

BARRIERS FOR THE DEVELOPMENT OF AN ENTREPRENEURIAL UNIVERSITY ON THE EXAMPLE OF THE WROCLAW UNIVERSITY OF TECHNOLOGY

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Abstract: *The entrepreneurship of the Polish economy is strongly determined by the development of innovativeness. It is understood as the ability to continuously search for and use the results of research and development works, new concepts, models, ideas and inventions in practice. The role of the state in supporting entrepreneurship and economic growth varies in the three distinguished types of economies. The type of economy and processes taking place in it affect the development of companies but also affect the functioning of organizations and institutions supporting entrepreneurship. We believe that a contemporary university, especially in post-communist countries, should focus on education not only to satisfy the needs of the local market but also the global market, typical of innovation-driven economies.*

Keywords: *innovation, entrepreneurship, university, higher education.*

JEL Classification: *I21, O31, O32*

1. INTRODUCTION

The entrepreneurship of the Polish economy is strongly determined by the development of innovativeness. It is understood as the ability to continuously search for and use the results of research and development works, new concepts, models, ideas and inventions in practice. According to the report "Global Entrepreneurship Monitor (GEM)"ⁱ Poland has been classified as efficiency-driven economy. Countries on the way to focus on efficiency, along with growing labor costs, need to create more efficient methods of production and improve the quality of products and services. This qualification places our country on an average position as compared to economies classified to the lower group (factor-driven economies) and the higher group (innovation-driven economies).

The role of the state in supporting entrepreneurship and economic growth varies in the three distinguished types of economies. This role in factor-driven economy is the most important in the development of institutions, infrastructure, macroeconomic stability as well as health and basic education. In efficiency-driven economy the state should improve the functioning of capital markets as well as labor, attract more foreign investments and create educational systems capable of educating people towards the adaptation of technology. On the other hand, in innovative-driven economy the key role of the state lies in creating and commercializing knowledge.

We believe that the type of economy and processes taking place in it affect the development of companies but also affect the functioning of organizations and institutions supporting entrepreneurship. Such organizations certainly include universities. The types of economies distinguished above correspond, in our opinion, to three types of universities:

- a university focused on production factors,
- a university focused on efficiency,
- a university focused on entrepreneurship and innovations.

The purpose of the thesis is to indicate constraints in the process of transforming universities in Poland towards innovative universities. We are, of course, aware of the controversy of this thesis. However, on the example of the functioning of the Wrocław University of Technology, we will attempt to justify our thesis.

2. TOWARDS AN ENTREPRENEURIAL UNIVERSITY – FACTORS AND CONDITIONS

In thesis entitled "*Uniwersytet trzeciej generacji. Uczelnia XXI wieku*", J.G. Wissemaⁱⁱ describes the historical development and the evolution of contemporary universities, distinguishing their three types:

- medieval universities, namely the first generation,
- Humboldt universities, namely the second generation, and
- the third generation of universities.

The encyclopedic definition defines the university as a higher school with numerous departments that has the right to award scientific degrees combining, at the same time, scientific functions with teaching-educational functions. At present, this concept determines various types of universities, including universities of technology, academies and vocational universitiesⁱⁱⁱ.

From the historical perspective, the development of universities is a continuous search for a new, improved formula of operation. Factors that imply these actions include:

- the increase in the number of students,
- the globalization of educational services,
- the growth in the significance of interdisciplinary research, etc.

The situation described above in a natural manner justifies questions about the university's role in the process of progressing transformation towards innovative entrepreneurship typical of knowledge-based economy, in which we may observe the operation of new factors, such as:

Barriers for the development of an innovative university on the example of the Wrocław University of Technology**Table 1** Models of economics and corresponding models of universities

Type of economy	Factors-driven economy	Efficiency-driven economy	Innovation-driven economy
Description of economy	Development of agriculture mining raw materials, creating the grounds for large-scale production	Industrialization, domination of large companies cooperating with small and medium companies	Research and development, knowledge, development of the services sector, increasing innovative potential of companies
Basic requirements	Production	Efficiency	Knowledge, entrepreneurship, innovations, creativity
Type of university	First generation university	Second generation university	Third generation university
Objective	Education	Education and research	Education, research and use of know-how
Task	Defence of the truth	Discovering nature	Generating values
Method	Scholasticism	Modern mono-disciplinary science	Modern interdisciplinary science
Education	Specialists	Specialists and scientists	Specialists, scientists and entrepreneurs
Range of operation	Universal	National	Global
Language	Latin	National languages	English
Organizational structure	National guilds, faculties, colleges	Faculties	Academic sections (departments)
Management	Chancellor	Scientists and administrative employees	Specialized managing personnel

