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Determinants of competitiveness in the IT sector in the Kraków cluster as a part of creative industries

The value of key firms' assets in a global competitive economy has a crucial role in their development. In creative industries, these assets mainly have a non-physical character. The paper presents the results of research in 223 firms in the IT sector in Kraków. The research was questionnaire-based and aimed to assess the importance of factors which determine the decision to create a firm in this city. Another aspect of the research is connected with the estimation of the value of factors which, in the opinion of their managers, contribute to their firms' competitiveness. Kraków is a city where the IT sector is well developed (with research centres of such multinational companies like IBM, Google, Motorola, ABB), and the research studies the nature of interactions among the firms in the sector. The role of institutional environment in the firms' development as an important factor in their growth is also researched, as are evaluations of the profits made by the firms as a result of cooperation with universities, R & D units, other IT firms, and personal relations. Special attention is paid to institutional aspects of direct government stimulation of innovativeness and knowledge transfer.

Keywords: creative industries, competitiveness, IT sector.

Creative industries

Creativity as a process of creating new, original ideas and concepts is the basic factor of upsetting the already existing equilibrium in commercially used technologies and methods of production and service delivery. As a result, more effective methods either replace already used ones or create new products or services which reduce the time of capital return from already invested sources. High levels of creativity in the external environment generate pressure in territorial units on their own ability to encourage creative activity in order to keep a standard of living based on competitiveness.

The term "creative industries" was first used in the mid-1990s. In an Australian report *Creative Nation: Commonwealth Cultural Policy*, published in 1994, culture was treated as a factor which adds value and makes an essential contribution to innovation. In a report prepared in 1998 by the United Kingdom's Department of Culture, Media and Sport (DCMS), which popularized the term,

13 categories of such industries were specified: advertising, antiques, architecture, crafts, design, fashion, film, leisure software, music, performing arts, publishing, software, TV, and radio. In this paper, software is defined very broadly, although some authors point that in the context of creativity, at its core are gaming industries. DCMS defines creative industries as "industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property" (2001: 5). The United Nations Conference on Trade and Development, in its definition of the term, stresses that creative industries "use creativity and intellectual capital as primary inputs; constitute a set of knowledge-based activities, focused on but not limited to arts" (UNCTAD 2008: 4). Such approaches stress the role of cultural assets which undergo creative transformation into market products. The concept of creative industries is closely connected with the development of works related to the economic dimension of culture (Throsby 2001, 2010). The interdependence of culture and creative industries was particularly confirmed in research concerning

Italy, where the 'heritage dependence' was observed as well as a correlation with institutional elements which are related to culture (Lazzeretti, Boix and Capone 2013). In Florence, for example, the role of restoration firms changed and they are no longer just elements of cultural industries but become creative resources and actors within the creative city (Lazzeretti, Cinti 2013).

The role of creative industries is growing because of their work places' relative resistance to relocation. This feature is especially important in light of traditional industries' relocation to countries characterized by cheaper production costs or with fewer ecological restrictions. Creative industries are also relatively resistant to reduction of jobs due to automation or implementation of new technologies. The stability of location is an effect of the profits such industries get from interactions within formal and informal networks, which can be neither simply copied nor transferred. Features such as efficiency of job creation and stability of location make supporting creative industries a desired policy orientation. These kinds of industries are based on long-life assets, which are a combination of art, culture, education, openness, and communication codes. Such assets are different not only at the national but even at the regional level. The analysis by Boix et al. (2013) confirms that profiles of specialization in creative industries differ across countries.

Firms in creative industries often build the value of their products on combining assets from other creative branches of the economy. For example, the Apple Corporation combines high-tech achievements with industrial design using it in the core of their added value. Kraków's computer-games firms owe their international success to cooperation with local graphic and music entities. The important role of design as a supporting product-value creator is confirmed by international researchers: Mamica (2014) shows that consumers are ready to pay for good-quality design: a higher quality of design increases the worth of a product by about 27 per cent.

