

SELECTED METHODS FOR MEASURING MARKET AND SECTOR GLOBALIZATION AND ENTERPRISE INTERNATIONALIZATION

Piotr KURAŚ

Czestochowa University of Technology; piotr.kuras@pcz.pl, ORCID: 0000-0003-4902-2748

Purpose: This paper aims to identify and describe the methods for measuring the level of globalization of national economies and sectors, as well as the level of internationalization of the business activities of manufacturing enterprises.

Design/methodology/approach: The paper is of a theoretical nature. The literature review served as the starting point, allowing for the assessment of the current state of knowledge on measuring globalization and internationalization. This allowed for the formulation of the research problem.

Findings: There is no single, universally recognized and accepted way to measure globalization, either at the level of economies or sectors. Globalization is a complex, complicated and multidimensional process. Researchers propose qualitative approaches, while quantitative measurement concepts are also known and developed. The level of internationalization is most often studied through the prism of either geographical scope or the degree of foreign involvement in particular activities.

Research limitations and implications: The research systematizes and synthesizes scientific knowledge in measuring the processes of globalization and internationalization. The main limitation of this research is that, due to the complexity of the studied phenomena and the nature of this article, it is not possible to provide a comprehensive analysis or exhaustive description. The paper presents only the most useful attempts to formally describe these, after all, qualitative economic phenomena.

Practical and social implications: The article is addressed mainly to the scientific community. The methods presented here can be a starting point for discovering new relationships and interdependencies. For example, the relationship between the level of internationalization and corporate performance can be studied. The results of such research can help managers make decisions about the scope and intensity of a company's foreign operations.

Originality and value: The originality of the research lies in the attempt to systematize and synthesize the scattered scientific studies on measuring the internationalization of enterprises and the globalization of sectors and economies. The conclusions of this paper contribute to a better understanding of these phenomena.

Keywords: internationalization, strategy, management, measurement.

Category of the paper: research paper.

1. Introduction

An enterprise seeks different opportunities to grow. Among the most important decisions is whether to choose a strategy of specialization or diversification (Kaulich, 2012). Another crucial choice is the one of the scale of operations. A small scale of operations translates into greater organizational flexibility, manifested in the ability to respond quickly to changes in the environment. On the other hand, such enterprises are less resistant to the confrontational competitive moves of larger and stronger rivals who have significantly more resources that provide greater opportunities for various development activities. Another issue is to decide whether to operate regionally, nationally or globally (Verbeke, Asmussen, 2016). Choosing how to compete requires adopting the right approach to serve markets. Choosing a large scale of operations often involves competing on cost or differentiation (Baker et al., 2016).

One way to grow a business is to adopt an internationalization strategy. Internationalization, in the simplest terms, means going beyond the borders of one's own country with the aim of increasing the enterprise's growth opportunities. This implies the need for the executives to adopt a global perspective and focus on foreign markets, which raises a number of strategic issues. Yip (1996) has shown that sectors and markets can have both global and local characteristics. Optimal exploitation of the potential of these markets is only possible if the overall strategy of the company is designed, implemented and consistently executed, including the assumptions of operating in foreign markets. This action must be coordinated on an enterprise-wide level, with resources properly configured. That means they should be adapted to suit the requirements of local markets while also providing added value from the perspective of the entire enterprise.

The result of an enterprise's foreign involvement is a shift of some resources to foreign markets. The degree of this shift constitutes an interesting research problem. The fundamental question in this area is how to study the extent and intensity of an enterprise's foreign operations. This work attempts to answer this question.

2. Research methodology

The study employs a research approach based on a literature review. The research process consisted of the following steps:

- Literature review: A thorough review of monographs and scientific articles was conducted. Reputable databases, including Scopus, Web of Science, ScienceDirect, were used to gather relevant literature. The literature covered the issues of internationalization of business operations and globalization.

- Formulation of the research problem: The literature review enabled the identification of a research gap. No studies were identified that comprehensively describe measurement methods of both the enterprise and its immediate environment (sector) and further environment (national economy). This allowed for the formulation of the research objective. The purpose of this paper is to identify and describe methods of measuring the level of globalization of national economies and sectors, as well as the level of internationalization of the activities of manufacturing enterprises.
- Information collection: Data was obtained from scientific articles, monographs, market reports and studies by international institutions.
- Analysis of collected information: The gathered data underwent careful selection and rigorous analysis based on the research objective. The classical assumptions of the qualitative approach were applied.
- Results and recommendations: The article concludes with findings and recommendations for businesses and researchers.
- Limitations: This paper serves as a research report aimed at systematizing knowledge on measuring internationalization and globalization. The article, as a form of scientific expression, does not allow for a comprehensive and complete description due to its limited volume. Furthermore, this study does not provide a complete catalogue of measurement methods. Instead, only the most useful ones from the perspective of the future research have been presented. The selection focuses on methods that enable the comparative analysis of objects in a horizontal framework.

In order to achieve the purpose of the work, it is necessary to provide a broad theoretical context. This issue will be addressed in the subsequent chapter.

3. Theoretical overview

Mintzberg and Quinn (1996) argue that strategy should provide an answer to the question of how an enterprise should act to gain and maintain the desired competitive position in the market. Strategy is a category in management theory that has become the basis for distinguishing strategic management. One of the most important elements that distinguishes the classical management approach from strategic management is time perspective and long-term planning. This was taken into account in the studies by Ansoff (1965); Andrews (1987); Grant (1991). Long-term planning makes it possible to align an enterprise's overall strategy with its environment (Stonehouse, Pemberton, 2002). In addition to the planning approach, McKiernan (1997) identified three other leading management approaches: evolutionary (learning), positioning and resource balancing. The evolutionary approach assumes that an organization's strategy will begin to emerge and develop spontaneously over time. Its proponents: (Quin,

1978; Mintzberg et al., 1995) argued that the organization will manage itself as a result of adapting to the changing environment. The positioning approach is associated primarily with Porter (1980). The main criticism of this approach emphasized its static nature, and that the profitability of a sector does not necessarily determine the profitability of an enterprise. Rumelt (1991) additionally emphasized the neglect of cooperation opportunities and a greater focus on the external environment rather than on an organization's competence. The resource balancing approach is different. It focuses on the relationship between an enterprise's resources and its competitive advantage (Prahalad, Hamel, 1990; Barney, 1991; Barney et al., 2001; Krupski, 2006). An enterprise is a collection of resources that distinguish it from others and shape its position (Obłój, 2007).

