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ORIGINAL PAPER

COLLABORATION AND COLLABORATION RISK IN SMALL AND MIDDLE-SIZE TECHNOLOGICAL ENTERPRISES*

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ABSTRACT. **Background**: Despite their relatively low economic potential and modest scale of activity of each single unit, en masse small and medium size enterprises (SMEs) create a major part of real GDP in all developed countries. Moreover, having very rarely own R&D backup facilities, SMEs are mostly strikingly open for new technical and technological solutions, perceiving innovations as a challenge and as an opportunity as well. Searching for such solutions, also in processes of implementation, they have to collaborate with a number of partners from various sectors, having diverse legal status, business culture and approach to cooperation. Frequently collaboration appears to be a source of problems, even threats.

Methods: The paper consists of a literature review, identification of collaboration risk areas and - as a separate part – presentation and discussion of selected results of own research conducted late 2016 by the authors within a group of over 300 small and medium technological enterprises (SMTEs), chosen according to the defined filters. The aim of research was to analyse the collaboration environment of SMTEs, their approach to collaboration and perception of collaboration problems and risks.

Results: Analysis of uncertainty areas within SMTEs' environment and modes of operation allowed to identify a selection of risks which may result from collaboration, divided into two divisions: those having general character, which may be observed in each SME, and those being SMTE specific, adjoint to acquiring of new technologies, cooperation with scientific R&D institutions, technology transfer etc. The survey - considering the strong specific features of SMTEs - delivered some interesting informations on characteristics of sources of new technologies, collaboration directions and relations with partners, also collaboration risk factors and exposure.

Conclusions: The paper shows a variety of problems referring to SMTEs' collaboration with partners in technology acquisition and implementation. Having difficulties in contacts with big enterprises and institutions, they prefer own solutions and cooperation with other SMEs. This obviously imposes some limitations on the choice of partners and availability of solutions, making relations more complex and difficult. From the survey results also that SMTEs do not regard vulnerability and exposure on collaboration risk as a major problem in their activities, however some risk factors – from legal ones to soft competencies of partners. Further research could refer to the low effectiveness of collaboration between SMTEs and institutions which are regarded as a natural source of innovative solutions and those which exist to support that sector.

Key words: collaboration, SME, SMTE, risk, collaboration risk.

INTRODUCTION

According to the published statistics [PARP Report 2015], sector of small and middle-size enterprises, (SMEs) in Poland – which contribution to the Polish GDP is roughly twice as much as that of big ones - is essential for the Polish economy. However, their own potential for development is relatively small, mostly SMEs simply cannot afford to spend considerable money for R&D activities. So

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much the more significant is their innovativeness and receptivity for new solutions. Within 3 years over 16% of Polish SMEs implemented at least one innovation of the country scale, whereas 8% at the global level. More than 8% (120 000 firms) of micro-enterprises is co-operating in R&D area with other entities [Tarnava, 2015]. Such activity is called „technological entrepreneurship" and such SMEs – technological enterprises (SMTEs).

In the paper we analysed the importance of some aspects of SMTEs' collaboration with extensive environment, including – in particular considering specificity of SMTPs – partners in acquisition and implementation of technologies, areas of collaboration risk and the way collaboration risk is perceived.

TECHNOLOGICAL ENTREPRENEURSHIP AND COOPERATION

The technological enterprise is a specific kind of the enterprise focused on the chances appearing in the environment. Therefore joins the technology transfer with the intellectual and academic entrepreneurship, concentrates around operations aiming in the effective connection of the scientific potential of academia and R&D centres with the market and the business activities [Lachiewicz et al. 2013] . Findings show that the technological enterpreneurship is a factor of emerging importance [Stawasz 2007] in the progress of civilization, the economic growth and wealth in the modern world [Wściubiak 2012]. In the sector of SMEs technological entrepreneurship characterizes the inclination to innovative actions and the intensive activity in introducing on the market of newly developed products as well as the transfer and the adaptation of new technological solutions from the science and R&D institutions.

The concept of the technological enterprise is ambiguous. In the literature one can find several models of the realization of this kind of business. The essence of the technological enterprise is the innovative idea or technological solution permitting the creation of the new or improved product.

SMTEs need partners due to limited own resources - within the range the management, the production and sales, but also in gaining of the technology. Their partners can be other companies from the SME sector , big firms, high schools and scientific institutes , R&D units, also centres supporting entrepreneurship and technology transfer. Small enterprises cooperate more seldom than large firms, though the range of the cooperation within the framework of clusters and the informal cooperation with high schools are considered the strong side of SMTEs in Poland .

Research made by PARP within the framework of Global Entrepreneurship Monitor [PARP] shows that the level of the cooperation among Polish enterprises is close to remaining countries EU, even higher in case of the cooperation re. gainings of new customers, sales, procurement, production and increase in efficiency. The cooperation in the area of new product development is rarer, concerns about 27% enterprises in comparison to 50-60% in other areas, but this result does not distinguish substantially our country from countries on the similar level of development. In evaluations of experts, in Poland appear favourable conditions for the transfer of research and the development, particularly because of the support from the state. Negatively evaluated, against the similar countries, became the transfer of the knowledge from public universities and research centres, the inequality in the access of small enterprises to the technology in comparison with large firms , and the poor scientific-technical base.

