

Towards a Taxonomy of International Competitiveness¹

Małgorzata Żmuda²

Submitted: 30.03.17. Final acceptance: 14.07.17

Abstract

Purpose: A wide range of approaches to defining, modelling, and measuring international competitiveness can be found in the scholarly literature across various fields of management and economics. Such number of perspectives enhances scientific research, but confuses public debate. Despite certain definitional ambiguities, there is a consensus that international competitiveness is a multi-faceted concept that should be analysed at different levels of aggregation: company level (micro), industry/cluster level (mezzo) and national level (macro). This paper addresses international competitiveness at all three levels and tracks the interlinkages between them with the aim to find a common ground for understanding this economic phenomenon in a systemic perspective: as a complex whole.

Methodology: The paper constitutes an in-depth literature review, forming a basis for a new approach to categorizing the main perspectives on international competitiveness. A synthesis of the latest international competitiveness literature sources has been performed in order to categorize the existing approaches to defining, modelling, and measuring international competitiveness. Following Chandhuri's and Ray's (1997) two-dimensional classification approach (the level of analysis and the variable), the paper introduces new insights into the existing taxonomy of international competitiveness.

Findings: Based upon the developed taxonomy, the paper offers an interdisciplinary, multi-layered model of international competitiveness.

Originality: The offered findings enhance the active shaping of modern competitiveness research directions to support the competitiveness policy on the regional and national level.

Keywords: international competitiveness, micro/mezzo/macro competitiveness, multi-layered model of competitiveness, conceptual framework

JEL: F23, F43, F60, L21, L52

¹ This project is funded by the National Science Centre, Poland (project: 2015/17/B/HS4/02075).

² Cologne Business School

Correspondence address: Hardefuststraße 1, D-50677 Köln, e-mail: m.zmuda@cbs.de.

Introduction

In the era of the fourth industrial revolution (Schwab, 2016) accompanied by disappearing trade and investment barriers, the competition amongst companies has intensified and become borderless (Porter and Rivkin, 2012; Zahra, 1999). A new breed of powerful actors – multinational enterprises – entered the global stage (Dunning and Lundan, 2008). Their strategies aim at boosting the levels of international competitiveness to achieve higher profits at the cost of the companies that have not managed to assume a position within the new hypercompetitive landscape (D’aveni, 2010). The intensity of the new age micro-competition can be illustrated by the metaphoric scientific parallels between a firm’s battle to survive in a global, integrated market and an organism’s struggle for biological existence in the context of environmental transition (Winsor, 1998). It has been stressed that market integration and intensified competitive interactions cause a shakeout of less competitive “locals”, eventually leading to “competitive exclusion or extinction” (Winsor, Sibeck and Rody, 1996).

This ruthless, zero-sum game in an international business reality has inspired discussions on the nature of relations on the macro level in the times of globalization, when some countries, through successful integration of their industrial sectors within the new global economy, have visibly outperformed others (Baily, 1993; Papadakis, 1994; Porter and Rivkin, 2012; Waheeduzzaman, 2011, p. 111). This is how the issue of competitiveness of a nation, popularized by Ronald Regan through his Presidential Commission on Industrial Competitiveness in 1985 (Huggins and Izushi, 2015), has become a catchy topic of high interest for policy makers and business strategists around the world (Thompson, 2004, p. 197).

The immense popularity of this concept in politics and media inspired debates amongst scholars³. On one end of this dispute, P. Krugman, in his trade-related view, has neglected the very sense of discussing the subject of “competition between nations” as being against the non-zero-sum game trade theory (Krugman, 1991b; 1996). His statement has inspired scholars to prove that macro competitiveness is a vivid academic category, worth further investigation (Cho and Moon, 2008; Dunn, 1994; Martin, 2005) – particularly relevant in conditions of free movement of production factors (Kojima and Ozawa, 1985; Siebert, 2000). In this view, competitiveness, as a qualitative category and a dynamic phenomenon, is understood as an ability to reach developmental goals in the era of globalisation (Jagiello, 2008; Radło, 2008; Reinert, 1995).

³ Elaboration on the controversies around the concept of national competitiveness in the academia together with the critical evaluation of the main points of Krugman’s critic can be found in Żmuda and Molendowski (2016).

Arising from controversies, macro competitiveness has developed to be one of the most broadly covered, yet still not clearly defined research areas of modern international economics. Existence of definitional ambiguities has become the reason for difficulties in grasping the very sense of this phenomenon, causing a lot of confusion in its modelling and measuring (Berger and Bristow, 2009; Bowen and Moesen, 2007; Misala, 2011; Olczyk, 2008; Siggel, 2010; Waheeduzzaman and Ryans, 1996) – hence offering space for further interdisciplinary studies. Despite the existing definitional ambiguities, there is a consensus that international competitiveness is a multi-faceted concept that should be analysed at different levels of aggregation (Berger, 2008; Daszkiewicz, 2008): company level (micro), industry/cluster level (mezzo) and national level (macro)⁴. This paper addresses international competitiveness at all three levels and tracks the interlinkages between them to develop a new categorization of research approaches. The ultimate objective of this paper is to find a common ground for understanding international competitiveness in a systemic perspective: as a complex whole. Based upon the developed taxonomy, the paper offers an interdisciplinary, multi-layered model of international competitiveness.

International Competitiveness: in search of definitional consensus

A wide variety of approaches for defining and modelling international competitiveness exists in the scholarly literature across various disciplines: from strategic management through trade theory and new economic geography to developmental economics. Scientists study competitiveness through the prism of one of these fields of inquiry or attempt to connect insights in an eclectic, multidisciplinary manner (e.g. Cho and Moon, 2008; Martin, 2005). Such a number of perspectives enhances scientific research, but confuses public debate. In popular discourse, simple analogies between companies, industries, and nations are drawn, which may lead to misinterpretation of reality and/or inspire counter-productive policies – the fact famously referred to by P. Krugman (1994) as a “dangerous obsession”.

In the light of the above, this section discusses the levels of inquiry and groups the main analytical approaches to competitiveness with the aim to develop a taxonomy of this economic phenomenon. To achieve this research objective, the paper addresses competitiveness at micro, mezzo and macro levels, and classifies the sources of inter-

⁴ Some researchers extend the international competitiveness analysis to the “mega” level, referring to relative performance of trading blocks and integration groupings within the global economy (Cho, 1998).

national competitiveness for each of the levels of analysis, distinguishing three types of variables: the whole economy, industry, and a firm. Following Chandhuri's and Ray's (1997) two-dimensional classification, table 1 offers a new approach to identifying 10 perspectives on competitiveness present in the literature on the subject. The greatest strength of the two-dimensional classification (the level of analysis-variable) is reflected in its comprehensive approach to uncovering the nature of international competitiveness as a multidisciplinary, multidimensional phenomenon. It additionally enables tracking interlinkages between the categories and thus sets the ground for developing an international competitiveness model, presented in the second part of the paper.

