DETERMINANTS OF INNOVATIVE POTENTIAL OF SMEs IN THE PERIOD OF THE COVID-19 PANDEMIC

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Purpose: The objective of the paper is to assess the degree of influence of determinants from the environment and the internal environment of SMEs on the growth of their innovation potential (IP) and to verify the moderating effect of the cooperation with external actors and financial condition on the relationship between the influence of external and internal determinants on the innovation potential of the investigated enterprises during the COVID-19 pandemic.

Design/methodology/approach: To achieve the paper's objective regression analysis has been applied.

Findings: The paper presents the results of empirical research conducted among Polish SMEs during the pandemic period in 2021. The results reveal that financial condition constitutes a significant moderator of the relationship between determinants coming from the company's environment and their level of SME innovation potential. Furthermore, it has been demonstrated that cooperation with entities responsible for helping to implement innovation significantly moderates the relationship between the influence of determinants coming from the internal environment of SMEs and their innovation potential. It has been also found, on the basis of a multivariate regression model, that among external determinants the strongest predictors of IP growth were socio-cultural and demographic factors, and among internal determinants: the quality management sphere and the financial sphere of the surveyed SMEs.

Research limitations/implications: The main limitation of the conducted research is the impact of the pandemic conditions and also the location of the investigated SMEs in the region of the Lower Silesian Voivodship.

Practical implications: The paper provides practical knowledge regarding the determinants of acting in the conditions related to a pandemic crisis.

Originality/value: The paper provides new knowledge, analyses the external conditions and the internal environment of SMEs during the COVID-19 pandemic in the region, which is known as one of the most innovative in Poland. The research is addressed to research scholars, business pretensioners and policy makers of innovative policy.

Keywords: innovation potential, measurement, enterprise, SME sector.

Category of the paper: research paper.

1. Introduction

Innovativeness represents one of the most important challenges for enterprises operating in a competitive economy, and the SME sector is the main driving force of the Polish economy (Lachiewcz, Matejun, 2012). Not only do SMEs constitute a significant part of Poland's GDP (PARP, 2022) but they also employ the largest number of employees and largely determine the innovativeness, modernity and position of many world economies (Aga et al., 2015). Therefore, a key challenge for researchers is to measure the innovation potential for the SME sector. In addition, the discussion on innovation measurement methods is ongoing among management practitioners with regard to the tools for measuring and evaluating innovation capability and the effectiveness of innovation processes taking place in firms (Prahalad, Krishnan, 2010). Moreover, during the pandemic period, there were changes in SME business models as a result of responses to current needs and changes in conditions of conducting business activity, as well as limited financial resources. Unfortunately, the COVID-19 pandemic negatively affected the economic situation and conditions of conducting business especially among Polish small medium-sized enterprises (PARP, 2020). In response to the crisis caused by the COVID-19 pandemic, a number of enterprises were forced to seek innovative solutions in order to adapt to the new environment (Clauss et al., 2022). It is worth noting that analyses regarding the impact of multiple factors on an organisation's innovation capacity are complicated due to the dynamics of their change (Pertuz et al., 2018). Therefore, the assessment of innovation potential and the factors determining its growth is an important issue for researchers and entrepreneurs.

In light of the above-mentioned, the objective of the paper is to assess the strength of the impact of determinants from the outside and the inside investigated SMEs that influence IP the during the COVID-19 pandemic and to verify the influence of the moderating effect of financial condition and the cooperation of the investigated enterprises with entities responsible for helping them implement innovations.

To this end, the following research questions were formulated:
1. What is the level of innovation potential of Lower Silesian SMEs?
2. What determinants from the company's external environment have the greatest influence on the growth of innovative potential of the investigated SMEs?
3. Which determinants from the company's internal environment have the greatest impact on the growth of the innovation potential of the investigated SMEs?
4. Is there a significant moderating effect of the cooperation of the investigated companies with entities responsible for helping to implement innovation on the relationship between internal determinants and the innovative potential of the investigated SMEs?
5. Is financial condition a significant moderator of the impact of determinants from the company's external environment on the innovation potential of the investigated SMEs?