Creative interactions

Changing teams and projects is a common characteristic of creative people who are looking for

new ideas (Grabher and Ibert 2006). Interactions are the main trait of creative networks (Belussi and Staber 2010). Cities where creative firms are located offer opportunities for specialists to change their place of employment or cooperation easily. The larger the number of such firms, the greater the probability of finding interesting and financially satisfying jobs. Interactions in creative communities are possible both remotely, using new IT technologies, and traditionally, face-to-face (Amin and Roberts 2008). Such an opportunity to communicate in order to find new chances for competing, given the fast changing nature of current technologies, is much more important than having the technologies themselves. Interactions should be understood as relations which are not based only on communications but they contribute to modifying the means of interacting. Such a way of thinking is close to the concept of community of practice (Lave and Wenger 1991, Wenger 1998), where the key role is played by active practitioners. Spatial proximity, which is more open to informal relations and contacts than remote communication, gives advantages to the firms whose employees can form such relations. Interactions are important because creativity is not limited to organizational boundaries and is possible beyond them (Staber 2004).

Informal interactions are extremely useful in the case of distributing the knowledge concerning failed projects and experiments. Information about failures is not usually distributed by more formal channels of communications but it has a measurable value for other firms, who can better use their own financial and human resources. Interactions also help to develop the tacit dimension of knowledge, the concept introduced by Polanyi (1967). Tacit knowledge, accumulated in communities of practice, increase their ability to solve problems (Lesser and Everest 2001). A number of specialists from different scientific areas, available and interacting in a creative city, increase the probability of success of interdisciplinary projects. For example, the development of the European Centre of Games cluster in Kraków, and of firms which belonged to it, was possible because of easy access to IT specialists, musicians, and graphic designers. Scott (2010) connects creativity with learning and innovations, where learning is considered as the basis for creative actions which depend

on thought and action. Spatial proximity, typical for big cities, supports the exchange of thoughts and ideas which is so necessary in the process of innovative solutions creation.

Interactions within a group of partners responsible for creative development could be supported by public administration. The authors of the report which analyzes the needs and the development process of creative industries in Poland (ECORYS 2009) stress the role of using an integrated approach to such industries in public administration by establishing close relations between departments responsible for culture, education, and economy.

Creative cities

Creativity, which consists in a big part in looking for new combinations of uses of existing knowledge or ideas, requires a stimulating environment where such knowledge and ideas are easily accessible. Cities, particularly big ones, were traditionally centres of human activity which developed by interactions. Today, despite the new technological communication possibilities and the existence of relational proximity without spatial proximity (Gertler 2008), to get creative results from interactions, it is still important to be in a big city. The United Kingdom is the country where the concept of a 'creative city' was first tested in research concerning the impact of creative industries on its development (Landry and Bianchini 1995).

Cities have always been centres of cultural activities. Modern culture and art is more focused on concepts, on new, often controversial and non-obvious combinations of objects. Artists are looking for new materials or for their non-traditional uses. Art is not only enclosed in museums but it is often shown in the public space. It is often intrinsically connected with creative industries like fashion, architecture, or design. Festivals of design are sometimes located in a number of places in a city (like in the case of the annual Polish Gdynia Design Days where, in 2013, over 70 different events took place in

many locations over one month). Therefore, we can observe not only the promotion of creative firms but, even more importantly, of creative behaviours and ways of thinking. Non-standard artistic performances and installations can be treated as an inspiration to new combinations of existing knowledge, materials, and ideas. The popular trend of dematerialization in modern art, where the role of material is decreasing and objects of arts are often digital in form, fits well with IT communication methods.

Although cities are the natural base for development of creative clusters, the latter can also exist outside of them. The research conducted by Lazzarotti, Boix and Capone (2013) shows that creative industries are dispersed in Italy, while in Spain they are concentrated around metropolitan areas.