Strategic management is a response to the increasing level of uncertainty in the business environment of enterprises (Baker, Bloom, 2016). It seeks new methods of building competitive advantage, as classic management methods are insufficient (Binnis et al., 2014; Kaplan, Orlikowski, 2015). For effective management, an enterprise must increase its strategic flexibility, which involves of the ability to adapt to changes in the environment (Shimizu, Hit, 2004).

The most important schools of strategic management have been characterized above. Central to this is strategy. Strategy is an integrated and coordinated set of actions taken to utilize core competencies and gain competitive advantage (Hitt et al., 1995; Johnson et al., 2010). There are two basic types of strategies: core (base) and functional (Stabryła, 2000). Functional strategies are concerned with decisions within an enterprise to increase the efficiency of its operations. Baseline strategies determine the overall approach a company takes to compete.

These can include, for example, the following:

- cost strategy,
- quality leadership/differentiation strategy,
- leading strategy,
- market niche strategy.

Strategies implemented in the global market involve diversification along two dimensions: industry and international. In the industry dimension, activities are undertaken in horizontal, vertical, concentric or conglomerate arrangements, and are related to the selection and management of markets for different products. Strategies implemented in the international dimension involve locating activities outside the home country and coordinating these activities on a global scale.

The literature distinguishes four basic models of corporate conduct. These strategies are generally referred to as cross-border or global (Yip, 1996). These strategies are:

- multinational,
- international,
- global,
- transnational.

The multinational strategy involves decentralization of decisions and delocalization of resources (Brock, Birkinshaw, 2004). Foreign subsidiaries have a high level of autonomy. This strategy is based on a strong differentiation of foreign markets served by individual subsidiaries. Their task is to adapt production to the needs of host country markets. Most suitable when there is strong pressure on adjustment and low pressure on costs (Zorska, 2002).

The international strategy involves diversification by product and by country/market (Hitt et al., 2016). Product diversification involves producing differentiated product assortments in individual foreign subsidiaries, tailored to regional requirements. Domestic/market diversification implies the use of different locations for specific operational activities (different for sourcing, production, sales). The autonomy of international subsidiaries is much lower than that of multinational subsidiaries.

The global strategy is characterized by integrated and coordinated activities on a global scale. It is applicable in markets where local customization requirements are low and there is strong pressure to reduce costs. The large scale of production in regions with optimal conditions for manufacturing (e.g., low-cost raw materials and labor) makes it possible to reduce costs and improve the company's position. The global strategy, compared to the previous ones, is characterized by less product adaptation to local markets, but a much higher degree of operational integration and stronger pressure on costs (Stonehouse et al., 2001).

The transnational strategy integrates the international and global strategies (Donaldson, 2009). It attempts to coordinate and standardize operations in both product and domestic market arrangements. It exhibits greater adaptation to local requirements than the global strategy. The main instruments for implementing this strategy are the decomposition of the value chain, the geographic dispersion of functions and the units carrying them out. This strategy is accompanied by standardization and specialization, integration and coordination.

The above strategies describe ways to serve foreign markets. Early studies argued that internationalization is a slow process, and is evolutionary in nature (Johanson, Wiedersheim-Paul, 1975; Johanson, Vahlne, 1990). The typical course of this process is initiated by export. The next phase is various forms of cooperation. Finally, foreign direct investments are undertaken. Such a course is known as the *Uppsala model*. In addition to the intensity of foreign linkages, researchers Caves (1982), Davidson (1982) and Root (1987) argue that an important criterion for distinguishing forms of internationalization is the level of control exercised.

There is no unanimity on the number of forms of internationalization. For example, Buckley (1996) distinguishes: export, non-capital (contract) cooperation and capital cooperation. Otta (1994), in turn, distinguishes: export-import, cooperative ties (capital, non-capital, strategic alliances), and running business independently. Certo and Peter (1998) point to four methods of foreign expansion: export, licensing, joint ventures and direct investment, while Hill and Johns (2007) distinguish five of them: export, licensing, franchising, joint ventures, and direct investment.

Regardless of the differences in the course of the internationalization process, the number of forms and the type of strategies for serving foreign markets, all the enterprises implementing it share one common characteristic. In each case, various activities and resources of the enterprise are shifted outside the home country. As a result, a certain portion of sales is made in the company's home country while another portion is made outside its borders. A part of production may also be carried out outside the country, as well as research and development activities. As a result of internationalization, some of the enterprise's resources are shifted outside the home country. This observation makes it possible to try to measure the intensity of a company's foreign linkages. That is, to examine the level of its internationalization. In the next part of the paper, an attempt is made to systematically describe the most universal methods of measuring the internationalization of enterprises' activities.

4. Measurement of globalization and internationalization

Globalization takes place at three levels:

- world economy,
- industry/sector,
- enterprise.

4.1. Measurement of the globalization of national economies

Progressive globalization is characterized by the growth of certain indicators. Among the most important are (Krugman, 1995):

- the share of world exports in world GDP,
- the growth rate of foreign direct investment in the world relative to the growth rate of world GDP,
- the growth rate of gross investment in the world.

Studies show the relationship between economic growth and the integration of countries. Presented, for example, in the *World Bank Policy and Research Bulletin*, the integration index expresses the importance of international flows of goods and foreign direct investment to a country's economy. This index describes the degree of participation of a particular country in the globalization process. It is built on the basis of four other indicators (Dunning, 1993):

- index of trade share in GDP,
- ratio of foreign direct investment to GDP,
- index of investment risk,
- share of manufactured goods in exports.

There have been many attempts to measure globalization over the years. The main problem with such studies is that they require data and information that is difficult to access, expensive or not published periodically. Therefore, there are few reputable, methodologically sophisticated, systematically published globalization rankings. One exception is the *KOF Index of Globalization*. This is an index of the degree of globalization of countries published by the Eidgenössische Technische Hochschule (ETH). The original version of the index was developed by Dreher (2006). It is based on three main criteria: economic, political and social. The index covers the period since 1970 and currently contains 203 entries (including entities not officially recognized by the UN as countries, of which there are currently 195). Revisions of the index took place in 2008 and 2019. The new index is more extensive, including 43 variables compared to the last version's 23 variables. The revised version of the index (Savina et al., 2019) proposes two additional globalization indexes: *de facto* and *de jure*. The *de facto* globalization index measures actual flows and activities, while the *de jure* globalization index measures the policies and conditions that enable and support flows and activities. The overall *KOF Globalization Index* is an amalgamation of the previous two.