The cooperation can appear in different models and forms [McMullen, Shepherd 2006,; Lachiewicz et al. 2013]. D. Węcławska [2015] uses research results of PARP to show with whom entrepreneurs cooperate. According to the same research, 60% innovations are elaborated independently by enterprises, 22% in cooperation with other entities. 15% is bought on the market. What is characteristic, cooperation is rather the domain of bigger enterprises, [Dzikowski and Tomaszewski, 2014].

RISK OF COLLABORATION

For the purpose of systematization of collaboration risk, there is a need of defining what is to be understood under this concept. Following the general definition of risk from the ISO 31000 standard, as effect of uncertainty on objectives, the class of collaboration risk may be introduced as a complex of all threats (also opportunities) resulting from uncertainty factors related to all forms and processes of the enterprise cooperation with partners, stakeholders and widely understood environment having influence on his performance and achieving of goals.

Certainly, collaboration risk defined in such way is a tremendously capacious concept, including wide spectrum of threats of miscellaneous phenomena – this is a very nature of the subject, indeed. As a matter of fact, cooperation encompasses a variety of risks –from "classic" threats as legal and financial ones, through e.g. risks re. communication, supply chain relations, technical, personal, business culture and relations up to those of behavioural and cognitional nature.

Finne [2003] gives an essential contribution to the matter discussing positive and negative aspects of the cooperation of R&D entities, indicating such risks as risks of inadequate communication resulting from differences in the culture of partners, risk of maladjustment (incompatible procedures of reporting), consequences of changes introduced in course of the processes, the cognitional risks in the management area, risks related to the safety, insufficient resources, ICT, matters of the inadequate selection of partners and defective relations, interpersonal risks , risks related to the responsibility for results, with the loyalty of partners and others. As the most significant threat the author points the risk resulting from the insufficiently precise formulation of goals on the stage of undertaking of the R&D project.

Urbanowska-Sojkin [2013] suggests risk categories requiring to pay attention in strategic choices – the ones underlined is choosing of partner to the cooperation, the settlement of cooperation principles as well as fulfilling commitments.

Considering various aspects of the problem of the cooperation in SMTEs in the context of elements of the uncertainty and risk factors related, we should differentiate areas of general, universal character, appearing in almost every enterprise of this category and in each activity, against those due to the specificity of technological entrepreneurship. To the first group will count risks of the cooperation concerning the corporate strategy, operations undertaken within the cooperation process, partnership, and risks of the cooperation within supply chain, as well as risks typical for the cooperation of every MSP with the environment - business, social and others. Threats appearing in these areas will have a similar character and in principle a similar influence on the realization of the enterprise goals.

The second group encompasses collaboration risks related to the very nature of the technological enterprise itself, business areas specific just for this kind of activity. We can distinguish here risks related to science-business cooperation, threats appearing in processes of the technology transfer and commercialization of innovative solutions, also risks of the internal character - personal and organizational, resulting from the particular enterprise structure, tasks and duties assignment, seen in the context of SMTE's cooperation with partners.

Strategy. Almost 50% MSP is unable to build correct relations with customers [Starczewska, 2012]. Uggla and Åsberg [2010] analyse a wide spectrum of benefits and risks from strategic branch cooperation. Drucker [2001] initiated miningul in the literature trend of perceiving cooperation in the context of achieving competitive advantage - this important for companies motif undertake also numerous other authors. The strategic character of the cooperation in case of enterprises introducing innovative products, as well as related to this risk discuss Edquist, Eriksson and Gren [2002] on the example of companies from Eastern Gotland. Kozłowski and Matejun [2012] discuss chosen functions

of the interorganizational cooperation in management of SMEs' projects finding, that such cooperation can lead to the occurrence of specific threats. The interesting problem of relations with large, strong partners, which has strategic meaning for SMTEs and their innovative activity, is shown by Baumol [2010].

Partnership and supply chain context. To the influence of the uncertainty on the cooperation in supply chain is dedicated the work of Ralston [2014]. Badea et al. [2014] analyse five areas conditioning the good cooperation in supply chain in the context of risk factors and two basic concepts of the cooperation (horizontal and vertical). Winkler and Kaluza [2006] place the risk of the cooperation in the centre of supply chain management, underlining its importance for the competitiveness and performance. Lack of the sufficiently close cooperation among partners in supply chain as the direct source of risk is noticed by Waters [2007]. The analysis of risk factors of the cooperation (understood as the deviation from the intended course) in supply chains present Wen, Zhao and Wang [2013]. Significance of relations in supply chains orientated to cooperation for effective risk management is discussed by Kaye [2008]. Chopra and Meindl [2010] attach importance to the problem of cooperation and trust in CPFR process. The question of confidence between cooperating partners is considered by many other authors [Braziotis and Tannock, 2011; Hardwick, Anderson and Cruickshank, 2013; also Latusek, 2009]. The quality of partnership may deliver also considerable problems in cooperation. Nowicka [2011; after Giannakis M.; Performance measurement of supplier relationships; Supply Chain Management. An International Journal, 12/6 2007] notices that possible differences in perception of collaboration conditions seen by supply chain partners may bring different level of engagement and misunderstandings. Gertner, Roberts and Charles [2011] pay attention on interpersonal conditionings in the cooperation between science and industry, in particular in the partnership for the transfer of the knowledge (KTP). Flaszewska et al. [2013] writes about risk of cooperation in technological enterprises bringing it to the possibility of the appearance of features other, than expected by partners. Cultural aspects of the cooperation in supply chain discuss Trent and Roberts [2010]. Zjidemans and Tanev [2014] deal with the special class of innovative enterprises , which are companies „born-global" and problems of their ability of network cooperation and creation of good relations with global partners.