2. Innovative potential of SMEs

The literature on the subject includes various definitions of the innovation potential (IP), ranging from a very narrow view to ones where it is understood broadly. In the narrow view, innovation potential is the ability to effectively introduce innovations in the form of new products and technologies, organisational methods and marketing innovations. Potential defined in this way is shaped by its four key elements: financial potential, human potential, material potential and knowledge (Poznańska, 1998). Financial potential means predominantly the company's own financial resources and those obtained from financial and non-financial institutions operating in the company's external environment. Human potential is defined as the company's employees and their structure, as well as the skills and qualifications they possess. Material potential, on the other hand, includes the structure of the production apparatus with its flexibility, i.e. the ability to quickly adapt production to the needs of a changing market. The age and level of mechanisation and automation of the machinery stock should also be considered. The final element of IP is knowledge, within which technical knowledge and information flowing from the market are particularly important.

In a slightly different way, innovation potential is considered by Żołnierski (2005), who argues that it is determined by internal innovation potential and access to external sources of innovation. He includes the following as the internal innovative potential:

- personnel (their knowledge and experience, qualifications and skills and how they manage the available resources, information management),
- R&D (dedicated R&D units, ongoing R&D, contracted work, etc.),
- technology (computers and ICT technology, machinery and equipment, and degree of modernity of machinery and equipment).

In his opinion, external sources of innovation include mainly universities and R&D units, but also competing companies, suppliers and customers.

A different definition of IP of enterprises is provided by Białoń, according to whom it is a set of interrelated elements of the enterprise's resources, which, thanks to work, will be transformed into a new state of affairs. In such an approach, innovation potential is treated as the sum of the potential of science, technology and the economy, which are closely linked one to another. The potential of science magnifies the potential of the economy and technology and creates potential for itself. The potential of technology increases the potential of the economy and science and vice versa. Each of the components creates potential for itself and can act as a barrier to growth for all three components of potential (Bialoń, 2010).

The potential of science can be defined as the quantitative and qualitative state of scientific personnel and the experimental base for research (Malecki, 1965) or the complex of research activities and the assets of knowledge held (Spruch, 1973). Economic potential, on the other hand, is the set of elements that enable the development of the economy, science and

technology, together with the incentive systems that encourage activity (Bialoń, 2010). On the other hand, in the interaction model of Rothwell and Zegveld it is suggested that a company's innovation potential should be based on R&D, production and marketing activities. These are the basic conditions for the effectiveness of innovation activities, and thus for the development and improvement of competitiveness and efficiency of a company's activities (Rothwell, Zegveld, 1985). IP is presented differently by Haffer. It is part of an integrated model of the innovation process in a company. IP consists of a number of interrelated and interdependent elements. It is thus defined by: tangible and intangible resources of the enterprise, which constitute the basis for defining the strategy of the enterprise's innovation activities and the tools for effective implementation of this strategy; sectoral environment (customers, suppliers, competitors, cooperators); institutional environment (including the sphere of science, government, business support institutions) (Haffer, 2004). Wang and Ahmed in turn, based on the literature, describe IP in five of its dimensions. These are product innovation, market innovation, process innovation, behavioural innovation and strategic innovation. In line with the literature research, they define an organisation's IP as the overall innovative capacity of an organisation to introduce new products to market or open new markets through a combination of strategic orientation and innovative behaviour and process (Wang, Ahmed, 2004)

During the Covid-19 pandemic, the financial situation of SMEs, as well as the economies of entire countries, became very difficult. The pandemic also affected the potential for innovation, as enterprises were forced to change their business model to adapt to the new situation (Omar et al., 2020). Covid-19 had a negative impact on the economic well-being of states and businesses (Sneader, Singhal, 2020). The pandemic not only affected global health, but also threatened the structure of the global economic order. As a result, a number of economies fell into recession (OECD, 2020).

