FOREIGN ENTRY MODES OF HIGH-TECH FIRMS IN POLAND[1]

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ABSTRACT. Objective: The main objective of the article is to present the role and importance of foreign entry modes in internationalization process and their key determinants. **Research design and methods:** A quantitative research design was used. A survey was conducted on the sample of 263 firms operating in high-tech industries in the territory of Poland. To verify the assumed hypotheses the statistical instruments were used including Chi-Square test and Cramer's V contingency coefficient. **Findings:** The investigated high-tech firms adopt a whole range of entry modes in their internationalization process. However, research results show that the choice of foreign entry modes is determined by the size of the company, pace of internationalization and internationalization intensity (measured by TNI index), namely bigger firms, born global and firms with high internationalization index are more likely to use more advanced and entry modes characterized by high-control. **Implications and recommendations:** Polish high-tech companies use more advanced entry modes in comparison with whole business population. Foreign entry mode choice is a multilevel phenomenon and it is influences by a multiplicity of factors. Thus, it is also difficult to investigate empirically. However, it provides significant future opportunities for further studies that bring us closer to understanding the phenomenon of entry mode choice decision. **Contribution and Added Value:** The research results presented in this article are one of the first in Poland investigating internationalization and foreign entry modes of firms operating in high-tech industries. The obtained results remain in line with the majority of empirical evidence world-wide.

Key words: internationalization of firms, born global, high-techs

JEL Classification: F23, D21

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Introduction

Foreign entry mode adopted by a firm is its strategic choice. It has significant influence on firm performance on international markets as it determines the level of resource commitment to the foreign market, the risk of a firm in the host country and the nature of control a firm has over its foreign activities (Arregle et al., 2006). SMEs usually choose different, i.e. less advanced foreign entry modes than big businesses and multinationals (MNEs). SMEs face different challenges during their expansion to foreign market and so they tend to choose cooperative entry modes, while large firms will rather choose independent entry modes (Bruneel, De Cock, 2016).

The industry in which a firm operates can also influence its entry-mode decisions (Gabrielsson et al., 2008). According to various research results *high-technology-based firms (high-techs)* may use a combination of different market entry modes through strategic alliances to enter foreign markets. Moreover, *high-techs* often develop different solutions for different markets at the same time (Daszkiewicz, 2016).

The main objective of the article is to present the role and importance of foreign entry modes in internationalization process and their key determinants. The article consists of three sections. In the first section it presents the literature review on the foreign entry modes and their role in internationalization process of firms. The second section includes the basic description of the material and methods used in empirical research. In the third section the discussion on empirical results is carried out. The empirical results were obtained on the sample of 263 firms operating in *high-tech* industries in Poland.

Literature Review

The discussion on the role and importance of entry mode in the process of internationalization of firms belongs to the key issues of research in the field of business research and internationalization. Internationalization

decision of a firm includes the choice of foreign markets and the structural nature of its activities in those markets (Carazo and Lumiste, 2010). Brouthers and Hennart (2007) define entry mode as the operational form used to enter foreign markets. Thus, firms may enter foreign markets i) alone, i.e. through direct exports, ii) in partnership with other firms via contracts with distributors, iii) by making a direct investment in a foreign country (FDI).

When a firm decides to invest equity it has at least two strategically important choices. It must choose the mode; either establish a foreign operation from scratch (invest in a greenfield facility) or to engage in an acquisition (buy equity share in an existing foreign entity) (Dikova and van Witteloostuijn, 2007). Internationalization literature provides much evidence that foreign entry mode choice is a very important strategic decision for an internationalizing company. It determines the level of its resource commitment, the risk in the host country and the nature of control it has over its foreign activities (Arregle et al., 2006). Brouthers and Hennart (2007) argue that once established, the mode of entry is difficult to change, because it has long-term consequences for a firm.

Particular modes of internationalization differ in many ways. Wach (2012) identifies differences in: (i) scope of capital commitment, (ii) scope of management commitment, (iii) scope of control, (iv) scope of risk, (v) scope of potential profits and (vi) scope of input costs. The author also stresses that generally, the higher the extent of management involvement is, the higher the scope of control and risk. In addition, the increasing of invested capital involves the increasing of the management on foreign markets. On the other hand, the lower the entry costs are, the lower the profitability of carried out transactions.

Also Anderson and Ganington (1986) focus on firms' control of resources when it enters foreign markets. Thus, resources may be located domestically or in a foreign market and a firm may fully control them or through export contract agreement. The scholars define "control" as the ability to influence systems, methods and decisions. Generally, high control modes increase both profitability and risk.