Operations. Disturbances on the operational level belong to most „popular" classes of risk. Very often they are a consequence of the quality of the cooperation and the relation among involved sides and may have diversified character - technical, organizational, personal, cognitional, even financial. According to Starczewska-Krzysztoszek [2012] among operational risks 37,3% investigated SMEs indicated the risk of unfair behaviours of contractors of the company as „very high" or „high". Analysing different aspects of the cooperation on the operational level Braziotis and Tannock [2011] divide it on factors conditioning, enabling the cooperation, and factors extending, strengthening the cooperation. Tsanos, Zografos and Harrison [2014] deal with the influence of behavioral factors on the operational cooperation in supply chains. Logistic aspects of the cooperation in supply chains were analysed by Sandberg [2007] among other things underlining the meaning of the human factor, esp. that of top management as the barrier limiting the cooperation. Soosay, Hyland and Ferrer [2008] on the basis of the analysis of case studies show how the suitable formation of relations the company may influence operations, but also the ability to the innovation.

Business environment. Any enterprise is suspended in vacuo - for enabling of the normal performance, gaining opportunities but also for the purpose of limitation of possible negative impact from the environment, the company is inherently convicted on the cooperation with that environment. Kordel [2014] treating the technological entrepreneurship as strategic developmental opportunity adverts on the uncertainty related to the occurrence „of the dynamic, hostile and complex environment". Forms of the cooperation with the business environment in the development of technological enterprises

is also an object of the work of Kozłowski and Matejun [2012]. The meaning and basic directions of SMTEs' relations with the environment as well as types of the cooperation analyse Lachiewicz, Matejun and Mosińska [2013]. Kurowska and Matejun [2013] presenting results of research carried out on SMEs find that the majority of investigated enterprises determined the external environment as „variable or stormy"; they pay also attention to the special kind of the relation which are contractual relations with banks, other financial institutions and assurance companies. Also Starczewska-Krzysztoszek [2012] indicates that with the source of threats in every MSPT - can appear to be the bad cooperation with institutions financing the activity of the company. Sitkiewicz [2014] investigated SMEs'relations with organizations supporting business - in case of technological entrepreneurship such relations due to the considerable risk of this activity can be of special importance. According to van de Vrande et. al. [2009], in case of SMEs external cooperation belongs to the major barriers.

Business-science cooperation. Because of convergent interests on the ground of technological entrepreneurship, collaboration between high-schools, institutes, R&D entities and business seems to be a natural one – as necessary as obvious practice. The reality is far to this ideal. Issues such as allocation of benefits, intellectual property sharing, responsibility for practical outcomes and consequences and others – all of them make this collaboration controversial, uneasy and sometimes abrasive. Philbin [2008] proposes the integrated model of the process {trial} of the cooperation between science and business. This model assumes full integration also within the range of operations undertaken within the framework, strategic and operational as well. The author pays attention also to risks eventually generated in such activities at both parties. Siegel et al. [2003] analysing barriers in the transfer of the knowledge from universities to enterprises indicates such problems in the cooperation, as lack of understanding of the specificity of scientific environment, research processes and standards, insufficient financial compensations of scientists for results of works, but on the other hand also the university-bureaucracy, lack of the elasticity, too low financial commitment and aggressive attitudes in the enforcement of IP rights, and other. Barriers in business-science cooperation describe also in similar research concerning „open innovation" Chi Kea Lam, Hills and Ng [2012] – they underline, that small enterprises face more serious troubles than bigger ones. Dooley and Kirk [2007] compare advantages and disadvantages of two models of the cooperation between business and science – state supported and integrated. Among challenges in the cooperation authors point out differences in the organizational culture , objectives and value-systems, conflicting interests, issues of the intellectual property and the necessity of some the adjustment of the strategies of both partners. Lind, Styhre and Aaboen [2013] discussing different forms of the cooperation deliver interesting observation referring to the dominant role of one or the other side. Bjerregaard [2009] in work dedicated to strategies of the cooperation among the science and MSP underlines the meaning of differences in objectives of the activity („ They have are deliver reports and articles, the shoe in must deliver products. They strive odds perfection, where in require applicability"), and also in the organizational culture of partners. Hampe and Steininger [2001] present findings ref. conditions of the survival of SMTEs, also in the aspect of the cooperation and interpersonal relations. The similar problem describe Hyytinen , Pajarinen and Rouvinen [2015]. Baumol [2010] shows that a very effective source of innovation for MSPT are often individual, independent inventors/of the creator of new solutions. It happens so because in such cases we have to with another kind of motivations - economic impact of initiating new solution is dominated by psychological motivations, and those connected with personal ambitions.