The impact of the coronavirus pandemic on the economic activities of SMEs exposed them to negative effects in the short or long term. The main obstacles were cash flow problems, business closures and employee layoffs (Wahyudi, 2014). Changes in business strategies and business conduct, as well as pressures to seek new growth opportunities, were considered key challenges to the survival of SMEs (Svatošovă, 2017). However, these changes vary depending on the types of business activity, the size of enterprises and the resources available (Cassia, Minola, 2012).

The survival of SMEs is of key importance for economic development due to their multifaceted role, so an outage in their operation harms the entire economy (Pu et al., 2021). During the pandemic, every sector of the economy was affected by crisis, the profound effects are also observed in the SME sector. In most economies, SMEs play an essential role in driving economic growth, creating jobs and opening new markets (Puriwat, Tripopsakul, 2021). In addition, the current pandemic has caused discomfort for SMEs by increasing financial

liabilities such as loan payments to financial institutions, inventory shortages and operational expenses (Le et al., 2020).

The global health crisis that started in 2020 affected all enterprises, but some of them showed resilience or discovered a new operational niche. Most SMEs in the service sector started to operate in new and previously unknown conditions (Gregurec et al., 2021). The negative impact of the pandemic had its economic, political, social and psychological consequences (Bretas, Alon, 2020), which provides a basis for further research and filling the research gap.

The COVID-19 pandemic affected the profitability and long-term viability of SMEs globally (Emejulu et al., 2020) as well as in Poland (Kliuchnikava et al., 2022). However, the new crisis situation created new opportunities for adaptive capacity and firm performance (Hadi, Supardi, 2020), reduced financial limitations (Nyanga, Zirima, 2020) and increased productivity (McGeever et al., 2020). Research shows that strategic resource support, such as technological integration, effective financial intermediation and government incentives, have been essential in enhancing the chances of survival for SMEs during the pandemic (Fitriasari, 2020), prompting the analysis of this phenomenon. While referring to the impact of technological integration on SMEs, a growing number of researchers opt for a positive relationship between technological adaptation and IP (Das et al., 2020). This means that operational efficiency enables SMEs to benefit from competitive markets. Innovative integration of financial services reduces the effects of financial redistribution and execution and enables higher levels of financial efficiency (McGuinness et al., 2018). Research indicates that technological adaptability, creative financing and government involvement are essential for SME growth (Pu et al., 2021).

In pursuit of the stated research objectives and questions and the identified research gaps, the following research hypotheses have been formulated.
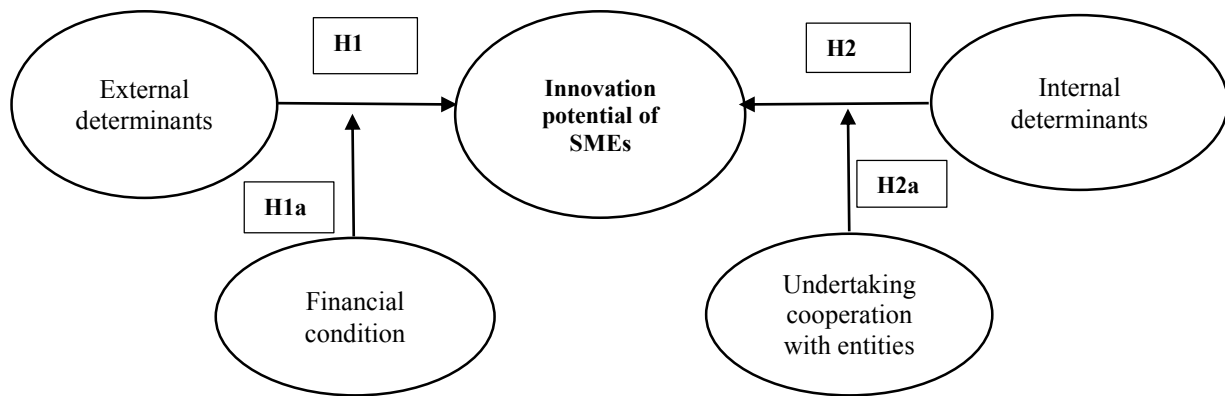
Research hypotheses:

H1: External determinants have positively influenced the increase in innovation potential of the investigated SMEs.

