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Perception of Changes in the Companies' Environment and Pro-Environmental Attitudes of Managers in Polish Enterprises in the Context of Implementation of Sustainable Development Driven by the European Green Deal

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Abstract:

Purpose: *Getting recognition whether activities of managers of medium and large enterprises operating in Poland are consistent with the concept of the European Green Deal.*
Design/Methodology/Approach: *An empirical study conducted using CAPI (Computer-Assisted Telephone Interviewing) method with 100 enterprises from different industry sectors to understand the awareness and perception of changes occurring in their environment and their pro-environmental behaviour. Practical findings are contrasted with available literature on this subject.*
Findings: *Companies do not systematically identify changes occurring in their macro-environment and, thus, do not react agilely to opportunities arising from the EU Green Deal. Such a proactive attitude is, however, necessary to gain a competitive advantage linked to inevitable progress in implementing the sustainable development principles in industry activities.*
Practical Implications: *Important contribution to future work on best-suited strategies supporting the enterprises in effective transition to a more sustainable, circular economy.*
Originality/Value: *Analysing for the first time how companies operating in Poland react to changes in their environment requiring them to implement more sustainable solutions and whether they are prepared for the so-called "green" transformation*

Keywords: *Eco-innovations, opportunities, macro-environment, business environment, sustainable development, European Green Deal.*

JEL Classification: *M2, Q57.*

Paper Type: *Research article.*

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1. Introduction

Eco-innovation has already been for years considered as one of the main policy priorities of the European Union (EU) (Wozniak *et al.*, 2010). In December 2019, the European Commission (EC) published a Communication on an EU Green Deal ((EC, 2019). This initiative was developed as a holistic response to the main environmental challenges, which the EU societies face. It is a very important element of EU environmental policy, paving the way for the sustainable development of its economy. As the climate is changing every year (IPCC, 2018) and that pollution and unsustainable use of natural resources must be addressed to ensure a sustainable future for current and future generations (Oberle, 2019; EEA, 2019), the EC is determined to guide its actions by placing the protection of the environment, and consequently also the protection of human health, high on its overall policy agenda.

The EU Green Deal aims to "transform the EU into a just and prosperous society, with a modern, resource-efficient and competitive economy with no net greenhouse gas emissions by 2050 and economic growth decoupled from resource use" (EC, 2019). Its ambition, important from the enterprises point of view, is the transformation of the European industry by creating markets for clean technologies and products, opportunities for innovation, investment, and jobs. This transformation will require the active involvement of many actors, including companies, whether small, medium-sized, or large.

On the one hand, the Green Deal is expected to create new opportunities for enterprises, but on the other hand, its implementation will inevitably link to changes in the business environment and the new challenges they must face. To be able to support companies in this transformation, it is important to recognise how companies currently perceive the changes (political-legal, economic, socio-demographic, technological) occurring in their environment, how they are positioned towards them, and what is the state of their current interest and involvement in the implementation of pro-environmental activities in the companies. It can be assumed that companies' attitudes to these issues will affect their ability to implement the Green Deal principles.

However, there is a lack of detailed knowledge on how companies operating in Poland respond to changes in the environment requiring them to implement pro-environmental solutions and whether they are preparing for the so-called "green" transformation. To at least partially fill this cognitive gap, we conducted both literature and empirical research. Their synthetic results are presented in this article.

2. Background

2.1 Changes in the Enterprise Environment as a Source of Opportunity

A widely accepted view in the literature is that the business environment is changeable. Changes in the business environment have always occurred, but to emphasise the intensity of changes in the environment of modern businesses, it is usually added that

they are turbulent and unpredictable (Trzcielińska, 2017). Such events are often difficult to predict, although in retrospect they become obvious. Their dynamics have intensified over the last decade. This applies both to the technological changes taking place in the economy, the progressive automation and robotisation of enterprises, and the growing importance of pro-environmental solutions.

Changes taking place in the environment may affect organisations in a positive, negative, and neutral way. The unpredictability of a negative environment is a source of potential threat to the organisation. Positive changes, on the other hand, can be treated as opportunities (Królas, 2020). Companies wishing to build a competitive advantage must make use of opportunities that appear unexpectedly and base the sustainability of their business and ways of dominating their competitors on them (Trzcieliński and Trzcielińska, 2011; Włodarkiewicz-Klimek, 2016).

Once an event has occurred, it is easy to assess its impact, but then it is too late to benefit from it or to avoid its devastating impact. Therefore, it is necessary to look out for changes to be able to address them at an early stage of their occurrence. The dynamics and unpredictability of the contemporary environment require companies to react quickly.

Companies should observe the environment and at the same time notice changes occurring in it, associate them and categorise them as favourable and unfavourable, i.e., as opportunities or threats. It should also assess the adequacy of its own resources and those that it would have to obtain from the environment to use the favourable situation (Trzcieliński and Trzcielińska, 2011).

