there is no statistically significant effect for ROA and SPREAD. Thus, the awards for social or public activity entail an increase in PREMIUM by 12.4%. Hypothesis H.2.1.3 is confirmed, while hypotheses H.2.1.1 and H.2.1.2 are rejected.

The ESG Human Rights Score calculated by Refinitiv is statistically significant for PREMIUM at the 10% level. An increase in the ESG Human Rights Score by 1 basis point encourages the growth of PREMIUM by 0.15%. Hypothesis H.2.3.3 is validated. For other considered dependent variables, the ESG Human Rights Score is statistically insignificant. Also, the ESG Community Score produces no statistically significant effect on any of the variables. Hypotheses H.2.2.1–H.2.3.2 are disproved. Thus, the general hypothesis for the social practices H2 is confirmed partially.

As for the inclusive practices related to human capital, the first analyzed variable is the share of employees represented by independent trade unions or signatories to the collective employment agreement. This variable is not statistically significant for any of the dependent variables. Thus, hypotheses H.3.1.1–H.3.1.3 are disproved.

The general traumatism ratio is statistically insignificant in all three models. Hypotheses H.3.2.1–H.3.2.3 are not confirmed. This result indicates that benefits from investment in workplace safety do not exceed the investment amount, therefore the traumatism level does not influence financial results and the value of metallurgical companies.

The next inclusive practice related to human capital is a reduction in the gap between the CEO's (top management) salary and the average employees' salary. The gap in the salary is statistically significant for ROA at the 1% level and is insignificant for the dependent variables SPREAD and PREMIUM. A growth in the salary gap by one entails an increase in ROA by 0.003%. These results support the tournament theory, which states that the salary gap enhances managers' motivation and has a positive impact on productivity. Thus, hypotheses H.3.3.1–H.3.3.3 are disproved.

The last considered practice related to human capital is employee training. The independent variable of expenses for

the training of one employee is statistically insignificant in all models. The obtained results indicate that investment in employee training yields no competitive advantage to the company. Thus, hypotheses H.3.4.1–H.3.4.3 are not confirmed.

The control variables in all three models preserve significance, signs and relative stability in the evaluation of ratios, except for the variable CAPEX in the model with the dependent variable PREMIUM. The control variable CAPEX in the model with the dependent variable PREMIUM is statistically significant with the negative sign, as expected.

Moreover, according to the conducted F-test, temporal effects should be added to each of the three analyzed models; 2020 and 2021 are statistically positively significant for the dependent variables ROA and SPREAD, which has been explained above in the present research.

The results of regression analysis for management practices and practices related to the business model are presented in Table 7.

The inclusive index of the supply chain is statistically significant at the 10% level for the dependent variable PREMIUM. An increase in the index by one entails the growth of PREMIUM by 1.28%. We may make the conclusion that building an inclusive supply chain is assessed positively by the market and creates additional return for shareholders as compared to the market. However, there is no statistically significant effect for ROA and SPREAD. Thus, hypothesis H.4.3 is validated, while hypotheses H.4.1 and H.4.2 are rejected.

The number of disputes over business ethics, tax fraud, anticompetitive behaviour is statistically insignificant in all models. These results contradict the legitimacy theory, which states that unethical behavior of companies brings about problems and loss of reputation. At the same time, it is not confirmed that, for example, corrupt practices encourage a growth of corporate effectiveness. Thus, we may make the conclusion that losses in case of public disclosure of violations of a company's business ethics may be compensated by the benefits gained by the company as a result of such violations. Hypotheses H.5.1.1–H.5.1.3 are disproved.

Table 7. Results of regression analysis for management practices and practices related to business model

Indicators	ROA		SPREAD		PREMIUM	
	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
INCLUSIVE_INDEX	0.0027	-0.0026	0.0001	-0.0032	0.0128*	-0.0083
CRIMGT	-0.0145*	-0.0084	-0.0172	-0.0147	-0.0509	-0.0462
CONTR	-0.0031	-0.0023	-0.0055	-0.0034	-0.0029	-0.0234
SIZE	0.0237	-0.0258	-0.109***	-0.0273	-0.0443**	-0.0216
GROWTH	0.0697***	-0.0138	0.0596***	-0.0143	0.465***	-0.0827
	ROA		SPREAD		PREMIUM	

Indicators	average marginal effect	standard error	average marginal effect	standard error	average marginal effect	standard error
EBITDA_MARGIN	0.0346	-0.0282	0.648***	-0.0693	0.495***	-0.1110
LEVERAGE	-0.330***	-0.0528	-0.294***	-0.0473	0.207*	-0.1390
CAPEX	0.0279	-0.0745	0.306***	-0.0911	-0.7670	-0.5250
2017.years	-0.0041	-0.0075	0.0052	-0.0064	0.479***	-0.0706
2018.years	0.0072	-0.0068	0.0113	-0.0084	0.361***	-0.0700
2019.years	0.0062	-0.0082	0.0199*	-0.0114	0.447***	-0.0698
2020.years	0.0133	-0.0088	0.0770***	-0.0148	0.441***	-0.0709
2021.years	0.0222*	-0.0131	0.0605***	-0.0163	0.0990	-0.0775
Constant	-0.4490	-0.5880	2.415***	-0.6150	0.5280	-0.4870
Observations	612		612		612	
R-squared	0.372		0.568		0.199	
Number of ric	102		102			
P-value	0		0		0	
Specification	FE		FE		Pool	

*** p < 0.01; ** p < 0.05; * p < 0.1.

The last practice of inclusive growth for metallurgical companies is risk management. At the 10% significance level, the existence of a risk management system is statistically significant for ROA, in particular, it is reduced by 1.45%. Building a risk management system may be expensive for companies and ultimately has a negative impact on financial results. At the same time, there is no significant effect for SPEAD. On these grounds we may assume that the existence of a risk management system mitigates a company's risks, therefore, there is a negative impact on ROA and no impact on SPEAD. Thus, hypotheses H.5.2.1–H.5.2.3 are disproved.

Control variables in the models for management practices and practices related to the business model behave in the same way as in the previous two cases. A relative stability of evaluation ratios is observed. Also, according to the conducted F-test, temporal effects should be added to each of the three analyzed models; 2020 and 2021 are statistically positively significant for dependent variables ROA and SPREAD.

When building all models, we conducted the Breusch-Pagan tests for heteroscedasticity, and when heteroscedasticity was discovered, we took robust errors into consideration. The constructed models were tested using the variance inflation factor. There was not a single result exceeding 4, which is indicative of absence of multicollinearity.

Conclusion

This paper is dedicated to the assessment of influence of the inclusive growth practices on financial results and the value of metallurgical companies. In this research, we determined the practices for metallurgical companies, carried out analysis of academic literature, which demonstrated the absence of a consensus between scientists on the issue of influence of each of the considered practices on financial results and company value, set forth hypotheses on the influence of these practices on financial results and company value. The research confirmed some of the hypotheses. At the same time, we proved that far from all inclusive growth practices have a positive impact on financial results and company value.

- There is a range of limitations for this research, namely:
- SASB standards were mainly used to define the inclusive growth practice;
- only one industry was considered in the paper; the results are not applicable to other industries;
- panel data analysis was used, alternative methods were not considered;
- testing of nonlinear dependence was not implied for the indicators of environmental practices effectiveness.

Limitations of this paper are also potential fields of further analysis.

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