

## INTERNATIONAL ACTIVITIES OF YOUNG TECHNOLOGY COMPANIES LOCATED IN SCIENCE AND TECHNOLOGY PARKS

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### Abstract

This article presents selected results of the research carried out in the second half of 2017 as part of a research project entitled *International business operations of companies located in science and technology parks in the Warmińsko-Mazurskie voivodeship*<sup>1</sup>. The aim of the study was to recognize the current and planned path of foreign expansion as well as to identify the main factors determining the internationalization of operations. To achieve the goal, literature studies on the subject and the conditions of internationalization of enterprises in relation to the SME group were carried out. Empirical studies were then conducted with the participation of three young, innovative enterprises located in science and technology parks in the Warmińsko-Mazurskie Voivodeship. Due to the specificity of business operations and the desire to fully understand the paths of foreign expansion, the empirical study was carried out in two stages: an interview with the questionnaire method using a questionnaire survey and personal interviews with representatives of top management of individual companies to enrich the results obtained earlier (*case study*). The results presented are for demonstration only and may not be used for generalisation. Nevertheless, they are an inspiration to undertake in-depth studies of this subject.

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## AKTYWNOŚĆ ZAGRANICZNA MŁODYCH FIRM TECHNOLOGICZNYCH ZLOKALIZOWANYCH W PARKACH NAUKOWO-TECHNOLOGICZNYCH

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Sł o w a k l u c z o w e: internacjonalizacja, młode firmy technologiczne, park naukowo-technologiczny.

### Abstrakt

W artykule zaprezentowano wybrane wyniki badania przeprowadzonego w drugiej połowie 2017 r. w ramach projektu badawczego pn. *Aktywność zagraniczna przedsiębiorstw zlokalizowanych w parkach naukowo-technologicznych w województwie warmińsko-mazurskim*<sup>2</sup>. Celem badania było rozpoznanie stosowanej obecnie i planowanej ścieżki ekspansji zagranicznej, a także identyfikacja głównych czynników determinujących umiędzynarodowienie działalności. Realizując cel, przestudiowano literaturę przedmiotu pod kątem istoty i uwarunkowań internacjonalizacji przedsiębiorstw w odniesieniu do grupy MSP. Następnie przeprowadzono badania empiryczne z udziałem trzech młodych, innowacyjnych przedsiębiorstw zlokalizowanych w parkach naukowo-technologicznych w województwie warmińsko-mazurskim. Z uwagi na specyfikę prowadzonej działalności gospodarczej oraz chęć pełnego zrozumienia realizowanych ścieżek ekspansji zagranicznej badanie empiryczne przeprowadzono w dwóch etapach: wywiadu metodą ankiety pocztowej z wykorzystaniem kwestionariusza ankietowego oraz osobistych wywiadów z przedstawicielami ścisłego kierownictwa poszczególnych firm w celu wzbogacenia uzyskanych wcześniej wyników (*case study*). Zaprezentowane wyniki mają charakter poglądowy i nie mogą służyć do uogólnień. Mogą jednak stanowić inspirację do podjęcia pogłębionych studiów z przedstawionej tematyki.

## Introduction

Until recently, the issue of international expansion of small and medium-sized enterprises (SMEs) has been rather neglected because of the restrictions they face in many areas when compared to large companies. Typical small businesses vary from large businesses not only in terms of the scale of their operations, but mostly in terms of resources they can use, governance policy they follow and the image and market position they have which has been built over the years.

However, studies of SME internationalisation reveal that despite numerous challenges and constraints of an endogenous and exogenous nature, entities in this group launch and successfully operate their businesses in international markets. It is said that SMEs are usually more flexible than large companies in responding to changes in the organisation itself and in their environment, thus

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playing an important role in ensuring economic flexibility and dynamism. Such flexibility and initiative are particularly typical of SMEs, which are strongly growth-oriented and operate in sectors where they play a prominent role as subcontractors or where they are leaders in new industries or markets (*Globalization and Small...* 1997, p. 18); in reality, small, innovative companies are somehow forced to expand to foreign markets at an early stage of business (CIEŚLIK 2011, p. 8).

The establishment of present and anticipated expansion paths as well as identification of key determinants of business internationalisation may provide valuable insights for small technology companies that plan on expanding to foreign markets. The research results may also help to formulate recommendations for managing bodies of science and technology parks on fostering businesses which plan on expanding internationally.