Technology and intellectual property transfer. On the specificity of the cooperation in processes of the technology transfer in SMEs point Lachiewicz, Matejun and Mosińska [2013]. Baumol [2010] describes two dimensions of the technology transfer requiring of the difficult cooperation and the compromise – where the first refers to allocation of effects (advantages, profits) of

the innovation and the technology transfer, whereas the other is a special kind of conflicting interests between the need of effective incentives for the entity investing resources into difficult and burdened a serious risk operations for initiating the innovation, and demand for fast and open availability of these solutions to partners. McCormack [2008] writing on risk categories appearing in supply chains pays attention on threats related to the protection of intellectual property and two technical risks of particular importance: possibility that new technology will not bring effects as they were expected, and unintentionally, it will develop threatening to existing production methods. About the risk of the limited access to latest technologies at the supplier write Hallikas and Virolainen [2004].

Commercialization of innovations. The extensive discussion of challenges inseparable from processes of the commercialization of new technological solutions make Al Natsheh et al. [2015]; interesting conclusion from their research belong statements concerning difficulties in building supply chain for new technologies, adequate distribution channels, and also problems of the after-sales service. Fini and Lacetera [2010] describe problems of commercialization of scientific research results from the position of the academy and also compare academic- and business-entrepreneurship; a very interesting contribution to these problems is rarely discussed matter of reasons and consequences of scientific frauds together with attempts of their commercialization.

From the report from the realization of the Norwegian programme FORNY [Borlaug et al., 2009] within which in the years 1996-2008 roughly 300 start-ups were created results, that science-business cooperation continuously requires popularization of "entrepreneurial thinking" among the academics – to make problems of the future commercialization of research works results an important imperative in the work of scientists.

Internal aspects. In processes carried on by SMTEs some role - sometimes very essential for the course of the cooperation with partners in transfer and adaptation of new solutions - may play problems related to the internal specificity of this kind companies. Such enterprises rarely dispose of all personal resources necessary for the assurance of the optimal performance of such processes. Janiszewski [2013] describing challenges of the creative process in the enterprise mentions that the author of the innovation not necessarily will have all organizational and technical competences necessary for effective initiating of new solution. In general he may need a support in form of the implementation team. Good cooperation within such team is – in natural way - the necessary condition of the ultimate success. The risk of poor cooperation inside the implementing team will be a crucial one. SMTE may also have difficulties with creation and efficient operation of such team. The personal barrier - as well as related to she the cognitional issues - can significantly threaten the success of the entire project. On the barrier of human resources points Madrid-Guijarro, Garcia and Van Auken [2009]. In this context, strengthened by the specificity of the management style in SMEs and other factors - we may have to deal with the occurrence of the syndrome of the internal resistance to the new solutions [Mc Adam and Mc Convery, 2004]. In the extreme case because of such phenomena the risk of the rejection of the strategy based on the innovativeness may occur. The problem of human and other resources restrictions in reference to the innovation undertakes Hewitt-Dundas [2006].

As a consequence of particular elements of the uncertainty in considered areas the set of potential threats will occur, constituting the overall risk spectrum of the cooperation.

RESEARCH FINDINGS

Research concerning collaboration and collaboration risk were performed by authors in the second half of 2016 on the sample of 304 Polish enterprises assorted on the basis of the following filters:

- enterprises from the SME sector,
- entities representing broad spectrum of the business activities (groups B, C, D, H, and J according to the division on sections provided by PKD),

– enterprises applying in their business activity new technical solutions being the result of own R&D works or elaborated by other units (academia and scientific institutes, research-and-development units etc.)

Respondents belonged to the group of persons responsible for the cooperation with the supplier of the technology.

Almost the half (49,3% of investigated companies) elaborates technologies by themselves, while 29,3% gains them from the outside. Only 6,3% companies cooperates in technology elaboration with high schools and other B+R units. Surprisingly low is the contribution from institutions qualified to do that as centres for supporting entrepreneurship, and those dealing with a technology transfer. Same percentage of investigated companies gains technologies from branch leaders. Interesting is here also the phenomenon of the exchange of technologies between enterprises from the SME sector (Fig. 1.)