Companies whose business models incorporate opportunity recognition, being more active in this area, achieve better turnover than those that do not recognise them. This conclusion seems logical, since the discovery or creation of opportunities is to exploit them in a way that benefits the company. While such a relationship is logical, there is not much empirical research that demonstrates this relationship (Trzcielinska and Kaps, 2021), especially regarding opportunities that may arise in connection with changes caused by the implementation of the Green Deal. The recognition of opportunities can be supported using strategic analysis methods, conducting marketing research and entrepreneurial innovation initiatives (Trzcielińska, 2014; Marinovic and Matovic, 2020; Rastogi and Trivedi, 2016; Peng and Nunes, 2007).

2.2 EU Environmental Policy as a Driver of Changes

According to the Treaty on the Functioning of the European Union (TFEU, 2012), the EU is empowered to take action in all areas of environmental policy, e.g., air and water pollution, waste management or climate change. The origins of this process date back to 1972, when the Paris European Council declared the need for the EU to establish an environmental policy to accompany its economic development (Farmer, 2012).

The number of programmes and strategies that have been implemented in this context since the 1970s is enormous. Here we would like to mention just a few programmes of recent years that directly and indirectly affect businesses.

The Sustainable Consumption and Production (SCP) Action Plan, published in 2008, brought several important initiatives "to improve the environmental performance of products throughout their life cycle, to increase consumer awareness and demand for sustainable goods and production technologies, to promote innovation in EU industry and to address international aspects" (EC, 2008).

On the industrial production side, the objectives of protecting the environment and human health by ensuring cleaner industrial processes are pursued in the EU among others through the implementation of the Industrial Emissions Directive (IED, 2010). Over the past decades, activities related to this directive in European industry have contributed to a significant reduction of harmful emissions to air, water, and soil by, among others:

- replacing hazardous substances in various sectors with safer alternatives,
- improving the efficiency of industrial processes, e.g., by reducing resource consumption,
- the application of numerous emission reduction measures.

One of the latest and key initiatives in the environmental arena that will have a significant impact on businesses is the implementation of the EU Green Deal. This undertaking, officially announced through an EU communication in December 2019, aims to transform the EU economy and society, putting it "on a more sustainable path" (EC, 2019). As part of the EU Green Deal, all 27 EU Member States, including Poland, have committed to this transformation which, in addition to reducing emissions and external energy dependency as well as improving the health and well-being of EU citizens, is expected to create many opportunities for business regarding innovation, investment and new jobs[3].

We expect that, because of this initiative, companies will have to continuously observe their environment and set themselves up for the need to constantly adapt their business to the changing situation. Within the framework of the EU Green Deal, in March 2020, the EC presented a very wide range of actions, key policies and measures that are necessary to achieve these ambitious goals, and which will inevitably influence the environment of enterprises, not only in the technological (promotion of e.g. "sustainable by design") or political-legal (new regulations) segment, but also in the economic (e.g., by creating new markets for environmentally-friendly products, greater use of ecological criteria in public purchases) and social (influence on trends, consumer behaviour).

[3] *European Commission website dedicated to the the Green Deal: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en*

One of the important elements of the EU Green Deal is the new Circular Economy Roadmap (EC, 2020), which aims "to adapt products to a climate-neutral, resource-efficient and circular economy, to reduce waste and to ensure that the performance of sustainability leaders gradually becomes the norm". The Commission is also addressing the substitution of harmful chemicals in products from various sectors such as electronics and ICT, textiles, furniture, and chemicals, and developing the so-called "sustainable by design" initiative. All these programmes aim to provide "a coherent framework in which sustainable goods, services and business models become the norm and consumption patterns become more sustainable" (Amanatidis, 2021).

2.3 Impact of Environmental Policy on the Market and Businesses

An in-depth analysis of how environmental policies affect the state of the economy, the development of markets and businesses themselves would require very extensive research, which is beyond the scope of this paper. Nevertheless, below we will try to sketch a general picture, referring to the main commissions of the EU Green Deal, namely the assumption that it should create new possibilities, including opportunities for innovation and investments.

The discussion on the impact of the environmental requirements is not new. Neoclassical economics, which takes a cost perspective as its starting point, is not unequivocal on this issue. There are views that environmental policies negatively affect business performance because they impose costs on firms and reduce their profits (Gollop and Roberts,1983; Gray and Shadbegian, 2003; He, 2006; Testa *et al.,* 2011), but also views that policymakers should intervene in the market through appropriate regulation only when the associated social and environmental benefits outweigh the costs (Martínez-Zarzoso *et al.,* 2019).he discussion on the impact of the environmental requirements is not new.

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"Revisionists" challenge these views by arguing that environmental measures can encourage innovation and improve firm performance, becoming a source of competitive advantage, through the promotion of technological innovation, higher productivity, or new market opportunities (Porter, 1991; Porter and van der Linde, 1995; Sinclair-Desgagné, 1999; Brunnermeier and Cohen, 2003; Leiter *et al.,* 2009). In this way, additional costs can be, partially or completely, compensated. Porter even postulated that environmental regulation could serve as an instrument to correct market failures, the so-called "externalities".