Hollenses (2010) identifies three categories of foreign entry modes according to level of control criteria:

1. <u>High control modes</u>: (i) foreign direct investment (FDI) in form of wholly owned subsidiaries (WOS), (ii) direct selling to big customers (OEMs). Both entry modes are equal to full control with activities in foreign markets.

2. <u>Intermediate modes</u>: (i) strategic alliances (SA), (ii) joint ventures (JV). These entry modes are located in-between high and low control modes; partners usually share resources, technology, profits, and jobs (usually, the local partner provides market-specific knowledge).

3. <u>Low control modes:</u> (iii) indirect export, (iii) direct export. In case of indirect export the level of control is the lowest. It is when a parent company uses independent organizations located in the parent company's own country or third country. In case of direct export the parent firm sells directly to an agent, distributor or importer located in the foreign market which provides a higher degree of control than with indirect export. However, still direct export belongs to the low control modes.

There are numerous reasons for firms to enter international markets, but the level of technological development is considered to be its key determinants, especially of FDI (Dikova and van Witteloostuijn, 2007). It is because, firms operating in high-technology industries frequently enter foreign markets to cover their costly R&D investments or prevent product obsolescence and gain new market share. Moreover, through FDI, MNEs transfer and share their proprietary knowledge, skills and knowledge with local organizations in order to gain additional profit or amortize R&D costs.

According to various research results, high-technology-based firms (high-techs) may start their expansion into foreign markets shortly after their creation. Firms internationalized early and fast are those which do not follow the traditional (stage-based) internationalization path, and whose internationalization begins shortly after their establishment. These firms are called born global. At the beginning of the 90ties it was believed that the phenomenon of born global primarily concerned firms operating in the high-tech and high-tech-related sectors. Later, however, numerous subsequent research led to finding born global also among firms operating in traditional (low-tech) industries. Yet, it is still in high-tech industries where we find more born global firms than in traditional industries (Daszkiewicz, 2016).

Gabrielsson et al. (2008) found that born global commonly use a combination of different market entry modes through strategic alliances to enter new markets. Moreover, born global often develop different solutions for different markets at the same time. Thus the scholars suggest that the role of industry in which a firm operates can influence its entry-mode decisions.

In addition, SMEs usually choose different, i.e. less advanced foreign entry modes than big businesses and multinationals (MNEs). It is so, because SMEs face different challenges during their expansion to foreign market and so they tend to choose cooperative entry modes, while large firms will rather choose independent entry modes (Bruneel, De Cock, 2016).

Theoretical Perspectives and Research

A number of theories have been so far used to explain the entry mode choice decision (Canabal and White, 2008). Brouthers and Hennart (2007) argue that the most commonly used are:

1. Transaction cost analysis (TCA, Williamson, 1985) – the theory is based on the assumption that managers suffer from bounded rationality, whereas potential partners may opportunistically act if given the chance. Three TCA factors are hypothesized to influence decisions: asset specificity, uncertainty (both internal–behavioural and external–market specific), and frequency.

2. The resource-based view (RBV) – firms develop unique resources that they can exploit in foreign markets or use foreign markets as a source for acquiring or developing new resource-based advantages. Firms develop resource-based advantages by acquiring or developing a set of firm-specific resources and capabilities that are valuable, rare and imperfectly imitable and for which there are no commonly available substitutes (Barney, 1991).

3. Institutional theory - a country's institutional environment affects firm boundary choices because the environment reflects the "rules of the game" by which firms participate in a given market. Research in this area has tended to concentrate on host country institutional environments or differences between home and host country (Brouthers and Hennart, 2007).

4. <u>Dunning's eclectic framework</u> - eclectic (OLI -ownership, location, internalization) framework link concepts that earlier research has shown influence the mode choice decision (Dunning, 1993). The three components of Dunning's framework are ownership or firm-specific advantages, location advantages (Daszkiewicz, 2016).

Recently, Bruneel and De Cock (2016) investigated the state of the SME entry mode literature by conducting a systematic literature review of 47 articles. The review showed that the most entry mode approaches, including RBV are embedded in TCE and OLI theories. Thus, TCE and OLI are the most frequently used theoretical perspectives, followed by RBV and NA (network approach). Many research results show that networks have a significant impact on the internationalization processes – its pace, pattern, market selection and entry mode. Networks trigger and motivate firms' internationalization intention and influence firms' market – selection and entry mode decisions (Daszkiewicz, 2014). Moreover, network relationships enable SMEs to move quickly to high entry modes such as sales subsidiaries. Thus, network also enables them to leapfrog stages in the internationalization process (Bell, 1995; Coviello and Munro, 1997).