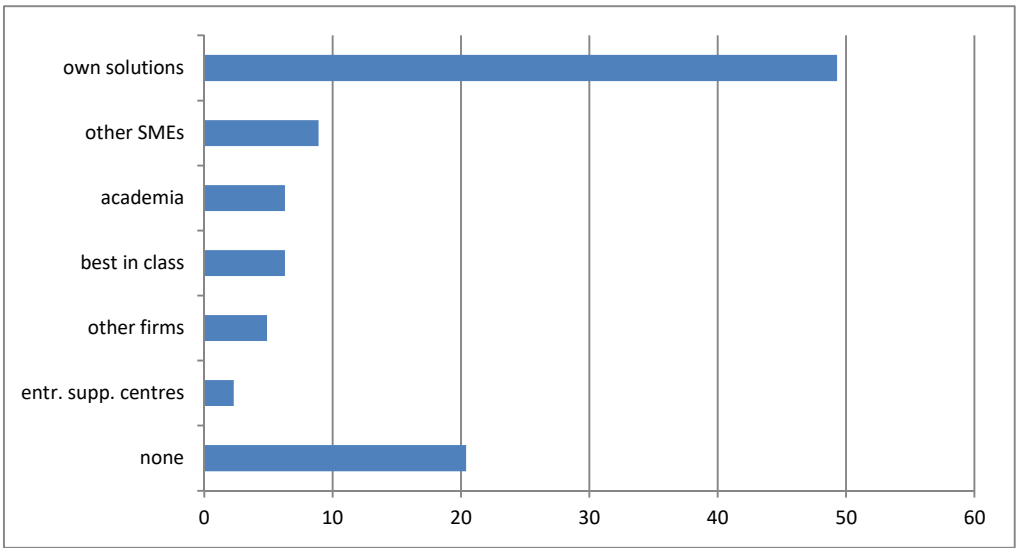

Fig. 1. Sources of new technologies (% of investigated firms)
Rys. 1. Źródła pozyskiwania nowych technologii (% badanych firm)

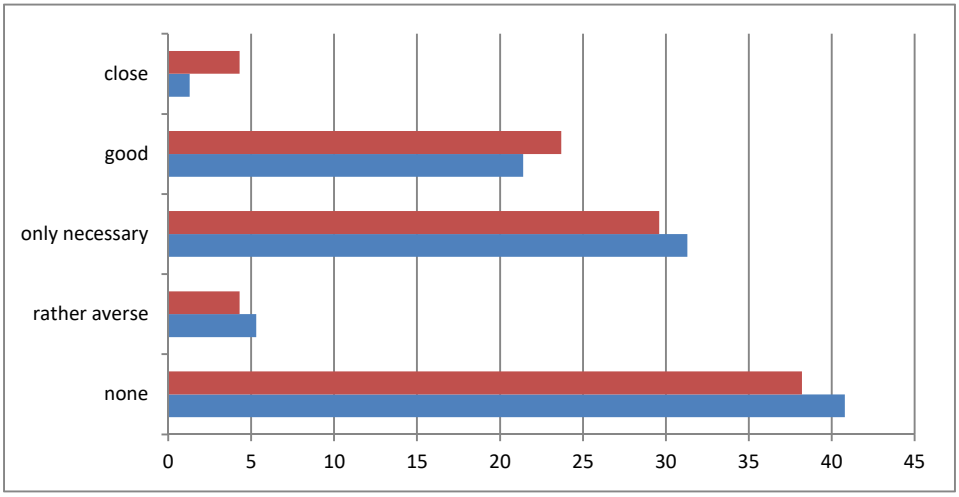

Fig. 2. Relations with academia and supporting centres (% of investigated firms)
Rys. 2. Relacje z uczelniami i instytutami oraz ośrodkami (% badanych firm)

As some kind of the comment to this situation one can treat answers to a question concerning relations with partners in gaining technologies - only 4,3% respondents defined these relations as „close", while 29,6% as „only necessary", and 38,2% pointed the answer „no relations". (Fig. 2.)

Cooperation with large partners in elaboration of technologies causes to companies from the SMTE sector some difficulties - answers concerning intensity of collaboration in different business areas show, that in general (also in the area of gaining technologies, research and development) what prevails is cooperation with enterprises about the similar size, whereas only in the production, the customer service and aftersale service dominates collaboration with companies significantly greater (Fig. 3.).

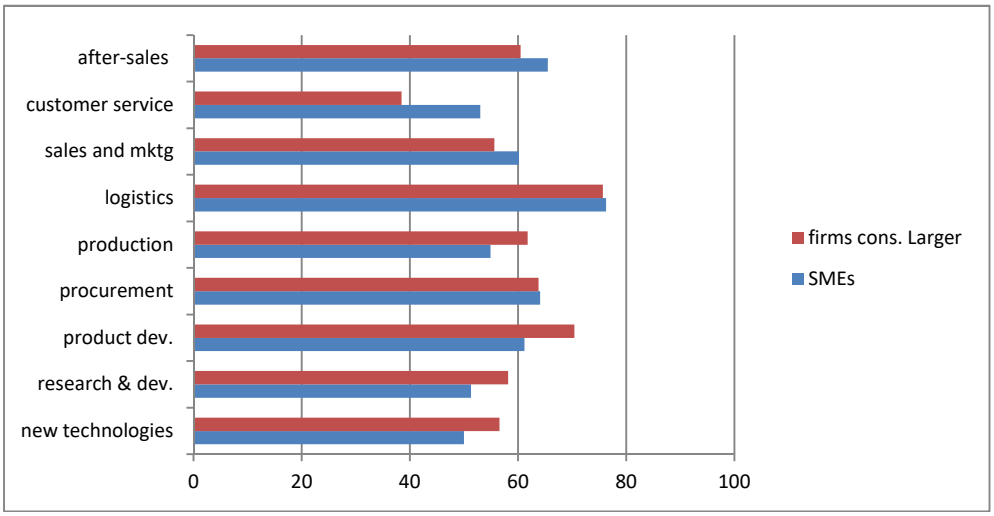

Fig. 3. Collaboration intensity with big partners and SMEs in various areas (% of investigated enterprises)
Rys. 3. Intensywność współpracy z większymi partnerami i z MSP w różnych obszarach (% badanych firm)

