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MALOPOLSKA SCIENCE AND BUSINESS UNITS – IN QUEST FOR THE MISSING LINK

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Abstract: The paper aims at answering the question how to persuade the managers of business units to use the research outcome of universities, independent research and development units, Think – Tanks and other science – oriented organizations. The basic assumption is that such an exchange should be based on short-, middle-, and long – term profits that could be realized by its both sides. The authors analyzed a group of universities and companies mainly from the Polish region of Malopolska and shared their considerations in the presented paper. The research focused on identifying the qualities that R&D units could possibly offer to business and on elaborating the mechanisms of knowledge transfer including an appropriate pay for the scientific side. The performed research led to a conclusion that an intermediary unit should be operating in order to contact R&D and science units with their future business partners. The authors described the main features and tasks of such a unit, identifying its financing possibilities both from the business, but also from various foundation and public funds. The awaited outcome should be a stable knowledge exchange system, dynamically adapting to the market needs, but also leaving the scientists some freedom of choosing their research topics. This should protect us from a situation where all the research would be business – oriented and possible exclusively after a company order. If implemented all over the European Union, such a system could be a useful tool for making the realization of the Lisbon Strategy more likely.

Keywords: Science Marketing, Business Spin – Out, Research Commercialization, R&D Units

1. An Overview of Polish Innovativeness

To begin we would like to provide the reader with a brief description of the innovativeness of Polish economy when the '89 Central- and Eastern – European system transformation has happened.

The mostly used method for improving Polish economy's innovativeness level was the transfer of foreign highly advanced technologies, instead of technological development based on national resources, which in regard to national potential was underestimated and neglected. Striking, in particular, was the lack of the innovation transfer system from R&D units to business.

As the time passed the need of increasing economic effectiveness by making products technologically more advanced resulted in opening up to co – operation with external units. Moreover, technology transfer from abroad seemed to be necessary, as the possibilities of creating and implementing new domestic inventions proved insufficient. A widely understood transfer of foreign know – how into the Polish economy took different forms, namely imports of commodities, Foreign Direct Investment, relocation of people with certain qualifications, purchase of licences, exchange of documentation not included in licence agreements, technical services, managerial contracts, consulting services, leasing, franchising, personnel training, personal contacts with foreign specialists. Although it would be difficult to point out precisely which of them was of utmost importance, FDIs seem to have played the dominant role [44].

The following facts show clearly that the innovativeness of Polish economy in the 90^{ties} was in a poor condition:

- The amount of submitted domestic patents was continually decreasing.
- The number of granted domestic patents was falling.
- The list of Polish inventions patented abroad was continuously shortening.
- The share of new and modernised products in industrial production was relatively low, in comparison with developed countries. Moreover, its growth was slow, too.
- Advanced technology products were just a small part of the totality of industrial production, however a slow growth tendency could have been observed.
- The export of high – tech products was unimportant [9].

Moreover, the passive attitude of domestic firms towards the question of technological progress did not help overcoming the above difficulties. The studies conducted in Poland at the end of the 90^{ties} on a sample of 68 enterprises have proven that, according to the top managerial staff, the quality of R&D personnel and outlays for R&D were perceived as relatively insignificant factors of their competitive potential [18,19].

These disturbing opinions have been slowly changing, mainly because of the Foreign Direct Investment led in Poland, which has been exerting a positive influence on innovativeness and therefore on competitiveness of Polish companies. This thesis has been confirmed by both the aggregated data of the Central Statistical Office and by the conducted surveys. Those last ones, carried out on a sample of 291 foreign and domestic enterprises proved that the firms with foreign capital were more willing to introduce new technological solutions than the national companies, although discrepancy between the results for both

groups was relatively small – 6 percentage points [47]. Access to results of R&D studies and use of new ideas implemented in the mother firm happened to become the most significant source of innovation for enterprises with foreign capital. On the other hand, the domestic firms are relatively more active in conducting their own R&D activities and more frequently make use of employees' creativity.

International corporations which invested in Poland also initiated, although on a limited scale, the establishment of scientific research centres. We can quote the following examples: in Bydgoszcz, Lucent Technologies has set up a prestigious Bella Laboratory; in Krakow, region of Malopolska, ABB opened a research centre, one of the eight in the World and the only one in Central Europe; also Delphi Automotive Systems established a scientific research centre in Krakow; Philips Works in Pila is making significant investments in development and research on energy – saving bulbs, phone company Ericsson started to build a research centre, the so – called software house.