Material and Methods

The research into the internationalization of high-tech firms has been carried out at the end of 2015 operating in the territory of Poland with the use of Computer Assisted Telephone Interviewing (CATI). Random sampling has been selected according to the following criteria (Daszkiewicz, 2016):

1. Conducting international activities (at least export activities)[3].
2. Belonging to one of the classes of activity (PKD - Polish Classification of Activities), namely "high-tech" or "medium-high-tech".

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[3] In the literature of the subject and numerous research also importers are considered internationalised firms. Since, at this level of the development of international connections, adopting import as the criterion of internationalisation, almost every firm could be regarded internationalised (they would only differ with the internationalisation level). Therefore, export was adopted as the internationalisation criterion in the research.

3. The necessity of fulfilling minimum one of the three following criteria by the firm:
- obtaining patents or signing licensing agreements in the areas considered high-tech.
- employing personnel with high scientific and technical qualifications.
- conducting industrial research or developmental works, as well as activities preparing the results of this research or works to be implemented in economy.

The target population was selected on the basis on the above criteria and the survey questionnaire was directed to 4075 businesses from the database. However it turned out that 857 firms in the database were not eligible for the investigation, or did not have the current phone number. Thus, the net population was 3218 of internationalized high-tech firms. During the survey we obtained 263 fully completed questionnaires (the return rate was 8.2%), relevant for further statistical processing.

Both, the literature studies, and especially the review of various empirical studies resulted in the following hypothesis to be testes:

H1: *The size of the firm is positively correlated with the use of high control modes (bigger firms are more likely to use high control modes).*

H2: *Belonging to the group of born global is positively correlated with the use of high control modes (born global are more likely to use high control modes).*
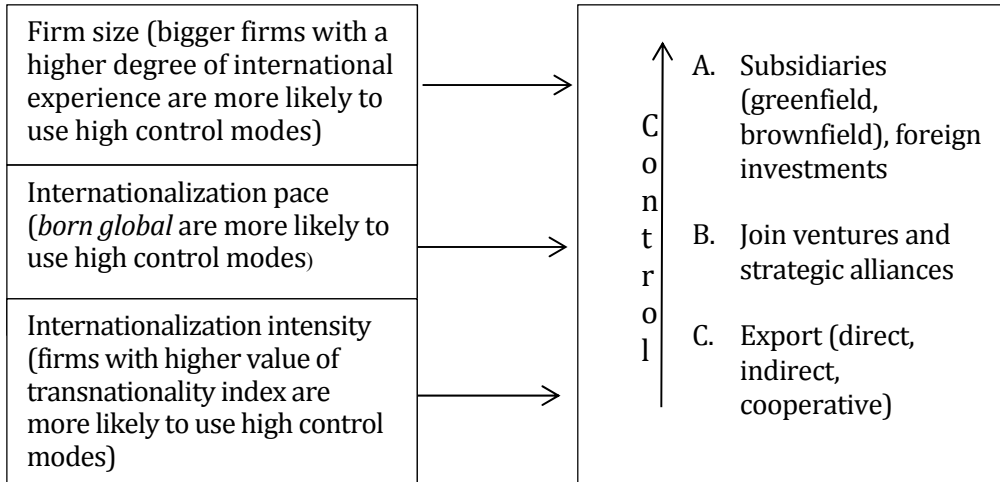
H3: *Internationalization intensity is positively correlated with the use of high control modes (firms with higher internationalization intensity measured by TNI index are more likely to use high control modes).*

The following research model (figure 1) presents the supposed relationships between the choice of entry mode (dependent variable) and the independent variables represented by hypothesis H1-H3.

The calculations with the use of the obtained survey results were made with the use of *Statistica*® PL v. 10 software. In the survey, the level of statistical significance was established on the basis of Pearson's χ^2 and Cramer contingency coefficient. It is because most of the used variables are dichotomous (that is, there are only two variants: 0 and 1) and because of such a small number of variants, rank correlation coefficients can be heavily biased. In such cases, the quota coefficients are

Figure 1. Research Model
Source: adapted from Boyd, B., Dyhr Ulrich, A. M., and Hollensen, S., 2012, p.8

Firm size (bigger firms with a higher degree of international experience are more likely to use high control modes)	→	Control	A. Subsidiaries (greenfield, brownfield), foreign investments
Internationalization pace (*born global* are more likely to use high control modes)	→		B. Join ventures and strategic alliances
Internationalization intensity (firms with higher value of transnationality index are more likely to use high control modes)	→		C. Export (direct, indirect, cooperative)

much better, and chi-square statistics are used to measure their significance. Based on the obtained statistics, level p was doubled to obtain a significant level α (Creswell, 2014, p. 169). Broadly understood interpretation of level p assumes that:

- $p < 0.05$ – means strong rejection of the null hypothesis,
- $0.05 < p < 0.1$ – means weak rejection of the null hypothesis,
- $p > 0.1$ – means no rejection of the null hypothesis.