The macro level of the international competitiveness analysis, including literature in categories 1–4, deals with the key issues of growth theory, and departs from the question of why some countries outperform others.

In **category 1**, competitiveness, as a broadly understood national ability to grow within a global economy, is evaluated through a macroeconomic lens in a growth accounting manner. A wide body of literature in this category deals with modelling of macro-competitiveness, expressed in the GDP per capita terms, with the main determinants including exchange rates and interest rates (Zorzi and Schnatz, 2010), capital investment (Landau, 1990), economic freedom (Bujancă and Ulman, 2015) or quality of institutions (Bieńkowski, 2005; Huemer, Scheubel and Walch, 2013). To some researchers, competitiveness is a function of cheap and abundant labour and/or available resources (Huggins and Izushi, 2015). Top competitiveness reports, based on complex benchmarking of economy-wide indicators (Global Competitiveness Report by World Economic Forum and World Competitiveness Yearbook by Institute of Management Development) emerge from this category (Radło, 2008, p. 6–7). They recapitulate the performance of individual indicators and combine these indicators into one overall tier to achieve transparency and comparability across the analysed countries (Ketels, 2016, p. 29).

Over the last years, the macro competitiveness discourse has been enriched by the socio-environmental aspects – also in the context of the above-mentioned competitiveness reports. Scholars stress the necessity for finding a balance between actions aimed at boosting national productivity levels, responsible use of natural resources, and the development of social welfare (Samans, Blanke, Corrigan and Drzeniek, 2015; Thore and Tarverdyan, 2016). These goals in the “beyond-GDP terms”, together with the strategies to address them, belong to the main research areas of **category 2** in the “sustainable national competitiveness” discourse. Attempts are made here to model conditions for sustainable and sustained competitiveness of a nation, based on produc-

tivity enhancements, environmental conditions, socio-political stability, and human resources (Doryan, 1993). The improving conditions for each of these competitiveness dimensions are enabled by institutions which encourage sustainability.

Table 1. 10 approaches to analyse international competitiveness

Analysis Level	Analysis focus	Variable	Analysis Category	Analytical approach
Macro	Evaluates competitiveness of a national economy	Whole economy	1 Macro – Macro	Competitiveness as the ability of a nation to grow in GDP terms
		Whole economy	2 Macro – Macro	Competitiveness as the ability of a nation to develop sustainably in beyond-GDP terms
		Industry	3 Mezzo – Macro	Competitiveness of a nation as a sum of competitive industries/clusters: ability to increase productivity through innovation, resulting in structural adjustments (evolution of RCA towards high-tech specialization)
		Firm	4 Micro – Macro	Competitiveness of a nation as a cumulative ability of firms acting within the national boundaries to compete on global markets (domestic market share, export performance)
Mezzo	Evaluates competitiveness of industries/ clusters as platforms for innovation, stimulating national competitiveness	Whole economy	5 Macro – Mezzo	Territorial factors and institutional factors shaping the emergence of clusters (new economic geography; institutional economy)
		Industry	6 Mezzo – Mezzo	Sectoral factors shaping the emergence of clusters (Porter's Diamond of Competitive Advantage and its extensions)
		Firm	7 Micro – Mezzo	Firm-level characteristics, determining diffusion of knowledge and creation of innovation within clusters
Micro	Evaluates competitiveness of firms as building blocks of competitive clusters and nations	Whole economy	8 Macro – Micro	Political, legal, and socio-economic factors shaping the ability of a company to achieve above-average returns (institutional perspective on business)
		Industry	9 Mezzo – Micro	Sectoral factors (Porter's 5) shaping the ability of a company to achieve above-average returns (industrial-organization perspective)
		Firm	10 Micro – Micro	Resources and capabilities creating core competencies as a basis for above-average returns (resource-based view on a firm)

Source: own elaboration based on two-dimensional classification by Chaudhuri and Ray (1997, p. M–85).

There is a general consensus that labour productivity, through its impact on production processes and production costs (Auzina-Emsina, 2014), constitutes a key factor influencing the competitiveness of a nation. According to P. Krugman, this is actually the only meaningful way of discussing competitiveness on the level of a whole economy (Krugman, 1996). As research points to significant variations in productivity across region-industries (Gugler, Keller and Tinguely, 2015), considerable attention has been drawn to the emergence of innovative clusters of related companies and industries operating within a given location and their importance in shaping national competitiveness (Delgado, Porter and Stern, 2014). In the light of the above, **category 3** shows the research discourse in which macro competitiveness is evaluated through benchmarking the profitability of industries and/or groups of industries in a national and cross-national perspective (Johnston and Chinn, 1996). Another group of scholars, reaching back to the evolutionary economics view, associates industrial ability to compete with exports specialisation patterns (Castellacci, 2008). In this respect, national competitiveness is defined as the ability to adjust a given nation's exports structure to global trade trends through shifts towards specialisation based on knowledge and innovation (Wysokińska, 2012).

Evolution of productivity and trade structure within various industries starts from efforts at the level of a single firm. Hence, **category 4** analyses national competitiveness through the prism of cumulated micro-success of internationally competitive companies acting within national boundaries (Chesnais, 1986). In this perspective, the relative economic success of a country is reflected in the share of domestic firms in the total consumption of a particular good or the category of goods (the market). This success can be evaluated through a domestic market lens (reflected in domestic market shares) and/or through a global market lens (reflected in the exports volumes of the domestic competitive firms) (Papadakis, 1994; 1996).

Scholars generally agree that competitiveness of a nation is stimulated by a given nation's capabilities to innovate (Atkinson and Ezell, 2012; Castellacci, 2008; Dosi and Soete, 1991; Fagerberg, 1988; Faucher, 1991; Karodia, Soni, and David, 2014; Pelagidis and Mitsopoulos, 2014). In the era of increased flows of production factors (including flows of ideas), the generated innovation does not have to be rooted in efforts of single domestic companies, but can emerge as an outcome of complex interconnections between domestic and foreign companies operating within industries of a host economy (Roper and Hewitt-Dundas, 2015). As multinational enterprises continuously spread their value chains across locations around the world, destinations with particular locational advantages emerge (Gugler et al., 2015), creating platforms for increased levels of cooperation and innovation. In this way, clusters, as geographically concen-

trated companies within a certain industry and/or group of industries, are born (Delgado et al., 2014). Clusters as centres of excellence enable forward, backward, and horizontal innovation flows (Huggins and Izushi, 2015), providing a basis for the development of a knowledge-based economy and thus enhancing an upgrade of a host country within global value networks (Fundeanu and Badele, 2014). Emerging from the cluster theory, the mezzo level of international competitiveness analyses clusters as stimulators for national competitiveness through linkages and spillovers of information, skills, and technology across firms and industries (Huggins and Izushi, 2015). As there is a wide spectrum of approaches to understand the factors determining the emergence of clusters, literature categories 5–7 have been introduced to group them.