"Porter's Hypothesis" viewed appropriate regulation and well-designed environmental policies as a factor that stimulates innovation and contributes to building competitive advantage for companies (Porter, 1991; Porter and van der Linde, 1995). There is also a third approach, considered an evolution of Porter's approach, the so-called "Resource-based view", which links the competitiveness of firms and industries to the quality and quantity of available resources and the ability of firms to optimise their use (Fouts and Russo, 1997; Testa *et al.*, 2011).

Besides looking at economic theories, it is interesting to examine current trends. There is a growing recognition among managers that the environmental problems associated with climate change represent a major existential crisis, with many companies expressing a desire to "be part of the solution to this crisis" (Holmes *et al.*, 2020). In 2019 in the United States at the Business Roundtable, more than 160 CEOs pledged to "protect the environment by adopting sustainable practices across the business" (USBR, 2019).

Holmes *et al.* (2020) in a paper prepared for the International Chamber of Commerce, points out that a focus on climate change, sustainable production and the circular economy can create opportunities for innovative businesses to grow. Sustainability issues are important to a growing group of consumers, which increases the market opportunities for companies that use cleaner technologies, are more socially responsible (CSR) and allow for the necessary investment in eco-innovations (Holmes *et al.*, 2020).

For instance, with the growing popularity of the concept of the circular economy (CE), one of the key elements of the Green Deal, among both, i.e., consumers and manufacturers, companies are apparently stepping up efforts to transform their operations and integrate CE principles into their business (Demirel and Ozturk Danisman, 2019).

However, if we look at the situation in Poland, it does not, unfortunately, look promising in comparison with other EU countries. Poland belongs to the least eco-innovative EU countries (Szpor and Śniegocki, 2012). The financial support from the EU allows to increase the pace of implemented changes, but in many areas mentioned above the Polish economy is still lagging. The activities of the government and local authorities lack a holistic approach and integration of the three key aspects of sustainable development - economy, society, and environment (Lewandowska, 2014).

Regardless of the advancement of countries in the implementation of the EU Green Deal, it can be expected that in the coming years companies will have to face an increased number of interventions by "policy makers" aimed at fostering eco-innovations, as well as growing demands in this area from consumers. It is therefore important for companies to prepare themselves in the best possible way for the forthcoming changes.

3. Research Methodology

The empirical research was conducted in 100 enterprises, 65 medium-sized and 35 large, across Poland in January 2020. These companies were assigned to 16 industry sectors due to similarities in their businesses. In order to facilitate the analysis, the surveyed

companies were further divided into eight groups, in which industries that are in some way similar to each other were placed: ***Group 1 Food industries (16 companies):*** consisting of: Production of food products (15), Beverage production (1), respectively; ***Group 2 Paper industries (10):*** Production of paper and paper products (5) i Printing and reproduction of recorded media (5); ***Group 3 Chemical non-metals industries (27):*** Production of chemicals and chemical products (10), Production of basic pharmaceutical products and preparations (4), Production of rubber and plastic products (7), Production of other non-metallic mineral products (6); ***Group 4 Metals industries (16):*** Production of metals (2), Production of metal products, except machinery (14); ***Group 5 Electronics industry (6):*** Production of computers, electronics and optical products (6); ***Group 6 Electric equipment industry (4):*** Production of electrical equipment (4); Group 7 Machines and vehicles Industries (17): Production of machinery and equipment (7); Production of motor vehicles, trailers and semi-trailers, except for motorcycles (8); Production of other transport equipment (2); ***Group 8 Furniture industry (4):*** Production of furniture (4).

Data were collected by means of an interview questionnaire with closed questions, using the CAPI (Computer-Assisted Telephone Interviewing) method. The respondents were, company owners, managing directors, technical directors, production managers, production engineers, among whom there were 13 women and 87 men. Each of the surveyed companies answered 17 survey questions (variables used later in the analysis).

The variables took values determined on a 5-point Likert scale.
The research questions were designed to find out:

1. Do companies observe their environment? (7 specific questions)
2. How do managers assess the impact of changes in the environment on their companies? (4 questions)
3. What importance do managers give to introducing pro-environmental changes? (6 questions)

For the purposes of this study, quantitative research was limited mainly to the frequency of occurrence of the phenomena analysed. Spearman's rank correlation was examined to determine if there was a relationship between variables related to observation and analysis of the environment (variables 1.1-1.7) and assessment of changes in the macro-environment (variables 2.1-2.4) and individual variables of pro-environmental actions (3.1-3.6). Variables 1.1-1.7 and 2.1-2.4 were treated as independent variables. Their reliability measured by Alpha Cronbach test is high and was 0.77 and 0.79 respectively. Each question 3.1-3.6 was assumed to be an individual dependent variable.

4. Results

In total, responses from 100 companies were collected, nevertheless, not all companies responded to all questions (i.e., for question 1.1 (see below for the specific questions formulation) - 92%, 1.2 - 96%, 1.3 - 93%, 1.4 - 99%, 1.5 - 98%, 1.6 - 99%, 1.7 - 96%,

2.1.- 94%, 2.2. - 95%, 2.3. - 97%, 2.4. - 100%, 3.1. - 98%, 3.2. - 97%, 3.3. - 99%, 3.4. - 100%, 3.5. - 99%, 3.6. - 100%, respectively.
The first group of questions aimed to find out whether and how often companies identify changes occurring in the macro-environment and industry environment segments.