H2: Internal determinants have positively influenced the increase in innovation potential of the investigated SMEs.

H1a: There is a significant moderating effect of the influence of the financial condition of the investigated enterprises during the pandemic period on the relationship between the influence of environmental determinants on the innovation potential of the investigated SMEs.

H2a: There is a significant moderating effect of the impact of the cooperation of the investigated SMEs with entities responsible for helping to implement innovation on the relationship between the impact of internal determinants on the innovation potential of the investigated SMEs.

Figure 1. The research framework.

Source: Own elaboration.

3. Methods

The questionnaire survey constituting the basis for the achievement of the set objectives and verification of the hypotheses was conducted in 2021 during the COVID-19 pandemic, which had already been going on for over a year, on a sample of 150 enterprises from the Lower Silesian Voivodeship. The study used stratified random sampling, allowing stratification of the population in terms of belonging to micro, small or medium-sized enterprises. The sampling frame covered 600 enterprises. The questionnaire return percentage was 25%. The final sample structure consisted of 50 micro-, 50 small- and 50 medium-sized enterprises. The research tool was an original survey questionnaire. The questionnaires were addressed to entrepreneurs/ owners of SMEs.

One-dimensional and multivariate regression analysis was carried out in GPower (version 3.1). A significance level of $\alpha = 0.05$ was adopted. The regression analysis for IP was the main focus of the calculations - a series of one-dimensional models were made, and multivariate models were also constructed using the stepwise method. Variables having a p-value < 0.250 in the unidimensional models (Hosmer et al., 2013) (and in later analyses, interactions between individual independent variables (moderation analysis) were introduced as predictors for the multivariate models. The R^2 coefficient value has been provided to assess the models. In the regression models, the collinearity of the predictors was analysed using the VIF coefficient. The operationalisation of the research model was carried out using the different categories of variables: the dependent variable (IP as an aggregate variable) and the independent variables (external and internal determinants) and the control variables (financial condition, undertaking cooperation with entities). The dependent variable and most of the independent variables were tested on a 5-point Likert scale. The size classification of the surveyed enterprises was adopted according to the number of employees: micro (up to 9 employees),

small (10 to 49 employees) and medium (50 to 249 employees). In the study, a series of unidimensional regression analyses were conducted in which the dependent variable was IP. The predictors were all the variables for which the correlation analysis was performed and the control variables: financial condition of the company (at the break-even point and below the break-even point, above the break-even point and well above the break-even point), undertaking cooperation with entities responsible for helping to implement innovation (binary variable - '1' or '0'). As the skewness in the distributions of all quantitative variables did not exceed the range -3.00; 3.00 it was considered that this would not affect the power of the models. Most analyses were statistically significant (at the $p < 0.001$ level, unless otherwise stated). The research diagram has been shown in Figure 1, which provides a visualisation of the interaction pattern of the relationships tested.

4. Results

The quantitative evaluation (aggregated IP variable) averaged 4.11 for the IP variable and indicates a good level of IP of the investigated SMEs. Moreover, the analysis of the one-dimensional regressions presented in Table 1 demonstrates that the impact of internal determinants (analysed individually) by one unit made it possible to predict an increase in IP by 0.42 units (R&D sphere) to a maximum of 0.83 units (intangible resources sphere). An increase in the level of the *internal determinants* variable (total) made it possible to predict an increase in IP of 1.09 units (95% CI = 0.94; 1.23). The range of increase in IP level with an increase in individual external determinants by one-unit ranges from 0.43 units (political-legal determinants) to 0.64 (socio-cultural and demographic determinants).

The impact of the *external determinants* variable (total) by one unit made it possible to predict an increase in IP level by 0.73 units (95% CI = 0.61; 0.85). Other significant determinants influencing IP growth in the unidimensional models include: an assessment of the need for state support in implementing innovation (B = 0.75; 95% CI = 0.62; 0.88) and sociocultural and demographic determinants (B = 0.64; 95% CI = 0.51; 0.77).