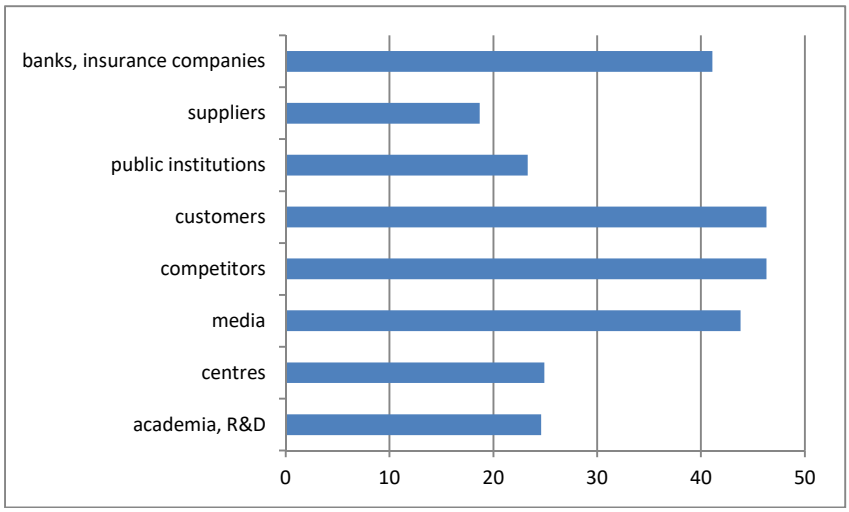

Fig. 4. Collaboration risk exposure (% of values 4-7)
Rys. 4. Ekspozycja na ryzyko wynikające ze współpracy (% ocen 4 -7)

In the evaluation of the risk exposure in collaboration with different kinds of partners respondents showed some restraint, mostly qualifying it on the level 1 to 3 in the seven-degree scale. Only such groups as „customers", „competitors", „banks and other financial institutions, including assurance companies", and also „media", gained the mark 4 to 7 from nearly 50% of investigated enterprises. (Fig. 4.)

Among a choice of several dozen of determined factors influencing the level of collaboration risk - grouped in 6 categories (contract, relations, economical conditions, general competences of partners, „soft" competences of decision-makers and „others") - respondents mostly bound considerable influence on risk with such circumstances, as general correctness of the contract, the detailed determination of collaboration principles, strong competition, the cost and responsibility allocations as well as the level of the professionalism, the level of the specialist knowledge and flexibility of parties. (Fig. 5.)

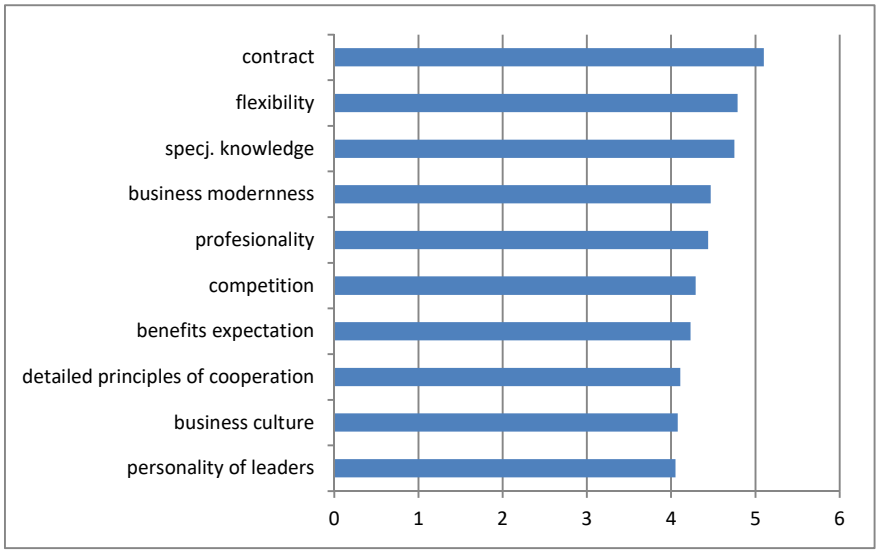

Fig. 5. Risk factors evaluation (for those of average value over 4.0 only)
Rys. 5. Ocena czynników ryzyka (diagram uwzględnia tylko te z 34 ujętych w kwestionariuszu, które uzyskały średnią ocenę powyżej 4,0 w skali 1-7)

SUMMARY AND CONCLUSIONS

Summarizing results of research one ought to underline the essential influence of the SMTEs' specificity on the results of the interviews. Small and middle-size enterprises often feel discomfortable in cooperation with large institutions, with large partners - and such are mostly high schools, research institutes and B&R units. As far as the intensity of their cooperation with such entities in reference to the activity of purely commercial, market transactions, also production, is on the similar level as with other SMTEs, in the area of elaboration of technologies and research - in some sense paradoxically, considering their R&D potential - they prefer cooperation with partners of the size similar to the own company. Their relations with typical technology suppliers - high schools, institutes, R&D units and other entities as well as with centres of supporting SMEs, centres of the technology transfer etc. - are not good. The vast majority of investigated SMTEs either does not maintain at all relations with such partners, or describes them as „reluctant" or „only necessary". Surprising is especially small range and the low efficiency of

the cooperation with institutions qualified to support SMEs and promote the technology transfer - this issue can constitute the interesting object of more detailed research. To some degree for the consequence of this phenomenon may be recognized the fact that the SMTE sector shows considerable autonomy in the elaboration and development of new technologies. The number of enterprises using own solutions and gained from other SMTEs almost seven times exceeds the number of these for whom a source of new solutions is academia, R&D units, also centres qualified to support SMEs and technology transfer.