Category 5 concentrates on the locational qualities that trigger the emergence of clusters in a new economic geography discourse. In the 1990s, economists led by P. Krugman (1991a) “rediscovered” geography as a factor determining trade specialisation (Tingvall, 2004, p. 667). According to this line of thought, industrial linkages combined with economies of scale and decreased transportation cost support emergence and development of clusters (Tingvall, 2004). Reaching to evolutionary economics, spatial collective learning in a regional context, and “spatial connotation of increasing returns” has been explained (Boschma and Lambooy, 1999). This observation is of particular importance for tracking the motives behind the ever-increasing “slicing” of activities of multinational enterprises in search of the optimum locations for strictly defined activities pursued along their value chains (Buckley and Ghauri, 2004; Ottaviano and Puga, 1998; Redding, 2010).

As firm-specific assets become increasingly mobile across the national borders within the globalised world (Dunning, 1998), locational advantages and lessons from the economic geography help tracking new developments in international business.

Inspired by studies of economic geographers, M. Porter has developed a comprehensive, interdisciplinary framework for understanding the reasons for economic success of countries, embodied in the concept of “competitive advantage of a nation” (Porter, 1990). Over the course of his research, Porter uncovered that the forces determining national competitiveness are not equally divided but rather “clustered within particular regions within national economy”. Based on this observation, he developed a diamond model as a set of self-reinforcing conditions for a long-run productivity growth of companies operating within internationally competitive industries. The systemic nature of the diamond model focuses on the nature of the business environment, stressing the importance of horizontal and vertical interconnections between companies within industries – thus highlighting the importance of clusters (Huggins and

Izushi, 2015). Porter's study sets the basis for research in **category 6**, focusing on sectoral characteristics that shape the success of companies as part of an internationally competitive industry/cluster.

In this popular discourse, numerous researchers have focused their attention on adjusting the diamond model to specific characteristics of respective countries and developments of a global economy. Dunning stressed the importance of market globalisation and the emergence of value networks for the gain of competitive advantage of a nation, suggesting recognizing multinational enterprises as an external factor shaping the national competitive advantage (Dunning, 1993). The growing importance of internationalisation has been supported by further studies on the diamond, resulting in numerous extensions of Porter's framework (Bellak and Weiss, 1993; Cartwright, 1993; Hodgetts, 1993; Rugman and Verbeke, 1993). The most comprehensive approach has been proposed by H. Moon, A. Rugman, and A. Verbeke in the concept of the generalised double diamond. Their model has been applied by numerous researchers to highlight the growing importance of international interconnections in shaping competitive advantage of smaller, catching-up economies (Liu and Hsu, 2009; Molenowski and Żmuda, 2013; Postelnicu and Ban, 2010).

It is acknowledged that the emergence of clusters leads to easier flows of ideas amongst cluster participants, to an accelerated learning process, and to spatial knowledge creation. Consequently, this notion assumes that clusters and other forms of inter-firm collaborations may increase firms' levels of absorptive capacity in the process of coevolution with their knowledge environment (Lewin and Volberda, 1999; Van den Bosch, Volberda and de Boer, 1999). Research within **category 7** explores the process of knowledge diffusion and innovation creation in a regional and global perspective, concentrating on firm-level characteristics. Studies have indicated diverse organisational determinants of absorptive capacity: the level of prior related knowledge (Cohen and Levinthal, 1990), organisation forms and combinative capabilities (Runiewicz-Wardyn, 2012; Van den Bosch et al., 1999), or the importance of micro-interlinkages within clusters (Fundeanu and Badele, 2014). Evidence shows that an integrated enthusiasm within a cluster stimulates the learning process amongst participants of a given community and, together with the emergence of global pipelines of knowledge communication, creates a set of advantages not available for cluster outsiders (Bathelt, Malmberg and Maskell, 2004).

The micro level of international competitiveness focuses on firms as building blocks of industrial and national competitiveness. International competitiveness is understood here as the ability of an individual firm to achieve and sustain above-average returns

on global markets. Attaining this goal involves creation of sustainable competitive advantage against competitors. Competitive advantage stems from the ability of a company to create value for its customers that exceeds the costs of generating this value (Porter, 1985). Investigation of sources of micro competitiveness constitutes one of the most prominent areas of research for strategic management scholars, with three main theoretical perspectives emerging: institution-based (macro-view within category 8), industrial-organisation (mezzo-view within category 9), and resource-based perspective, enriched by the notion of dynamic capabilities (micro-view within category 10).

Companies do not build their competitiveness in a vacuum; they are surrounded by diverse environmental forces that shape their ability to achieve developmental goals (Kolasiński, 2012). The higher the level of unpredictability of the external environment (including conditions in political, legal, and economic spheres), the higher the risk for companies operating within a certain territory, which results in a lower willingness to commit oneself to long-term investments. This observation constitutes the basis for studies within **category 8**: institution-based view of a firm. Based upon a metaphor of the “rules of a game”, D. North defines institutions as “humanly devised constraints that shape human interaction (...) and structure incentives in human exchange, whether political, social, or economic (North, 1990, p. 3)”. The institutional perspective is rooted in the transaction costs theory (Williamson, 1981) and assumes that the costs associated with making an economic exchange of any kind are high in a situation when institutions do not constrain and eliminate opportunistic behaviours of market players. In consequence, the more solid the institutions, the lower the operational risk and the higher the trust in business contacts, which directly leads to greater levels of long-term investments (Wojtyna, 2008), triggering productivity and aiding firms operating within a given territory to reach their developmental goals.

The literature covering **category 9** emphasises the dominant influence of industrial environment on the company's ability to achieve above-average returns (Porter, 1981). The Industrial Organisation (I-O) model assumes that within respective industries, firms are endowed with similar resources and follow similar strategies. As the resources are highly mobile across firms, managers are expected to identify an industry with the highest potential for above-average returns through an analysis of its structural characteristics. In the most popular analytical discourse, attractiveness of an industry is evaluated through the prism of five forces: bargaining power of buyers, bargaining power of suppliers, competitive rivalry, market entry barriers, and product substitutes (Porter, 1980). As the Industrial-Organisation perspective occupies a prominent place within the strategic management research, diverse approaches to conceptualise industrial environment exist, with numerous studies revealing how an industry's characteristics

influence the profitability of firms operating therein (Dess, Ireland and Hitt, 1990; McGahan and Porter, 1997; Sharp, Bergh and Li, 2013).

