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Does high-tech industry matter for marketing strategy selection? Adaptation vs. standardization on the international market

Abstract: This article's objective is to present the results of our research on the selection of an international strategy (adaptation vs. standardization) of Polish firms on the international market in the area of product and promotion, depending on whether they belong to the high-tech industry or not. The research methodology applied in the article includes a critical literature review and quantitative methods using a CATI survey. This study is based on a sample of 355 internationalized businesses from Poland. A two-step approach was used in the quantitative study: 1) Student's t-test and 2) logistic regression. Research shows that Polish firms from the high-tech industry adjust their international strategy to a greater extent to the requirements of individual international markets, both in product and promotion, than firms from non-high-tech industries. This study enriches the problem of international marketing strategy with the current view of the high-tech industry. The specificity and attributes of high-tech firms shed new light on the choice of a marketing strategy. It proves that the specificity of the sector can be essential and differentiate marketing decisions. In addition, high-tech attributes allow firms to respond better to today's turbulent environment. The study can have many practical inspirations for managers, business owners, and entrepreneurs deciding on their international strategy and implementing high-tech attributes in building competitive advantage in the internationalization process.

Keywords: adaptation; high-tech; international marketing; internationalization; standardization; Poland

Received: 12 December 2022

Accepted: 5 January 2023

Suggested citation

Głodowska, A., Wach, K., Maciejewski, M. (2023). Does high-tech industry matter for marketing strategy selection? Adaptation vs. standardization on international market. *Prace Komisji Geografii Przemysłu Polskiego Towarzystwa Geograficznego* [Studies of the Industrial Geography Commission of the Polish Geographical Society], 37(1), 70–82. doi: <https://doi.org/10.24917/20801653.371.4>

INTRODUCTION

High-tech firms belong to one of the most dynamically developing industries on the international market, thus this is one of the eagerly investigated industries in international business and international entrepreneurship research (Głodowska, 2022; Freixanet, Federo, 2022). They are often associated with organizations such as born globals,

international new ventures, or high-tech start-ups (Daszkiewicz, 2019; Kowalik, Pleśniak, 2022). The specificity of this industry makes the internationalization process rapid and on an enormous scope, as these firms usually operate in many markets from the very beginning of their activity (Wach, 2016). Yin et al., (2022) prove that technology-intensive firms internationalize faster and more extensively than less technology-intensive firms. The high-tech industry has several attributes (e.g., high innovativeness, knowledge-intensiveness, high expenditure on research and development (R&D), short product life cycle, and fast innovation diffusion process), which determine its competitive advantage on the international market (Głodowska, 2019; Daszkiewicz, 2022; Wach, 2019).

Moreover, a new round of digital transformation, driven by a new generation of information technology (e.g., the Internet, Big Data, Cloud Computing, Artificial Intelligence, Blockchain, Metaverse, etc.), is pushing firms to reformulate their production, organization, management model and operating strategy, particularly on the international market (Rymarczyk, 2020; Gao et al., 2022; Sabatini et al., 2022; Wadood et al., 2022). These digital elements of internationalization have also become the basis for reorganizing the marketing strategies of many firms. Previous research confirms that recent technological advances facilitate the introduction of products to global markets (Yin et al., 2022) and consumers' behaviours (Giza, Wilk, 2021). We believe that high-tech attributes play a vital role in the internationalization of firms as a powerful instrument in the selection of an international strategy (Gao et al., 2022). By leveraging the attributes of the high-tech industry, firms can break the path of dependence on traditional operations at lower costs, expand the boundaries and scales of their operations, and penetrate the global market more efficiently.

The Covid-19 pandemic served to accelerate digitalization processes and proved that only the newest high-tech solutions make it possible to function in crisis conditions (Banaszyk et al., 2021; González-Tejero et al., 2022; Suder et al., 2022). Hashai et al., (2022): notice that the "high-tech sector is an engine of recovery from the COVID-19 crisis."