A study conducted by Marketing Research Centre INDICATOR on demand of the State Agency for Foreign Investments have shown that the level of production modernisation in enterprises with foreign capital was rising. Most of the companies with foreign capital apply technologies not older than one year (63,4%). In 1997 the newest technologies were applied by 55,6% of them. At the same time the number of companies using technologies older than ten years fell down from 20,3% in 1997 to 11,2% in year 2000. They have also been modernising their machinery and equipment. Although in the years 1997 and 2000 the same number of the review companies used one – year – old machines (62,0% and 63,6% respectively), at present less of them are exploiting the equipment older than 5 years (in 1997 – 64,2% comparing to 57,6% in 2000) and older than 10 years (22,9% and 13,0% respectively). One third (32,3%) is already using normalisation standards and quality procedures, most popular are ISO 9001 (22,1%) and ISO 9002 (17,1%).

Low level of technical achievement and a limited interest in innovations of Polish enterprises is accompanied by a third kind of problem. Even if firms with foreign capital are the most dynamic actors of the market, they are still unable to improve rapidly the situation of the whole Polish economy, mainly because of its size. Competitiveness is still low and trade deficit is growing [9].

Taking into account all of the above, it seems justified to search with all the possible means for new forms of bringing science to the market, which should lead to improvement of innovativeness and therefore of competitiveness of Polish companies and economy. In order not to make the task too complex and ipso facto unachievable, the focus has been pointed on improving the communication between technology creators and users at regional level, basing on Malopolska's example. The authors strongly believe, that the main qualitative jump can be achieved by efficient linking of innovation producers (*supply side*) and its consumers (*demand side*), which equals a successful Science Marketing. In the succeeding points of this paper we will present a solution aiming at persuading Malopolska companies to make use of the important amount of scientific research led "at their door". At the same time we will try to acknowledge the researchers that they should search for the opportunities of commercialisation of their work's effects.

2. Science and R&D Units Vs Business Units

Let us begin by describing the substance of the relations between Science and Business Units in the region of Malopolska. In fact, the Science Units constitute a *pure supply side*. The following provides characteristics of the *pure supply side* which:

- in general is *not inspired* by companies, however there are examples of commissioning research by Business Units;
- involves scientific research that is carried out for purely *scientific self-development* of the researchers. Commercialization is not in the picture;
- is subject to *internal competition* only;
- seeks for a *benchmark* merely in its closest environment. Lack of external point of reference causes stagnation and slows value – added growth.

Because of the above a *Supply Enclave* is being created. Its search for financing possibilities is caused only by a need of surviving and preserving the status quo. A *Supply Enclave* provides no incentives for selling the results of its research, therefore no urge for commercialization of scientific research results is observed. It is possible to name various reasons for this state of arts, but in our opinion the most important for the region of Malopolska has been an ineffective national science financing system. Its main defaults are the following:

- *Centralized decision – making process* when accepting or rejecting the grants for financing.
- Expensive and complicated *Patent Protection*, partly caused by European law regulations.
- *Copy- and patent rights* belong to the institution, or the person, which covers the patent protection costs. In case of international patents they are in most cases hardly affordable for the author, which creates the need to search for an institution ready to cover them. When so, this unit acquires a part or the entire patent, which puts the author in an uncomfortable position in terms of executing his rights – he can make use and draw profits from them, but exclusively within the scope of agreement signed with his mother institution. This often means a very limited access to the fruits of researcher's scientific work, which can be highly demotivating.

The effectiveness of the Science – Business cooperation depends on both partners of the tandem that is why the authors suggest taking a look on the issue from the enterprises' point of view. In fact, the Malopolska Business Units do not differ much in their behaviors from their scientific counterparts. By being a *pure demand side*, the enterprises also create an enclave. The reasons for this are numerous:

1. The enterprises are using mainly their *internal innovative solutions* and R&D Units.
2. Innovation comes mainly as a direct effect of *spying* the competing companies.
3. Non – existing or very low *Think – Tank* culture.

4. They do not possess, neither search for information on *what kind of research* is being carried out in the Malopolska R&D and Science Units.