On the basis of the research results it may be noticed that SMTEs attach the rather small importance to threats related to the cooperation. Also in the context of risk management process itself - identification of risks and risk assessment in the majority of SMTEs are declared to be based on formalized procedures (also on the experience and the intuition), but the significance of these processes in reference to the collaboration risks is estimated on level of average. This low vulnerability of investigated enterprises against the risk of the cooperation with „technological" partners is confirmed in answers concerning risk exposure. Sources of this exposure are associated with „typical" threats which in the economic activity are delivered by relations with all partners and refer first of all to such areas, as finance, relations with customers, image and reputation issues (relatively the high position of media), playing the crucial role in the current activity. Among many possible collaboration risk factors, its level in SMTEs is influenced in significant way by legal matters (the correctness and detailed provisions of contracts) , the cost allocation (what can be interpreted as the risk of the exceeding the assumed cost level, frequent in innovative solutions), the detailed definition of collaboration principles and sharing responsibilities. Important are also some „soft" competences of partners - as the specialist knowledge, the professionalism and the flexibility of partners. The general outcome of the research may bring the conclusion that issues related to collaboration do not constitute neither the central problem in the SMTEs activity, nor the very serious threat , however are noticed and contain elements contributing to the understanding of the specificity of this sector. It seems to be reasonable to focus possible further research on matters related to the generally low level and quality of cooperation in SMTEs with academia and R&D units, and in particular with centres for support of the entrepreneurship and transfer of technologies.

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WSPÓŁPRACA I RYZYKO WSPÓŁPRACY W MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTWACH TECHNOLOGICZNYCH

STRESZCZENIE. **Wstęp:** Pomimo relatywnie niskiego potencjału ekonomicznego i umiarkowanej skali działalności każdej pojedynczej firmy, w swojej masie małe i średnie przedsiębiorstwa (MSP) we wszystkich rozwiniętych krajach wytwarzają znaczącą część realnego Produktu Krajowego Brutto (PKB). MSP są również w imponujący sposób otwarte na nowe rozwiązania techniczne i technologiczne, postrzegając innowacje jako wyzwanie oraz szansę. W poszukiwaniu takich rozwiązań, jak również w procesach ich wdrażania, MSP skazane są na współpracę z licznymi partnerami o różnym statusie prawnym, z różnych sektorów, o zróżnicowanej kulturze biznesowej i różnym podejściu do współpracy. Niejednokrotnie taka współpraca staje się dla nich źródłem problemów, a nawet zagrożeń.
Metody: W pierwszej części artykułu zawarto przegląd literatury przedmiotu oraz identyfikację i ramową taksonomię obszarów ryzyka współpracy. Druga część zawiera prezentację i dyskusję wybranych wyników badań własnych autorów przeprowadzonych w drugiej połowie 2016 roku na próbie ponad 300 firm z grupy małych i średnich przedsiębiorstw technologicznych (MSPT), wybranych na podstawie określonych filtrów. Celem badań była analiza środowisk współpracy MSPT, ich podejścia do współpracy, oraz postrzegania problematyki ryzyka we współpracy.
Wyniki: Analiza obszarów niepewności w otoczeniu MSPT oraz form współpracy pozwoliła zidentyfikować grupę ryzyk mogących wynikać ze współpracy, które ujęto w dwie kategorie: mające charakter ogólny, występujące w każdym MSP, oraz charakterystyczne dla specyfiki MSPT, związane z pozyskiwaniem nowych technologii, współpracą z uczelniami wyższymi, jednostkami badawczo-rozwojowymi, oraz ośrodkami wspierającymi przedsiębiorczość i powołanymi w celu ułatwiania transferu technologii. Badania – uwzględniając silną specyfikę MSPT – dostarczyły interesujących informacji dotyczących typowych sposobów pozyskiwania nowych technologii, kierunków współpracy i relacji z partnerami, oraz czynników i ekspozycji na ryzyko.
Wnioski: Artykuł zwraca uwagę na szereg problemów odnoszących się do współpracy MSPT z partnerami w pozyskiwaniu i wdrażaniu nowych technologii. Mając pewne trudności z kontaktami z dużymi jednostkami, MSPT preferują rozwiązania własne i współpracę z firmami o zbliżonej wielkości. To oczywiście nakłada pewne ograniczenia w doborze partnerów a także na dostępność rozwiązań, czyniąc relacje trudniejszymi i bardziej złożonymi. Z przeprowadzonych wywiadów wynika również, że większość MSPT generalnie nie uważa wrażliwości i ekspozycji na ryzyko współpracy za znaczący problem w swojej działalności, jakkolwiek niektóre czynniki ryzyka – np. kwestie prawne czy „miękkie" kompetencje partnerów uznają za istotne. Dalsze badania mogłyby dotyczyć niskiej efektywności współpracy pomiędzy MSPT i instytucjami stanowiącymi naturalne źródło innowacyjnych rozwiązań i powołanych dla zapewniania wsparcia dla tego sektora.