Firms from the high-tech industry face issues and dilemmas typical for all firms in the internationalization process. However, they use their high-tech attributes to face these challenges, which increases their competitive advantage. One such specific dilemma is implementing an appropriate marketing strategy on the international market. Many factors condition the selection of a marketing strategy. Solberg and Durrieu (2015) assume that the industry's structure may be important. They say that global marketing strategies are generally more effective in concentrated industries than in fragmented ones. Batraga and Puke (2015) believe that this is a highly personalized issue depending on an internationalized firm's internal and external conditions. A broad spectrum of determinants of the choice of marketing strategy is also presented by Wach (2014). The literature offers two model behaviours as for the internationalization strategy, namely standardization (global unification) and adaptation (local adjustment) strategies. Nevertheless, according to empirical studies, the third strategic model behaviour is applied the most, which is a mixed method (glocalization) (Wach, 2014). The problem is not new, as it has been researched since the 1970s, but the debate remains unresolved (Vrontis et al., 2009).

Moreover, this problem comes in totally new frameworks in the high-tech industry. Standardization and adaptation as a marketing strategy have so far been discussed in the context of traditional industries. Meanwhile, the development of high-tech novelty has opened new opportunities to standardize global marketing activities. On the other hand, thanks to the use of information and technological wonders, adaptation can lead

to a greater degree of individualization and differentiation of marketing components (Fritz, Dees, 2009; Kowalik, Pleśniak, 2022). The standardization or adaptation in this industry has excellent opportunities resulting from its specificity. High-tech attributes offer unlimited possibilities for product customization and promotion or their unification, much more significant than in other industries due to the speed and scope of possible modifications with relatively low expenditure. This assumption, however, has not been verified in previous research. Gao et al. (2022) observe that current research pays attention to the influence of digital transformation on firms' decision-making process but misses the issue of digital transformation's impact on international strategy selection. Ipsmiller et al. (2022) recently noticed the problem of corporate website strategy selection for online internationalization. In online internationalization, firms use an "active" or "default" strategy regarding the choice of the corporate website. The active strategy means the adoption to the specifics of the local market in terms of content and design. At the same time, the default internationalization website is a strategy for unifying the approach according to the home-country orientation. It is, in fact, an issue of adaptation versus standardization in digital internationalization. We are still unsure whether belonging to the high-tech industry can indicate the selection between the adaptation and standardization strategies on the international markets.

Our article attempts to fill this research gap by considering internationalized Polish firms from high-tech and non-high-tech industries. Our study aims to present the research results on the selection of an international strategy (i.e., adaptation vs. standardization) of Polish firms on the international market in the areas of product and promotion, depending on whether they belong to the high-tech industry or not. We focus on two specific components of firms' marketing strategies: product and promotion, which, as we believe, have important implications for building firms' competitive advantages in the international market. We undertake to answer three research questions:

- RQ1: Do the firms differ in their approach to choosing an international strategy depending on whether they belong to the high-tech industry or not?
- RQ2: What international strategy is applied by high-tech firms on the international market regarding the product?
- RQ3: What international strategy is applied by high-tech firms on the international market regarding promotion?

The methodology applied in the study is a literature review and its critics and the quantitative design uses a CATI survey. The article is based on a sample of 355 internationalized businesses from Poland. A two-step approach was used in the quantitative study. First, the Student's t-test was used to assess the degree of strategy differentiation depending on the area studied: a) product, b) promotion. Secondly, logistic regression was used to verify the selection between an adaptation strategy and a standardization strategy by firms from high-tech and non-high-tech industries in the areas of product and promotion.

The article is divided into typical sections. After a brief introduction, we move on to more detailed elaboration explaining the study's theoretical background and prior research. Then we describe the applied methodology, present our findings, and compare them with other studies. The article finishes with conclusions.

LITERATURE REVIEW AND PRIOR STUDIES

The adaptation-standardization dilemma determines the entirety of a firm's internationalization-related strategic activities. In this context, the standardized and adapted marketing mix is most often discussed (Powers, Loyka, 2010), meaning that the dilemma concerns in at least four aspects (4Ps): product, price, place, and promotion (but also the remaining elements related to the organization and management) (Solberg, Durrieu, 2022). The most remarkable actions in this area take place in the promotion and product dimensions, as the issues of distribution and pricing are naturally subject to local adaptation. However, by their very nature, they are subject to universal laws. Numerous factors determine the choice between adaptation and standardization. In general, firms must confront the imperative of globalization and local responsiveness. The approach of contingency supporters is also visible. These aspects are discussed and referred to in the field of international marketing, and the first empirical studies in this area concerned primarily multinational corporations.