More recently, the debate on the sources of performance differences between companies has been enriched with the resource-based view. This perspective, with research classified within **category 10**, argues that a firm's profitability is determined by its unique resources, capabilities, and organisational processes (Barney, 1986; Conner, 1991; Mahoney and Pandian, 1992; Wernerfelt, 1984). It stresses that firms may start out as homogenous entities, but as they grow, they develop distinct bundles of tangible and intangible resources that constitute the basis for their above-average returns (Rumelt, 1997; Wernerfelt, 1995). These valuable and rare bundles of resources and skills are embodied in the core competencies: "collective learning in the organisation, especially how to coordinate diverse production skills and integrate multiple streams of technologies" (Prahalad and Hamel, 1990, p. 81). The concept of core competencies provides a theoretical basis for the strategic actions aimed at reaching corporate developmental goals (increasing long-term-profitability): outsourcing of non-core activities or diversification to new markets/lines of business through transfer of core competencies.

Systemic International Competitiveness

On the basis of the overview of interdisciplinary approaches for defining international competitiveness and suggested taxonomy, this section aims at introducing a comprehensive model of international competitiveness. To grasp the very sense of the notion of "systemic competitiveness", the section opens with reaching back to the roots of micro competition in the theory of strategic management and extends it further to mezzo and macro levels in an attempt to develop a complex view, indicating that that macro competitiveness is not only a sum of its micro and mezzo parts, but also a complex system of the interconnections among them.

Origins of the competitiveness concept can be traced back to the theory of strategic management and the notion of competitive advantage, widely promoted by Michael E. Porter in his ground-breaking book *Competitive Advantage* (1985). As stated by the author, "competitive advantage is at the heart of a firm's performance in the competitive markets", and is determined by the appropriateness of the activities contributing to the company's performance (Porter, 1985, p. 1–2). Competitive advantage grows from the firm's ability to compete as a result of implementation of the said strategies, which the firm's competitors are unable to duplicate or find too costly to imitate. G.D. Flint, in his efforts aimed at grasping the sense of "sustainable competitive advantage,

stresses its “reference to a contest which results in an achieved goal consisting of some form of superior reward, be it financial or non-financial in nature” (2000, p. 123).

This exact logic has been applied in this paper. International competitiveness, rooted in strategic perspective, has been defined as the ability of a “subject” (economic agent) to pursue and attain its developmental goals. In the context of systemic competitiveness, this will mean that competitiveness of a system is enabled by bundled, self-reinforcing abilities. Such understanding of competitiveness “as set of abilities” can be traced back e.g. to the works by H. Trabold (1995) and Relijan, Hinrikus and Ivanov (2000).

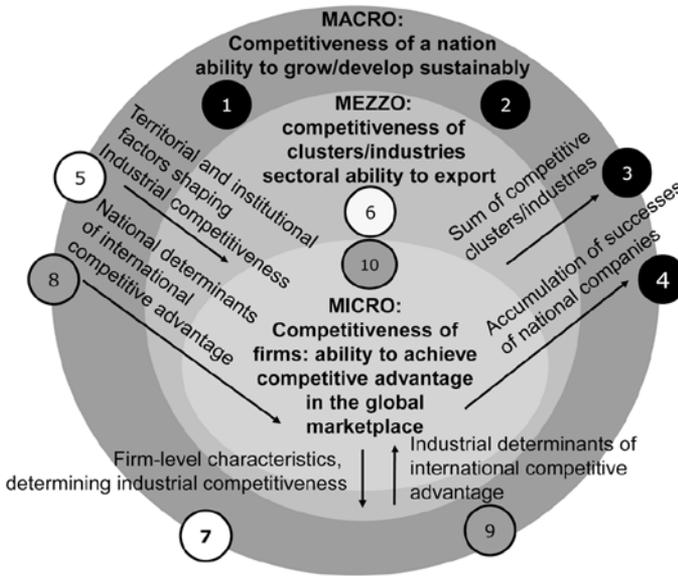
At each of the aggregation levels of international competitiveness (micro, mezzo, and macro) the goals differ. The goal of the company is to achieve above-average returns on international markets through the ability to offer products that competitors find too costly to imitate (cost-leadership strategies) or impossible to duplicate (differentiation strategies) (Porter, 1985). Sectoral/industrial competitiveness is associated with the ability of industries to compete with their foreign counterparts (Castellacci, 2008), and can be reflected in growing shares of domestic industries in the world exports (Cohen and Zysman, 1988), and through increasing the levels of technological advancements and productivity (Castellacci, 2008). The ultimate goal of a competitive economy is to grow and produce high and sustained living standards for citizens (Porter, 1990; Porter and Rivkin, 2012), additionally stimulated by efforts to increase attractiveness of a given location for mobile (both domestic as foreign) factors of production.

Such approach in analysing competitiveness implies an “existence of an active *economic agent* (a “subject” of economic process) that makes choices, defines strategies, and seeks to control variables” (Chesnais, 1991, p. 144). At the company level, there are no greater concerns about this logic, embodying the agent in the person of a strategic manager. However, moving to the mezzo and macro levels of national economy, the ability to achieve goals implies active involvement of governments, manifested by industrial and technological policies. F. Chesnais (1991, p. 144–145) stresses that this depends on the ability to establish cooperative agreements between the state and the business world: leading to a win-win situation from all three perspectives: of a company, a given industry, and a state. As the goals of economic agents at each of the levels are not mutually exclusive, international competitiveness constitutes a multidimensional phenomenon.

Following this logic, in the competitiveness model suggested in Figure 1, international competitiveness is evaluated from different perspectives as “a cause, an outcome and a means of achieving” respective goals (Waheeduzzaman and Ryans, 1996, p. 20). The competitiveness sphere (“onion”) encompasses all ten, self-enforcing and mutually

influencing dimensions of competitiveness, as discussed in the first section of the paper. The analytical categories attributed to each of the aggregation levels have been marked in colours (black for macro, white for mezzo, and grey for micro). The categories are covered in Figure 1.

Figure 1. “Competitiveness Onion”: A multi-layered model of international competitiveness



Source: own work based on Chaudhuri and Ray (1997, p. M–85).

The metaphor of an onion means that competitiveness is a multi-dimensional phenomenon, encompassing three aggregation layers: micro (firm), mezzo (industry/cluster), and macro (whole economy). In a systemic perspective, the interconnected layers of competitiveness create a complex whole – a competitiveness sphere. Agents at each of the aggregation levels have their respective goals which are pursued and met in a form of cumulative efforts that shift the systemic competitiveness into a higher level, enabling the economy to develop further.