As regards observation of changes in the ***political and legal segment*** (1.1), 33% of companies do not do it at all or do it sporadically (11% and 22% respectively). 15% of companies conduct such activities occasionally and 52% of companies conduct them systematically or very systematically (42% and 10% respectively). The largest share of companies that recognize and analyze changes systematically or very systematically belongs to the Food industries (63%) and Electric equipment industry (75%).

On the other hand, the largest number of companies that do not conduct such analyses or conduct them sporadically is among the Paper industries (44%) and Furniture industries (66%).

Regarding changes in the ***economic segment*** (1.2), 9% of companies do not recognize them at all or do it sporadically (0% and 9% respectively). 17% of companies conduct such activities occasionally, and as many as 74% do it systematically or very systematically (54% and 20% respectively). The industries with the highest share of recognizing and analyzing changes in this segment belong to the Electronics industry and Electric equipment industry groups. 100% of companies from those sectors declare that they conduct such activities systematically. On the other hand, the largest number of companies that do not conduct such analyses or conduct them sporadically belong to the Machines and vehicles industry (29%) and Furniture industry (33%).

In terms of changes in the ***socio-demographic segment*** (1.3), 38% of companies do not engage in such analysis or do so sporadically (12% and 26% respectively). Companies that do it occasionally are 31%. The same share of companies (31%) conducts these activities systematically and very systematically (28% and 3% respectively). The industries with the highest shares regarding recognizing and analyzing changes in their environment belong to Chemical industries (non-metals) (42%) and Electric equipment industry (50%). The highest share of companies that do not conduct such activities or do it only sporadically is in the Electronics Industry group (60%) and Furniture industry group (66%).

As regards changes in the ***technology segment*** (1.4), 9% of companies do not study such developments or do so sporadically (0% and 9% respectively). 15% conduct such activities occasionally. 76% of companies analyse changes in this segment systematically or very systematically (64% and 12% respectively). The largest share of companies undertaking these activities systematically belong to the Food industries (63%), Paper industries (70%), Chemical industries (non-metals) (73%), Electronics industry (67%), Electric equipment industry (75%) and Furniture industry (75%) groups. On the other hand, the highest share of companies doing this occasionally belongs to the group Machines and vehicles industries (29%).

Only 5% of the companies do not analyse changes in their environment regarding the ***buyers segment*** (1.5), or do it sporadically (1% and 4%). 84% of companies do it systematically or very systematically (54% and 30% respectively). Companies belonging to all industries do it systematically or very systematically in the range between 65% and 100%. However, the highest share of companies that do not analyse their environment from this point of view or do it sporadically belong to the Furniture industry group (25%).

In terms of observing changes in the ***supplier segment*** (1.6), 8% of companies do not recognize and analyze such changes or do so sporadically (1% and 7% respectively). 17% of companies take such actions occasionally, while 75% do so systematically or very systematically (55% and 20%). The highest share of enterprises taking these actions systematically or very systematically belong to the groups from Food industries, Paper industries, Chemical industries (non-metals), Metals industries, Electronics industry and Electric equipment industry in the range of 69% to 100%. On the other hand, the highest share of companies not doing it or doing it occasionally belongs to the Food industries (19%) and Furniture industries (25%) groups.

Regarding the ***competitor segment*** (1.7), 15% of companies do not recognize changes in the environment or do so sporadically (4% and 11% respectively). 17% of companies take such actions occasionally, and 68% do it systematically or very systematically (51% and 17% respectively). The largest share of companies in the industries that analyze changes in the environment systematically or very systematically belongs to the Food industries, Paper industries, Chemical industries (non-metals), Electronics industry and Electric equipment industry groups, ranging from 73% to 83%. On the other hand, the highest share of companies not doing it or doing it sporadically belongs to the Food industries, Metals industries (27% each) and Furniture industries (25%) groups.

The second group of questions was designed to find out ***how managers assess the impact of changes in the macro-environment on their companies***.

Changes taking place in the ***political and legal segment*** (2.1.) are assessed by 59% of respondents as very unfavorable or unfavorable (19% and 40% respectively), by 30% as having no impact, and by 11% as favorable or very favorable (9% and 2% respectively). The highest share of companies assessing the changes as unfavorable or very unfavorable to businesses belong to the Food industry (76%) and Electronics industry (84%) groups. In contrast, the largest share of companies rating them favorable and very favorable (22-25%) belong to the Paper industries and Electric equipment industry groups.

