

IDENTIFICATION OF SUSTAINABILITY RISKS AND THEIR QUANTIFICATION IN THE CONDITIONS OF SMALL AND MEDIUM-SIZED INDUSTRIAL ENTERPRISES

VIERA BESTVINOVA, FILIP PRAJ, MILOS CAMBAL

Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Slovakia

DOI: 10.17973/MMSJ.2022_11_2022137

e-mail: filip.praj@stuba.sk

The paper deals with sustainability risks and their measurement in the conditions of small and medium-sized enterprises. SMEs in the context of sustainability have to find solutions to many complex issues because, in the transformation of enterprises towards sustainability, significant changes are needed in all business processes from product development through operational execution, logistics, and marketing, not excluding their management. To implement sustainable development, SMEs need to identify and quantify the risks that may affect their path towards sustainability.

KEYWORDS

sustainability, sustainable development, EGS, environmental risks, social risks, corporate governance risks

1 INTRODUCTION

Sustainability, sustainable development and socially responsible business are increasingly coming to the attention of business stakeholders (management, owners, employees, suppliers, creditors etc.). As stated by Cabinova et al. [Cabinova 2019], despite declaring sustainability implemented in the corporate strategy, businesses do not have established processes toward sustainability. Most industrial enterprises consider economic goals the primary business objectives, even though sustainability is becoming an increasingly important factor influencing the enterprise's competitiveness [Fabozzi 2004, Dyadyura 2021].

In transforming enterprises towards sustainability, all business processes from product development, production, sales, and management need to be implemented in this direction.

Sustainability and sustainable development are increasingly appearing in international documents and professional publications [Mcmenam 1999]. Originally, sustainability was understood to ensure the long-term use of natural, renewable resources. [Ptak-Chmielewska 2021] The current understanding of sustainability is linked to the famous Brundtland Commission report (1987), which defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is a way of developing human society that reconciles economic and social progress with fully preserving the environment. The United Nations Educational, Scientific and Cultural Organisation's Sustainable Development Goals (2000) articulated sustainability and sustainable development as follows: sustainability is most often understood as a long-

term goal (i.e. a more sustainable world), as the ability to continue over a long period, while sustainable development refers to the many processes and pathways to achieve sustainability. Sustainable development, as stated by the European Commission in 2019, means meeting the needs of current generations without compromising the needs of future generations.[Khan, 2021] It is a comprehensive approach that combines economic, social and environmental aspects in a way that mutually reinforces each other. The concept of sustainability and sustainable development is intended to enable the present and future development of the individual, society and civilisation without compromising the gift and future existence of human beings [Kiselkova 2016].

The achievement of sustainability objectives is affected by various environmental, social and corporate governance risks, which must be identified and quantified in the context of each industrial enterprise.

2 METHODOLOGY

A questionnaire survey was used to obtain information on sustainability and sustainability risk measurement in a group of small and medium-sized industrial enterprises, and the following basic research methods were used to process the data and draw conclusions from the survey: analysis method, synthesis method, induction method, deduction method, and statistical method. The survey was conducted in the first half of 2022. Two hundred forty enterprises in the field of industrial production in the region of Western Slovakia were contacted by e-mail in the questionnaire survey. The number of enterprises that participated in the survey was 84, i.e. the return rate of questionnaires was 35%. The survey focused on sustainability, quantification of sustainability and the role of financial management in sustainability. This paper presents a comprehensive part of the information on sustainability and quantification of sustainability risks. We have divided enterprises by size into small and medium-sized enterprises. We have also included micro-enterprises in the group of small enterprises. In categorising enterprises, we have based the categorisation on the generally accepted definition of enterprises by size based on the European Commission Recommendation.

The results of the findings, on the one hand, were a validation of how knowledge about sustainability and sustainable development is applied in the practice of industrial enterprises and, on the other hand, became a source of valuable information about the need to identify sustainability risks and quantify them through appropriate indicators.

3 RESULTS

In addition to the identification questions (size and scope of activities), the questionnaire asked 8 questions on sustainability, of which 4 were multiple choice, 3 open and 1 semi-closed. We categorised the enterprises according to size (Figure 1) and industry sector (Figure 2).