The macro layer of the competitiveness onion illustrates the national ability to grow/develop sustainably and is understood as a sum of competitive industries/clusters with their joint capacities to increase productivity through innovation (“ability to grow/develop sustainably”). Cumulative shifts in productivity within industries stimulate evolution of trade specialization and result in structural adjustments (“ability

to adjust”). Internationally competitive industries/clusters are made up of firms able to compete on global markets (“ability to sell”).

The systemic character of the model shows that agents do not reach their goals in isolation. The onion is made of cumulative efforts at each of the aggregation levels (bottom-up dependencies: research categories 3 and 4). Furthermore, each of the layers constitutes a powerful determinant of competitiveness, achieved at the remaining levels of aggregation (top-down determinants: research categories 5, 8, and 9; bottom-up determinants: research category 7).

Conclusions and implications

International competitiveness constitutes one of the most frequently discussed topics in modern research within the fields of business and economics. Such a popularity causes definitional chaos and makes it difficult to grasp the very sense of this complex phenomenon.

In the first section of the paper, the arguments in question have been catalogued with the aim to develop a taxonomy for navigating amongst the existing approaches to define international competitiveness. Following the classification developed by Chaudhuri and S. Ray (1997), the paper has addressed competitiveness at the micro (firm), mezzo (industry/cluster), and macro (economy) level, grouping the sources of international competitiveness for each of the analysis dimensions, and distinguishing three types of variables: the whole economy, an industry, and a firm.

The suggested taxonomy creates a basis for developing a multi-layered model of self-enforcing interconnections between micro, mezzo, and macro dimensions of international competitiveness to grasp the systemic characteristics of this phenomenon. It has been stressed that as none of the competitiveness layers should be evaluated in isolation, markets and states must reinforce one another for sustained systemic competitive performance. The key role of regional and national institutions is to design rules supportive of the development of innovative clusters, encompassing internationally competitive companies. Such joint efforts lead to the evolution of the competitiveness of a whole economy.

To support this point, Ireland and Singapore can be seen as prime examples of such a “programmed” approach to strategic building of international competitiveness in a systemic perspective. Both “tigers”, as poster children of successful convergence,

are often referred to as benchmarks for other catching-up economies striving to improve their competitive position within the global network of interconnections (Żmuda, 2016a, 2016b). Their success is based on the concept of developmental state (Caldentey, 2008; Chong, 2007; Huff, 1999; Khondker, 2008; O Riain, 2000), in which a national growth path is strategically designed and carefully followed. An important cornerstone of this strategy assumes selecting “industries of the future” and, consequently, developing them according to a given strategic plan and industrial policy. In order to achieve developmental goals, national agencies have targeted the interest of international top players from selected industries, creating favourable conditions for investments. Their efforts have been reflected in a consistently high performance attained by both countries for years as documented in the rankings of “doing business” and “economic freedom” by The Heritage Foundation (2008; 2016; 2017). As a result, innovative clusters were created in both of the countries under analysis⁵, which triggered inflows of other established global players as well as creation of innovative start-ups. Starting from micro successes, competitive industries have emerged from scratch. This is how both countries managed to gradually shift exports structure towards specialization in the area of high-technology products, which enabled their socio-economic upgrade and placed them among the most competitive economies in the world⁶. In order to stay attractive for high-tech investments, both governments have laid emphasis on continual strengthening of their global image of high-tech hubs through high expenditures into R&D (Huff, 1999).

The outcomes of the analysis presented in this paper are of importance to shaping the modern competitiveness research directions actively, and supportive to the implementation of competitiveness policy on both the regional and national level. In the light of the rising environmental and social tensions in particular, the role of institutions has to be strengthened in the effort to build sustainable competitiveness. Future research should thus concentrate on the best-case examples for strategic building of systemic sustainable competitiveness and investigation into policies endorsing strengthening of the economic growth of nations without their social and economic degradation.

⁵ Singapore is home to one of the most prominent bio-tech and life-science clusters in the world (Pereira, 2006; Waldby, 2009), whereas Ireland created strong clusters in: pharmaceuticals (O’Clery, 2016; Van Egeraat, 2006; Van Egeraat and Barry, 2009), software and ICT (Barry, Panizza and Bogdanowicz, 2013; Gleeson, Ruane and Sutherland, 2005; Gleeson et al., 2005; Green, 2000; Porter, 2013).

⁶ Analysis of the strategic building of competitiveness in Singapore and Ireland in Żmuda (2016a; 2016b).

References

- Atkinson, R.D. and Ezell, S.J. (2012). *Innovation Economics: The Race for Global Advantage*. Yale University Press.
- Auzina-Emsina, A. (2014). Labour Productivity, Economic Growth and Global Competitiveness in Post-crisis Period. *Procedia – Social and Behavioral Sciences*, 156: 317–321, <https://doi.org/10.1016/j.sbspro.2014.11.195>
- Baily, M.N. (1993). Made in the U.S.A.: Productivity and Competitiveness in American Manufacturing. *The Brookings Review*, 11(1): 36–39, <https://doi.org/10.2307/20080363>
- Barney, J.B. (1986). Organizational Culture: Can It Be a Source of Sustained Competitive Advantage? *Academy of Management Review*, 11(3): 656–665, <https://doi.org/10.5465/AMR.1986.4306261>
- Barry, F., Panizza, A., de and Bogdanowicz, M. (2013). *The knowledge economy, economic transformations and ICT in the EU25+: regional dynamics in the deployment phase. Case study: Southern and Eastern Ireland*. Luxembourg: Institute for Prospective Technological Studies.
- Bathelt, H., Malmberg, A. and Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28(1): 31–56, <https://doi.org/10.1191/0309132504ph469oa>
- Bellak, C.J. and Weiss, A. (1993). A Note on the Austrian ‘Diamond’. *MIR: Management International Review*, 33: 109–118.
- Berger, T. (2008). Concepts on National Competitiveness. *Journal of International Business and Economy*, 9(1): 3–17.
- Berger, T. and Bristow, G. (2009). Competitiveness and the Benchmarking of Nations – A Critical Reflection. *International Advances in Economic Research*, 15(4): 378–392, <https://doi.org/10.1007/s11294-009-9231-x>
- Bieńkowski, W. (2005). *Instytucje jako czynnik konkurencyjności krajów postkomunistycznych: kilka uwag ogólnych dotyczących Europy Środkowo-Wschodniej*. Warszawa.
- Boschma, R.A. and Lambooy, J.G. (1999). Evolutionary economics and economic geography. *Journal of Evolutionary Economics*, 9(4): 411–429, <https://doi.org/10.1007/s001910050089>
- Bowen, H.P. and Moesen, W. (2007). *Benchmarking the competitiveness of nations: benevolence versus equal treatment*. MIT Press Scholarship Online, <https://doi.org/10.7551/mitpress/9780262013963.003.0006>
- Buckley, P.J. and Ghauri, P.N. (2004). Globalisation, economic geography and the strategy of multinational enterprises. *Journal of International Business Studies*, 35(2): 81–98, <https://doi.org/10.1057/palgrave.jibs.8400076>
- Bujancă, G.-V. and Ulman, S.-R. (2015). The Impact of the Economic Freedom on National Competitiveness in the Main Economic Power Centres in the World. *Procedia Economics and Finance*, 20: 94–103, [https://doi.org/10.1016/S2212-5671\(15\)00052-0](https://doi.org/10.1016/S2212-5671(15)00052-0)
- Caldentey, E.P. (2008). The Concept and Evolution of the Developmental State. *International Journal of Political Economy*, 37(3): 27–53.
- Cartwright, W.R. (1993). Multiple Linked ‘Diamonds’ and the International Competitiveness of Export-Dependent Industries: The New Zealand Experience. *MIR: Management International Review*, 33: 55–70.
- Castellacci, F. (2008). Innovation and the competitiveness of industries: Comparing the mainstream and the evolutionary approaches. *Technological Forecasting and Social Change*, 75(7): 984–1006, <https://doi.org/10.1016/j.techfore.2007.09.002>
- Chaudhuri, S. and Ray, S. (1997). The competitiveness conundrum: literature review and reflections. *Economic and Political Weekly*, M83–M91.