In the ***economic segment*** (2.2.), 45% of companies rate the changes as very unfavorable or unfavorable (7% and 38%, respectively), 39% as having no impact, and only 16% as favorable or very favorable for doing business (14% and 2%, respectively). The industries that significantly rate the ongoing changes as unfavorable belong to the Paper industries and Machines and vehicles industries group (56% each). The highest share of companies describing the changes as favorable belong to the Electric equipment industry group (50%). Interestingly, the Chemical industries (non-metals) group is the only group

that very significantly (62%) indicate the ongoing changes as having no impact on their business.
Regarding changes occurring in the ***socio-demographic segment*** (2.3.), 67% of companies assess them as very unfavorable or unfavorable (10% and 57% respectively), 22% as having no impact, and only 11% consider them favorable and very favorable (9% and 2% respectively). The largest share of companies that explicitly identify these changes as unfavorable and very unfavorable (67-70%) belong to the Food industries, Paper industries, Metals industries, and Electronics industries groups. The largest share of companies that identify the changes as favorable (20%) also belong to the Paper industries group. A very high share of companies describing them as having no impact on business (67%) belong to the Furniture industry group.

In the ***technology segment*** (2.4), only 7% of companies consider such changes as very unfavorable and unfavorable (1% and 6%, respectively), 25% as having no impact, and as many as 68% describe them as favorable and very favorable (57% and 11%, respectively). The highest share of companies considering the identify changes as unfavorable for doing business (25%) belong to the Electric equipment industry group, while the highest share of responses assessing the changes as favorable and very favorable (67%-100%) is found among companies in the Paper industries, Chemical industries (non-metals), Metals industries, Electronics industry and Furniture industry groups.

The third group of questions asked ***how important the following activities are to the company****:*

Replacing harmful technologies with friendly technologies (3.1.): No company considers these actions to be unimportant, 4% consider them unimportant, 8% consider them irrelevant, and as many as 88% consider them important and very important (36% and 52% respectively). For companies in all groups, taking such actions is important or very important ranging from 73% to 100%. The highest share of industries considering them unimportant belongs to the Electronics industry group (17%).

Use of own waste in manufacturing processes of other companies (3.2.): A small share of companies describe such actions as definitely unimportant (3%), 11% of companies consider them unimportant, 14% describe them as irrelevant, and as many as 71% of companies consider them important or very important (44% and 27% respectively). The highest share of industries for which such actions are both important and very important belong to the Food industries, Chemical industries (non-metals), Electronics industry, Electric equipment industry, Machines and vehicles industries and Furniture industry groups ranging from 69% to 100%. On the other hand, the industries that most consider them unimportant and unimportant belong to the group Metals industries (27%) and Electric equipment industry (25%).

Generating waste harmless to the environment (3.3.): No company considers these actions as definitely unimportant, only 3% consider them unimportant, 6% irrelevant, and as many as 91% of companies describe them as important and very important (27% and

64%). The research shows that industries from all groups consider taking such actions as important and very important in a range from 75% to 100%. The highest share of industries saying they are unimportant belongs to the Electronics industry group (20%).

Conducting analysis of threats to human health and life during product (product/service) design (3.4.): These activities are considered definitely unimportant or unimportant by 14% of companies (3% and 11% respectively), the same share (14%) consider them as irrelevant, and 71% as important and very important (44% and 27% respectively). A very high share of firms in all industries rank these activities as important and very important in range from 83% to 100%. The companies with the highest share (17%) that consider such actions not important are in the Electronics industry group.

Conducting risk analysis of human health and life hazards during the design of manufacturing/provisioning systems (3.5.): The smallest share of companies of all industries (1%) considers these activities as definitely unimportant and unimportant (0% and 1% respectively), 6% as irrelevant, and as many as 93% of companies consider them as important and very important (29% and 64% respectively). This means that companies belonging to all industries consider these activities important or very important (ranging from 80% and 100%). The companies with the highest share (6%) that do not consider such actions unimportant belong to the Food industries group.

Systematic replacement of human labor with machine labor (3.6.): Such actions are considered unimportant or unimportant by 15% of companies (4% and 11% respectively), 20% describe them as irrelevant, and 65% consider them important and very important (43% and 22% respectively). The highest share of companies for which taking such actions is important or very important belongs to the Paper industries, Chemical industries (non-metals), Electronics industry and Furniture industry, ranging from 67% to 90%). The highest share of industries considering them not important belongs to the Electric equipment industry group (25%).

The above data summarises the answers given by both medium-size and large companies. Restricting only to activities carried out systematically and very systematically (questions 1.1-1.7), positive and very positive evaluations (questions 2.1-2.4) and high and very high importance of activities (questions 3.1-3.6), the response rate for each question was (the first number refers to medium-size enterprises and the second to large enterprises): 1.1 – 48% and 49%, 1.2 – 66% and 80%, 1.3 – 29% and 29%, 1.4 – 75% and 74%, 1.5 – 80% and 86%, 1.6 – 69% and 83%, 1.7 – 63% and 69%, 2.1. – 6% and 17%, 2.2. – 18% and 9%, 2.3. – 12% and 9%, 2.4. – 65% and 71%, 3.1. – 83% and 91%, 3.2. – 75% and 57%, 3.3. – 94% and 86%, 3.4. – 91% and 99%, 3.5. – 91% and 94%, 3.6. – 62% and 71%.