The influence of internal determinants analysed together made it possible to predict the highest increase in IP among the studied predictors (B = 1.09; 95% CI = 0.94; 1.23), and among the determinants analysed individually, the highest increase in IP was observed for the intangible resources sphere (B = 0.83; 95% CI = 0.63; 1.02). This sphere included past experiences and contacts, the company's reputation and image, as well as technical knowledge and information flowing from the market. In addition, a high increase in IP was observed for the financial sphere (B = 0.72; 95% CI 0.57; 0.86). For all the analysed predictors, a positive effect on the IP growth of the investigated SMEs was observed. Thus, the hypothesis H1 has been confirmed.

The analysis concerning the correlation of the effect of financial condition (above the break-even point compared to condition at the break-even point and below the break-even point) allowed predicting an increase in IP of 0.98 (95% CI = 0.55; 1.41), and financial condition well above the break-even point compared to condition at the break-even point and below allowed predicting an increase in IP of 1.29 units (95% CI = 0.76; 1.81). The presented analysis shows that financial condition statistically significantly affects IP growth. The hypothesis H1a has been confirmed.

Table 1.
One-dimensional regression models for the impact of analysed variables on the growth of innovation potential

Predictor	Innovation potential		
	B	**95% CI dla B**	**p**
Internal determinants			
Production sphere	0.70	0.52; 0.87	< 0.001
Employment sphere	0.56	0.39; 0.72	< 0.001
Logistics sphere	0.48	0.35; 0.61	< 0.001
R&D sphere	0.42	0.29; 0.55	< 0.001
Organization and management sphere	0.72	0.57; 0.87	< 0.001
Quality management sphere	0.71	0.62; 0.81	< 0.001
Marketing sphere	0.63	0.48; 0.78	< 0.001
Intangible resources sphere	0.83	0.63; 1.02	< 0.001
Financial sphere	0.72	0.57; 0.86	< 0.001
Information and communication sphere	0.71	0.61; 0.81	< 0.001
External determinants			
Economic determinants	0.49	0.38; 0.60	< 0.001
Political-legal determinants	0.43	0.26; 0.59	< 0.001
Socio-cultural and demographic determinants	0.64	0.51; 0.77	< 0.001
International determinants	0.57	0.46; 0.69	< 0.001
Technical determinants	0.56	0.47; 0.66	< 0.001
Geographical determinants	0.58	0.48; 0.68	< 0.001
Sectoral determinants	0.53	0.43; 0.64	< 0.001
Total			
Internal determinants	1.09	0.94; 1.23	< 0.001
External determinants	0.73	0.61; 0.85	< 0.001
Financial condition (compared: at and below the break-even point)			
Above the break-even point	0.98	0.55; 1.41	< 0.001
Well above the break-even point	1.29	0.76; 1.81	< 0.001
Undertaking cooperation with entities (no vs. yes)	0.21	-0.10; 0.52	0.178

B – non-standard regression coefficient; 95% CI – confidence intervals 95%; p – p value for the regression model.
Source: own elaboration.

Only the variables significantly affecting the predictive power of the model remained in the multivariate model 1 (Table 2). The variables that had a p-value < 0.250 in the unidimensional models were entered as predictors in the model (except for internal and external determinants analysed together): all internal and external determinants, financial condition and undertaking cooperation with entities. Model 1 was statistically significant (p < 0.001) and explained 81% of the variance in IP (very strong effect). The following variables remained in model 1 shown in Table 2 (although not all statistically significant): production sphere (p = 0.002), organisation

and management (p = 0.023), quality management (p < 0.001), finance (p = 0.002), political and legal conditions (p = 0.056), socio-cultural and demographic (p = 0.031), international (p = 0.155), technical (p = 0.074), geographical (p = 0.002).