Another indicator of globalization is the *Maastricht Globalisation Index* (MGI), developed in 2009. The MGI, unlike the *KOF Globalisation Index*, takes into account environmental factors. The index was last revised in 2016 (Figge, Martens, 2016).

The *Globalization Index* was jointly developed by the international consulting firm A.T. Kearney and the bimonthly political and social magazine *Foreign Policy Magazine*. It was published from 2001 to 2007. The index measured countries in terms of their economic, technological, political and social integration.

Another tool was developed by the Center for the Study of Globalization and Regionalisation, Warwick University. It measured the economic, social and political dimensions of globalization of individual countries using sub-indices, which in aggregate form build the overall globalization index. The index was calculated for the years 1982-2004.

The *Globalization Index* was jointly developed by Ernst & Young and the Economist Intelligence Unit in 2009, and was updated in 2012 (Ernst & Young, 2013, pp. 30-34). The Index is based on a comprehensive survey of five main areas: openness to trade, capital flows, technology exchange, labor flows and cultural integration. The study covered the 60 largest countries for the period falling between 1995 and 2012.

The methodology for measuring globalization is constantly being developed by scholars of various disciplines, in particular: economics, sociology and economic geography (Andersen, Herbertsson, 2003; Bobek, Vide, 2005; Raab et al., 2008; Arribas et al., 2009; Houseman, Mandel, 2015). An overview of new directions in the construction of globalization indices is presented in the article by Martens and others (2015).

The aggregated indices presented are a powerful tool for capturing, illustrating, monitoring and communicating such a complex and multidimensional issue as globalization. However, it is important to note that constructing indices involves numerous subjective decisions made

by their authors. An important observation is also that globalization can only be measured indirectly, so there is no single correct or objective way to measure it, and therefore these subjective methodological choices must be transparent.

4.2. Measurement of the globalization of sectors

A company does not operate in a vacuum, but in the immediate environment of other companies that are engaged in the same core activity; that is, that produce goods or services with a similar purpose. They form a sector (Šmid, 2010, p. 216). To assess the attractiveness of a sector and determine the competitive position of an enterprise, methods of strategic analysis are used, primarily sector structural analysis. The position of the company in the sector can be determined by the strategic balance method and portfolio methods: the BCG matrix, McKinsey matrix, ADL matrix, SWOT analysis model. The assessment of the strategic situation is based on the following methods: scenario analysis, value chain model, Porter's Five Forces model. These methods should be used to assess the attractiveness of sectors in foreign markets.

Measuring the globalization of a sector requires the formulation of assumptions different from those of classical strategic analysis and the application of alternative methods, techniques and tools. The initial assessment of a sector should begin with an analysis of the importance and strength of the factors that either lead to or are a consequence of the internationalization of a company. These processes interact and reinforce each other. Another important remark is that sector assessment should be conducted at the national level. It may also be supplemented by an analysis of regional markets. The following are of particular importance in measuring the level of globalization:

- factors shaping the overall globalization process,
- strategies of companies using internationalization strategy.

Identification of globalization factors makes it possible to compare the globalization potential of different sectors or a specific sector over time. Measuring the level of these factors enables the determination of the directions and scope of necessary changes in the enterprise. According to Yip's (1996) concept, four groups of factors influence the process of internationalization of a sector:

- market,
- cost,
- government,
- competitive.

Some of these measures can be quantified, others require qualitative assessments.

Market factors include the homogeneity of customer needs, which is a difficult factor to measure. Customer needs may differ across countries. It is key to assess whether a product in its unchanged form can be supplied to different markets. If not, it is necessary to estimate the cost required to produce a product acceptable to the customer in a given market compared to the cost of manufacturing a globally standardized product. Distribution channels are much

easier to measure. A factor referred to as transferable marketing can be measured by the degree of customer acceptance of foreign *marketing-mix* elements, i.e. company name, brand name, packaging, advertising and promotion. The method of measurement for leading countries, on the other hand, can be based on the consideration of a certain number of recent, most significant innovations in a given sector.

Cost factors, despite their numerical nature, are difficult to obtain, particularly on a sector-wide scale. Economies of scale and scope can be estimated by calculating the minimum global market share required to achieve the minimum production scale that ensures profitability. Regarding the learning and experience curve, an indicator popularized by the Boston Consulting Group is applicable. It measures the effect of learning and experience as the percentage decrease in costs with each doubling of accumulated expertise. The measure of procurement efficiency, on the other hand, is the hypothetical percentage reduction in purchasing costs caused by central sourcing. To identify the cost differentiation of countries, the production costs of the most expensive country are compared with those in the least expensive one. The globalization potential of a sector can be estimated using the share of the total development cost (excluding marketing costs) of a new product. Another indicator for this group of factors is technology volatility, which can be measured by the length of the typical product life cycle in the market.

Another group of factors are government factors. They reflect the degree of favorable trade policies of host countries. They are evidenced by the levels of tariffs, subsidies and non-tariff barriers. The latter can be measured by the extent of import blockades. The level of comparability of technical standards can be measured by the ratio of the cost of manufacturing globally compatible components that make up a product to the total cost of manufacturing that product. The uniformity factor of marketing regulations, on the other hand, can be estimated by comparing the marketing costs incurred for marketing activities applicable in all countries to the total marketing costs of a company.

The group of competitive factors includes, among others, exports and imports. Their level is determined by examining the share of the home country beyond its borders relative to the global total. This group also includes the factor of production concentration. International enterprises, whose nature of business requires the maximum utilization of economies of scale, are forced to concentrate production, while aiming to sell in as many markets as possible. The interdependence of countries can be measured by adding up the volume of sales from participating manufacturers and dividing it by the total sales volume of a global competitor. Measuring the level of global competition is possible by estimating its level using the measures of global strategy instruments discussed next. These factors are summarized in Table 1.