- Chesnais, F. (1986). Science, technology and competitiveness. *STI Review*, 1.
- Chesnais, F. (1991). Technological Competitiveness Considered as a Form of Structural Competitiveness. In: *Technology and National Competitiveness*. McGill-Queen's University Press.
- Cho, D.-S. (1998). From National Competitiveness to Bloc and Global Competitiveness. *Competitiveness Review*, 8(1): 11–23.
- Cho, D.-S. and Moon, H.-C. (2008). *From Adam Smith to Michael Porter: evolution of competitiveness theory* (Reprinted). New Jersey: World Scientific.
- Chong, A. (2007). Singapore's Political Economy, 1997–2007: Strategizing Economic Assurance for Globalization. *Asian Survey*, 47(6): 952–976, <https://doi.org/10.1525/as.2007.47.6.952>
- Cohen, S.S. and Zysman, J. (1988). Manufacturing Innovation and American Industrial Competitiveness. *Science*, 239(4844): 1110–1115.
- Cohen, W.M. and Levinthal, D.A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128–152, <https://doi.org/10.2307/2393553>
- Conner, K.R. (1991). A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within Industrial Organization Economics: Do We Have a New Theory of the Firm? *Journal of Management*, 17(1): 121–154, <https://doi.org/10.1177/014920639101700109>
- Daszkiewicz, N. (ed.) (2008). *Konkurencyjność. Poziom makro, mezo, mikro*. Warszawa: Wydawnictwo Naukowe PWN.
- D'aveni, R.A. (2010). *Hypercompetition*. Simon and Schuster.
- Delgado, M., Porter, M.E. and Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, 43(10): 1785–1799.
- Dess, G.G., Ireland, R.D. and Hitt, M.A. (1990). Industry Effects and Strategic Management Research. *Journal of Management*, 16(1): 7–27, <https://doi.org/10.1177/014920639001600102>
- Doryan, E.A. (1993). An institutional perspective of competitiveness and industrial restructuring policies in developing countries. *Journal of Economic Issues*, 27(2): 451.
- Dosi, G. and Soete, L. (1991). Technological Innovation and International Competitiveness. In: *Technology and National Competitiveness*. McGill-Queen's University Press.
- Dunning, J.H. (1993). Internationalizing Porter's Diamond. *MIR: Management International Review*, 33, 7–15.
- Dunning, J.H. (1998). Location and the Multinational Enterprise: A Neglected Factor? *Journal of International Business Studies*, 29(1): 45–66, <https://doi.org/10.1057/palgrave.jibs.8490024>
- Dunning, J.H. and Lundan, S.M. (2008). *Multinational Enterprises and the Global Economy*. Edward Elgar Publishing.
- Dunn, M. (1994). Do Nations Compete Economically. *Intereconomics*, November: 303–308.
- Fagerberg, J. (1988). International Competitiveness. *The Economic Journal*, 98(391): 355–374, <https://doi.org/10.2307/2233372>
- Faucher, P. (1991). The State and International Trade: Technology and Competitiveness. In: *Technology and National Competitiveness*. McGill-Queen's University Press.
- Flint, G.D. (2000). What is the Meaning of Competitive Advantage? *Advances in Competitiveness Research*, 8(1): 121–129.
- Fundeanu, D.D. and Badele, C.S. (2014). The Impact of Regional Innovative Clusters on Competitiveness. *Procedia – Social and Behavioral Sciences*, 124: 405–414, <https://doi.org/10.1016/j.sbspro.2014.02.502>
- Gleeson, A.M., Ruane, F. and Sutherland, J. (2005). Promoting Industrial Clusters: Evidence from Ireland, Multinationals, Clusters and Innovation, 89: 107–119.

