

OBJECTIVES AND EFFECTS OF INNOVATIVE ACTIVITIES OF ENTERPRISES – A THEORETICAL AND EMPIRICAL APPROACH IN THE CONTEXT OF THE COVID-19 PANDEMIC

Danuta ROJEK

Warsaw University of Technology, Faculty of Management; Danuta.Rojek@pw.edu.pl,
ORCID: 0000-0002-7390-9341

Purpose: The purpose of the study is to present the objectives and potential effects of innovative activities of enterprises - in qualitative and quantitative terms, as well as to analyze and evaluate selected effects of innovative activities of small, medium-sized, and large enterprises in Poland in the years 2018-2021, including - in the critical year 2020.

Design/methodology/approach: A thesis was formulated, assuming that the COVID-19 pandemic became a catalyst for a short-term increase in the effects of innovative activities in the population of small, medium-sized, and large enterprises in Poland, as measured by the share of enterprises that introduced at least one innovation. The author's considerations are based on literature studies and a review of the results of selected secondary research. The basic research method is desk research (analysis of existing data).

Findings: The author presented the objectives and effects of innovative activities in qualitative and quantitative terms. Analysis of the results of selected existing studies allowed the author to confirm the thesis.

Research limitations/ implications: The limitation of the study is the exclusion of micro-enterprises. Further research should also address the effects of innovative activities of this group of companies.

Practical implications: Research results lead to recommendations for managers. Innovative activities should not be undertaken incidentally, but systematically. This requires the adoption of a strategic approach in the pursuit of innovative maturity of enterprises.

Social implications: The inclusion of recommendations by leaders/managers should have a positive impact on the effects of innovative activities of enterprises.

Originality/value: The results of analysis have cognitive value for the development of knowledge in the studied area. Strategic management factors were recommended to managers striving to achieve innovative maturity of enterprises. The author pointed out the advisability of further research in this area.

Keywords: innovation, innovative activity, objectives and effects of innovative activities of enterprises, COVID-19 pandemic.

Category of the paper: general review; research paper.

1. Introduction

The innovativeness of the Polish economy has been assessed as relatively low for many years. Poland belongs to the group of so-called “emerging innovators”, ranking fourth from the bottom among the 27 European countries (European Commission, 2022). Within a set of factors taken into account when assessing the innovativeness of economies, significant importance is assigned to the level of innovativeness of enterprises. Innovativeness, as the ability to seek, generate and implement innovations, as well as to absorb them, is a recognized factor in the competitiveness of enterprises and economies (Dachs et al., 2017; Gundolf et al., 2019).

The innovative activity of enterprises is the subject of systematic research, and in recent years it has become a particularly interesting area of research interest, due to the conditions that occurred as a result of the COVID-19 pandemic.

The pandemic, which began in 2020, caused numerous problems and losses in many areas of life. It paralyzed the national and global economy and significantly influenced the functioning of enterprises, forcing companies to undertake activities enabling adaptation to new conditions (Danielak, 2021; Diekhof et al., 2021). Researchers emphasize that the COVID-19 pandemic forced many organizations to introduce innovations by changing the purpose of their business activity, changing the product offer, or introducing materials preventing the spread of the virus (Wojnicka-Sycz et al., 2022).

The purpose of this study is to present examples of objectives and effects of innovative activities of enterprises - in qualitative and quantitative terms, as well as to identify, analyze and evaluate selected effects of innovative activities of small, medium-sized, and large enterprises in Poland in the years 2018-2021, including - in the critical year 2020. The research problem focuses on the question of whether the unexpected external event, i.e., the COVID-19 pandemic, had a positive impact on selected effects of innovative activities of enterprises. A thesis was formulated, assuming that the COVID-19 pandemic became a catalyst for a short-term increase in certain effects of innovative activities in the population of small, medium-sized, and large enterprises in Poland, as measured by the share of enterprises that introduced at least one innovation.

The author's considerations are based on literature studies and a review of the results of selected secondary research. The basic research method used in the study is desk research (analysis of existing data). The analysis is aimed at confirming the thesis.

In the conclusion of the study the author presents her own approach to the problem, leading to recommendations for managers interested in the survival and growth of their enterprises in the contemporary economy. Recommendations for further research and analyses are also included.

2. Innovation. Innovative activities of enterprises

J.A. Schumpeter introduced the concept of innovation to economic studies and defined it as new combinations of factors of production, including the introduction into practice of a new solution – in terms of products, production methods, markets, sources of raw materials or semi-finished products, organization of production (1960). Innovation – in a narrow sense – was understood by the creator of this concept as a novelty for the market, in contrast to imitation.