Source: prepared by the author on the basis of: J.G. Wissema, *Uniwersytet Trzeciej Generacji. Uczelnia XXI wieku*, Wydawnictwo ZANTE, Zębice, 2009, p. 34; S. Singer, J.E. Amoros, D. Moska, *Global Entrepreneurship Monitor 2014, Global Report*, <http://www.babson.edu/Academics/centers/blank-center/global-research/gem/Documents/GEM%202014%20Global%20Report.pdf>, p. 11 (accessed on: June 1, 2015).

- new earning possibilities related to conducting business activities by universities,
- deepened cooperation between the university and business,
- participation in mutual business projects undertaken in the region, such as science and technology parks, innovation clusters

The presence of these new factors, as well as the variability and instability of the environment, growing competitive pressure as well as the society's growing expectations regarding the improvement in efficiency and effectiveness of the university's functioning, make universities search for new ways and methods to meet these challenges.

Challenges currently faced by Polish universities are nothing unusual in the global academic world. Almost each national system of higher education faced similar problems. After all, competitive rivalry is the inevitable consequence of limited resources (e.g. financial) and the growing demand for them. Therefore, the survival and development of any organization, including a university, depends to a large extent on its effectiveness in acquiring and using limited resources.

The content presented in Table No 1 shows mutual interactions between the economics and processes taking place in it and the development of the company as well as organizations and institutions supporting the widely understood entrepreneurship. Such organizations include universities. And thus the university of the first generation dominates in the model of factor-driven economy. On the other hand, the university of the second generation operates in the efficiency-driven economy. The university of the third generation is a university operating and implementing its functions in innovation-driven economy.

If we assume that such relation between the model of economy and the type of university actually exists, it is easy to indicate the differences between universities in each of these economies. These differences relate, among others, to the objective and methods of education, the dominating

graduate profile, the range of operation and management methods.

The university of the first generation focuses on education with the use of scholastic methods and Latin. Such universities mainly educate specialists and their organizational structure reminds national guilds (faculties, colleges). This type of university dominated in the Middle Ages and survived in its basic form until the early 19th century.

The university of the second generation, apart from education, also conducts scientific research. It is focused on educating specialists and scientists. It is mainly of a national character which is determined by teaching classes in national languages. Its organizational structure consists of faculties with an independent status as the university's basic organizational units. They conduct at least one major and PhD studies as well as scientific research in at least one scientific discipline. The university of the second generation is managed by scientists and administrative employees. The formula of the second generation university operates until this day, especially in countries in which the model of economy is focused on effectiveness.

The university of the third generation has extended the range and type of education, and the scope of its operation is global. Its organizational structure consists of scientific sections and departments. The university is managed by specialized personnel.

The formula of the concerned third generation university still has no specific form. Neither does the variable and dynamic model of innovative economy.

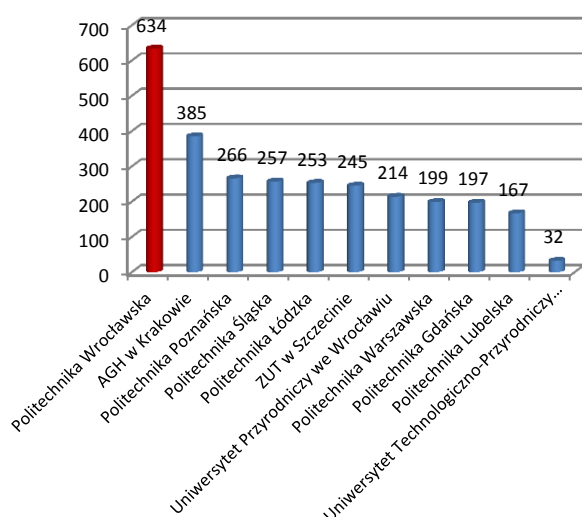
The university of the third generation is often defined as an entrepreneurial university the functioning of which is defined by: innovations, scientific research and academic teaching (I+R+B). Such opinion is presented, among others, by A. A. Gibb who claims that the entrepreneurial university of future "is designed to empower staff and students to demonstrate enterprise, innovation and creativity in research, teaching and pursuit and use of knowledge across boundaries. They contribute effectively to the enhancement of learning in a societal environment characterized by high

levels of uncertainty and complexity and they are dedicated to creating public value via a process of open engagement, mutual learning, discovery and exchange with all stakeholders in society - local, national and international^{iv}. From this perspective, the university of the third generation not only contains feature typical of previously described universities (local and national) but also is characterized by its global character with regard to the range of its operation. This global character strongly affects attitudes and behaviors creating culture, especially in the local aspect.