### **The nature of business internationalisation and conditions for it**

There are various definitions of business internationalisation<sup>3</sup>. One of the first was proposed by JOHANSON and VAHLNE (1977, p. 26) who see internationalisation as a process in which companies gradually increase their international participation. The authors believe that internationalisation is a result of a series of incremental decisions. WELCH and LUOSTARINEN (1988, p. 36) define internationalisation as a dynamic process of increasing engagement in international markets, both internally and externally. CALOF and BEAMISH (1995, p. 116) consider internationalisation to be a process of adapting business operations (e.g. strategies, structure, resources) to international environments. Such attempts to define internationalisation indicate that there are many aspects describing this process. As per the most important of them, business internationalisation (WU, ZHAO 2007, p. 185):

- is a process including many incremental decisions and strategies;
- involves various external and internal products, services or resources transferred across national borders;
- depends on a variety of business-related and environment-related determinants.

This article follows the definition of internationalisation proposed by RY-MARCZYK (2004, p. 19) who claims that internationalisation is “any type of economic activity conducted by a company abroad”<sup>4</sup>.

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<sup>3</sup> In the literature on the subject, internationalisation is interchangeable with international development. Cf. HYNES (2010, p. 87), NUMMELA, SAARENKETO (2010, p. 1).

<sup>4</sup> The author considers globalisation as a further step of business internationalisation.

In the literature on the subject, business internationalisation is illustrated statically (institutionally), as existing relations between international business partners or based on specific indicators, but also dynamically, as a process of development representing transformation into wider and more complex forms of activity in international markets and is usually presented as a model<sup>5</sup>.

In general, domestic (national) business internationalisation involves three phases: exchange, production and full internationalisation.

The first phase entails exchange through export of one's own products or import of resources, materials and other things required for production. In this phase, the company learns about the nature of international markets (i.a. geographical, cultural, political, and economic determinants) and seeks reliable business partners. In the second phase, the national company begins its production processes or other direct operations outside its home country, which makes it an international company, thus a new entity in the global economy in terms of quality. The third phase consists in business globalisation, which is manifested in the global coverage of the company's operations and in the implementation of a global strategy (KISIEL-ŁOWCZYK 1999, p. 12, BEDNARZ 2012, p. 44–45).

Domestic businesses that decide to expand abroad can undergo internationalisation in many forms. They differ from each other in terms of risk, return of investment, use of resources and the possibility to run and manage foreign operations. Each of them has specific advantages and constraints for a business (RYMARCZYK 2004, p. 28, 29, BUCKLEY 2002, p. 96–99, WAŚOWSKA 2014, p. 76).

Business internationalisation means international expansion through export, contracts (e.g. licensing, franchising) or foreign direct investments implemented on the company's own or in cooperation with another company.

It is worth noting that, in a broader sense, internationalisation may also proceed passively – by developing connections with foreign entities without expanding abroad. Signs of passive business international expansion may include, e.g. import of raw materials, use of a foreign license and participation in a domestic joint venture in cooperation with international corporations (GORYNIA 2007, p. 35, 36, RYMARCZYK 2004, p. 28, 29). The reason behind passive internationalisation is usually seeking specific resources or trying to increase performance (KOWALSKI 2015, p. 11). In addition, passive business internationalisation allows the company to gain specific knowledge and skills which the company can use in its expansion. Therefore, it is possible to go from passive internationalisation to active internationalisation (KARASZEWSKI 2004, p. 73–84, GORCZYŃSKA 2008, p. 54, 55).

Table 1 presents the conventional internationalisation path with emphasis put on active and passive forms of expansion. As the process approach suggests, forms of operation in foreign markets change over time. The model indicates that

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<sup>5</sup>The forms mentioned in phase models may be considered as more or less equivalent variants and possible differences may regard the number of phases (usually 3–5).

Table 1

## Active and passive business internationalisation

Features	Internationalisation			
	1 <sup>st</sup> phase	2 <sup>nd</sup> phase	3 <sup>rd</sup> phase	4 <sup>th</sup> phase
Contact with foreign markets	indirect, passive	direct, active	direct, active	direct, active
Place of international operations	at home	at home	at home and abroad	at home and abroad
Orientation of the company	domestic-oriented	domestic-oriented	mainly domestic-oriented	oriented towards many countries
Type of international operations	indirect export and direct import	direct export and direct import	mixed	mixed
Organisational structure	conventional	international division located in the home country	parent company – branches	structure with an international division or global structure

Source: based on KORTH (1985, p. 7).

active internationalisation begins when the company's organisational structure is transformed and a special department for international operations is established by that company, whereas the increased significance of direct import provide grounds for considering it as an active form of expansion. A company in the third phase of internationalisation may generate goods or provide services both in the home country and abroad. As the company gains experience, it becomes more and more involved in foreign markets and the benefits it achieves encourage the company to expand even further.