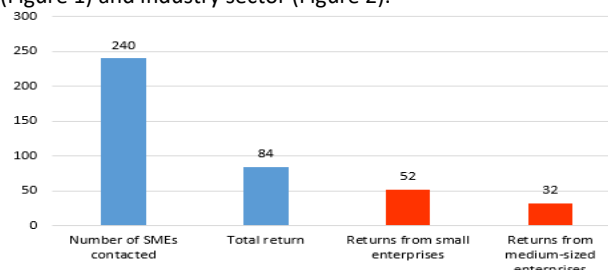


Figure 1. Return rate of questionnaires by company size

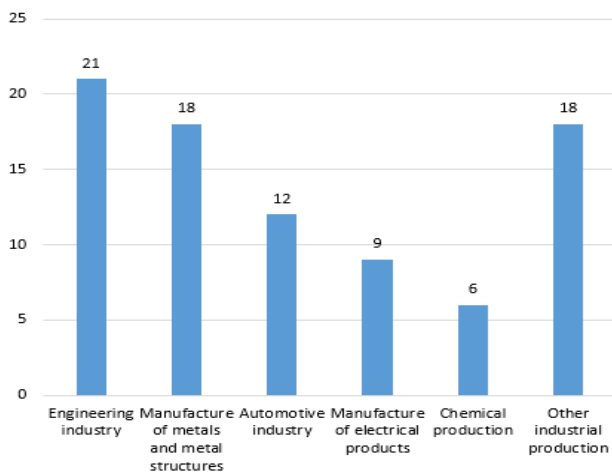


Figure 2. Return rate of questionnaires by industry sector

1. Has your company implemented a sustainability concept?

Of the total number of enterprises, 47 enterprises (56%) have implemented a sustainability concept. The remaining enterprises (37, i.e. 44%) indicated that they have not formally declared sustainability despite not having a sustainability concept [EEA Europa 2022]. These enterprises are not sufficiently aware that sustainability is becoming necessary in the business, and enterprises that transform to sustainability early on become more competitive and more reliable for customers, investors and the public [Bozek 2021].

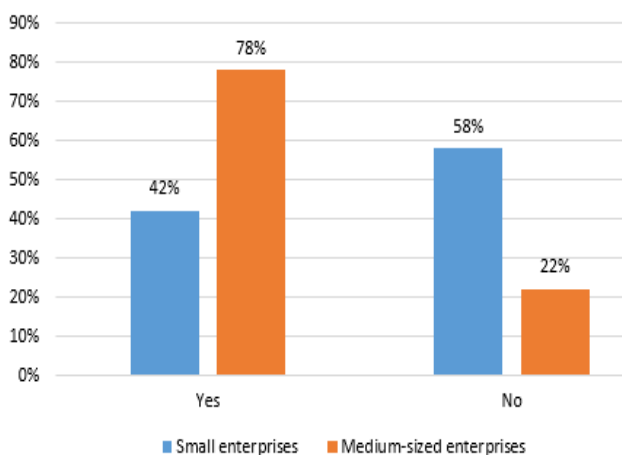


Figure 3. Implementation of sustainability/social responsibility

2. What environmental sustainability activities does your company carry out? (Open question)

The fifth question was aimed at finding out which industrial enterprises implement environmental sustainability activities. The most common activities that industrial enterprises carry out can be summarised as follows:

- separating the waste produced to ensure its environmentally sound treatment,
- efficient use of materials in production without large waste and residues, reuse of materials, production from recycled materials, prolongation of the product life cycle/production of remanufactured products (zero-waste economy),
- reduction of emissions and wastewater,
- investment in new greener technologies,
- optimisation or reduction of energy consumption - electricity, heat, gas, fuel,
- use of renewable energy sources (use of waste heat from industrial processes, heat pumps, photovoltaic systems, biomass combustion etc.),

- reducing the energy consumption of buildings (insulation and replacement of windows),
- implementation of an environmental management system according to ISO standard 14001:2015.

3. What activities does your company carry out in relation to social sustainability? (Open question)

The most frequent social sustainability activities of the surveyed enterprises are:

- creation of stable jobs with appropriate wage levels, stabilisation of employees, reduction of turnover,
- organising training activities for employees beyond the legally stipulated training,
- supporting the career development of employees,
- providing various employee benefits, especially in medium-sized enterprises, less so in small enterprises. The benefits provided to employees most often include, for example, the introduction of the Cafeteria system, under which employees choose their employee benefits, the introduction of flexible working hours to reconcile work and personal life, the organisation of team-building activities for employees, the provision of benefits to employees beyond the scope of the law following the Collective Bargaining Agreement, the organisation of social and sporting events for employees,
- increasing the level of internal communication as a prerequisite for sharing information and knowledge and promoting employee commitment, stability and loyalty,
- philanthropy (supporting athletes, artists, talented youth etc.),
- excursions, internships and graduate placements for secondary and university students.