Table 1.
Overview of sector globalization indicators

Factor	Indicator
MARKET	
<i>Homogeneous needs</i>	• The degree of similarity in customers' needs worldwide. • The percentage share of global common element costs in total product manufacturing costs.
<i>Global customers</i>	Share of the global sales volume accounted for by customers seeking suppliers worldwide.
<i>Global distribution channels</i>	Share of distribution networks based on centralized purchasing in global sales volume.
<i>Transferable marketing</i>	Share of foreign countries where elements of the marketing mix are accepted (applied to each element of the marketing mix).
<i>Leading countries</i>	Number of countries most significant in innovation creation.
COST	
<i>Economies of scale and scope</i>	Share of the world market that ensures a minimum (from the point of view of profitability) scale of production or services.
<i>Learning and experience</i>	Percentage reduction in costs calculated per unit of production following a doubling of accumulated skills.
<i>Sourcing efficiencies</i>	Potential percentage savings obtained from doing all purchasing centrally.
<i>Favorable logistics</i>	Percentage share of transportation costs on standard intercontinental routes in sales prices.
<i>Differences in country costs & skills</i>	The ratio of the cheapest to the most expensive countries in a given sector for: • hourly labor cost, • total unit cost of production.
<i>Product development cost</i>	The cost of developing a new product or service, calculated as a share of the sales value realized throughout the product lifecycle.
<i>Fast-evolving technologies</i>	Life cycle length of a new typical product on the market.
GOVERNMENT	
<i>Effects of tariffs</i>	Calculated as a share of the sales price before customs duties, in a global average
<i>Effect of subsidies</i>	• Average global share in the sales price before subsidy. • Net percentage impact of subsidized competitors on the sales price.
<i>Non-tariff barriers</i>	Global market size not available for imports (in %).
<i>Compatible technical standards</i>	Percentage of the cost of technically compatible components in the total cost of a typical product (worldwide).
<i>Common marketing regulations</i>	The share of a sector's worldwide marketing expenditures spent on marketing activities allowed in each country.
<i>State-owned competitors</i>	The total global market share of all competitors that are state-owned.
<i>State-owned customers</i>	The total share of global sector purchases made by state-owned entities.
COMPETITIVE	
<i>Export</i>	Percentage share of exports in the global market.
<i>Import</i>	Percentage share of imports in the global market.
<i>Competitors from different continents and countries</i>	The number of continents that serve as home markets for global competitors.
<i>Interdependence of countries</i>	Sales volume (in each country) dependent on production from factories serving more than one market (average calculated for all competitors).
<i>Competitors globalized</i>	The degree of adoption of global strategy tools by competitors.

Source: Yip, 1996, p. 261 and following.

4.3. Measurement of the globalization of sectors

The following measures can be used to examine the level of globalization of the sector:

- global market participation,
- global products,

- global location of operations,
- global marketing,
- global competitive moves.

Time-based comparisons of these metrics allow for determining the dynamics and directions of change of the global strategy applied by the enterprise. Comparing them with competitors enables the identification of competitive opportunities and threats.

The global market participation index is calculated by determining the ratio of a specific enterprise's activity to the total global volume of that activity conducted by all companies in the sector. In order for an enterprise to participate fully in the global market, it must be present in markets of strategic importance. It is therefore important to examine participation in these markets. This can be done by assessing the level of sustainability of participation in that market. For this assessment, it is necessary to compare the percentage distribution of sales in a given sector with the distribution resulting from the activity of the enterprise under analysis. If they overlap, this indicator will take the value of 1; in the case of a complete discrepancy, the value of 0. The level of participation in the global market can be measured by the number of countries in which sales are made.

The level of use of global products can be measured by the degree of their standardization. If the share of standardized products of a given company in the total volume of production is 70%, this is the level the standardization index takes. If it is necessary to relate the measurement only to certain markets (for example, markets of strategic importance), the so-called static indicator of product standardization is used. For this purpose, the percentage of standardized products (X) in countries representing Y% of the global market volume is determined. The indicator is the product of X and Y.

A full assessment of the level of global localization of activities is possible after conducting an analysis of:

- the concentration of a given business activity,
- the concentration of the value chain,
- the production location matrix.

Comparing the distribution of revenues with the distribution of costs, based on geographic criteria, allows for assessing the level of business concentration. To assess the level of concentration of the entire value chain, such a comparison should be carried out for the individual activities that make up the chain. The development of a production location matrix makes it possible to identify product flows and demonstrate the degree of dependence of sales on individual local factories.

Qualitative indicators are primarily used to assess global marketing. Quantitative measures include the marketing intensity index, which is calculated as the standard deviation of the input-sales relationship in each of the countries analyzed and for each marketing element. Determining the uniformity of marketing elements is possible by calculating the degree of

similarity between the marketing elements used in each country and those used in the home country.

Global competitive moves can be reflected by measuring the frequency of a company's response to attacks from competitors, while the degree of coordination of competitive moves can be reflected by the number of countries participating in each sequence of these moves.

These measures are summarized in Table 2.

Table 2.
Instruments of the global strategy

Instrument	Indicator
PARTICIPATION IN THE GLOBAL MARKET	
<i>Global Market Share</i>	The global business volume of the enterprise divided by the total global market volume.
<i>Strategic Market Share</i>	The business volume of the company in markets of countries with global strategic significance, divided by the total volume of these markets.
<i>Balancing Global Market Share</i>	Comparison of the percentage distribution of the company's revenues with the percentage distribution of revenues on the global market.
<i>Market Presence</i>	The number of countries in which the company conducts sales.
<i>Global Market Coverage</i>	The share of global sales volume from the markets of countries where the company conducts sales.
GLOBAL PRODUCTS AND SERVICES	
<i>Product-Mix Standardization</i>	Percentage share of global sales revenue from standardized products or services.
<i>Product Characteristic Standardization</i>	Percentage share of standardized elements in the product or service cost.
GLOBAL LOCATION OF ACTIVITIES	
<i>Concentration of a Given Activity</i>	Share of global expenditures incurred in the country where the largest portion of the given activity is located
<i>Concentration of the Entire Value-Added Chain</i>	Weighted average of the concentration indicators for individual links in the value chain.
GLOBAL MARKETING	
<i>Comparison of Marketing Intensity</i>	The intensity of marketing activities in individual countries.
<i>Standardization of Marketing Elements</i>	The degree of similarity between the marketing elements used in each country and those used in the home country.
<i>Overall Marketing Standardization</i>	An index calculated for each element, weighted by the share of revenues obtained by the company in each country and the significance of each element.
GLOBAL COMPETITIVE MOVES	
<i>Multinational Competitive Moves</i>	Moves involving three or more important countries.
<i>Counterattacks</i>	Responding to a competitive attack in a given country by undertaking actions in other countries.