Jeannerat and Crevoisier distinguish four types of territorial development through cultural activities (2013). In the first type, culture is considered as an economic market commodity, co-locally produced and consumed. In the second type, cultural activities are treated as an input within broader commercialization context. The third type of territorial development considers culture as a mobilized resource to produce a market commodity. In the last type, culture is not treated as a commodity which is produced and consumed but as an important component of an exported product or service. The latter is typical of the activity of a Polish IT firm which makes a computer music game based on Chopin's music with the participation of the world's best pianists and in cooperation with The Polish Ministry of Culture and National Heritage.

An important promotional role in development of creativity is played by Creative Cities Network under the patronage of UNESCO. The fields of excellence are classified as: Literature, Music, Film, Design, Craft and Folk Art, Media Arts, and Gastronomy. This network promotes socio-economic and cultural development through creative industries and helps creating a healthy urban environment. In the group of 40 cities, members of the network, there is only one Polish city – Kraków (designated as a city of literature).

Kraków's IT sector, the methodology of research and basic characteristics of the researched group

Kraków is the second largest city in Poland, with the population of about 750 thousand inhabitants. It is an academic city with over 170 thousand students in 2013. In communist times, after the Second World War and up to the 1989 transformation, technical universities had limited access to modern world-class laboratory equipment. It created a pressure to develop more theoretical fields of technical science. Mathematics and later computer programming were taught very well and guaranteed a supply of well-qualified employees for IT enterprises. Some firms were established by university professors (like Comarch, which operates in many countries). Kraków is also home to research departments of multinational corporations such as Google, Motorola, IBM, or ABB.

In Kraków's IT sector, over 4800 firms were registered in 2010. Our random sample consisted of 360 firms. The research, based on questionnaires, filled in during personal interviews or by post, whose results are presented here, was conducted in 2011 and covered 223 firms. Almost 75 per cent of the enterprises were small firms (68 per cent micro firms with up to nine employees), 21 per cent, medium firms (50-249 employees) and 4 per cent large firms with over 250 employees. Only 5 per cent of them were established before the 1989 transformation from communism to market economy. Over 27 per cent were created in the 1990s, while 10 per cent had only up to two years activity at the market.

Determinants of IT firms' establishment

To create an effective policy of attracting investments, it is useful to know what triggers the decision to establish a firm. The most important reason for setting up a firm in Kraków, with the highest average mark (3.99), was easy access to clients (on a 5-point scale, where 1 means not important at all, and 5 very important). Over 40 per cent of the firms' representatives ranked this factor as the most important. The second most important factor was access to qualified workers (average mark 3.36), and the third, attractiveness of the city as a space of living (average mark 2.95). The least important were family and friends in Kraków (average mark 2.51). Analyzing the data concerning the factors for choosing Kraków as a location (Table 1), we can see that the most important are those connected with making business, and family relations and quality of life are less important (but also appreciated by firm representatives).

The role of factors generating benefits for IT firms

The most popular source of benefits for representatives of IT firms in Kraków were their former university colleagues (declared by over 88 per cent of them). The average mark for this source was 2.67 (on a 5-point scale, where 1 means no benefits, and 5 – very high benefits). Over 80 per cent of the respondents declared they kept in touch with other IT firms in the city and in the country. The highest average importance mark

Table 1 Marks given to determinants of firms' establishment (in %)*

Type of factor	Percentage of answers choosing the following marks					Average mark
	1	2	3	4	5	
Easy access to clients	8.60	4.50	10.80	29.30	44.10	3.99
Access to qualified workers	12.60	13.10	20.30	28.80	22.10	3.36
Attractiveness of the city as a space of living	18.00	18.50	21.20	26.60	11.70	2.95
Family or friends in Kraków	33.80	18.00	15.30	18.00	10.40	2.51

* On a 5-point scale (where 1 means no benefits, and 5 – very high benefits) and average marks.