In the literature, the degree of adaptation of the strategy to local conditions is considered a key issue that determines all other aspects of the firm's internationalization (Wach 2003b: 141–150; Wach 2003a: 71–79). The issue of standardization (global unification) and adaptation (local adjustment) is considered in the literature with two model approaches to shaping the internationalization strategy. In most cases a mixed approach is applied (glocalization, glocalizm, or hybridization). While classifying the international business strategies on foreign markets, Wiktor (2012: 28) starts their systematics from adaptation/standardization, classifying them in terms of the overall approach according to the criterion of isolating these functional strategies.

One of the major strategic actions that a firm internationalizing its products must make is the degree to which it will standardize its products for particular markets. Three basic strategies can be observed in the international market: (i) standardization strategy, (ii) adaptation strategy, and (iii) hybridization or glocalization strategy (diversification). Standardization means entering into new markets, so going international or global with unchanged products. It mainly allows the firm to reduce the unit production cost and distribution and marketing costs. In addition, standardization makes it easier to maintain the firm's image and product consistency. The adaptation strategy consists of adapting the product to the requirements of new markets. The products are mainly adapted due to cultural differences and different technical standards. Adaptation is a form of half standardization and diversification. The diversification strategy involves offering distinct products in different national markets. This strategy's main disadvantage is the high implementation cost (Theodosiou, Leonidou, 2003).

Levitt (1983) argues that our world is becoming a common market, where people, regardless of where they live, want the same products. The uniformity of lifestyles and consumer needs worldwide is the primary driver for standardization of products and globalization of promotion. Following by Boorstin, Levitt compared our epoch to "Republic of Technology," where the imperative is convergence, meaning making everything like everything else (Levitt, 1983). Requirements for certain product groups are standardized almost everywhere. Medical products (i.e., drugs and procedures) are a good example, as most diseases are similar worldwide. Considerable differences in culinary and dietary trends are also disappearing. So-called oriental dishes became widespread in America and Europe, whereas European dishes are widely available in Asia (Wach,

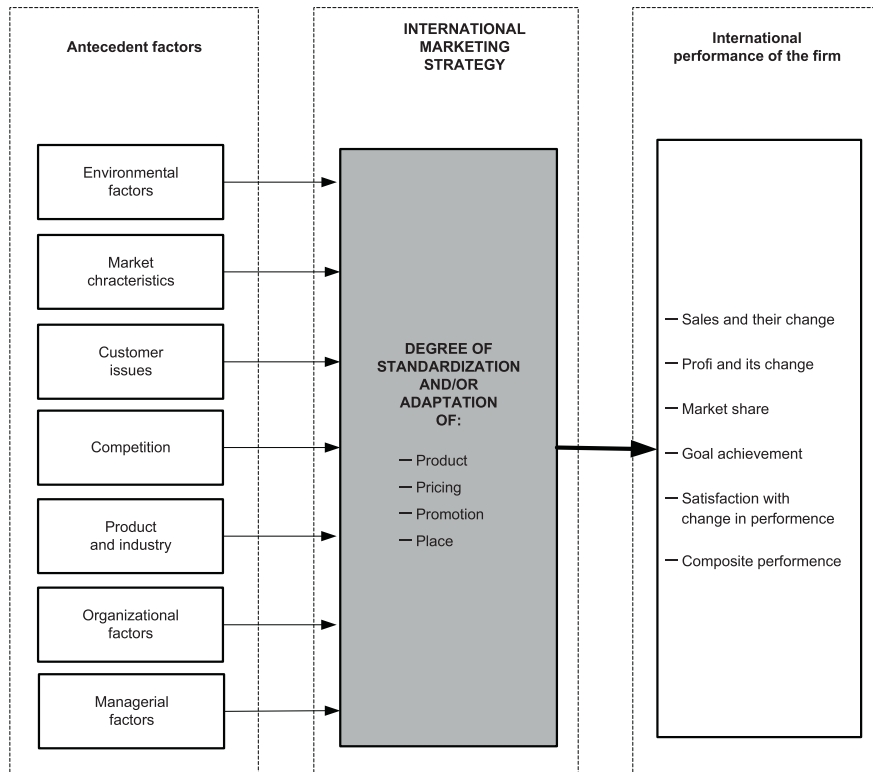
2003a). Computers are another excellent example of global standardization at a high level. Their manufacturers can easily standardize both hardware and software. However, considering language differences and metric systems, one must mention that some hardware and/or software elements should be adopted.