- Green, R. (2000). Irish ICT cluster. In: *Paper delivered to the OECD Cluster Focus Group Workshop*, Utrecht.
- Gugler, P., Keller, M. and Tinguely, X. (2015). The role of clusters in the global innovation strategy of MNEs: Theoretical foundations and evidence from the Basel pharmaceutical cluster. *Competitiveness Review*, 25(3): 324–340, <https://doi.org/10.1108/CR-09-2014-0033>
- Hodgetts, R.M. (1993). Porter's Diamond Framework in a Mexican Context. *MIR: Management International Review*, 33: 41–54.
- Huemer, S., Scheubel, B. and Walch, F. (2013). Measuring institutional competitiveness in Europe. *CEifo Economic Studies*, 59(3): 576–608.
- Huff, W. G. (1999). Turning the Corner in Singapore's Developmental State? *Asian Survey*, 39(2): 214–242, <https://doi.org/10.2307/2645453>
- Huggins, R. and Izushi, H. (2015). The Competitive Advantage of Nations: origins and journey. *Competitiveness Review*, 25(5): 458–470, <https://doi.org/10.1108/CR-06-2015-0044>
- Jagiello, E. (2008). *Strategiczne budowanie konkurencyjności gospodarki*. Warszawa: Poltext.
- Johnston, L.D. and Chinn, M.D. (1996). How well is the United States competing? A comment on Papadakis. *Journal of Policy Analysis and Management*, 15(1): 68–81, [https://doi.org/10.1002/\(SICI\)1520-6688\(199624\)15:1<68::AID-PAM4>3.0.CO;2-H](https://doi.org/10.1002/(SICI)1520-6688(199624)15:1<68::AID-PAM4>3.0.CO;2-H)
- Karodia, A.M., Soni, D. and David, J.E. (2014). International Competitiveness, Globalization and Technology for Developing Countries: Some Reflections from Previous Research. *Singaporean Journal of Business, Economics and Management Studies*, 2(9): 25–34.
- Ketels, C. (2016). *Review of Competitiveness Frameworks*, https://www.researchgate.net/publication/303522738_Review_of_Competitiveness_Frameworks
- Khondker, H.H. (2008). Globalization and State Autonomy in Singapore. *Asian Journal of Social Science*, 36(1): 35–56.
- Kojima, K. and Ozawa, T. (1985). Toward a Theory of Industrial Restructuring and Dynamic Comparative Advantage. *Hitotsubashi Journal of Economics*, 26(2): 135–145.
- Kolasiński, T. (2012). Devious Competitiveness Paths of SMEs in sub-Saharan Africa: Selected Issues. *Management and Business Administration. Central Europe*, 5(118): 83–99, <https://doi.org/10.7206/mba.ce.2084-3356.30>
- Krugman, P. (1991a). Increasing Returns and Economic Geography. *Journal of Political Economy*, 99(3): 483–499.
- Krugman, P. (1991b). Myths and Realities of U.S. Competitiveness. *Science*, 254(5033): 811–815.
- Krugman, P. (1994). Competitiveness: A Dangerous Obsession. *Foreign Affairs*, 73(2): 28–44.
- Krugman, P. (1996). Making sense of the competitiveness debate. *Oxford Review of Economic Policy*, 12(3): 17–25.
- Landau, R. (1990). Capital Investment: Key to Competitiveness and Growth. *The Brookings Review*, 8(3): 52–56, <https://doi.org/10.2307/20080166>
- Lewin, A.Y. and Volberda, H.W. (1999). Prolegomena on Coevolution: A Framework for Research on Strategy and New Organizational Forms. *Organization Science*, 10(5): 519–534, <https://doi.org/10.1287/orsc.10.5.519>
- Liu, D. and Hsu, H. (2009). An international comparison of empirical generalized double diamond model approaches to Taiwan and Korea. *Competitiveness Review*, 19(3): 160–174, <https://doi.org/10.1108/10595420910962043>
- Mahoney, J.T. and Pandian, J.R. (1992). The resource-based view within the conversation of strategic management. *Strategic Management Journal*, 13(5): 363–380, <https://doi.org/10.1002/smj.4250130505>

- Martin, R. (2005). *A Study on the Factors of Regional Competitiveness. Final Report for the European Commission*.
- McGahan, A.M. and Porter, M.E. (1997). How Much Does Industry Matter, Really? *Strategic Management Journal*, 18: 15–30.
- Misala, J. (2011). *Międzynarodowa konkurencyjność gospodarki narodowej*. Warszawa: Polskie Wydawnictwo Ekonomiczne.
- Molendowski, E. and Żmuda, M. (2013). Changes In Competitiveness Among The Visegrad Countries After Accession To The European Union: A Comparative Analysis Based On A Generalized Double Diamond Model. *Comparative Economic Research*, 16(4): 121–153, <https://doi.org/10.2478/ce-2013-0031>
- North, D.C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- O'Clery, N. (2016). A Tale of Two Clusters: The Evolution of Ireland's Economic Complexity since 1995. *Science*, 317: 482–487.
- Olczyk, M. (2008). *Konkurencyjność. Teoria i praktyka*. Warszawa: CeDeWu.
- O Riain, S. (2000). The flexible developmental state: globalization, information technology and the 'Celtic Tiger'. *Politics and Society*, 28(2): 157–193.
- Ottaviano, G.I.P. and Puga, D. (1998). Agglomeration in the Global Economy: A Survey of the 'New Economic Geography'. *World Economy*, 21(6): 707–731, <https://doi.org/10.1111/1467-9701.00160>
- Papadakis, M. (1994). Did (Or Does) the United States Have a Competitiveness Crisis? *Journal of Policy Analysis and Management*, 13(1): 1–20, <https://doi.org/10.2307/3325088>
- Papadakis, M. (1996). Confounding Productivity and Competitiveness: A Rejoinder to the Comment, 'How Well Is the United States Competing?' *Journal of Policy Analysis and Management*, 15(1): 82–88.
- Pelagidis, T. and Mitsopoulos, M. (eds.) (2014). *Unlocking Growth: Innovation as a Driver of Competitiveness and Prosperity*. In: *Greece*. Brookings Institution Press.
- Pereira, A.A. (2006). Biotechnology foreign direct investment in Singapore. *Transnational Corporations*, 15(2): 99–123.
- Porter, M. (2013). *The Irish Internet Cluster: Helping a Tiger Regain Its Stripes*. Harvard Business School.
- Porter, M.E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Free Press.
- Porter, M.E. (1981). The Contributions of Industrial Organization to Strategic Management. *Academy of Management Review*, 6: 609–620.
- Porter, M.E. (1985). *Competitive Advantage*. New York: The Free Press.
- Porter, M.E. (1990). *The Competitive Advantage of Nations*. New York: Free Press.
- Porter, M.E. (1990). What Is National Competitiveness? *Harvard Business Review*, 68(2): 84–85.
- Porter, M.E. and Rivkin, J.W. (2012). The Looming Challenge to U.S. Competitiveness. *Harvard Business Review*, 90(3): 54–62.
- Postelnicu, C. and Ban, I.M. (2010). Some Empirical Approaches of the Competitiveness' Diamond – The Case of Romanian Economy. *Romanian Economic Journal*, 13(36): 53–77.
- Prahalad, C.K. and Hamel, G. (1990). The Core Competence of the Corporation. *Harvard Business Review*, <https://www.profrandes.com.br/userfiles/37e2f78e93b640608ec17b8de1b6d4b5.pdf>
- Radło, M.-J. (2008). Międzynarodowa konkurencyjność gospodarki. Uwagi na temat definicji, czynników i miar. *Czynniki i miary międzynarodowej konkurencyjności gospodarek w kontekście globalizacji – wstępne wyniki badań. Prace i Materiały*, 284: 3–15.
- Redding, S.J. (2010). The Empirics of New Economic Geography. *Journal of Regional Science*, 50(1): 297–311, <https://doi.org/10.1111/j.1467-9787.2009.00646.x>