Today, innovation can also be defined in a broad sense. For example, according to the *Oslo Manual 2018* – a business innovation is a new or improved product (product or service) or business process (or combination thereof) that differs significantly from previous products or business processes, and that has been placed on the market or brought into use by an enterprise (OECD/Eurostat, 2018).

Innovative activities include all activities of a developmental, financial, and commercial nature undertaken by an enterprise, the intended purpose of which is innovation. Some of these activities are of innovative nature, while others are not novel, but are necessary for the implementation of innovation. Innovative activities also include research and development (R&D) activities that are not directly related to the creation of a specific innovation (Statistics Poland, 2020). In research conducted in Poland, a distinction is currently made – on the basis of the *Oslo Manual 2018* – between product innovation and business process innovation. Business processes include all the basic activities of a company related to the manufacture of products and all activities of ancillary and supportive nature. Innovations in business processes include the following functional categories: manufacture of products and provision of services, distribution and logistics, marketing and sales, information and communication systems, administration, and management (Statistics Poland, 2023). Product and business process innovations do not have to be new to the market in which the enterprise operates, but they must be new at least to the enterprise itself. This approach is adopted by Statistics Poland (i.e. the Polish Central Statistical Office) in the conducted research, the results of which are published, among others, in the reports from the series *Innovation activities of enterprises*.

The development of an enterprise based on innovation requires the undertaking and effective implementation of innovative processes. In a simplified form – an innovative process includes the following stages: search; selection; implementation and discounting (of the benefits of innovation) (Tidd, Bessant, 2013). Innovative processes evolve, from linear process models through interactive models, all the way to the *Open Innovation* model – including centripetal, centrifugal, and mixed processes (Gassmann, Enkel, 2004). Making rational decisions concerning the selection of innovative ideas involves activity in the scope of utilizing internal and external sources of innovation (Rojek, 2021). The efforts of researchers have resulted in the development of classifications of the sources of innovative ideas and solutions.

However, in general terms - a source of innovation is “everything that inspires a person to the process of change” (Pomykalski, 2001, p. 34), thus becoming an impulse for change. In light of the adopted objective of the study, it’s worth emphasizing that P.F. Drucker mentions “an unexpected external event” among the impulses for innovation (Figure 1).

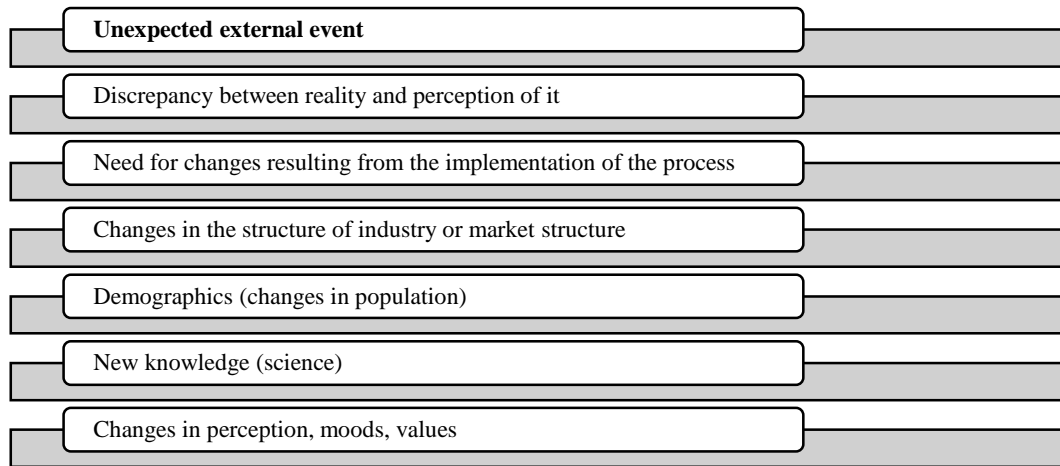


Figure 1. Impulses for innovation.

Source: own compilation on the basis of: Drucker, 2002.

Other authors also list among the sources of discontinuation “events that no one could have foreseen” or “unimaginable events, and thus ones for which it was impossible to prepare, and which – sometimes fundamentally – change the world and redefine the rules of the game” (Tidd, Bessant, 2013, p. 66). According to the cited researchers, a significant breach of the existing framework, or a change in the rules, often implies new approaches and innovative solutions.