The number of clients interested in standardized products is increasing more and more. Many customers, traveling around the world buy chocolate as a gift or for personal enjoyment. The taste of chocolate can be easily influenced by adding local ingredients (such as macadamia nuts in Hawaii or kiwi fruits in New Zealand), and this phenomenon also attracts travelers to buy the product abroad. Travelers encounter various types of chocolate, that can set the world standards for the perception of its quality and taste. For example, the Poles prefer less sweet chocolate than Western European consumers. Therefore, foreign chocolate manufacturers are expected to adjust their products to the local taste requirements. Many firms have the experience that not every product needs to be standardized, as some product groups depend on customer tastes (Wach, 2003b). A good example is the dilemma of Polish chocolate mentioned above. Also, in some African countries, Coca-Cola needs to be less sweet and sparkling than the Coca-Cola sold in other markets (Wach, 2003b). The marketing mix's product element allows the most significant standardization strategy implementation. There are various arguments in favour of standardizing products, such as: (i) increasing product globalization, and thus the formulation of universal behaviour models in the globe; (ii) building a global image of a firm (a global company) or a product (a global product); (iii) lowering the unit costs of production. However, there are also some arguments for diversifying and thus, expanding the production line by avoiding the problems caused by cultural and linguistic differences (such as historical and ethnocentric recommendations). The brand is also one of the characteristics of a global product. It is one of the essential marketing tools. A good brand makes it easier to enter new markets and maintain the market position in a given foreign market. In some cases, it also becomes one of the firm's valuable incentives. Expansion into international markets requires deciding whether the operation will be performed under the existing brand or if there is a need to create a new brand that considers new market conditions and requirements (Wach, 2003a). Theodosiou and Leonidou (2003) stress that the international marketing strategy is the standardization and adaptation of the four elements of marketing-mix (product, price, promotion, and place) to the given environmental conditions (Figure 1).

The standardization-adaptation dilemma determines a firm's overall strategic actions related to internationalization. In this context, the standardization/adaptation marketing mix is most often discussed (Powers, Loyka, 2010), meaning that the dilemma concerns at least four aspects: product, price, place, and promotion. In this context, Keegan (1969) distinguishes five international strategies (Figure 2), which complement four conventional solutions (the two-component matrix of a product and promotion, 2x2 type) with an approach rooted in the entrepreneurship theory (now from the international entrepreneurship perspective), which is the creation of new products and value for the customer across borders.

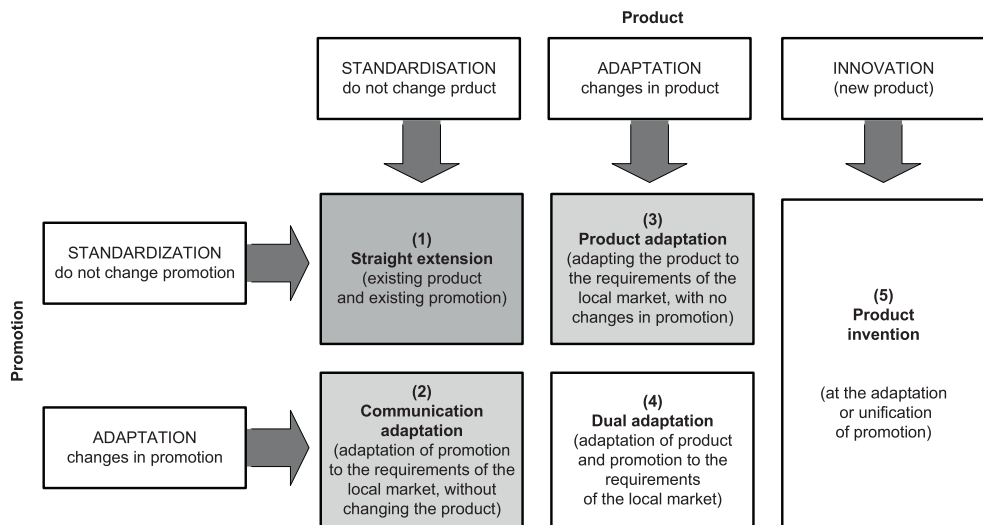
Numerous factors determine the choice between standardization and adaptation. When conceptualizing five strategic behaviours. Keegan (1969) distinguished two main determinants, namely (i) product functions and their meeting customer needs, and (ii) product use conditions. On the other hand, extended operationalization of the choice