Słowa kluczowe: współpraca, MSP, MSPT, ryzyko, ryzyko współpracy.

DIE ZUSAMMENARBEIT UND DEREN RISIKO IN KLEINEN UND MITTELSTÄNDISCHEN TECHNOLOGIE-UNTERNEHMEN

ZUSAMMENFASSUNG. Einleitung: Trotz eines relativ niedrigen wirtschaftlichen Potenzials und einer begrenzten Betätigungsskala jeder einzelnen Firma erzeugen kleine und mittelständische Unternehmen in ihrer Gesamtzahl in den hochentwickelten Ländern namhafte Anteile am realen Bruttosoziallandesprodukt. Die kleinen und mittelständischen Unternehmen (KMU) sind in imponierender Weise für neue technische und technologische Lösungen offen, indem sie sie die Innovationen als eine Herausforderung und Chance wahrnehmen. In der Nachsuche nach solchen Lösungen und bei deren Einführung sind die KMU angewiesen auf die Zusammenarbeit mit zahlreichen Partnern von unterschiedlichem Rechtsstatus, von unterschiedlicher Herkunft, von verschiedenartigen Geschäftskultur und Herangehen an die Kooperation zuletzt. Nicht selten wird für sie eine solche Zusammenarbeit zur Quelle von Problemen und sogar Gefahren.
Methoden: Im ersten Teil des Artikels wurden ein Überblick über die Gegenstandsliteratur sowie eine Identifikation und die Rahmen-Taxonomie von Risikobereichen innerhalb der Zusammenarbeit dargestellt. Der andere Teil enthält eine Präsentation und die Diskussion über ausgewählte Ergebnisse der Forschungen, die von den Autoren in der 2. Hälfte 2016 innerhalb der Losgröße von 300 kleinen und mittelständischen und anhand bestimmter Filter ausgewählten Technologie-Unternehmen (KMT-U) durchgeführt wurden. Das Ziel der Erforschung war es, das Kooperationsumfeld bei den KMT-U, deren Herangehen an die Zusammenarbeit und deren Wahrnehmen der Risikoproblematik innerhalb der Kooperation zu analysieren.

Ergebnisse: Die Analyse der Gefährdungsbereiche im Umfeld der KMT-U und der betreffenden Kooperationsformen ließ eine Gruppe von Risiken, die einer Zusammenarbeit zugrunde liegen, identifizieren. Die Risiken fasste man in zwei Kategorien zusammen: die Risiken, die einen allgemeinen Charakter aufweisen und in jedem KMU auftreten und die Risiken, die für die Eigenart der KMT-U charakteristisch sind und mit der Gewinnung von neuen Technologien und mit der Kooperation mit Hochschulen, innovativen Einrichtungen unternehmensfördernden, den Technologietransfer erleichternden Zentren verbunden sind. Die die starke Spezifik der KMT-U berücksichtigenden Forschungsergebnisse lieferten interessante Informationen bezüglich der typischen Verfahren zur Gewinnung von neuen Technologien, bezüglich der Kooperationsausrichtungen und Relationen mit Kooperationspartnern sowie der Risikofaktoren und -anfälligkeit.
Fazit: Der Artikel weist auf eine Reihe von Problemstellungen hin, die sich auf die Zusammenarbeit der KMT-U mit ihren Partnern bei der Gewinnung und Einführung der neuen Technologien beziehen. Indem sie gewisse Schwierigkeiten im Kontakt mit größeren Einrichtungen haben, ziehen sie eigene Lösungen und die Zusammenarbeit mit Firmen von ähnlicher Größe vor. Dies zwingt selbstverständlich gewisse Einschränkungen bei der Auswahl von Partnern auf. Das Gleiche gilt auch für die Zugriffsbarkeit der Lösungen, was die betreffenden Zusammenhänge umfassender und dadurch auch komplizierter macht. Aus den durchgeführten Interviews ergibt sich ebenfalls, dass die KMT-U die Risikoempfindlichkeit -anfälligkeit innerhalb einer Kooperation generell gesehen nicht als bedeutendes Problem in ihrer Geschäftstätigkeit wahrnehmen, wobei sie allerdings manche Risikofaktoren wie z.B. Rechtsfragen oder „weiche' Kompetenzen der Partner als relevant ansehen. Weitere Forschungen könnten die niedrige Effektivität der Zusammenarbeit zwischen den KMT-U und den innovativen Einrichtungen, die als eine natürliche Quelle innovativer Lösungen bestehen und zur Gewährleistung der betreffenden Unterstützung innerhalb dieses Sektors berufen sind, anbetreffen.

Codewörter: Zusammenarbeit, KMU, KMT-U, Risiko, Kooperationsrisiko

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