The COVID-19 pandemic was a phenomenon that can be categorized as the so-called black swan, a phenomenon at the third level of uncertainty - the occurrence of which cannot be fully predicted; it affected the performance of all management functions, such as planning, organizing, personnel management, leading and controlling (Wolniak, 2022). Difficulties in running a business caused by the COVID-19 pandemic forced enterprises to look for innovative solutions. Research conducted PAIR (Partnership for Australia-Indonesia Research) stated that with the COVID-19 pandemic, companies are increasingly aware of an opportunity in a crisis and adapt to the events that occur by innovating (Sudjatmoko et al., 2023). Examples include collaborating interorganizationally (Haneberg, 2021), business model innovation (Seetharaman, 2020), and to accelerate digitization (Barnes, 2020).

3. Objectives and effects of innovative activities of enterprises

The objectives of innovative activities of enterprises – if achieved – may constitute the effects of this activity. The observed effects may also be unintended, different than the objectives set, which can be demonstrated as a result a carried assessment of the effects of innovation implementation. The objectives and effects of the activity can be formulated both in qualitative and quantitative terms – using the adopted indicators.

3.1. Objectives and effects of innovative activities of enterprises – in qualitative terms

Examples of objectives of the innovative activities of enterprises, in qualitative terms, relate both to the enterprise's interior and to the external environment, including the protection of the environment (Table 1).

Table 1.

Objectives of innovative activities of enterprises

AREA: Markets for the company's products
Upgrading of products (goods or services). Expansion of the product range.
Creation of new markets. Entry into new markets.
Adaptation of existing products to new markets.
Increasing or maintaining market share.
Increase in reputation, brand awareness, or visibility of goods or services.
Compliance with market regulations. Adoption of standards and accreditation.
AREA: Production and delivery
Upgrading of outdated process technologies or methods.
Improvement in product quality .
Improved flexibility for producing goods or services.
Increased speed of producing goods.
Reduction of labor costs per unit of output.
Reduction of material and energy costs or operating costs per unit of output.
Reduced time to market.
AREA: Organization of the enterprise's operation
Improved capabilities for absorbing, processing, and analyzing knowledge.
Improved sharing or transfer of knowledge with other organizations.
Improved efficiency or function of the enterprise's value chain.
Improved communication within the company.
Improvement or development of new relationships with external entities.
Increase in the resilience of enterprises and their adaptability to change.
Improvement in the working conditions, health, or safety of the firm's personnel.
Implementation of a new business model.
Contribution to the development of standards.
AREA: Economy, society, or environment
Reduction of negative environmental impact.
Delivery of Environmental Benefits.
Improvement of public health, safety, or defense.
Improvement in the scope of social inclusion. Improvement in the scope of gender equality.
Improvement in the quality of life or well-being.
Compliance with mandatory regulations Compliance with voluntary standards.

Source: own compilation on the basis of: OECD/Eurostat, 2018.

The following are selected results of existing surveys carried out in Poland, indicating the effects of innovative activities of enterprises in qualitative terms. For example, the results of surveys conducted among 442 industrial enterprises in the years 2009-2012 (Dzikowski, 2013) show that the most often achieved effects of innovative activities include: an increase in production range and an improvement in product quality (63% of indications). Other significant effects indicated include: increase in production capacity (32% of indications), entry into new markets (22.4% of indications) and reduction in unit labor costs (21% of indications).

In turn, the results of innovative activities indicated in 2021 in a study covering 1488 innovative enterprises, are presented in Table 2.

Table 2.

Effects of innovative activities mentioned by enterprises (N = 1488)

EFFECT	SHARE OF INDICATIONS Strongly agree or Agree (%)
Overall development of the company	90.8
Improvement in the quality of services and products	83.6
Increased work efficiency	83.4
Improved work organization and working conditions	75.3
Improved quality of customer service	71.1
Increase in sales	69.6
Increasing market share	66.0
Better adaptation to customer requirements	63.5
Reducing the costs	05.3

Source: own compilation on the basis of: PARP, 2022.

It should be noted that among the objectives and effects of innovative activities – based on the results of selected studies – the improvement of product quality was considered as an important effect.

3.2. Objectives and effects of innovative activities of enterprises – in quantitative terms

Both the objectives and the effects of the innovative activities of enterprises - in quantitative terms - can be determined by means of indicators, i.e. measures that enable comparative analysis and diagnosis of the existing state.

In the literature on the subject, we encounter various measures of the effects of innovative activities of enterprises that are used in scientific research or proposed by the authors for use. These indicators are also used in the assessment of the innovativeness of enterprises, alongside other indicators, such as expenditure on innovation. Selected indicators of the effects of innovative activities of enterprises are presented in Table 3.