- Reiljan, J., Hinrikus, M. and Ivanov, A. (2000). Key issues in defining and analysing the competitiveness of a country. *Faculty of Economics and Business Administration, Working Papers, 1*.
- Reinert, E. (1995). Competitiveness and its predecessors – a 500-year cross-national perspective. *Structural Change and Economic Dynamics, 6*: 23–42.
- Roper, S. and Hewitt-Dundas, N. (2015). Knowledge stocks, knowledge flows and innovation: Evidence from matched patents and innovation panel data. *Research Policy, 44*(7): 1327–1340, <https://doi.org/10.1016/j.respol.2015.03.003>
- Rugman, A.M. and Verbeke, A. (1993). Foreign Subsidiaries and Multinational Strategic Management: An Extension and Correction of Porter's Single Diamond Framework. *MIR: Management International Review, 33*: 71–84.
- Rumelt, R.P. (1997). Towards a Strategic Theory of a Firm. In: N.J. Foss (ed.), *Resources, Firms, and Strategies: A Reader in the Resource-based Perspective*. Oxford University Press.
- Runiewicz-Wardyn, M. (2012). Tworzenie i upowszechnianie wiedzy w branży biotechnologicznej na przykładzie regionów Flandrii i Walonii w Belgii. *Management and Business Administration. Central Europe, 5*(118): 100–113, <https://doi.org/10.7206/mba.ce.2084-3356.31>
- Samans, R., Blanke, J., Corrigan, G. and Drzeniek, M. (2015). *The Inclusive Growth and Development Report 2015*. Geneva: World Economic Forum, <http://www.ledevoir.com/documents/pdf/davosinegalites2015.pdf>
- Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum.
- Sharp, B.M., Bergh, D.D. and Li, M. (2013). Measuring and Testing Industry Effects in Strategic Management Research: An Update, Assessment, and Demonstration. *Organizational Research Methods, 16*(1): 43–66, <https://doi.org/10.1177/1094428112470847>
- Siebert, H. (2000). *Zum Paradigma des Standortwettbewerbs*. Mohr Siebeck.
- Siggel, E. (2010). Concepts and Measurements of Competitiveness: Toward an Integrated Approach. *Dimensions of Competitiveness, 95*.
- The Heritage Foundation (2008). *Index of Economic Freedom 2008*. Washington.
- The Heritage Foundation (2016). *Index of Economic Freedom 2016*. Washington.
- The Heritage Foundation (2017). *Index of Economic Freedom 2017*. Washington.
- Thompson, E.R. (2004). National Competitiveness: A Question of Cost Conditions or Institutional Circumstances? *British Journal of Management, 15*(3): 197–218, <https://doi.org/10.1111/j.1467-8551.2004.00415.x>
- Thore, S. and Tarverdyan, R. (2016). The Sustainable Competitiveness of nations. *Technological Forecasting and Social Change, 106*: 108–114.
- Tingvall, P.G. (2004). The Dynamics of European Industrial Structure. *Review of World Economics / Weltwirtschaftliches Archiv, 140*(4): 665–687.
- Trabold, H. (1995). Die internationale Wettbewerbsfähigkeit einer Volkswirtschaft. Vierteljahresheft, <http://sowiport.gesis.org/search/id/gesis-solis-00204888>
- Van den Bosch, F.A.J., Volberda, H.W. and de Boer, M. (1999). Coevolution of Firm Absorptive Capacity and Knowledge Environment: Organizational Forms and Combinative Capabilities. *Organization Science, 10*(5): 551–568, <https://doi.org/10.1287/orsc.10.5.551>
- Van Egeraat, C. (2006). Spatial concentration in the Irish pharmaceutical industry: the role of government intervention and agglomeration economies. *(NIRSA) Working Paper Series, 28*.
- Van Egeraat, C. and Barry, F. (2009). The Irish pharmaceutical industry over the boom period and beyond. *Irish Geography, 42*(1): 23–44.
- Waheeduzzaman, A.N.M. (2011). Competitiveness and convergence in G7 and emerging markets. *Competitiveness Review, 21*(2): 110–128, <https://doi.org/10.1108/10595421111117425>

- Waheeduzzaman, A.N.M. and Ryans, J. (1996). Definition, Perspectives and Understanding of International Competitiveness: a Quest for Common Ground. *Competitiveness Review*, 6(2): 7–26.
- Waldby, C. (2009). Singapore Biopolis: Bare life in the city-state. *East Asian Science, Technology and Society*, 3(2–3): 367–383.
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2): 171–180, <https://doi.org/10.1002/smj.4250050207>
- Wernerfelt, B. (1995). The resource-based view of the firm: Ten years after. *Strategic Management Journal*, 16(3): 171–174, <https://doi.org/10.1002/smj.4250160303>
- Williamson, O.E. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3): 548–577, <https://doi.org/10.1086/227496>
- Winsor, R.D. (1998). Regional Integration and Competition from a Biogeographic Perspective: An Extension and Elaboration of Organization Ecology. *Journal of Competitiveness Studies*, 6(1): 30.
- Winsor, R., Sibeck, G. and Rody, R. (1996). Regional integration agreements and the borderless market: Lessons from history. *Competitiveness Review*, 6(1): 59–67.
- Wojtyła, A. (2008). O badaniach nad głębszymi przyczynami wzrostu gospodarczego. In: R. Rapacki (ed.), *Wzrost gospodarczy w krajach transformacji. Konwergencja czy dywergencja?* Warszawa: PWE.
- Wysokińska, Z. (2012). Konkurencyjność w międzynarodowym i globalnym handlu towarami technologicznie intensywnymi (high-tech). *Studia Europejskie*, 1: 127–146.
- Zahra, S.A. (1999). The changing rules of global competitiveness in the 21st century. *The Academy of Management Executive*, 13(1): 36–42.
- Żmuda, M. (2016a). Evaluating sustainability and transferability of the ‘Singaporean Competitiveness Model’: Lessons for the catching-up European states. *Research Papers of Wrocław University of Economics*, 447: 111–123.
- Żmuda, M. (2016b). Strategie pobudzania konkurencyjności Singapuru i Irlandii w świetle koncepcji państwa rozwojowego – wnioski dla gospodarek doganiających. *Studia i Materiały. Miscellanea Oeconomicae*, 3.
- Żmuda, M. and Molendowski, E. (2016). W poszukiwaniu istoty konkurencyjności gospodarki narodowej: studium interdyscyplinarne. *Finanse, rynki Finansowe, ubezpieczenia*, 81(3): 323–333.
- Zorzi, M.C. and Schnatz, B. (2010). Explaining and Forecasting Euro Area Exports: Which Competitiveness Indicator Performs Best? In: *Dimensions of Competitiveness*. MIT Press.