Figure 1. International marketing strategy as the standardization and adaptation of the four elements of marketing-mix



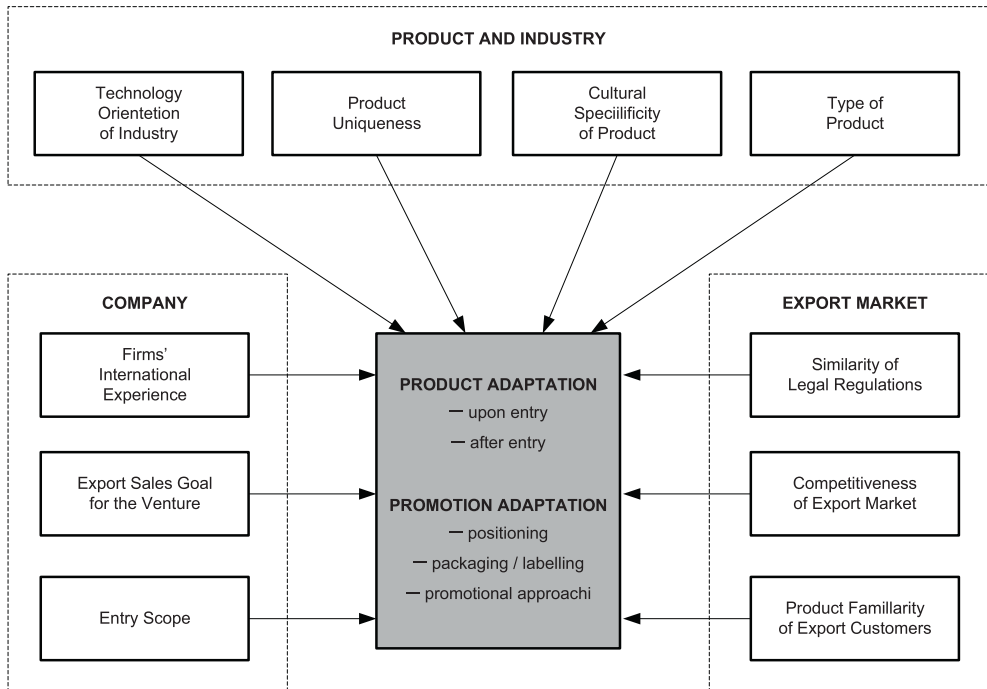
Source: adapted from (Theodosiou, Leonidou, 2003: 142)

Figure 2. Five international product-promotion strategies



Source: adapted from (Kotler et al., 2002: 242)

Figure 3. Determinants of the standardization – adaptation dilemma in the product – promotion strategy



Source: Cavusgil, Zou & Naidu (1993: 485)

is made by Cavusgil, Zou, and Naidu (1993) who isolate 10 basic decision variables, systematized in three groups (Figure 3).

The choice of a marketing strategy may depend on the industry in which the firm operates. Industrial products are more accessible to standardize than consumer products. By contrast, durable consumer products are easier to standardize than non-durable consumer products. Previous research has indicated that standardization more than adaptation in the high-tech industry (Gao et al., 2022). However, newer research is not clear-cut, as it suggests the importance of adaptation, especially in product functionality or design. Innovations are crucial in this respect. However, it is rarely mentioned in the literature on the subject. The high-tech industry is characterized by specific properties that give a wide range of marketing strategy selection in a much more advanced way compared to industries where the level of saturation with knowledge and technology is lower (Nambisan, 2017). The application of modern digital platforms, advanced operating systems, e-commerce, intelligent production systems, and digital infrastructure make high-tech firms more effective in the international market. Thanks to them, high-tech firms are more flexible and adapt more efficiently to the turbulent global environment. At the same time, high-technology is characterized by a relatively high degree of integration. This digital and technological convergence fosters intelligent, mechanized, and automated products and processes. Improving their added value and quality encourages high-tech firms to standardize their product on a global scale (Hong et al., 2022).