The number of innovations implemented in an enterprise during the assumed period is a frequently used way of measuring the effects of innovative activities of enterprises. To this end the studies consider the introduction of at least one innovation over a three-year period (OECD/Eurostat, 2018), or the introduction of two or, for example, three innovations over a five-year period (Bhaskaran, 2006). The measures of intellectual property refer to the number

of inventions for which patent applications were filed, the number of obtained patents, industrial design registration rights or protective rights for utility models. One universal measure of the effects of innovative activities of enterprises is the **percentage of sales** generated by new or significantly improved products in total sales.

Table 3.

Selected metrics of the effects of innovative activities of enterprises (review of selected items in the literature)

INDICATOR	SOURCE
Indicators (measures) of intellectual property	M. Pichlak (2012)
Number of innovations implemented within the assumed period	
Rate of return on research and development (R&D) expenditures	
Number of innovations adapted within the assumed period	
The value of sales of new or significantly improved products within the assumed period	
The value of sales of implemented innovations in relation to previous years	L. Białoń (2010)
Value of profits obtained from the sales of product innovations	
Level of savings resulting from process innovations	
Increase in the share of sales on domestic and foreign markets	
Number of patent applications or obtained patents.	
Number of innovations implemented within a three-year period	OECD/Eurostat (2018)
Share of sales generated thanks to new or significantly improved products in the total sales	
Share of sales generated thanks to new or significantly improved products – new to the market – in the total sales	
Share of sales generated thanks to new or significantly improved products – new to the company – in the total sales	
Measures of Intellectual Property	
Percentage of employees directly affected by business process innovation during the observation period	
Customer Satisfaction Indicator (share of customers who are usually satisfied with the product or service)	

Source: own compilation on the basis of: Pichlak, 2012; Białoń, 2010; OECD/Eurostat, 2018.

It should be noted that in the literature of the subject there are attempts to develop an aggregated indicator of the effects of innovative activities of enterprises, which would take into account selected measures of effects in this area. For example, selected researchers adopted as key measures of effects the indicators presented in Table 4.

Table 4.

Metrics of the effects of innovative activities of enterprises (key metrics - according to researchers)

INDICATOR	SOURCE
Number of new product categories introduced in the reported year	A.V. Trachuk, N.V. Linder
Number of patents and other intangible assets based on the results of R&D work received in the reporting period and the previous two years	
Economic effects of R&D work and innovation	
Percentage of employees trained in the area of innovation	
Volume of financing of innovative projects, including R&D works, with own funds, as a percentage of the company's revenues for services	

Source: own compilation on the basis of: Trachuk, Linder, 2019.

Research on the innovative activities of enterprises in Poland conducted by Statistics Poland utilizes measures of effects considered to be the most important among those recommended in the Oslo Manual 2018 (OECD and Eurostat, 2018).

The indicators for measuring the effects of innovative activities presented above can be used both as part of an individual assessment of a single enterprise and in relation to a selected population of enterprises.

3. Selected effects of innovative activities of enterprises in Poland in 2018-2021 – In light of the research carried out by Statistics Poland

The chapter focuses on the analysis of existing data in order to confirm the formulated thesis. The author used selected results of surveys conducted by Statistics Poland on small, medium-sized, and large enterprises operating in Poland in the period 2018-2021.

In these studies, it was assumed, that an “innovative enterprise” is one which introduced at least one product innovation or business process innovation within the studied period. Selected effects of innovative activities of enterprises, determined with the use of selected indicators, and related to small, medium-sized, and large enterprises in Poland, are presented in Table 5.

The pace of changes between the years 2019 and 2018 indicates a decrease in the studied shares of innovative industrial and service enterprises in the overall enterprise population. On the other hand, a comparison between 2020 and 2019 shows a clear increase in the share of innovative enterprises in the total number of enterprises, both in the case of industrial enterprises (+12.5 p.p.) and services-sector enterprises (+18.9 p.p.). In 2020 innovative enterprises accounted for nearly one third of each of the surveyed groups of enterprises. An increase is also observed in the total number of enterprises (both industrial and services-sector enterprises) – in terms of new or improved products; in the total number of enterprises – in terms of new products or products improved for the market; in the total number of industrial enterprises – in terms of new or improved business processes.

The highest growth was recorded in the latter case. Meanwhile, a comparison between 2021 and 2020 shows a decrease in each of the above indicators.