Source: own calculation based on questionnaire research.

was given to contacts with other IT firms in the city (2.72 on a 5-point scale, where 1 means no benefits, and 5 – very high benefits). Over 20 per cent of respondents gave this factor a 4 or a 5. Almost the same rank was given to other firms in the country (average mark 2.7). The lowest number of firm representatives (almost 66 per cent) declared contacts with R & D institutions. At the same time, the average mark of advantages derived from such contacts was only 2.35 on the 5-point scale.

Human capital is the most valuable for creative firms, which is confirmed by the analysis of declarations of Kraków's IT firm representatives concerning internal factors generating profits for them. The average mark for this asset was 4.2 (on a 5-point scale where 1 means no benefits, and 5 – very high benefits), and almost 50 per cent

gave the highest rank to the role of employees. The second most important asset, with the average mark of 4.0, were business contacts. Almost 40 per cent of IT firm representatives ranked them as the most important.

Assets which represent the material aspects of a firm's property were judged as curiously unimportant. The value of their own computer programs got the mark 2.9 on a 5-point scale, with only just below 20 per cent of highest marks received. Tangible assets, which received only 2.4 points on average, was perceived as even less important. Only just below 10 per cent gave it the highest rank. These results confirm the dynamic market situation in IT firms, where the ability to discover new combinations and solutions is much more important than using those already in existence.

Table 2 Marks given to the role of the following institutional and personal factors which generate benefits for firms (in %)*

Type of factor	Percentage of firms with contact with the following sources of benefits	Percentage of answers choosing the following marks					Average mark
		1	2	3	4	5	
Other IT firms in the city	87.1	9.5	34.4	33.3	16.9	4.2	2.72
Other firms in the country	82.9	12.6	24.8	22.1	15.3	5.4	2.7
Universities	73.6	17.6	28.9	27.0	20.8	3.8	2.64
Former university colleagues	88.3	17.1	23.0	21.6	18.9	5.0	2.67
R & D institutions	65.8	18.9	15.8	17.1	9.9	1.4	2.35

* On a 5-point scale (where 1 means no benefits, and 5 – very high benefits) and average marks.

Source: own calculation based on questionnaire research.

Table 3 Marks given to assets generating benefits for firms and average marks (in %)*

Type of factor	Percentage of answers choosing the following marks					Average mark
	1	2	3	4	5	
Employees	4.5	4.1	7.2	33.3	48.2	4.2
Business contacts	5.4	4.5	14.0	33.8	38.7	4.0
Own computer programs	26.1	12.6	12.6	22.5	18.5	2.94
Durable properties	2.25	19.8	25.2	22.5	8.6	2.44

* On a 5-point scale, where 1 means very low impact, and 5 – very high.

Source: own calculation based on questionnaire research.

Level of cooperation and the relation among cooperation and the economic situation of IT firms

Over one fourth of all the Kraków’s IT firm representatives interviewed described cooperation among them as intensive or very intensive (Figure 1). Only 10 per cent of the research group did not see such cooperation. The opinions of firm representatives concerning the level of cooperation are mainly influenced by their individual experiences in this matter. As part of the research, the representatives were asked to give marks to their economic situation compared to the previous year (on a 5-point scale, where

1 means much better, 2 – better, 3 – with no changes, 4 – worse, and 5 – much worse). Among those who do not see such cooperation at all or to a small degree, the results concerning their economic situation was 2.22, and among those who describe it as not very intensive it reached 2.31. The economic situation was rated 2.29 by those who observe intensive or very intensive cooperation, so it was higher than in the group who only perceive cooperation as minimal, but lower than in the group who describe it as not very intensive. Also, the correlation indicator does not confirm a relation between economic situation and the observed level of cooperation.