Source: Yip, 1996, p. 271 and following.

4.4. Measuring the foreign involvement of the enterprise

So far, various approaches and ways of determining globalization and internationalization of national economies and sectors have been discussed. The rest of the article describes how to measure a company's foreign involvement, that is, the globalization of a company and the internationalization of a company's operations.

4.4.1. Measuring the globalization of the enterprise

The indicators presented in the previous subsections allow to determine the level of globalization of the sector and the globalization of the enterprise's strategy. In addition to this, it is possible to examine the degree of globalization at the level of the economic unit. The degree of adaptation of the enterprise to the global market can provide information about the overall level of internationalization. Including the time factor in the analysis makes it possible to assess the dynamics of the internationalization process.

Measures of the globalization of the organization are overwhelmingly qualitative, and the assessment of the degree of globalization of the entity obtained from them is descriptive. The assessment of foreign involvement is made in strategically important areas of the company, i.e. its organizational structure, management processes, human resources and organizational culture. In general, a qualitative study enables an explanation of an enterprise's development in relation to changes in its surrounding environment. It answers the question to what extent the enterprise is adapted to the global market, what position it occupies in the sector undergoing globalization processes and to what extent its base strategy coincides with the global strategy (globalization of operations).

The most important measures of the degree of globalization of an enterprise are presented in Table 3.

Table 3.
Indicators of the degree of an enterprise's globalization

Organizational Element	Indicator
ORGANIZATIONAL STRUCTURE	
<i>One Global Manager</i>	Is there a designated person whose primary responsibility is leading the global enterprise?
<i>International branch</i>	Are there branches of the enterprise that limit their activities to their home market?
<i>Functional line management</i>	Is there one line manager leading each functional area?
<i>Functional staff management</i>	Is there a coordinator position for each functional area?
<i>Importance of the "enterprise" dimension</i>	This measure refers to the strength of the "enterprise" dimension in terms of the geographic and functional dimensions.
MANAGEMENT PROCESSES	
<i>Global strategic information system</i>	The degree of formal standardization and regularity of the collection of strategic information from around the world.
<i>Cross-country coordination</i>	Scope of cross-country strategy coordination (information exchange, negotiating plans, aligning plans).
<i>Global strategic planning</i>	Degree of effective strategic integration of international planning processes.
<i>Global budget</i>	The degree of globalization of global program budgets.
<i>Global evaluation and reward systems</i>	The degree to which global achievements are used as a criterion for evaluating senior management.
PEOPLE	
<i>Foreign nationals in a given country</i>	Percentage of senior managers in a given country who are foreign nationals.
<i>Citizens of a given country in another country</i>	Percentage of senior managers from a given country working in other countries as foreign nationals.
<i>Foreign nationals in other countries</i>	Percentage of senior managers in other countries who are foreign nationals there.

Cont. table 3.

CULTURE	
<i>Global culture</i>	To what extent is the culture of a corporation or enterprise more global than national?
<i>Cultural interdependence</i>	To what extent does the culture foster more interdependence than autonomy?

Source: Yip, 1996, pp. 278-279.

The proposed indicators, however, do not provide a definitive measure of an enterprise's degree of internationalization. The lack of objective criteria makes it very difficult to compare individual companies. These questions are attempted to be answered in the following section of the paper.

4.4.2. *Measuring the degree of internationalization of an enterprise's operations*

There are various proposals in the literature for measuring the degree of internationalization. For example, there are proposals that recommend analyzing as many elements that describe the process as possible. Such an approach works well for observing a specific enterprise over a certain period of time. However, it is of limited use in comparative analysis. Mainly due to the difficult availability of relevant data. To eliminate this disadvantage, other proposals have been developed. These, in turn, take into account few elements through the prism of which internationalization is studied, but ones that are relatively easy to obtain. This approach has been criticized mainly for its poor description of the causes and course of internationalization. The following section presents the most widely represented proposals in the literature for measuring the level (degree) of this phenomenon

4.4.2.1. Preliminary assumptions

Internationalization, understood as the transfer of economic activity abroad, allows for considering it as a function of foreign activity of the enterprise. As a result, changes occur (in the country/foreign context) in many areas of the enterprise's operations. This is revealed in changes in the structure of: sales, production, assets, employment and organizational structure. The usefulness of information on these areas depends on whether they are quantifiable on a country/foreign basis and whether they are significantly related to internationalization. Elements that meet these conditions are called internationalization features. A feature is a random variable whose values, assigned to individual items of the studied population, vary randomly. Thus, the feature takes different values for items of the same kind (enterprises) occurring under the same conditions. The inclusion of less important features in the calculations may result in the risk of obtaining unreliable results. However, it should be noted that it is very difficult to categorically determine the impact of the proposed features on the overall level of internationalization. The greatest difficulty arises from the intermingling of several factors that affect internationalization and which influence this process in different directions with varying strength. The overall level of internationalization consists of the coexistence of a set of features, which, through their interconnections, trigger very strong but difficult-to-directly observe interactions.

A separate research problem is the inclusion of too few or, conversely, too many features in the study. Too few may give rise to the accusation of inadequate description of the phenomenon under study, while too many complicate its evaluation and the determination of the true significance of the process under study. In the literature, two groups of indicators are most often used to study the internationalization of enterprises:

- unit indicators (analytical) – these are indicators that serve as individual measures of specific areas of the enterprise's operations,
- aggregated indicators (composite/synthetic) – these are indicators constructed from individual analytical indicators.

Dörrenbächer (2000, p. 120) additionally distinguishes measures of spatial international diversification (regional concentration, networked organization, geographical and cultural distance).

Internationalization profiles are a specific group of indicators. This is a graphical method of presenting the level of a company's internationalization.