It has to be highlighted that, from a practical standpoint, foreign business expansion is a process that is not always is sequential with specifically defined steps and theories of international business development or of direct investments which are often inappropriate for the interpretation of internationalisation of SMEs. Company-specific factors (e.g. years of operation, size, resources, experience) and characteristics of the environment may slow down model-based progression of the company to the next phases; and going beyond the traditional patterns, companies can establish their own ways of development of their operations in foreign markets (CIEŚLIK 2011, p. 7, 8, GOLONKA 2014, p. 448, 449).

A company makes a decision on foreign expansion taking into consideration numerous aspects and reasons. Motives (stimuli) for internationalisation can be defined as internal and external determinants of a company's decision to launch, develop and sustain international business operations (KOWALSKI 2015, p. 26). In general, there are two categories of internationalisation drivers that make companies expand to international markets:

- proactive motives for internationalisation,
- reactive motives for internationalisation.

In the first case, a strategic change is triggered in a company that wants to grow, e.g. as a result of excess production capacity or of skills development and the process of foreign expansion is initiated based on reasonable grounds and in the form of decisions. In the second case, a decision of the management to go international is a response to certain external stimuli (e.g. unexpected purchase orders from foreign partners, excess production for the domestic market which can be small and saturated, incentives provided by the government) and the management attempts to adapt to the changes in the business environment as well as to face competitive pressure in order to avoid loss (WIEDERSHEIM-PAUL et al. 1978, CAVUSGIL, NEVIN 1980, ALBAUM et al. 1994, HOLLENSSEN 2007, BUCKLEY 2002, CZINKOTA 2004).

Economically, it is evident that an initial decision to expand to international markets through exports is a sum of proactive and reactive motives for internationalisation. It is also evident that the main reasons behind internationalisation of a company shift when it increases the intensity of its activity in foreign markets (WAŚOWSKA 2014, p. 57).

Nonetheless, export-related stimulus is necessary, yet insufficient, for a company to become an international entity. Business internationalisation is dependent on various factors and determinants which affect the choice of strategies, forms (instruments) and models allowing for analysing this entire process (NOGALSKI, DASZKIEWICZ 2006, p. 52). In principle, they can be divided into two main groups: external (endogenous) determinants which result from the nature of business operations and from resources the company has, and internal (exogenous) determinants related to the domestic and foreign environment that is independent and beyond control of the company (ROOT 1987, FORD, LEONIDOU 1991, MCKIERNAN 1992, SITEK 1997). In the literature on the subject, classifications of internationalisation factors (determinants) correspond to the above two-factor classification and are complemented by additional factors or in reference to particular groups of economic operators.

For instance, the classification of internationalisation determinants specific to SMEs proposed by the Organisation for Economic Cooperation and Development (*Globalization and Small...* 1997, p. 9, 35–37) includes the following:

- push factors (determinants) which force the company to consider international expansion,
- pull factors (determinants) where international sales are perceived as a potential source of higher profits,
- chance factors (determinants) related to seizing opportunities,
- entrepreneurial factors (determinants) oriented towards continuous growth and development.

It is worth noting that the factors representative of individual groups usually interact with each other, resulting in cause-and-effect relationships (WACH 2012, p. 74, MATIUSINAITE, SEKLUCKIENE 2015, p. 28); thus when making a decision to go international, the company has to take into account all of the determinants.

Concentration only on the key areas – from the point of view of a given company – disregarding other areas, may underlie wrong decisions and may result in loss (SITEK 1997, p. 76, BUCKLEY 2002, p. 99, 100). Table 2 illustrates the classification of the most important internationalisation determinants at SMEs developed on the basis of an analysis of the available empirical research results.

Since the phenomenon of internationalisation is observed in the formation of a business or from the early years of its operations (the Born Global concept), research was conducted to identify determinants of early internationalisation (OVIATTI, MCDUGAL 1995, KEEBLE et al. 1998). Such information could help develop future theories about new international projects and their global success (ZAHRA 2005, p. 20, MATIUSINAITE, SEKLIUCKIENE 2015, p. 28) as well as help formulate guidelines for SME candidates concerning business internationalisation and recommendations regarding activities aimed at fostering and supporting business operations outside the home country.