The above presents three types of threats:

- Ad 1. As many companies had to resign from their own R&D units, because of very high maintenance costs, the innovativeness level of Malopolska enterprises is relatively low. They do not perform any R&D on their own, at the same time the R&D outsourcing proves problematic, which is mainly due to the fact that gaining the effects of external Science Units' work is difficult. The reasons, among which the lack of incentives for commercialization is seen as most important, have been presented in the part discussing the Science Units.
- Ad 2. Business Units, and Science Units alike, are in search of a *benchmark* exclusively in their closest microenvironment, which results in a ***Demand Enclave*** being created. The negative effects of such an enclosure are very similar to those of the *Supply Enclave*, leading to marginalization of innovativeness and as a consequence a gradual decrease of competitiveness at the national and world level.
- Ad 3. Due to the fact that in the past few years there were no proper Think – Tank institutions in Malopolska, and the ones recently created are actually taking their first steps in this form of research activity, the entrepreneurs share a common opinion that searching for complex solutions and problem solving in cooperation with Science Units proves expensive and rather ineffective. This highly untruthful opinion is rooted in negative connotations with the centrally – planned and supervised scientific research in the past communist era.

Another important reason for an impeded communication between Science and Business Units is the lack of a coherent *National Innovativeness Support Program*. However, some positive signs can be observed. As an example we can quote the Regional Innovation Strategy for the region of Malopolska for the years 2005 – 2013 recently published by the Marshal Office of Malopolska Voivodeship. Moreover, the *Innovativeness Support Law* is being prepared at the governmental level and the decentralization of decision - making process in *financing of purpose – oriented grants* is taking place, mainly in the field of technology, affecting institutions such as the Main Technical Organization and others.

Last, but not least, Malopolska has not developed as yet any widely recognized *Science – to – Business Institutions*, representing the entire sector, the problem which affects both *supply* and *demand side*. The German examples of Deutsche Forschungsgemeinschaft, representing Science and R&D Units, and Deutsche Industrie- und Handelskammer, representing Business Units, indicate that the communication between these two groups can be facilitated exclusively when *one* intermediary institution exist. However, it is compulsory that this institution is acceptable as a reliable negotiation partner by both *supply* and *demand sides*.

3. The Missing Link

The authors believe that the task of this paper is to present a set of features that should describe the ideal intermediary between the Science and Business Units. Taking into account the existence of many contact brokers, our institution definitely should not be just yet another agent linking particular science and business partners. Its main task would be to create a framework for a fruitful cooperation between researchers and entrepreneurs in the region of Malopolska. From the very beginning it should be equipped with an initial credit of trust and

confidence from both sides. The authors are of the opinion that this can be achieved by the intermediary featuring the following:

- It should have a *clear institutional form*.
- It should create *real added value*, instead of being just another institution.
- It should enjoy a very *positive social perception* in both the *supply* and *demand groups* by being known for its high standards and trustworthiness.
- The last requirement could be met by hiring *science and business professionals* who enjoy *high social esteem* in both groups. They, also, should derive from a variety of *backgrounds* ranging from units of budgetary and business profiles through private and public institutions, with governmental and non – governmental entities at the other end of the spectrum.
- The key and strategic role of the new institution is to *create the border conditions for innovation transfer* from Malopolska Science Units to Malopolska Business Units.

4. Solution proposal

A Public Trust Institution (PTI) is being created:

- The legal form of the newly created institution would be based on the recently introduced Law on *public – private partnership* and would take a form of the public – private partnership joint – venture.
- PTI's financing should come from both partners. It seems that it will be much easier to get financing from the public sector. The main part of the budget would come from the Polish Ministry of Science and Informatization and the Polish Ministry of Economy in a form of delegation of resources, decision making and responsibility in the area of *purpose – oriented grants budget*.
- The ideal form of financing deriving from the private sector would be *dividends* that innovation users yield to patent owners i.e. the 'producers' of innovation. Our Institution may operate on the basis similar to that of artist's license whereby a user pays a regular subscription to the institution which guarantees the transmission of funds to the authors. This solution would also solve the problem of the possession of knowledge created on demand of the PTI – as the new innovation would be available to all the subscription buyers, there will be no need to discuss its private or public character. As it has been a rather delicate issue, a sound and clear juridical framework of such a solution should be established.
- The newly created Institution would manage the *entire purpose – oriented grants budget* for the region of Malopolska, being at the same time exclusively equipped with executive powers in terms of funds allocation.
- It would be able to allocate part of the region's funds towards the development of infrastructure thus making investments in Technology Parks or innovative businesses possible.
- Effects an active and effective influence on the *direction of scientific research* led in Malopolska – by disposing the research grants for purpose - oriented projects, accordingly to the structure and preferences of the Malopolska production potential.