4. What other sustainability-related activities does your company carry out? (Open question)

The most common activities are:

- Ensuring transparency by publishing both financial and non-financial information. Publication of financial statements (financial information) is mandatory for SMEs operating in double-entry bookkeeping.
- Particularly in medium-sized enterprises, establishing good relations with stakeholder groups (shareholders, management, customers, business partners, and employees). In the group of small enterprises, it is mainly a question of bringing together the interests of owners and employees.
- Both small and medium-sized enterprises consider it essential to meet their obligations (to trade, employees, insurance companies, and the state) promptly.
- Innovation, especially product innovation - manufacturers are forced to consider customer requirements when designing and manufacturing a product. The customer is the entity that sets the criteria for product quality, and the supplier is forced to adapt its operational capabilities to these requirements.
- The production of products with higher added value is characterised as the difference between the value of output and consumption in production [Cacko 2014]. This means that SMEs include in their production programme products that meet customer requirements, while the result of the products is associated with a reduction in material and energy intensity.
- Introduction and certification of a quality management system according to ISO standard (ISO 9001).
- Adherence to a code of ethics, ethical principles and standards of conduct.

5. Has the implementation of sustainable development brought about the need to change the management of your company? If yes, please specify your answer. (Semi-closed question)

More than two-thirds of the medium-sized enterprises answered that management changes have occurred due to the implemented innovations, especially technological ones. These changes were mainly related to changes in the work organisation and the need for further training of employees to develop their knowledge and skills. In the group of small enterprises, there were no significant changes in management. This is probably because small enterprises have a more straightforward management organisation and the responsibility for the direction of the enterprise lies with the owners.

6. Does your company have a sustainability risk concept and indicators to quantify them?

Comprehensive sustainability risk assessment and quantifying metrics are not implemented to the extent SMEs need. Enterprises mainly monitor the environmental impact of their production (e.g. amount and type of waste produced, emissions, energy and input consumption). Some, mainly medium-sized enterprises, feel the need to develop a data system to quantify the impacts of the sustainability-related activities carried out by their enterprise.

7. Divide the 100 points between the areas of information provision according to the importance your enterprise places on reporting financial, environmental and social indicators.

With this question, we wanted to determine how SMEs provide information on financial and non-financial indicators. The responses showed that enterprises report economic indicators to the greatest extent, with environmental and social indicators reported sporadically (Figure 4).

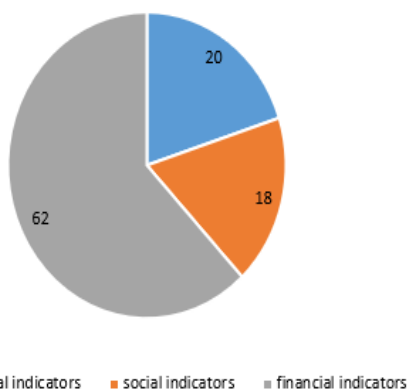


Figure 4. Reporting of financial and non-financial indicators

8. Do employees of your company participate in educational activities, conferences or other events in the field of sustainable development?

55% of enterprises reported that the enterprise regularly organises learning activities in this area as needed, and 30% of enterprises said that they inform employees about activities in company magazines, leaflets, on the intranet or at work meetings. 11% of enterprises reported that their employees gain knowledge through self-study, and 4% of enterprises responded that they do not provide learning for employees (Figure 5).

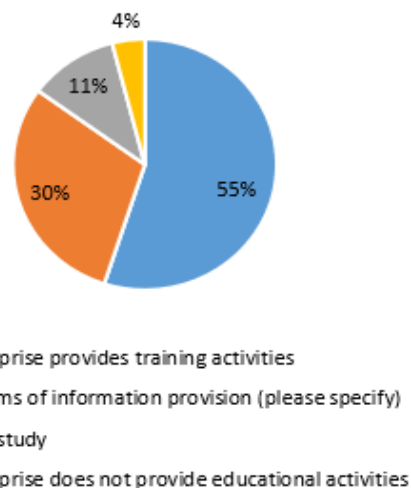


Figure 5. Forms of staff training on sustainability

4 DISCUSSION AND RESULTS

A survey conducted by the Slovak branch of the foreign bank UniCredit Bank in February 2022 on a sample of more than 1,000 respondents showed that up to 97% of people consider sustainability and adherence to the principles of social responsibility important. Half of the respondents think that an employer's socially responsible behaviour and its focus on sustainability are as important as maximising profits. Nearly 20% of survey respondents said employer sustainability and social responsibility are even more important to them than profit maximisation. Only 12% of respondents agreed that profit maximisation is a company's leading and only goal. The survey showed that businesses should not underestimate sustainability and social responsibility, which are essential for business success. SMEs do not yet have sufficient experience in implementing sustainability and social responsibility and should therefore learn from the experience of large enterprises and multinational corporations in their transformation into sustainable organisations [Finreport 2022].