The multivariate regression model revealed that the strongest predictors among the external determinants influencing the increase in IP of the investigated SMEs were socio-cultural and demographic determinants (95% CI = 0.02; 0.29). On the other hand, among the internal determinants, the strongest predictors were the quality management sphere, whose increase by one unit predicted an increase in IP by 0.26 units (95% CI = 0.12; 0.40) and the financial sphere - an increase in the level of this variable by one unit allowed predicting an increase in IP by 0.21 units (95% CI = 0.08; 0.34). While analysing the introduced variables in model 1, a negative value of the beta coefficient was observed for some of the significant predictors: geographical determinants (B = -0.16; 95% CI = -0.29; -0.02) and the organisation and management sphere (B = -0.16; 95% CI = -0.29; -0.02). This means that an increase in the level of the examined variables under was associated with a decrease in IP by the value of the beta coefficient (Table 2).

Table 2.
Multivariate model 1 for innovation potential (determinants individually)

Predictor	Innovation potential		
	B	95% CI dla B	p
Production sphere	0.19	0.07; 0.30	0.002
Organization and management sphere	-0.16	-0.29; -0.02	0.023
Quality management sphere	0.26	0.12; 0.40	< 0.001
Financial sphere	0.21	0.08; 0.34	0.002
Political-legal determinants	-0.11	-0.24; < 0.01	0.056
Socio-cultural and demographic determinants	0,15	0.02; 0.29	0.031
International determinants	0.08	-0.03; 0.18	0.155
Technical determinants	0.12	-0.01; 0.24	0.074
Geographical determinants	-0.21	-0.34; -0.08	0.002

B – non-standard regression coefficient; 95% CI – confidence intervals 95%; p – p value for the predictor.

Source: own elaboration.

Although the VIF (collinearity of variables) value in the multivariate model 1 exceeded 5.00 for no predictor, some of the values were close to this limit. However, it was recognised that the relationships between the individual predictors may have distorted the results of the multivariate regression. It was decided to build multivariate models (2 and 3) that included internal and external determinants as two averaged variables.

In order to test the significance of the moderating effect (H1a and H2a), models 2 and 3 were built in which the variables internal and external determinants, financial condition and cooperation with entities responsible for helping to implement innovations were entered as well as the interactions between the investigated variables (external determinants*financial condition; internal determinants*cooperation with entities). As the different variables were analysed in detail in the earlier models, Table 4 only shows the models where the interaction effect remained significant.

The results revealed that financial condition was a significant moderator of the relation between external determinants and IP (B = -0.37; 95% CI = -0.58, -0.16; p < 0.001). A post-hoc simple slop analysis also confirmed that the relation between the two variables (external determinants, innovation potential) was significantly lower among firms with financial condition well above the break-even point than among firms with financial condition above the break-even point (p = 0.012) or on the borderline and below (p = 0.045).

In addition, it was found that undertaking cooperation with entities responsible for helping to implement innovation was a significant moderator of the relationship between internal determinants and IP (B = -0.36; 95% CI -0.67; -0.05; p = 0.026). Post-hoc analysis detected a significant difference between the strength of the relationship between these variables among the companies that undertook cooperation and those that did not. The relationship between internal determinants and IP was stronger among the companies that did not undertake cooperation with entities responsible for helping them to implement innovation (p = 0.026).

Table 4.
Multivariate regression models with moderation for innovation potential (internal and external determinants together, control variables and interactions)

Predictor	Innovation potential		
	B	95% CI dla B	p
Model 2: control variable – financial condition			
Internal determinants	0.86	0.59; 1.14	< 0.001
External determinants	0.89	0.41; 1.37	< 0.001
Financial condition	1.90	0.99; 2.80	< 0.001
External determinants*financial condition	-0.37	-0.58; -0.16	< 0.001
Model 3: control variable – cooperation with entities			
Internal determinants	1.19	1.02; 1.36	0.005
Undertaking cooperation with entities	1.63	0.25; 3.01	< 0.001
Internal determinants*undertaking cooperation with entities	-0.36	-0.67; -0.05	0.026

B – non-standard regression coefficient; 95% CI – confidence intervals 95%; p – p value for the predictor.

Source: own elaboration.

5. Discussion

The conducted research allowed confirming hypotheses H1 and H2 on the positive influence of the analysed determinants from the SME's environment and internal environment. The regression analysis has revealed that the strongest predictors among the influence of internal determinants on IP are the quality management sphere and the financial sphere, while among the external determinants socio-cultural and demographic determinants, which considered factors such as labour mobility, educational level of the population and work ethics.