- In partnership with the Polish Ministry of Science and Informatization and the regional authorities of Malopolska, the PTI would co – elaborate the *medium- and long – term scientific and industrial regional development strategy*, being at the same time the main decisive organ in this area. For example, navigate Malopolska scientific research and industry areas towards clean technologies in order to preserve the region’s cultural heritage and maintain its tourist attractiveness.
- It would be responsible for taking decisions on whether to *accept or reject individual R&D projects*, which results from its precise knowledge of the peculiarities of the regional industry and the region’s potential and success cases in the research field.
- It should indirectly contribute to the *creation of new work posts*, which will come as a result of assuring best development conditions for all industrial sectors while supporting research that is considered beneficial/profitable for newly established small and medium-sized enterprises. The examples are numerous, let us name a few:
 1. Recently, Krakow has become known for its activities in relation to outsourcing the accounting services. During the past few years IBM, PriceWaterhouseCoopers (Cap Gemini), Lufthansa and Electrolux all have moved their accounting centers over here. Having the knowledge of the above, the PTI should make sure to provide support for research in accounting as well as in all the related fields such as:
 - Accounting Software.
 - Architecture, i.e. intelligent buildings purposefully designed for Accounting Centers.
 - Development of technical infrastructure i.e. secure computer networks, data backup and automated archives, burglar – proof devices, etc.
 - Crisis Management, i.e. world – wide accounting activities that may prove helpful in preventing terrorist attacks in Krakow and other cities.
 - Assuring a sufficient number of accounting professionals, computer specialists and other experts by giving incentives to Higher Education Institutions to train young people accordingly to the local market needs, also, focusing on improving foreign language skills.
 2. With MAN, the car manufacturer, investing in Niepolomice, Malopolska, establishing a new truck assembly line and, consequently, French Valeo opening further plants manufacturing car accessories, the PTI’s role would be to allocate its financing towards:
 - Purpose – oriented grants for scientific research in fields related to automobile industry.
 - Development of spare parts suppliers’ potential.
 - Overall innovativeness of the entire Malopolska automobile sector.
 - Development of necessary infrastructure.

5. Concluding remarks

The authors highlight the fact that if the suggested Public Trust Institution was to be established it would be for the purpose of *modeling the juridical and economic regional environment* to create favorable conditions and make the commercialization of the effects of scientific research in the region of Malopolska possible. Otherwise, being just yet another intermediary between the innovation demand and supply sides, it will not satisfactorily fulfill its role for which it has been established in the first place. To illustrate this negative scenario let me exploit the case of an institution created for helping regional development, also by improving the innovation transfer, namely the Malopolska Agencja Rozwoju Regionalnego S.A, The Malopolska Agency for Regional Development, which apparently has abandoned its main statutory goals and instead focused on investing its funds in the real estate market.

One should not confuse PTI with regional Science and Technology Parks. These constitute platforms for the cooperation between local high schools, science and advanced technology promotion centres as well as potential investors, with partners having its roles clearly defined. High schools should provide a sufficient number of well educated and highly specialised personnel as well as management and organisation specialists. The science and advanced technology promotion centres should provide the technological and scientific know – how along with a constant technological or scientific development of the young company by supplying information on the latest work and achievements in the concerned field of research. It has been a very simple and obvious fact that investors invest into the most promising projects. The Science and Technology Park, and its role as such, is to provide necessary buildings i.e. office rooms, assembly rooms, office infrastructure and assistance. Even if the Science and Technology Parks improve the innovativeness of local businesses, they do not have the means necessary to change the regional legislation and economical environment. Nonetheless, their role should be seen as very positive.

Another connotation that automatically comes to mind is the resemblance of PTI to the *regional clusters*. In authors' opinion, regional clusters could become a convenient, yet not sufficient, tool for achieving PTI's goals. Creating areas that bring together enterprises operating in the same field will definitely improve the flow of innovations, which has already been observed in Science and Technology Parks. However, a success in this field should not obscure the medium- and long – term objectives of PTI devoted to creating a dynamic innovation – friendly economic microenvironment.

Last but not least, the PTI should not become an obstacle to free and unrestricted development of scientific research or entrepreneurship in fields and activities other than those currently supported or promoted in Malopolska. The financing of basic research, as well as national and other grant budgets, remain at the discretion the Ministry of Informatization and Science and the Ministry of Economy.

With the solution presented above, the authors believe that the question of how to improve the communication between Science and Business Units in order to create an innovative and entrepreneurship friendly environment in the region of Malopolska, with the long – term development strategy incorporated, could be effectively addressed. The proposed Public Trust Institution should be considered as one of the possible solutions for finding the *Missing Link* between the innovation supply and demand sides.

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