Table 2

Determinants of internationalisation in small and medium-sized enterprises

Endogenous determinants related to the entrepreneur and management	Demographic information on the entrepreneur	Age educational background
	determinants related to international exposure and experience	experience in international business knowledge of foreign markets managerial strategic orientation
Endogenous determinants related to the enterprise	core profile of the enterprise	size of the enterprise type of products R&D technological intensity
	attitude towards internationalisation	exploration of foreign markets on a regular basis engagement in international business development
Exogenous determinants	external incentives	public support external international factors external domestic factors
	external difficulties	various factors related to foreign markets, e.g. public support or political instability

Source: own analysis based on HESSELS (2007, p. 200–202).

## Methodology of research carried out and a description of respondents

This article presents selected results of a survey carried out in the second half of 2017 as part of the research project entitled *Aktywność zagraniczna przedsiębiorstw zlokalizowanych w parkach naukowo-technologicznych w województwie*



*warmińsko-mazurskim (International business operations of companies operating in science and technology parks in the Warmińsko-Mazurskie voivodeship).*

The aim of the study was to recognize:

- the current and planned path of foreign expansion,
- identification of the main factors determining the internationalization of activities.

Three companies complying with the following criteria were invited to take part in the survey (subject of research):

- the company has to be located in one of the three science and technology parks operating in the Warmińsko-Mazurskie voivodeship: Olsztyn, Elbląg, Ełk;
- the company has to be a micro-, small or medium-sized enterprise;
- the primary activity of the company has to have high innovative potential.

An empirical study, aimed at obtaining primary data, was carried out using a research tool, which was a questionnaire survey. At the beginning, the correctness of the research tool was verified. After taking into account the opinions of the scientific environment and consultations with the Head of the Science and Technology Park in Olsztyn, the final version of the questionnaire survey was developed and used in the empirical research.

Due to the specificity of business operations and the desire to fully understand the paths of foreign expansion, the empirical research was carried out in two stages. The first stage of the study consisted in conducting an interview using the questionnaire method using the research tool. In the second stage of the study, personal interviews were conducted with representatives of the top management of individual companies in order to enrich the results obtained earlier and a more comprehensive understanding of their individual paths of international expansion (*case study* – BRYCZ, DUDRYCZ 2010).

To ensure the anonymity of the respondents, their business names are not disclosed. The results presented are for demonstration only and may not be used for generalisation. Nevertheless, they are an inspiration to undertake in-depth studies of this subject.

The companies participating in the research are so-called *small businesses*, including one medium-sized and two micro-enterprises. They are young companies that have been operating in the science and technology park for one to four years. In addition, only one of them has conducted an economic activity in the past.

The primary activities that the respondents are engaged in are related exclusively to production or provision of services, whereas according to the Polish Classification of Business Activities (PKD), they belong to the medium-high-technology production industry or render technologically advanced knowledge-oriented services characterised by high innovative potential (cf. *List of industries in the field...* 1995).

It is good that all of the companies implemented process innovations which resulted in improving the production or delivery process (material changes



in technology, equipment and/or software). Two companies also implemented a product innovation which should be understood as a new or improved product (commodity or service). It is noteworthy that the solutions developed and implemented are environmentally friendly. Two of the companies have already begun commercialising the research results. All of the companies applied for a patent to protect their innovations being developed or already implemented; they also employed other forms of protection, including formal procedures (registration of utility models or trademarks). In addition, all of them commenced to collaborate with other entities to improve their innovativeness. They established lasting relationships with technology institutions (national universities, business incubators) as well as with vendors and suppliers at home and abroad.

A description of the respondents presented in Tables 3 and 4 indicates that they are the companies referred to in the literature as young technology companies which have been operating in the market for no longer than 5–8 years and usually have limited financial resources and property as well as little experience in conducting an economic activity. The innovative nature of this group of companies can manifest itself by operating in hi-tech sectors or of having an advantage at least at a national level (CIEŚLIK 2011, p. 7).