4.4.2.2. Analytical indicators

The first proposals for measuring internationalization used analytical indicators. Measurement should begin by defining the features of the process. They can be divided into state (relatively constant) features and variable quantities. State quantities include (Macharzina, Welge, 1989, p. 966):

- number of plants,
- value of invested capital,
- value of capital (own and foreign),
- number of employees,
- number of board members,
- number of shareholders.

The variable quantities are:

- volume of capital expenditures/value of investments,
- volume of research and development expenditures,
- value of manufactured products,
- number of manufactured products,
- volume of sales revenues,
- volume of employee compensation,
- volume of interest paid,
- volume of taxes,
- financial result.

An important tool for describing and interpreting economic phenomena is ratio analysis. It allows for the examination of the current state of specific phenomena occurring in the economy or enterprise and reveals the trends taking place within them. An appropriately selected set of indicators can help assess the intensity of internationalization. Among the most important ones are (Rymarczyk, 1996, pp. 21-22):

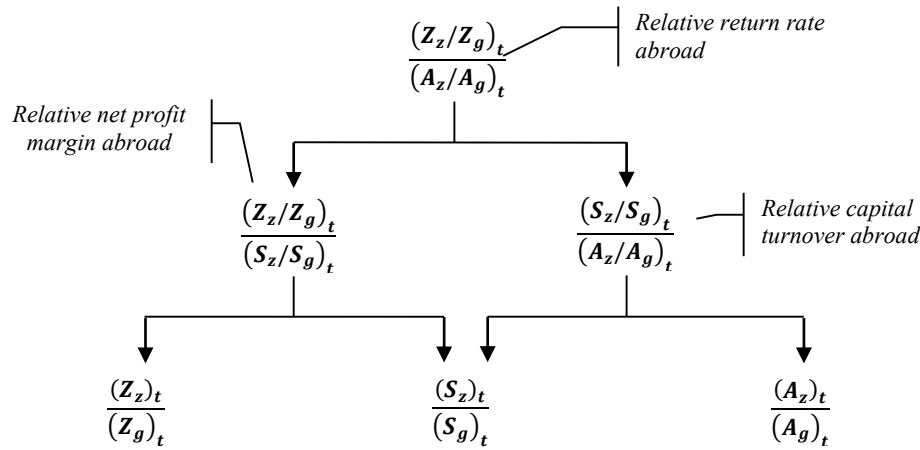
- number of foreign markets served,
- share of book value of assets abroad in the total assets of the enterprise,
- share of turnover in the total turnover of the enterprise,
- share of foreign profits in the global profit of the enterprise,
- forms of foreign involvement in value or volume terms (e.g., exports, license sales, franchising, foreign subsidiaries, subsidiaries),
- size of foreign direct investment (absolute or in relation to the total investment of the enterprise),
- shares in foreign markets,
- share of foreign employees in global employment.

The actual volumes related to operations in the home country and abroad allow for the calculation of the "foreign volume" for individual characteristics, which in this paper will be referred to as the "foreign share". It is calculated using the formula:

$$\text{foreign share in turnover} = \frac{\text{foreign turnover}}{\text{global turnover}} \cdot 100\%$$

To assess the level of internationalization, one can also use certain systems of indicators containing defined links between individual indicators. An example may be the widely used in financial analysis ROI (*Return on Investment*) indicator and its representation using the Du Pont formula (see: Macharzina, Welge, 1989, p. 966). The first version of the formula shows the rate of return on invested capital expressed as the product of the net profit margin and the overall turnover rate. The possibility of its use in internationalization analysis is presented in Figure 1.

Internationalization is described here by the relationship between specific quantities in the home country and abroad. This is obtained by dividing certain volumes (e.g., profit, capital, revenue) achieved outside the country by their global counterparts. This yields so-called relative volumes. The results obtained can be used as a tool for inference according to the principle: the greater the relative rate of return, relative profitability and relative turnover of capital abroad, the greater the degree to which the company is internationalized.



Where:

A_g – global assets,

A_z – assets located abroad,

S_g – global sales,

S_z – sales generated abroad,

Z_g – global profit,

Z_z – profit generated abroad,

t – point in time at which internationalization is measured.

Figure 1. Relationships between factors shaping ROI in international business.

Source: Macharzina, Welge, 1989, p. 966.

Information on the activities of competitors can also be included in the calculations, creating the appropriate benchmark values according to the formula:

$$\text{relative size of foreign market share} = \frac{\text{foreign market share}}{\text{domestic market share}} \cdot 100\%$$

Internationalization can be studied by observing nominal values over time. For the purpose of comparative observation of internationalization, certain measurement values can be used. They can be defined as follows:

$$\text{foreign turnover measurement} = \frac{\text{foreign turnover } (t)}{\text{foreign turnover } (0)} \cdot 100\%$$

$$\text{domestic turnover measurement} = \frac{\text{domestic turnover } (t)}{\text{domestic turnover } (0)} \cdot 100\%$$

These values allow for the calculation of the relative growth size of foreign turnover for the time period from 0 to t , expressed by the formula:

$$\text{relative growth size of foreign turnover} = \frac{\text{foreign turnover measurement}}{\text{domestic turnover measurement}} \cdot 100\%$$

4.4.2.3. Aggregated indicators

In addition to the discussed analytical indicators, indices, which are indicators derived from the aggregation of unit indicators, can also be used to study internationalization. Among the best known are:

- DOI (*Degree of Internationalization*).
- TNI (*Transnationality Index*).
- TASI (*Transnationality Activity Spread Index*).

The DOI index was developed by Sullivan (1994; 1996) as a result of observing 74 American transnational corporations with a production focus. The index is a combination of variables that characterize, in a country/foreign context:

- sales structure,
- asset structure,
- branch location structure,
- foreign experience of the management team.

The index takes values from 0.0 (no international activity at all) to 5.0 (doing business exclusively outside the home country). It consists of five unit indicators, which are:

- FSTS (*Foreign Sales as a Percentage of Total Sales*):

$$FSTS = \frac{FS}{TS} \cdot 100\%$$

where:

FS – *Foreign Sales*,

TS – *Total Sales*.

- FATA (*Foreign Assets as a Percentage of Total Assets*):

$$FATA = \frac{FA}{TA} \cdot 100\%$$

where:

FA – *Foreign Assets*,

TA – *Total Sales*.