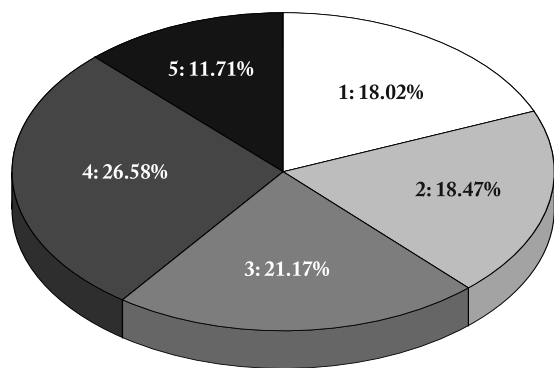


Figure 1 Opinions of IT firm representatives concerning the intensity of cooperation among this type of firm in Kraków*

* Where 1 means lack of cooperation, 2 – occasional cooperation, 3 – not very intensive, 4 – intensive, 5 – very intensive cooperation.

Source: own calculation based on questionnaire research.

Role of problems for the functioning of IT firms

The representatives did not consider lack of qualified workers as a problem for their firm (Table 3). This factor received an average mark of 2.65 (on a 5-point scale, where 1 means not important at all, and 5 – very important). More than one fourth of them think that it is not important at all. This is a very good signal for other firms interested in relocating or starting their business activity in Kraków, and it shows that there is sufficient supply of qualified IT specialists in the region. Also, unstable exchange currency rates are not an important problem for firm development (average mark 2.41 on this scale). This is probably related to the devaluation of the Polish currency due to the global financial crisis, which helped domestic exporters.

Table 4 Marks given by IT firm representatives to different kinds of problems in the functioning of their firms and average marks (in %)*

Type of problem	Percentage of answers choosing the following marks					Average mark
	1	2	3	4	5	
Lower demand for products and services	5.9	11.7	24.3	30.2	13.5	3.39
Tax rates and social insurance fees	8.1	12.6	26.1	26.1	23.9	3.47
Lack of qualified workers	25.7	22.5	20.7	17.6	11.3	2.65
Unstable exchange currency rate	30.6	22.5	21.6	16.2	5.4	2.41

* Where 1 means not important at all, and 5 – very important.

Source: own calculation based on questionnaire research.

The most important problem for creative firms in Kraków are tax rates and social insurance fees: almost one fourth of the researched group ranked it as the most important, and the average mark was 3.47. A relatively great importance was also attributed to lower demand for products and services (average mark 3.39) which is also related to the poorer economic situation.

Conclusion

To prepare an effective industrial policy, it is important to know the factors which contribute to the competitiveness position of creative firms and of barriers to their development. Creative industries that improve their economic position and increase the number of employees are becoming increasingly important for such policy. The representatives in our research stress the role of business factors (like easy access to clients and access to qualified workers) rather than family relations and quality of life in a given place. The greatest role of institutional and personal factors is confirmed by the respondents' positive assessment of the cluster and relations which take place there and which generate profits for firms. The non-material character of creative firms' assets is evidenced by the fact that they appreciate employees and business contacts much more than their own computer programs and tangible assets. The research confirmed that Kraków offers IT firms easy access to qualified workers (this barrier to development was not considered very great). The recommendation for policy makers is to maintain at least the current number of computer science students and to support cluster initiatives which integrate actors operating in the IT sector. The most important problem for creative firms were tax rates and social insurance fees.