Table 3

Description of the companies participating in the questionnaire survey

Feature	Company A	Company B	Company C
Primary business activity	services	production	services
Technological advancement	technologically advanced knowledge-oriented services	medium-high technology	technologically advanced knowledge-oriented services
Status	micro-enterprise	medium-sized enterprise	micro-enterprise
Year of establishment of operations in the science and technology park	2013	2013	2017
Economic activity	new	continued	new
Implementation of an innovation during the operation of the company in the science and technology park	yes	yes	yes
Type of the innovation implemented during the operation of the company in the science and technology park	process innovation	product innovation and process innovation	product innovation and process innovation

Source: own research.

## Research results

Research shows that two companies participating in the study have already begun to expand to foreign markets and the third company, the youngest one, is preparing for business internationalisation. All of them have expanded to selected Member States of the EU. The main driver of business internationalisation was a desire to achieve higher profits (proactive motive) and when it comes to Companies *B* and *C*, also to gain a significant technological advantage over foreign competition (proactive motive) and spontaneous international purchase orders (reactive motive).

Studies suggest that the key determinants of expanding a business to foreign markets are both external and internal, though it turned out that the most important of them are the present and prospective potential of a given foreign market, barriers to entry and the way of establishing business relations (Fig. 1).

The respondents admit that their decisions to go international were preceded by a number of preparatory activities, particularly by identification of the company's objectives in terms of internationalisation and by a comprehensive analysis of the market. Business internationalisation involved the necessity to design a new business model or modify an existing one, taking into account

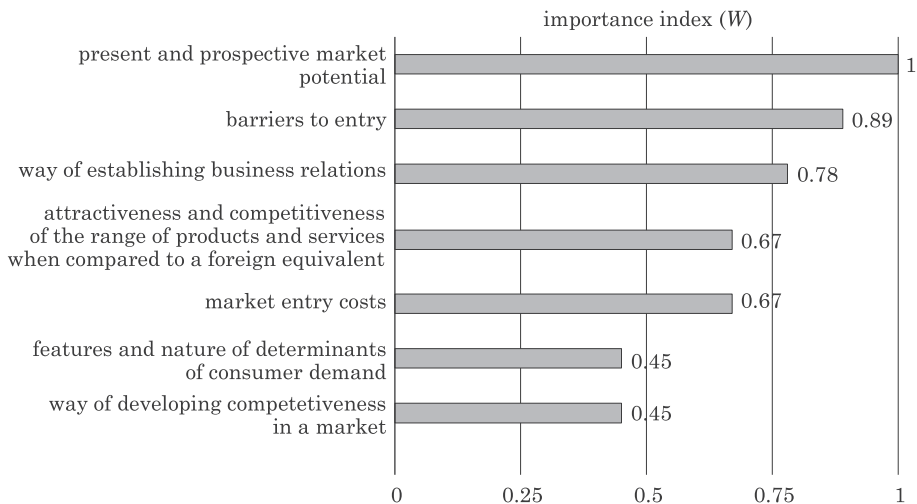


Fig. 1. Core determinants of business internationalisation according to the respondents  
 Explanation: the importance (influence) index (in Polish: wskaźnik ważności  $W$ ) of the determinants of internationalisation of the businesses participating in the study was calculated as a weighted arithmetic mean as per the following: 3 – very important, 2 – important, 1 – neutral, 0 – insignificant. The importance (influence) index is a number between 0 and 1, whereas: index  $W=0$  – insignificant determinant;  $0 < W \leq 0.5$  – neutral determinant;  $0.51 \leq W < 1$  – important determinant;  $W=1$  – very important determinant. The index corresponds to the idea proposed by KARASZEWSKI and SUDOŁ (1997, p. 17, 18)

Source: own analysis.

the nature of a selected foreign market. In order to better communicate with foreign customers, the companies also launched their websites in English and German.

Since each of the companies has different business profiles, they follow different paths of international expansion. In the first case, the company employs a non-capital form of expansion that entails subcontracting for the benefit of a foreign partner. In the second case, the company employs a form of expansion based on international trade, which is import (passive internationalisation) and direct export (active internationalisation). What is more, the company actively takes part in such international industry events as fairs and symposia.

Both companies perceive internationalisation as a learning process and declare a willingness to gain experience and increase their engagement in international business operations in the next three years. Company *B* additionally plans on establishing R&D cooperation with foreign partners.

On the other hand, Company *C* – due to a relatively short time in business – currently focuses on the domestic market, although it carried out certain preparatory activities for international expansion. By 2020, the company intends to go international with active forms of expansion (direct export and subcontracting) and to actively participate in international industry events, thus making it possible to establish business relations with foreign business partners.