Results and Discussion

Among the surveyed firms 99.2% use low control modes in their internationalization process. Up to 60.8% of businesses use medium control modes and only 6.9% high control entry modes.

Size and Choice of Entry Mode

The research sample includes firms of every size class: micro, small, medium and large. The share of enterprises belonging to the SME sector among the surveyed firms is 82% (216 companies), while the share of large enterprises is 18% (47 firms). In the analysed research sample we are dealing with overrepresentation of both large and medium enterprises as compared to the whole population of enterprises in Poland.

Table 1. Size of firms
Source: Daszkiewicz (2016, p. 127) (N=263)

Size class	Number	Cumulative number	Percent	Cumulative percent
Micro-enterprises (1–9 employees)	24	24	9	9
Small enterprises (10–49 employees)	68	92	26	35
Medium enterprises (50–249 employees)	124	216	47	82
Large enterprises (> 250 employees)	47	263	18	100

The statistical analysis that has been carried out shows that there is a statistically significant relationship of moderate force between the size of the firm and the choice of entry modes (χ^2 =16,59486, df =3, p =0, 00086, Cramer's V contingency coefficient = 0,2511939).

Thus, the first hypothesis that bigger firms are more likely to use high control modes is confirmed.

Pace of Internationalization and Entry Mode

In the sample of surveyed firms, 44.49% according to the adopted classification can be classified as *born global*, i.e. they are firms that have taken first actions on foreign markets less than 3 years after the foundation. In the case of 53.99% of the surveyed firms, the first expansion took place after more than 3 years after the establishment of the firm, which was a traditional one. The remaining 1.52% of companies did not respond.

There is a statistical relationship of weak force between the internationalization pace and the choice of entry modes (χ^2 =9,594462, *df* =4, *p* =0,04784, Cramer's V contingency coefficient =0, 1924689). Thus, the second hypothesis that *born global* are more likely to use high control modes is confirmed.

TNI and Choice of Entry Mode

The transnationality index (TNI) was calculated as the average of foreign assets, sales and employment to the total ones and being expressed as a percentage according to the following formula:

$$TNI = \frac{\frac{A_F}{A_T} + \frac{S_F}{S_T} + \frac{E_F}{E_T}}{3} \times 100 \ [\%]$$

where:

A_t - total assets;
A_f - foreign assets;
S_t - total sale;
S_f - foreign sales;
E_t - total employment;
E_f - foreign employment

The average value of the transnationality index (TNI) for the whole research sample (*N* = 263) is 20.6, the median is 13.33, and the standard deviation is equal to 19.48. It means that on average, in a continuum from 0 to 100, the level of the internationalization of the studied firms is low, that is, a great majority of the firms in the sample are poorly internationalised.

There is a statistically significant relationship of moderate force between the transnational index value and the choice of entry mode (χ^2 =37,89869, *df* = 18, *p* =0, 00399, Cramer's V contingency coefficient =2704875).

Thus, the third hypothesis that firms with higher internationalization intensity measured by TNI index are more likely to use high control modes is partially confirmed (firms with higher internationalization intensity measured by TNI index are more likely to use medium control modes).

Conclusions

The presented research is not without considerable limitations. The most important is the lack of the representativeness of the sample, therefore, the study results cannot be generalized to other high-tech and medium-high-tech firms in Poland. In spite of this, the research sample can be regarded large as for Polish conditions. It should be also stressed that the survey was conducted all over the country and it includes all industries, i.e. firms representing each industry are present in the research sample.

Based on the carried out analysis, the following conclusions can be drawn:

1. The investigated high-tech firms adopt a whole range of entry modes in their internationalization process.

2. The size of the firm is positively correlated with the use of high control modes; bigger firms are more likely to use high control modes.

3. Belonging to the group of *born global* is positively correlated with the use of high control modes; *born global* are more likely to use high control modes.

4. Internationalization intensity is positively correlated with the use of high control modes; firms with higher internationalization intensity measured by TNI index are more likely to use medium and high control modes.

Foreign entry mode choice is a multilevel phenomenon and it is influenced by a multiplicity of factors. Thus, it is also difficult to be investigated empirically. However, it provides significant future opportunities for further studies that bring us closer to understanding the phenomenon of entry mode choice decision.

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