The data obtained by answering the survey questions allowed us to conduct Spearman rank correlation analysis. We considered of particular interest whether the environmental activities of enterprises (variables 3.1-3.6) are statistically significantly correlated with the other variables. In this respect, we obtained a negative result.

5. Discussion and Conclusions

It seems that the results obtained are closer to neoclassical theory than to Porter's theory. Although they show that pro-environmental issues are important for managers (variables 3.1-3.6), it is not strongly reflected in the evaluation of changes occurring segments of the macro-environment (variables 2.1-2.4). This is confirmed by the lack of a statistically significant correlation between these variables.

Considering the share of answers indicating high and very high importance, the most important issues for managers are conducting hazard analysis of threats to human health and life when designing manufacturing systems/provision organization (3.5 - 92%), followed by that waste should be harmless to the environment (3.3 - 91%), replacing technologies harmful to the environment with friendly technologies (3.1 - 86%), and equally important (69%) using own waste in manufacturing processes of other companies (3.2) and conducting hazard analysis of threats to human health and life when designing products (3.4). Although issues 3.1, 3.2, 3.3 are important to all industries, 3.2 is relatively less important to companies in the Metals Industries group (25%) and 3.1 and 3.2 (17% each) to the Electronics Industry group.

Surprisingly high is the share of companies that do not or only occasionally observe and analyse changes occurring in the macro-environment, especially in its political-legal segment (1.1 - 30%), where regulations are made, and socio-demographic segment (1.3 - 35%), which reflects the needs and attitudes of society and the market. Leading the way are companies belonging to the Furniture Industry group (50% each) and the Paper Industry group (40%) and Electronics Industry group (50%), respectively.

It is also surprising to note that the observation of macro-environment segments (1.1-1.4) does not have a statistically significant relationship with their evaluation (2.1-2.4). This may indicate that both the tracking of changes in the environment and their evaluation are cursory. Such a conclusion is confirmed by a relatively high share of enterprises that evaluate changes occasionally. For individual segments 2.1-2.4 it is 28%, 37%, 21% and 25% respectively.

We believe that a necessary condition for the implementation of sustainable development principles is the simultaneous observation and analysis of changes in at least the political-legal, economic, and socio-demographic segments of the macro-environment (variables 1.1-1.3). Although the share of companies that never recognize changes or do so occasionally is 3%, the share of those that do so systematically or very systematically is also not large (only 19%). The parameters look even worse in terms of assessing the impact of the changes taking place (variables 2.1-2.3). 18% of companies believe that these changes are unfavorable or very unfavorable for doing business and only 1% believe that they are favorable or very favorable. This can be interpreted as a contradiction of Porter's thesis on the positive impact of pro-environmental regulations on business innovation.

Significant differences in the approach to recognizing and analyzing changes in the macro-environment, assessing their impact on business, and the importance of pro-environmental measures for companies are found between medium-sized and large companies. In the political and legal segment (1.1), the share of medium enterprises that do not recognize changes or recognize them occasionally is higher than that of large enterprises (35% and 20% respectively). For the economic segment (1.2) it is 14% and 0%, respectively, and for the socio-demographic segment (1.3) it is 37% and 31%. In the technology segment (1.4), it is 9% in both groups of companies.

The differences between medium-sized and large companies that systematically or very systematically recognize changes in the environment are smaller. In individual segments, these figures are respectively: 1.1 - 48% and 49%, 1.2 - 56% and 80%, 1.3 - 37% and 31% and in segment 1.4 they are both 9%. This means that a higher share of large companies than medium ones recognize changes occasionally.
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A similar pattern is found in the assessment of the impact of changes in the macro-environment on business. In the political and legal segment (2.1), the share of medium-size enterprises that assess the ongoing changes as unfavorable or very unfavorable is 66% and for large enterprises it is 37%. The respective figures for the economic segment are 49% and 31%, for the socio-demographic segment 62% and 71% and for the technological segment 8% and 6%. The difference between medium-sized and large companies that rate the ongoing changes as favorable or very favorable is smaller and in each segment is respectively: 2.1 - 6% and 17%, 2.2 - 18% and 9%, 2.3 - 12% and 9%, 2.4 - 65% and 71%.

Although, in general, most medium and large enterprises attach high and very high importance to environmental activities (variables 3.1-3.6), a larger proportion of medium-sized enterprises treat these issues as very unimportant or unimportant (2%-18%).

When analysing the assessment of changes taking place in the macroenvironment in the cross-section of sectors, it can be noted that the highest percentage of companies that assess negatively the changes taking place in the political and legal segment belongs to the Food Industry (75%) and the Electronics Industry (84%). On the other hand, the industries that assess these changes as favourable are Paper Industry and Electric Equipment Industry (20-25%). The changes taking place in the economic segment are assessed most unfavourably by companies in the Paper Industry, the Electric Equipment Industry and the Machines & Vehicle Industry (50-53%).

The Electric Equipment Industry companies have the best assessment of these changes (50%). In the socio-demographic segment, companies in the Paper Industry, Chemical Industry and Electronics Industry have the lowest opinion of the changes (66-70%). Companies in the Paper Industry are the best at assessing these changes (20%). Changes in the Technology segment are generally rated the best by all industry sectors (67-81%), while a relatively small percentage of companies in the Electric Equipment Industry rate the lowest (25%).