While analysing socio-cultural and demographic determinants, Dambal, Chandrashekar (2010) indicate that demography is an important indicator of the IP of companies. The authors confirmed the impact of education and highly specialised staff on IP (Dambal, Chandrashekar, 2010). Coinciding with the above results is a study by Zhang et al. (2013), which confirms that higher levels of education correlated positively with the entrepreneurial orientation of SMEs, especially in terms of innovation, competitiveness and proactiveness. Completely different results were obtained in the Czech Republic, with the research finding that education has no significant impact on SME innovation (Kozubíková et al., 2015). The discrepancies in the research results prove that the impact of socio-cultural and demographic conditions on SME's IP depends on the state and socio-demographic situation, which proves the complexity of the problem of building IP.

A study was conducted in Argentina and France among SMEs to analyse the impact of internal determinants on IP. The analysis of IP was based on six criteria (creativity, new product development, human resource management, strategy, project management and knowledge management). In Argentina, creativity was identified as the most significant predictor, while knowledge management was identified as the least significant one. In Argentina, all six criteria analysed show a similar impact on IP growth (Galvez et al., 2013). Among French companies, management strategy had the most important impact on IP. The strategy consisted of an integrated strategy favouring innovation, network operation and the importance of the customer. The importance of innovation financing for IP growth was confirmed, also by the above-mentioned study, which is also confirmed by our results. Nevertheless, it was creativity that accounted for the greatest growth in IP (including the use of tools to enhance creativity, the integration of customers and suppliers into the concept development process and the organisation, compilation and management of external information). Similar research findings were obtained in England, Wales and Scotland, and IP was described in five dimensions: product, market, process, behavioural and strategic. It revealed that strategy had the greatest impact on IP growth (Wang, Ahmed, 2004). However, our research demonstrates that it is the hard elements of management like quality management and innovation financing that stimulate IP growth. The differences in IP growth in Argentina, France and Poland may stem from their geographical location (Norek, Costa, 2015). In France, a deliberate strategy focused on innovation, the Internet, the customer and innovation financing dominates. In Argentina, IP is influenced by the creativity process through customers, suppliers and tools to support creativity and external information management. However, it is worth noting that the financial potential of the company, access to external financing and the degree of computerisation, financial and accounting activities are important strategic elements for SMEs (Popa, Ciobanu, 2014). SMEs that have a favourable financial situation and credit opportunities can allocate significant resources to innovation and thus IP growth (Padilla-Ospina et al., 2021). Madrid-Guijarro et al. (2009) confirm that poor financial condition and excessive costs effectively reduce the IP of SMEs.

Wonglimpiyarat (2014) analysing IP in Thailand based on five IP criteria (organisational, process, service, product and marketing) states that organisational categories have the highest impact on IP growth. This bears a similarity to our study which is the sphere of quality management, which constitutes a key element of efficient management.

Our model shows that there is a positive moderating effect of financial condition on the relationship between IP and the impact of external determinants. The hypothesis H1a has been confirmed. Firms that are well above the break-even point tend to have substantial resources and need less assistance from the entities responsible for helping them to implement innovations to strengthen their IP (Gherghina et al., 2020). Those SMEs that possess sufficient resources tend to invest in innovative solutions, while the potential increase in profits encourages them to seek such solutions. They also tend to have staff who are able to deal with the implementation of innovations and anticipate the revenue they can bring to the company. Some of them also have their own R&D units, so they can improve their potential by looking for solutions that increase innovation. In contrast, companies with poorer financial condition and fewer resources are much more in need of external assistance, including from the state. In this case, concessions, technical assistance and financial support help to strengthen innovation potential. Such companies often do not have the staff to plan and consider innovative solutions (North, Smallbone, Vickers, 2001). In such companies, it is necessary to provide substantive assistance in selecting solutions that are appropriate for the organisation, as well as in activities related to formalities, such as filling in forms for assistance in co-financing innovation from the European Union funds. It also involves financial assistance, which is indispensable for the implementation of innovative solutions that should generate more revenue and income for companies and which will be returned to the state in the form of higher taxes after a successful innovation.