References

- Amin, A., and Roberts, J., eds. (2008). *Community, Economic Creativity and Organization*. Oxford: Oxford University Press.
- Belussi, F., and Staber, U. (2010). *Managing Networks of Creativity*. London: Routledge.
- Boix, R., Lazzeretti, L., Capone, F., De Proporis, L., and Sánchez, D. (2013). "The geography of creative industries in Europe, comparing France, Great Britain, Italy and Spain", in L. Lazzeretti, ed., *Creative Industries and Innovation in Europe*. London and New York: Routledge.
- DCMS (2001). *Creative Industries Mapping Document 2001*. London: DCMS.
- ECORYS (2009). *Analiza potrzeb i rozwoju przemysłów kreatywnych*. Warszawa, November.
- Gertler, M. (2008). "Buzz without being there? Communities of practice in context", in A. Amin and J. Roberts (eds.), *Community, Economic Creativity and Organization*. Oxford: Oxford University Press, pp. 203–226.
- Grabher, G., and Ibert, O. (2006). "Bad company? The ambiguity of personal knowledge networks", *Journal of Economic Geography*, 6(3): 251-71.
- Jeannerat, H., and Crevoisier, O. (2013). "Cultural activities in territorial development", in L. Lazzeretti (ed.), *Creative Industries and Innovation in Europe*. London and New York: Routledge.
- Landry, C., and Bianchini, F. (1995). *The Creative City*. London: Demos.
- Lazzeretti L., Boix R., and Capone, F. (2013). "Why do creative industries cluster?", in L. Lazzeretti, ed., *Creative Industries and Innovation in Europe*. London and New York: Routledge.
- Lazzeretti, L., and Cinti, T. (2013). "From cultural cluster to creative cluster", in L. Lazzeretti, ed., *Creative Industries and Innovation in Europe*. London and New York: Routledge.
- Lave, J., and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Lesser, E., and Everest, K. (2001). "Using communities of practice to manage intellectual capital", *Ivey Business Journal*, 65(4): 37–41.
- Mamica, Ł. (2014). "Added value of design as a factor of firms' competitiveness in times of crises", in Ł. Mamica and P. Tridico, eds., *Economic Policy and the Financial Crisis*. London and New York: Routledge.
- Polanyi, M. (1967). *The Tacit Dimension*. New York: Doubleday.
- Throsby, D. (2001). *Economics and Culture*. Cambridge: Cambridge University Press.
- Throsby, D. (2010). *The Economics of Cultural Policy*. Cambridge: Cambridge University Press.
- Scott, A. J. (2006). "Creative cities: Conceptual issues and policy questions", *Journal of Urban Affairs*, 28(1): 1–17.
- Scott, A. J. (2010). "Cultural economy and the creative field of the city", *Geografiska Annaler, Series B, Human Geography*, 92(2): 115–30.

Staber, U. (2004). "Networking beyond organizational boundaries: The case of project organizations", *Creativity and Innovation Management*, 13(1): 30–40.

UNCTAD (2008). *Creative Economy. Report 2008*. Geneva and New York: UNDO and UNCTAD.

Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.

Determinanty konkurencyjności w sektorze technologii informacyjnych w krakowskim klastrze, stanowiących składową przemysłów kreatywnych

Wartość kluczowych zasobów firm w warunkach globalnej gospodarki odgrywa zasadniczą rolę w ich rozwoju. W przemyśle kreatywnym zasoby te mają głównie niematerialny charakter. W artykule zaprezentowano wyniki badań 223 firm sektora technologii informacyjnych w Krakowie. Badania te przeprowadzono przy wykorzystaniu kwestionariuszy, a ich celem było określenie znaczenia zasobów determinujących decyzje o zakładaniu firm w tym mieście. Innym zamierzeniem było zbadanie roli poszczególnych czynników, które w opinii menedżerów determinują poziom konkurencyjności zarządzanych przez nich firm. Kraków jest miastem charakteryzującym się wysokim poziomem rozwoju firm sektora technologii informacyjnych. To tam między innymi zlokalizowane są centra badawcze takich firm, jak: IBM, Google, Motorola, ABB. W badaniach uwzględniono również kwestie dotyczące znaczenia otoczenia instytucjonalnego oraz rolę współpracy przedsiębiorstw z uniwersytetami, jednostkami B+R, innymi przedsiębiorstwami z branży technologii informacyjnych, jak i znaczenie bezpośrednich relacji osobowych. Szczególna uwaga została poświęcona kwestiom dotyczącym instytucjonalnych aspektów stymulowania innowacyjności i transferu wiedzy.

Słowa kluczowe: przemysły kreatywne, konkurencyjność, sektor technologii informacyjnych.