The data obtained and the discussion carried out allow us to formulate some synthetic conclusions.

It can be expected that adaptation to the principles of the Green Deal and implementation of pro-environmental investments will be most difficult in those industries which assess these changes most negatively.

It seems that companies focus more on recognizing and analyzing changes in the industry environment than the macro-environment. Consequently, solving current problems of operational management is more important for them than strategies adjusting them to the principles of EU Green Deal and eco-investment. Companies do not systematically identify changes occurring in the macro-environment and pay too little attention to their analysis and impact assessment. As a result, they do not react agilely to opportunities that arise in connection with these changes (Trzcieliński, Trzcielińska, 2011).

Certainly, implementing Green Deal principles is costly and difficult, but as we indicated earlier it is and will be enforced by both the regulator and the market. Companies that adapt their technological and organizational systems to them faster will also gain a competitive advantage sooner. This business aspect must be in balance with ecology and meeting social needs.

Thus, the authors are of the opinion that further research is necessary to work out well-suited and effective strategies to support polish companies to become agile and competitive in a more sustainable future micro-environment driven by the "green" transformation" of the EU.

References:

Amanatidis, G. 2021. Factsheets of the European Union: Sustainable consumption and production. Available under: https://www.europarl.europa.eu/factsheets/en/sheet/77/sustainable-consumption-and-production.

Banaszyk, P. 2011, Zmienność zarządzania strategicznego przedsiębiorstwem. Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań.

Brunnermeier, S.B., Cohen, M.A. 2003. Determinants of environmental innovation in US manufacturing industries. Journal of Environmental Economics and Management, 45, 278-293.

Czerski, M. 2016. Otoczenie organizacji jako punkt odniesienia dla działań przedsiębiorstwa, In: K. Pujer (red.), Zarządzanie przedsiębiorstwem w zmiennym otoczeniu w kontekście zrównoważonego rozwoju, Exante, Wrocław, 17-30.

Demirel, P., Ozturk Danisman, G. 2019. Eco-Innovation and firm growth in the circular economy: Evidence from European small- and medium-sized enterprises. Business Strategy and the Environment, 28(8), 1608-1618. DOI: https://doi.org/10.1002/bse.2336.

EC. 2008. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, COM(2008)0397.

EC. 2019. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committees and the Committee of the Regions, The European Green Deal, COM/2019/640.

EC. 2020. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committees and the Committee of the Regions, A new Circular Economy Action Plan For a cleaner and more competitive Europe, COM(2020) 98.

EEA (European Environment Agency). 2019. The European environment – state and outlook 2020, Knowledge for transition to a sustainable Europe, 2019, ISBN 978-92-9480-090-9, DOI: 10.2800/96749.

Farmer, A.M. (Ed.). 2012. Manual of European Environmental Policy. Routledge, London.

Fouts, P.A., Russo, M.V. 1997. A resource-based perspective on corporate environmental performance and profitability. The Academy of Management Journal, 40, 534-559.

Gollop, F.M., Roberts, M.J. 1983, Environmental regulations and productivity growth: the case of fossil-fuelled electric power generation. Journal of Political Economy, 91(4), 654-674.

Gray, W., Shadbegian, R. 2003. Plant vintage, technology, and environmental regulation. Journal of Environmental Economics and Management, 46, 384-402.

He, J. 2006. Pollution haven hypothesis and environmental impacts of foreign direct investment: the case of industrial emission of sulfur dioxide in Chinese provinces. Ecological Economics, 60, 228-245.

Hitt, M.A., Iteland, R.D., Hoskisson, R.E. 1995. Strategic management. Competitiveness and globalization, New York, West Publishing Company.

Holmes, S., de Stefano, G., Dolmans, M., Jensen, S., Luebbig, T., Riley A. 2020. Competition Policy and Environmental Sustainability. The International Chamber of Commerce (ICC), November 2020. Available online at: https://iccwbo.org/publication/competition-policy-and-environmental-sustainability/.

IED. 2010. The Directive 2010/75/EU of the European Parliament and the Council on industrial emissions.

IPCC. 2018. Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (Masson-Delmotte, V., P. Zhai, H.O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)). World Meteorological Organization, Geneva, Switzerland.

Johnson, G., Scholes, K. 1999. Exploring Corporate Strategy. Prentice Hall, Harlow.

Królas, P. 2020. Methodology of risk management associated with short life cycle business opportunities. Proceedings of the 36th International Business Information Management Association Conference, 4-5 November, Granada, Spain.

Kurrer, C.H. 2021. Factsheets of the European Union: Environment policy: general principles and basic framework. Available under: https://www.europarl.europa.eu/factsheets/en/sheet/71/ environment-policy-general-principles-and-basic-framework.

Leiter, A.M., Parolini, A., Winner, H. 2009. Environmental Regulation and investment: evidence from European industries. Working papers 2009–04. Faculty of Economics and Statistics, University of Innsbruck.