A prerequisite for sustainable growth is securing its financing. SMEs that rely on their financial resources grow more slowly because it is more difficult for them to invest. The way to overcome the lack of financial resources to move towards sustainability is to attract external finance from the banking sector and EU programmes for green investments. An important factor in raising funds from these sources is implementing an ESG strategy.

The main areas of ESG focus on environmental 'E' factors (climate change, waste management and pollution, use of renewable energy), social 'S' factors (respect for human rights, diversity, inclusion and equal opportunities, local community impact and philanthropy) and corporate governance 'G' factors (business ethics, quality of management and independence of boards). Many investors make investment decisions based not only on economic performance but also on ESG performance. The World Economic Forum in Davos in January 2020 set out key indicators to measure environmental, social and corporate governance risks.

The author of the ESG Metrics paper [Majid 2021] lists sustainability risks and indicators to quantify them (Table 1 - Table 3). For SMEs, taking into account their specificities, they can be a starting point for identifying and quantifying their sustainability risks.

Table 1. Environmental risks and indicators to measure these risks

Environmental risks	Environmental indicators
Carbon emissions (greenhouse gases) or GHG emissions	<ul style="list-style-type: none"> Greenhouse gas emissions (million tonnes) Emission intensity (emissions per unit of output or 1 euro of revenue)
Energy efficiency	<ul style="list-style-type: none"> Amount of energy consumed Energy intensity (energy per unit of production or 1 euro of revenue)
Waste	<ul style="list-style-type: none"> Amount of waste produced Waste intensity (waste per unit of production or euro of revenue)
Product life cycle	<ul style="list-style-type: none"> % of products made from recycled materials % of recyclable or compostable products (including packaging)

Table 2. Social risks and indicators to measure these risks

Social and human capital risks	Social indicators
Supply chain	<ul style="list-style-type: none"> % of sales/suppliers covered by supplier codes of conduct or industry-recognised principles
Product safety	<ul style="list-style-type: none"> Fines/litigation related to product safety Number of product recalls
Data security	<ul style="list-style-type: none"> Number of data breaches per year Fines related to data security
Working procedures	<ul style="list-style-type: none"> Staff turnover Fines/litigation relating to staff matters
Employee health and safety	<ul style="list-style-type: none"> Lost time (hours lost by employees for health and safety reasons) Mortality rate per year

Table 3. Social risks and indicators to measure these risks

Management risks	Management indicators
Business ethics	<ul style="list-style-type: none"> % of sales in countries at high risk of corruption Fines/lawsuits related to business ethics
Management remuneration	<ul style="list-style-type: none"> Total remuneration of senior executives/EBIT % of performance-based remuneration for executives (salary vs. bonus)
Structure of the board of directors/owners	<ul style="list-style-type: none"> Age/gender/professional diversity on the board % of shares owned by the board (high levels of ownership may increase the quality of governance)
Accounting/disclosure transparency	<ul style="list-style-type: none"> Quality of profit (e.g. number of exceptional items) Absence of key disclosures

Sustainability reporting has not been defined by legislation for SMEs until now, and it was up to the company to measure and report sustainability; therefore, benchmarking between companies was not possible due to inconsistencies in reporting. According to Wollmert and Hobbs [Wollmert 2021], the new EU

Corporate Sustainability Reporting Directive (CSRD) will represent a fundamental change. The 27 EU member states are expected to translate the new Directive into national law by 31 December 2022, and, as a result, companies falling within the scope of the Directive (listed and large companies) will have to comply with it for fiscal years beginning on or after 1 January 2023. Listed SMEs will start reporting information under the Directive from 1 January 2026. The CSRD aims to ensure that companies disclose adequate information on sustainability risks and opportunities and the impacts they have on people and the environment. SMEs are expected to report sustainability information appropriate to their size and resources.

According to the CSRD, sustainability disclosures should include forward-looking and backwards-looking information, both quantitative and qualitative. They should also consider the time horizon (short, medium and long term) and have information on the entire value chain. Businesses will use the new standards for reporting sustainability information in their annual reports, providing individual stakeholders with an integrated view of their environmental, social, governance and performance impacts.

5 CONCLUSION

Sustainability is becoming increasingly important in all areas of business. Sustainable development requires high investments in the renewal of facilities and buildings, technological and product innovation, digitisation and automation of business processes. It contributes to reducing the environmental burden by lowering emissions, reducing energy intensity, implementing a zero-waste economy, etc., and changes in the social environment and corporate governance. Sustainability processes require changes in all business processes from product design, procurement, production and sales, including care for employees, the environment and governance. It is a lengthy, complex and costly process that requires employees' commitment to different job roles. In small enterprises, owners and top management play a decisive role in their transformation into sustainable enterprises; in medium-sized enterprises, this role falls to owners and top and middle management. For overall success, SMEs' employees must also be aligned with the idea of sustainability.