- OSTs (*Overseas Subsidiaries as a Percentage of Total Subsidiaries*):

$$OSTS = \frac{OS}{TS} \cdot 100\%$$

where:

OS – *Overseas Subsidiaries*,

TS – *Total Subsidiaries*.

- TMIE (*Top Manager's International Experience*) – an index measuring the share of top managers' time working overseas to total managerial time.
- PDIO (*Psychic Dispersion of International Operations*) – an index measuring the dispersion of overseas operations within zones that differ in terms of so-called psychic distance. Each of the identified zones, as suggested by Adler et al. (1986) and Hofstede (1993), has a unique “cognitive map” of management principles. This assumes that the greater the dispersion of a company's subsidiaries in these zones, the greater the mental distance of its international operations.

The aggregated indicator takes the form of:

$$DOI = FSTS + FATA + OSTs + TMIE + PDIO$$

Aggregated indices have an advantage over indices that describe only one area. They take into account several areas, but return only one numerical value. This makes it easier to compare and observe index values over time. However, there are risks associated with selecting the right areas and assuming the strength of their influence on a given phenomenon. The DOI index is a non-weighted index. Such an index is characterized by the uniform importance (or rank) of each constituent element. It is not infrequently the origin of criticism. In accordance with the model of internationalization, the enterprise commences its expansion from the stage of sales. In the course of the present stage, a number of enterprises conclude their internationalization efforts and do not progress to more advanced forms of internationalization, such as direct investments. Greater investment is required in terms of capital, and a higher level of coordination is also necessary. In accordance with this assumption, it is recommended that each element be assigned a different degree of importance.

The *Transnationality Index* (TNI) was developed by researchers (including Dunning, Cantwell, Kim, Kumar, Wells, Young) associated with the *Division on Transnational Corporations and Investment* – an agency of UNCTAD (*United Nations Conference on Trade and Development*). The index was first published in 1995 in the *World Investment Report*. The authors assumed that internationalization can be described as a function of an enterprise's foreign activity. This allows for its examination through the analysis of selected variables that can characterize this process. It was assumed that these variables are the value of sales, the value of assets and the amount of employment achieved in foreign markets in relation to the total size of these parameters. The TNI index is built from three sub-indices:

$$ITA = \frac{FA}{TA} \cdot 100\%$$

where:

ITA – index of transnationality of assets,

FA – foreign assets,

TA – total assets.

$$ITS = \frac{FS}{TS} \cdot 100\%$$

where:

ITS – index of transnationality of sales,

FS – foreign sales,

TS – total sales.

$$ITE = \frac{FE}{TE} \cdot 100\%$$

where:

ITE – index of transnationality of employment,

FE – foreign employment,

TE – total employment.

The TNI index is calculated as the arithmetic mean of the partial indices:

$$TNI = \frac{ITA + ITS + ITE}{3}$$

The TNI index is probably the most important and most widely used measure of an enterprise's internationalization at present (Przybylska, 2006, p. 43; Wach, 2016, p. 115). This is certainly supported by the authority of its creators and the reputation of the institution that endorses the index. The mentioned elements suggest a high methodological quality, as well as the reliability of input data and calculations. The cyclical nature of the index's release and its methodological continuity also play a significant role.

The disadvantage of the indicator is that it does not take into account the number of countries in which the company operates, their size and strategic importance. The index only captures the relationship between activity in the home country and abroad.

This index shares a disadvantage with the one discussed earlier: it assigns equal weights to its components – sales volume, asset value, and employment size. As a result, two companies following fundamentally different internationalization strategies can achieve the same index value. For example, one company may have a high share of foreign sales but relatively low shares of foreign assets and employment. In contrast, another company might hold significant foreign assets and employ a large number of staff abroad, yet generate a relatively small portion of its sales from foreign markets. The index value does not reflect these strategic differences. A more nuanced understanding is possible, to some extent, through an analysis of the internal structure of the index.

Over time, the TNI has been expanded to include other indices (Wach, 2016, p. 116):

- NSI (*Network Spread Index*) – calculated as the quotient of the number of foreign markets (countries) in which an enterprise has subsidiaries and the number of foreign countries in which that enterprise could potentially have subsidiaries,
- *Internationalization Index* – expressed as a percentage, it is calculated as the number of foreign subsidiaries of a given enterprise divided by the total number of its subsidiaries,
- GSI (*Geographical Spread Index*) – calculated as the square root of the Internationalization Index multiplied by the number of countries in which the enterprise operates.

The NSI index was constructed by the same team as the TNI index. It considers internationalization through the lens of the number of countries in which the enterprise operates. It is also called the corporate networking index. It captures the relationship between the number of countries in which an enterprise locates its subsidiaries/branches and the number of all countries in the world receiving foreign direct investment (FDI), minus the home country. *World Investment Report 2022* indicates that there are 168 such countries out of 195 officially recognized by the UN.

The index takes the form of:

$$NSI = \frac{\text{number of countries in which the company has subsidiaries/branches}}{\text{number of countries where FDI activities are undertaken} - 1} \cdot 100\%$$

A large number of countries where subsidiaries/branches are located can mean high management costs for a company, high transaction costs, but also indicate a high level of ownership advantage. The main disadvantage of the index is that it does not take into account the size of countries. Each host country is given the same weight, regardless of the potential of its market, the size of the assets involved or the volume of sales or employment.

A correlation analysis of TNI and NSI conducted by authors from the *Division on Transnational Corporations and Investment* showed their low degree of interdependence. In addition, it was found that enterprises can internationalize their operations without stretching their activities to a large number of countries. Instead, they should focus on markets of the greatest strategic importance. The result of such a strategy is the possibility of achieving a high TNI index with a relatively low NSI indicator.

In summary, TNI and NSI capture different aspects of internationalization. The first one indicates the extent to which an enterprise is moving its core business activities across the borders of its home country, while the second one indicates its geographic reach. Both of these indicators, although in different ways, are a source of knowledge about the intensity of internationalization and the opportunities for building competitive advantages in the global market.