Lewandowska, A. 2014. Wdrażanie zrównoważonego rozwoju w Polsce i w krajach Unii Europejskiej.

Lynch, R. 2012. Strategic Management. Pearson, Harlow.
Marinovic Matovic, I. 2020. PESTEL Analysis of External Environment as a Success Factor of Startup Business. ConScienS Conference Proceedings, September 28-29, 96-102.
Martínez-Zarzoso, I., Bengochea-Morancho, A., Morales-Lage, R. 2019. Does environmental policy stringency foster innovation and productivity in OECD countries? Energy Policy, 134, ISSN 0301-4215. https://doi.org/10.1016/j.enpol.2019.110982.
Nitank Rastogi, M.K. 2016. Trivedi, Pestle Technique – A Tool to Identify External Risks in Construction Projects. International Research Journal of Engineering and Technology (IRJET), 03(01).
Oberle, B., Bringezu, S., Hatfeld-Dodds, S., Hellweg, S., Schandl, H., Clement, J., Cabernard, L., Che, N., Chen, D., Droz-Georget , H., Ekins, P., Fischer-Kowalski, M., Flörke, M., Frank, S., Froemelt , A., Geschke, A., Haupt , M., Havlik, P., Hüfner, R., Lenzen, M., Lieber, M., Liu, B., Lu, Y., Lutter, S., Mehr , J., Miatto, A., Newth, D., Oberschelp , C., Obersteiner, M., Pfster, S., Piccoli, E., Schaldach, R., Schüngel, J., Sonderegger, T., Sudheshwar, A., Tanikawa, H., van der Voet, E., Walker, C., West, J., Wang, Z., Zhu, B.A. 2019. Global Resources Outlook 2019: Natural Resources for the Future We Want. The International Resource Panel (IRP), United Nations Environment Programme, Nairobi, Kenya.
Obłój, K. 2007. Strategia Organizacji. Polskie Wydawnictwo Ekonomiczne, Warszawa.
Peng, G.C.A., Nunes, M.B. 2007. Using PEST Analysis as a Tool for Refining and Focusing Contexts for Information Systems Research. In: ECRM 2007. 6th European Conference on Research Methodology for Business and Management Studies, 9th - 10th July, Lisbon, Portugal. Academics Conference International, 229-236.
Płaczek, E. 2021. Zrównoważony rozwój–nowym wyzwaniem dla współczesnych operatorów logistycznych. Prace Naukowe Politechniki Warszawskiej. Transport, 84, 79-92.
Porter, M.E. 1991. America's Green Strategy. Scientific American, 264, 4.
Porter, M.E., van der Linde, C. 1995. Toward a new conception of the environment competitiveness relationship. Journal of Economic Perspectives, 9, 97-118.
Sinclair-Desgagné, B. 1999. Remarks on Environmental Regulation, Firm Behaviour and Innovation. Scientific Series, 99s, 20, Cirano, Montreal.
Sull, D.N. 2005. Strategy as Active Waiting. Harvard Business Review, October, 2-10.
Szpor, A., Śniegocki, A. 2012. Ekoinnowacje w Polsce Stan obecny, bariery rozwoju, możliwości wsparcia. Publikacja powstała w ramach projektu (Eko)innowacje – szansą dla Polski finansowanego ze środków otrzymanych z Fundacji im. Stefana Batorego.
Testa, F., Iraldo, F., Frey, M. 2011. The effect of environmental regulation on firms' competitive performance: The case of the building & construction sector in some EU regions. Journal of Environmental Management, 92.
TFUE. 2012. Consolidated Version of the Treaty on the functioning of the European Union, 2012, OJ C326/47, document amended.
Trzcielińska, J. 2014. Entrepreneurship in SMEs. Advances in the Ergonomics in Manufacturing: Managing the Enterprise of the Future: Proceedings of the 5th International Conference on Applied Human Factors and Ergonomics, Kraków, 51-61.
Trzcielińska, J. 2021. Entrepreneurial Traits in Recognizing Opportunities by SMEs. Proceedings of the 37th IBIMA Conference on 1-2 April, Cordoba, Spain.
Trzcielińska, J., Kaps, R. 2021. Business Models and Opportunities Recognition, 37th IBIMA Conference, 30-31 May, Cordoba, Spain.

Trzcieliński, S., Trzcielińska J. 2011. Some elements of theory of opportunities. Human Factors and Ergonomics in Manufacturing and Service Industries, Special Issue: Agility and Ergonomics Aspects in Network Organizations, 123-223.

USBR (US Business Roundtable), Statement on the Purpose of a Corporation, August 2019. Available online: https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans.

Włodarkiewicz-Klimek, H. 2016. Agility of Knowledge-Based Organizations. In: Schlick, C., Trzcieliński, S. (eds). Advances in Ergonomics of Manufacturing: Managing the Enterprise of the Future, Proceedings of the AHFE 2016 International Conference on Human Aspects of Advanced Manufacturing, July 27-31, Walt Disney World®, Florida, USA, 375-384.