Taking into consideration their competitive potential, the companies also identified their competitive position when compared to foreign competitors as

Table 4

International business operations of the companies participating in the questionnaire survey

Feature	Company A	Company B	Company C
International business operations during the operation of the company in the science and technology park	yes	yes	yes
Form of business internationalisation implemented presently	subcontracting	import and direct export	–
International business operations conducted presently	–	participation in international industry events	participation in international industry events
Form of expansion to be implemented by 2020	as above	as above	direct export and subcontracting
International business operations to be conducted by 2020	–	joint research to be conducted with a foreign partner	as above
Competitiveness when compared to international competitors	comparable	higher	higher

Source: own research.

comparable or higher. The respondents believe that the decisive factors of their position included: a range of very innovative products, marketing operations they conducted and knowledge of the foreign market (Tab. 4, Fig. 2). Even though their current position in the foreign market is as they expected, the companies are focused on the continuous development and improvement of their range of products and services addressed both to domestic customers and to international ones. The respondents unanimously claim that business internationalisation fosters the development of the company and helps improve its image in Poland and abroad.

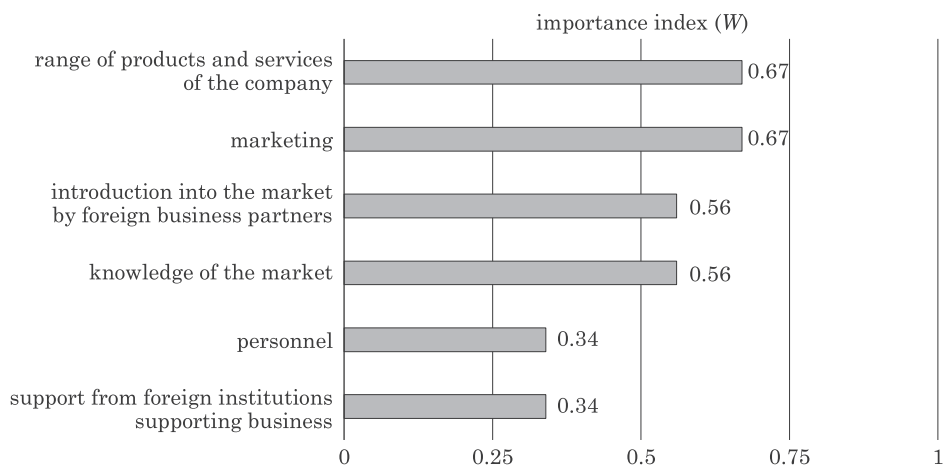


Fig. 2. Core determinants of international success according to the respondents  
Explanation: see explanation to Figure 1.

Source: own analysis.

It is worth adding that the companies had no experience in conducting international business operations and have not yet benefited from international expansion support programmes, but they would gladly use some help from experts collaborating with science and technology parks in virtually every area, though in relation to specific foreign target markets (i.e. in terms of market analysis, legal and tax advisory, opportunities of business relations with business partners, scale-up).

## Conclusions

Studies of SME internationalisation show that despite numerous challenges and constraints of endogenous and exogenous nature, entities in this group launch and successfully operate their businesses in international markets.

In reality, nowadays, young businesses with high innovative potential are somehow forced to go international right at the beginning of their operation.

The questionnaire survey conducted among the three small technology companies operating in science and technology parks in the Warmińsko-Mazurskie voivodeship proves that companies expand to foreign markets in their first years of operation.

The main motive for business internationalisation is a desire to achieve higher profits and to gain a significant technological advantage over foreign competition (proactive motives) as well as spontaneous purchase orders from abroad (reactive motive).

The key determinants to expanding a business to foreign markets are both external and internal, though the most important determinants are the present and prospective potential of a given foreign market, barriers to entry and the way of establishing business relations.

Companies approach business internationalisation with caution; the decisions of the companies under analysis were preceded by a series of preparatory activities.

Since companies generally have different business profiles, they follow different paths of international expansion and simultaneously declare a willingness to improve their engagement in international business operations in the next three years.

The companies under consideration had no experience in conducting international business operations and have not yet benefited from international expansion support programmes, but they would gladly use some help of experts collaborating with science and technology parks in virtually every area, though in relation to specific foreign target markets (i.e. in terms of market analysis, legal and tax advisory, opportunities of business relations with business partners, scale-up).

The results presented are for demonstration only and may not be used for generalisation. Nevertheless, they are an inspiration to undertake in-depth studies of this subject.

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