The results of the Central Statistical Office surveys, analyzed in the study, enable the confirmation of the thesis assuming that the COVID-19 pandemic became a catalyst for a short-term increase in the effects of innovative activities in the population of small, medium-sized, and large enterprises in Poland, as measured by the share of enterprises that introduced at least one innovation. Due to the decrease in the surveyed shares of innovative enterprises in 2021, the growth observed in 2020 can be considered significant, but short-lived.

Table 5.

Selected effects of the innovative activities of small, medium-sized, and large industrial and services-sector enterprises in Poland in the years 2018-2021

SPECIFICATION	2018	2019	CHANGE 2019/2018	2020	CHANGE 2020/2019	2021	CHANGE 2021/2020
	%	%	pp.	%	pp.	%	pp.
Industrial companies							
Share of innovative enterprises in the total number of industrial enterprises	24.0	18.9	- 6.1	31.4	+ 12,5	22.0	- 9.4
Share of innovative enterprises in the total number of industrial enterprises – new or improved products	16.8	13.6	- 3.2	18.4	+ 4,8	13.1	- 5.3
Share of innovative enterprises in the total number of industrial enterprises – new products or products improved for the market	7.5	6.1	- 1.4	7.8	+ 1,7	6.0	- 1.8
Share of innovative enterprises in the total number of industrial enterprises – new or improved business processes	19.9	15.3	- 4.5	26.3	+ 11.0	18.00	- 8.3
Services-sector companies							
Share of innovative enterprises in the total number of services-sector enterprises	19.6	11.9	-7.7	30.8	+ 18,9	19.7	- 11.1
Share of innovative enterprises in the total number of services-sector enterprises – new or improved products	9.6	6.3	- 3.3	12.1	+ 5,8	6.8	- 5.3
Share of innovative enterprises in the total number of services-sector enterprises – new products or products improved for the market	4.2	2.8	-1.4	4.4	+ 1.6	3.2	-1.2
Share of innovative enterprises in the total number of services-sector enterprises – new or improved business processes	17.5	10.3	- 7.2	27.6	+ 17,3	18.1	- 9.5

Source: own compilation on the basis of: Statistics Poland, Bank Danych Lokalnych [Local Data Bank]; Statistics Poland, 2020; Statistics Poland, 2021; Statistics Poland, 2022.

The limitation of the study is the exclusion of micro-enterprises.

Conclusions

The examples of the objectives and observed effects of innovative activities of enterprises, presented in the article in qualitative and quantitative terms, point to the complexity and multidimensionality of this phenomenon. On the other hand, the examples presented show the suitability of these objectives and effects for the purpose of analysis and diagnosis of innovative

activities - both as part of an individual assessment of a single enterprise and in relation to a selected population of enterprises.

In the empirical part, as a result of analysis of the existing data the author confirmed the formulated thesis assuming that the COVID-19 pandemic became a catalyst for a short-term increase in selected effects of innovative activities in the population of small, medium-sized, and large enterprises in Poland, as measured by the share of enterprises that introduced at least one innovation. The COVID-19 pandemic – as an unexpected external event – affected the process of undertaking of innovative activities resulting in the implementation of innovations in 2020 by a larger number of enterprises than in the previous year. The considerations lead to a confirmation of a clear, albeit short-lived effect (as the shares of innovative enterprises are already lower in 2021).

Intentional innovative activity by enterprises is always desirable, but it's not enough for it to be undertaken on a small scale and incidentally. An enterprise that has demonstrated effects in the form of innovation in products or business processes should not give up on the adopted direction leading to innovation-based development.

It is therefore important to strive to achieve so-called **innovation maturity**. M. Romanowska indicates that innovatively mature enterprises conduct multilateral, systematic activities focused on many aspects of the company's operation, and innovative activities are an important element of their development and competition strategies and an important factor of financial success (2016).

According to her, in conditions of constant change in the company's environment, it is particularly worthy for modern managers to take up the above challenge. Innovation management requires a strategic approach, including the search for strategic factors of innovation as those that have the most significant positive impact on the ability to create and implement innovations, and thus on the results of innovative activities of enterprises. In light of the results of the author's own research – strategic factors in the area of management concern, on the one hand, managerial competences of the executives in the implementation of a development strategy based on innovation, as well as the effective use of workers' key competences, motivating and inspiring to seek new solutions, building relationships based on trust. On the other hand, these factors are related to the openness of innovation processes, based on the *Open Innovation* model (Rojek, 2022).

Contemporary circumstances for the development of enterprises in conditions of a changing environment, inspire further research efforts to identify strategic factors that positively affect the ability to create and implement innovations, leading to increases in the effects of innovative activities and increases in the level of innovative maturity of enterprises. Further research should also address the effects of innovation activities of micro-enterprises.

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