Gao et al. (2022), on the example of Chinese firms, analyzed the impact of digital transformation on an international strategy of the firms, but they did not relate directly

to the issue of product/promotion standardization and adaptation. Rokshit et al. (2022) suggested that the implementation of blockchain technology by SMEs from India enables them to develop their marketing capabilities in the global market. We can therefore assume that high-tech firms have greater possibilities and ability to differentiate their product and promotion strategy than non-high-tech firms. Kristiansen and Schweizer (2022) shed light on which company is affected by the dilemma of marketing strategy. It is because multinational corporations operate differently than international new ventures. It is indicated that standardization is closer to corporations than smaller firms, although it is not the rule. An adequate example of standardization of products and channels was presented by Breskovic et al. (2013), referring to electronic markets. There are many advantages to implementing these markets compared to traditional ones. In addition to being fast, simple and inexpensive, they allow users to place bids at any time and from any geographic location. It is how many IT firms operate (e.g., eBay, Amazon, Yahoo). In turn, Rao-Nicholson and Khan (2017), examining mergers and acquisitions in the international market, indicated that in high-tech sectors, the value of the target brand is likely to discourage investors from implementing a global brand management standardization strategy in favor of adaptation.

In the high-tech industry, particularly IT firms, more and more implementation of dual approach of standardization-adaptation is visible. According to Lehrer and Behnam (2009), it is based on modularity, programmability, and defragmentation of the designing and production process. It means that the complexity of the above aspects may lead to standardization strategies at certain stages of product development, e.g., if the product/production process can be broken down into modules – modularity (e.g.: aircraft, automotive). In turn, programmability increases the product's ability to adapt to more complex changes in the environment, e.g., adjust the product to the requirements of the local market. Adaptability allows users to adjust the product to their needs (e.g., smartphones).

RESEARCH METHODOLOGY

Apart from the literature review and its critics, the qualitative design is applied by using a CATI (computer-assisted telephone interviewing) survey. Telephone interviews were conducted by a professional market research agency. The sample included only internationalized firms. The research sample was selected based on firms registered in Poland in REGON (National Business Registry), of which 7,100 firms were randomized and the survey questionnaire was sent to them. However, the actual population included 3,313 businesses, as the contact details of the remaining firms were out of date and no contact was possible with them. Of these firms, only 355 agreed to participate in the survey (the return rate was 5%, but the real return rate was 10.7%). Accordingly, the article is based on the sample of 355 internationalized businesses from Poland.

In the research sample there were 18.8% firms from the high-technology industries, 51.3% firms from the moderate-high-technology industries, 25.9% firms from the moderate-low-technology industries, and 7% firms from the low-technology industries.

For further analysis, we distinguished two groups of companies: 1) high-tech, which includes firms of high and moderate-high technology; 2) low-tech, which includes firms of low and moderate-low technology.

We asked the surveyed firms to answer the question about the strategy (standardization or adaptation) they use in relation to the product and promotion on foreign

markets. We used a 7-point Likert scale, where 1 means full standardization and 7 means full adaptation to the requirements of foreign markets.

A two-step approach was used in the quantitative study. First, the student t-test for independent samples was used to verify the degree of strategy differentiation depending on the area studied: a) product, b) promotion. Secondly, logistic regression was used to verify the selection between adaptation strategy and standardization strategy by firms from high-tech and low-tech industries in the area of product and promotion.

EMPIRICAL FINDINGS AND DISCUSSION

The Student's t-test (Table 1) confirmed statistically significant differences in the selection of an international strategy depending on whether the company is in the high-tech industry or not. It is evident regarding the promotion ($p=0.033$) and, to a lesser extent, the product ($p=0.083$). However, in both cases (promotion and product) the average is higher for firms from the high-tech industry (promotion: $3.399 > 3.846$; product: $4.685 > 4.249$), i.e., these firms to a greater extent, adapt the product and the promotion to the requirements of individual international markets.

Table 1. Adaptation and standardization strategy by firms from high-tech and low-tech industries in the area of product and promotion (the Student's t-test results)

Group of firms	Valid N	Mean	Std. Dev.	t-value	df	p-value
Product						
High-tech	238	4.685	2.285	1.740	353	0.083
Low-tech	117	4.249	2.096			
Promotion						
High-tech	238	4.399	2.325	2.139	353	0.033
Low-tech	117	3.846	2.215			

Source: own calculation

In the logistic regression model (Table 2), the dichotomous variable was the affiliation (or not) of the firm to the high-tech industry, and the independent variable was the value from the Likert scale separately for the product (Model 1) and individually for the promotion (Model 2).