It is, therefore, essential to consider sustainability from an economic point of view and an environmental and social point of view, as well as from the point of view of SME management.

ACKNOWLEDGMENTS

This research was funded by the Ministry of Education, Science, Research and Sport of the Slovak Republic; the paper is a part of VEGA project No. 1/0348/17 "The impact of the coexistence of different generations of employees on the sustainable performance of organisations" and a part of the project Cultural Educational Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic KEGA 027STU-4/2022 - Integration of the requirements of practice in the automotive industry with teaching within the study programmes Automation and Computerization of Processes in Industry and Industrial Management.

REFERENCES

[Bozek 2021] Bozek, P., Nikitin, Y., Krenicky, T. The Basics Characteristics of Elements Reliability. In: Diagnostics of Mechatronic Systems. Series: Studies in Systems, Decision and Control, 2021, Vol. 345, pp. 1-15. ISBN 978-3-030-67055-9.

- [Cabinova 2019] Cabinova, V., Onuferova, E., Sofrankova, B. Theoretical background approaches on the quantification of sustainable development. *Young Science*, 2019, Vol. 7, No. 2, pp. 12-25. ISSN 1339-3189.
- [Cacko 2014] Cacko, P., Krenicky, T. Impact of lubrication interval to operating status of bearing. *Applied Mechanics and Materials*, 2014, Vol. 616, pp. 151-158. ISSN 1660-9336.
- [Dyadyura 2021] Dyadyura, K., Hrebenyk, L., Krenicky, T., Zaborowski, T. Modeling of the Manufacturing Systems State in the Conditions of the Lean Production. *MM Science Journal*, 2021, Vol. June, pp. 4408-4413.
- [EEA Europa 2022] The road to global sustainability (Cesta ku globalnej udržateľnosti) [online]. Available at: www.eea.europa.eu/sk/signaly-eea/signaly-2012/clanky/cesta-ku-globalnej-udrzatelnosti (in Slovak)
- [Fabozzil 2004] Fabozzil, F.J., Peterson, P.P., Habegger, W.D. *Financial management and analysis – workbook*. New York: John Wiley & Sons, 2004, 448 p. ISBN 0-471-48893-3.
- [Finreport 2022] Survey: Slovaks want socially responsible and sustainable companies (Prieskum: Slovaci chcú spoločensky zodpovedné a udržateľné firmy). *Financial Report* [online, 22-06-2022]. Available at: www.finreport.sk/podnikanie/prieskum-slovaci-chcu-spolocensky-zodpovedne-a-udrzatelne-firmy/ (in Slovak)
- [Khan 2021] Khan S.I., Ahmad M.O., Majava J. Industry 4.0 and sustainable development: A systematic mapping of triple bottom line, Circular Economy and Sustainable Business Models perspectives, *Journal of Cleaner Production*, Volume 297, 2021, 126655, ISSN 0959-6526, <https://doi.org/10.1016/j.jclepro.2021.126655>.
- [Kiselkova 2016] Kiselkova, D., Soltes, M. Enterprise performance management in models of financial performance of SMEs. In: *Management 2016: International business and management, domestic particularities and emerging markets in the light of research*. Presov: Bookman, pp. 262 -268. ISBN 978-80-8165-155-7.
- [Majid 2021] Majid, K. 2021. EGS Metrics. [online, 25-06-2022]. Available at: <ESG Metrics - Financial Edge fe.training>
- [Mcmenamin 1999] Mcmenamin, J. *Financial management – an introduction*. New York: Routledge, 1999, 760 p. ISBN 0-415-18161-5.
- [Ptak-Chmielewska 2021] Ptak-Chmielewska A., Chlon-Dominczak A. Spatial Conditions Supporting Sustainable Development of Enterprises on Local Level, *Sustainability* 2021, 13, 2292. <https://doi.org/10.3390/su13042292>
- [Wollmert 2009] Wollmert, P., Hobbs, A. [online] [cit. 27-06-2022]. Available at: www.ey.com/sk_sk/assurance/how-the-eu-s-new-sustainability-directive-will-be-a-game-changer.

CONTACTS:

Ing. Filip Praj

Slovak University of Technology in Bratislava, Faculty of Science and Technology in Trnava

Jana Bottu 2781/25, Trnava, 917 24, Slovakia

+421 949 157 893, filip.praj@stuba.sk