The analyses conducted confirm the hypothesis H2a that the cooperation undertaken with entities responsible for helping to implement innovation has a positive impact on the level of IP of SMEs. Enterprises that use the assistance of research centres, consulting firms or business partners are able to significantly increase their IP (Cankar, Petkovsek, 2013). They enter into cooperation with such entities, counting on expert support. These partners have specific knowledge that helps to effectively increase IP by finding the right solutions, as well as the means to implement them. Enterprises that do not use the help of innovation support centres instead use their functional and resource spheres to increase their IP. These organisations base their development on their own financial resources and staff who are able to put such solutions into practice by implementing innovations for the benefit of the enterprise.

6. Summary

The presented considerations concerning the determinants of the growth of SME innovation potential give grounds for formulating the following conclusions. The results from the conducted empirical study confirm the hypotheses that internal and external determinants have a positive impact on the growth of innovation potential. Despite the fact that the level of innovative potential of the investigated SMEs is good, effective innovative activities of enterprises in this region are required, as they are insufficient in relation to the activities in enterprises of EU countries. SMEs can be highly innovative, but actions are required from within the enterprise, whose managers must be convinced that innovation brings high returns, and from outside, in the form of incentives, facilitation and assistance in innovation activities.

The hypothesis has been confirmed stating that there is a significant moderating effect of the influence of cooperation with entities responsible for helping to implement innovation on the relationship between internal determinants and the IP of the respondents. SMEs that do not cooperate with research centres, business partners or consulting companies are forced to engage their own internal resources to increase IP. The financial expenses, the workforce and their know-how are sufficient to undertake effective innovation activities that will generate profits as well as strengthen the competitiveness of the enterprise.

Organisations whose financial condition is good base the growth of their innovation potential on their own functional and resource spheres. They have well-qualified staff who are able to pursue innovative ideas and implement them with sufficient financial resources. Companies and their managers do not need external support, instead they know that innovation can increase the company's competitiveness, knowledge, profits and also reduce overall operating costs.

In conclusion, it can be said that the issue of the impact of the determinants of IP growth is very broad and should be still analysed. The effects of external and internal determinants on IP growth examined in this paper do not exhaust the entire list of determinants. The complexity of the economy makes it impossible to identify all its components due to the different types of economic activities and the dynamically changing market situation. Therefore, new influences of the determinants of the environment and the internal environment of enterprises will have to be taken into account over time. Further research is needed to identify new factors influencing the construction of IP in order to make small and medium-sized enterprises modern innovators.

An important direction for future research is the study of environmental determinants and internal determinants, i.e. the functional and resource spheres of enterprises and the moderation with other control variables such as enterprise size, legal form.

This study also has its important limitations. An important issue is the time of the pandemic in which the study was conducted. The period of the pandemic and the uncertainty of the environment may change the impact of IP determinants, due to the adaptation of SMEs to the

current problems of the crisis and the war across Poland's eastern border. Therefore, new research will be needed, conducted the times after the crises. The dynamics of changes in the impact of determinants depends on the changing markets in which SMEs operate. Another limitation is the location of the research in one voivodship, thus, it is necessary to carry out research throughout Poland, nevertheless the Lower Silesian Voivodship, as a region of Poland, is one of the most rapidly developing in terms of innovation in the whole country (Osiadacz, Chalabala, Książek, 2019).

Innovation is a necessary condition for companies to operate on contemporary markets. Enterprises in the Lower Silesian Voivodship have a good level of innovative potential, but numerous stimuli are needed to trigger the growth of innovativeness, because at present SMEs, similarly to other Polish enterprises, are moderately innovative in comparison with organisations from other European Union countries. State aid, EU funds and other external factors are important, but the most important are internal determinants which- being functional resources shape innovative potential. SMEs are able to increasingly introduce innovations and, in this way, ensure growth in their competitiveness on the market.

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