Ietto-Gillies (1998) criticized the TNI and NSI indices. TNI on its own reports only the degree of a company's foreign involvement, but says nothing about geographic scope. The NSI, on the other hand, independently reports the reach, but says nothing about the level of involvement. The researcher proposed to solve this problem by including both indices in the construction of another index, the TASI (*Transnational Activities Spread Index*). The structure is as follows:

$$TASI = TNI \cdot NSI$$

The low correlation coefficient between the indicators confirmed in studies (Hassel et al., 2003) indicates that they inform about different aspects of internationalization. This means that corporations with the highest degree of foreign involvement of their resources are not at the same time the companies with the greatest reach. For this reason, attempting to draw conclusions solely based on the TASI index, without its components, presents a certain issue. The same level of the index can occur in the case of a combination: a company with a strong commitment of resources and a low reach, and a company with a low commitment of resources and a high reach. These enterprises certainly cannot be considered similar, as their international situation is radically different.

4.4.2.4. Internationalization profiles

In addition to individual indicators, the level of internationalization can also be studied utilizing so-called internationalization profiles. This graphical method involves selecting features significant from the point of view of internationalization, calculating foreign shares for each feature, and then graphically presenting them in the form of a profile. Only those characteristics that are significantly related to internationalization, that is, either directly affect

it or directly result from it, should be qualified for the construction of the profile. Otherwise, there is a risk of obtaining unreliable results (Figure 2).

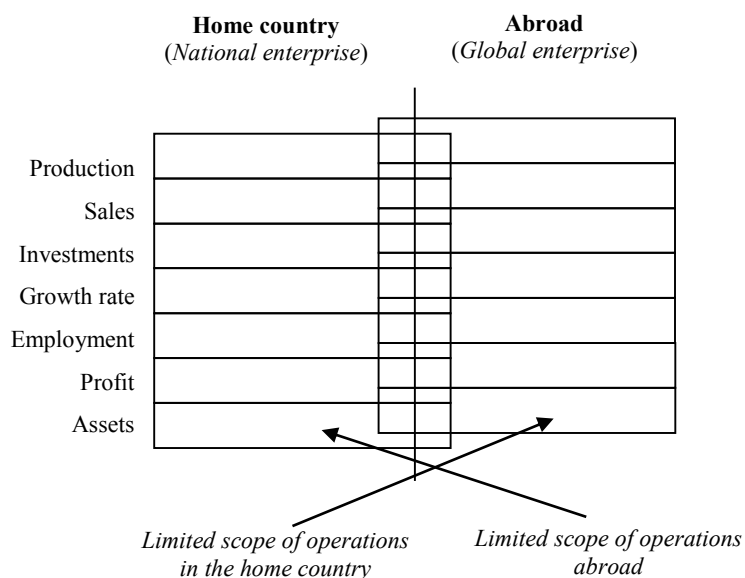


Figure 2. Ideal type of internationalization profile.

Source: Rymarczyk, 1996, p. 24.

The use of the profile to study internationalization involves analyzing its center of gravity. The further this point shifts towards foreign markets, the higher the degree of internationalization. Since some areas of activity undergo internationalization more strongly and rapidly than others, the actual type of profile will differ from the ideal one (Figure 3).

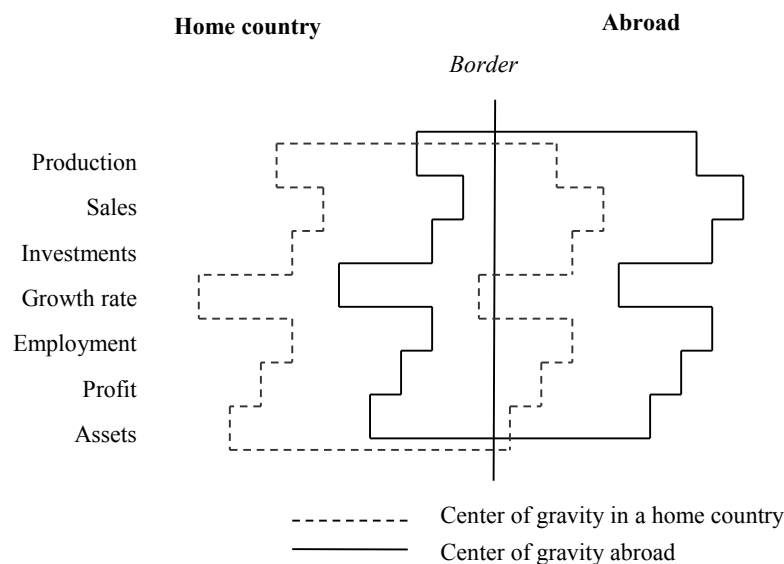


Figure 3. Real type of internationalization profile.

Source: Rymarczyk, 1996, p. 25.

Analysis of the internationalization profile allows for observing which types of activities are carried out with greater intensity and which with lesser intensity. Comparing profiles constructed based on data from different points in time allows for drawing conclusions about the dynamics of the company's foreign involvement and the leading strategy for market servicing (export, investment-based). Profiles can also be used for comparative analysis with other companies in the sector. In this sense, they can be an important tool to support the business management process.

5. Conclusions

The search for characteristics suitable for studying internationalization is based on the assumption that it is measured by the extent to which core business activities expand beyond the enterprise's home country. However, determining the impact of the proposed features on the overall level of internationalization is very difficult. The greatest difficulty arises from the interplay of multiple factors influencing the internationalization of enterprises, each affecting the process with varying strength and in different directions. The overall level of internationalization consists of the coexistence of a set of features that, due to their strong interconnections, create very powerful interactions that are difficult to observe directly. Specific levels of this phenomenon can result from a variety of causes, which include political changes, technological changes or changes in economic systems. The existence of a large number of characteristics that can be attributed to the internationalization process significantly complicates its assessment and the determination of the actual significance and impact they have on shaping this process.

The paper attempts to systematize and describe methods of measuring globalization processes at three levels: economies, sectors and enterprises. The descriptive measures presented in the paper, as well as indexes and profiles, allow a static view of internationalization.

None of the described ways of measuring internationalization is perfect or fully captures all aspects of the phenomenon under study. The indicated methods and assessment tools provide data and information that, when used correctly, meet the premises of objectivity, and this already makes them a tool that can be useful in the process of business management.

The paper contains only theoretical content. This convention has been adopted because, given the stated objective, illustrating with numerical data would require a significant expansion of the work. Undoubtedly, such works should be created, as there is a place for them in the economic literature. Of particular interest would be studies on the measurement of the dynamics of the internationalization process and the links between the level of internationalization and its efficiency.

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