Table 2. The affiliation to the high-tech industry towards the adaptation and standardization strategy (the logistic regression results)

N=355	Model 1 (Product)		Model 2 (Promotion)	
	Final loss: 223.52722798, Chi2(1)=2.9996, p=0.08329		Final loss: 222.75679736, Chi2(1)=4.5405, p=0.03311	
	Const.	Product	Const.	Promotion
Estimate	0.320	0.087	0.320	0.105
Standard Error	0.249	0.050	0.249	0.049
t (353)	1.282	1.732	1.282	2.122
p-value	0.201	0.084	0.201	0.034
Wald's Chi-square	1.645	2.999	1.645	4.505
Odds ratio	1.377	1.091	1.377	1.111

Source: own calculation.

The regression model is statistically significant, especially for promotion ($\text{Chi}^2(1)=4.5405, p=0.3311$). The evaluation of the promotion strategy is statistically significant ($p = 0.034$). The odds ratio at the level of 1.111 indicates that an increase in the value on the scale by one unit increases the probability that the company is in the high-tech industry by 11.1%. The regression model is less statistically significant for product ($\text{Chi}^2(1)=2.9996, p=0.08329$). The evaluation of the product strategy is statistically less significant ($p=0.084$). The odds ratio at the level of 1.091 indicates that an increase in the value on the scale by one unit increases the probability that a company is in the high sector by 9.1%.

Our research contributes to current studies in several aspects. In our paper, we expand insight into international marketing, talking both in the sense of the object and the scope of research. First, we undertake the problem of adaptation and standardization, considering the distinction between high-tech and non-high-tech industries. There is much research on the internationalization of high-tech firms, however, they sporadically and selectively relate to the aspects of standardization and adaptation. Secondly, we take a closer look at firms from Poland, i.e., the region of Central and Eastern Europe. The vast majority of findings about strategy selection on the international market were confirmed by the example of firms from Western Europe, where specificity and conditions differ from those we investigate in our study. We believe that our findings constitute the inspiring starting point for future research to explore international strategy selection, including opportunities resulting from the attributes of the high-tech industry.

CONCLUSIONS

Internationalized firms from Poland are confronted with the well-known compromise between standardization and adaptation of the product and promotional strategies on the international market. Research shows that Polish firms from the high-tech industry adjust their international strategy to a greater extent to the requirements of individual international markets, both in product and promotion than firms from non-high-tech industries.

The conducted research may contribute to developing literature and business practice. Even though there is a lot of research on marketing strategy in the internationalization process, there is no general agreement on the problem. Looking at the number of publications in recent years, one can get the impression that the topic has been forgotten. Deciding on the product and promotion strategy is one of the essential decisions in reaching global customers. Considering how dynamically the environment and the conditions of conducting international business are changing and the significant impact of the digital revolution, we cannot neglect this topic. That is why we recall this problem and enrich it by considering current market conditions and focusing on the high-tech industry. We believe that the industry's specificity may influence the marketing strategy choice.

The article can have many practical inspirations for managers, business owners, and entrepreneurs deciding on their international strategy and implementing high-tech attributes in building competitive advantage in the internationalization process. First of all, the study shows how important it is to act thoughtfully on the international market and evaluates the advantages and disadvantages of using various marketing strategies. Moreover, it can inspire practitioners to rethink the issue of combining adaptation and standardization, thanks to the characteristics of innovation and knowledge.

The study is also not without limitations. The case of Polish firms cannot be a reference to the global high-tech sector, as it is challenging to generalize research on this research sample. It is, therefore, worth expanding the study by considering other examples and providing a comparative analysis. In the future, we should also focus on the determinants of choosing an international strategy, which would allow us to understand how and why a given approach is implemented. One gets the impression that the clear delimitation between standardization and adaptation is also blurring, prompting more in-depth research on the trade-off between these approaches in the area of product and promotion.

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Acknowledgements and financial disclosure

This publication has been financed by the Minister of Education and Science within the “Regional Initiative of Excellence” Programme for 2019–2022. Project no.: 021/RID/2018/19. Total financing: 11 897 131,40 PLN.

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