3. WROCLAW UNIVERSITY OF TECHNOLOGY TOWARDS AN ENTREPRENEURIAL UNIVERSITY

Comments presented above justify the question whether and to what extent the Wrocław University of Technology is developing towards a university of the third generation? Is its market position related to innovative actions?

When searching for answers to these questions, we may state that, as compared to other universities in Poland, the Wrocław University of Technology is one of the leaders in the number of published patent applications (see Fig. No 1).



Key: Politechnika Wrocławska – Wrocław University of Technology, AGH w Krakowie – AGH University of Science and Technology, Politechnika Poznańska – Poznań University of Technology, Politechnika Śląska – Silesian University of Technology, Politechnika Łódzka – Łódź University of Technology, ZUT w Szczecinie – West Pomeranian University of Technology, Uniwersytet Przyrodniczy we Wrocławiu – Wrocław University of Environmental and Life Sciences, Politechnika Warszawska – Warsaw University of Technology, Politechnika Gdańska – Gdansk University of Technology, Politechnika Lubelska – Lublin University of Technology, Uniwersytet Technologiczno-Przyrodniczy w Bydgoszczy – University of Technology and Life Sciences in Bydgoszcz.

Fig. 1. Number of patent applications published by universities in Poland in the years 2008–2012

Source: Sprawozdanie Rektora Politechniki Wrocławskiej za rok 2012, Documents of the Wrocław University of Technology, Wrocław 2013.

In our opinion, such high position is the result of actions undertaken at the university aimed at organizational changes towards an entrepreneurial university. The university's new strategy assumes educating innovative attitudes and behaviors among students, the commercialization and liberalization of scientific research

towards an increased cooperation with entrepreneurs, especially from our region.

As part of the implemented development strategy, institutes were liquidated and the three-level university management structure was introduced: The rector and central administration, deans and faculties as well as managers of departments and departments. It was assumed that departments will be autonomous units focused on scientific research, projects of an innovative character (regional and international).

Over the last twenty years autonomous units supporting innovative processes were created at the Wrocław University of Technology, including ones related to the commercialization and transfer of knowledge and technology to the market. The Wrocław Center for Technology Transfer (WCTT) is the longest operating unit of this type. The mission of WCTT is to commercialize scientific research, stimulate research and technological cooperation as well as support the innovative activities of companies.

Other units executing the objectives indicated above related to the transfer of knowledge and innovation and new technologies to the market include: University Business Incubators, Career Bureaus, Lifelong Education Center and Information Center on Scientific-Technical Knowledge.

For several years, students of technical majors, apart from traditional courses in economics and management, may use new courses based on knowledge related to entrepreneurship, innovativeness and intellectual property protection. At the same time, it is possible to take an individual course of studies on this major.

All the actions described may be assessed in positive terms because they are used to realize the vision of an entrepreneurial university. However, we see barriers and obstacles that delay or even limit the process of bringing the university to the market. These barriers are internal and external. The most serious internal barrier is the constantly progressing growth in academic bureaucracy. It is expressed by the growth in the number of administrative employees the number of whom significantly exceeds the number of scientific employees. Paradoxically, this increased number of administration employees is not reflected in the reduction in the load for scientific employees related to administrative activities. On the contrary, administrative issues are delegated to scientific employees both in terms of the teaching process as well as in research and projects.

When it comes to external factors constraining and delaying the development of the Wrocław University of Technology towards an entrepreneurial university, their sources include poor outlays on science and higher education as compared to other sectors in Poland and as compared to other countries. The amount of these outlays in Poland in 2014 was, as compared to GDP, 0.39%. In 2015 these outlays are to increase to 0.42%. These are values below the average outlays of European leaders such as Denmark, Finland or Sweden.

Another, equally important barrier in the development of an entrepreneurial university, is the petrification of the currently existing economic system the functioning of which is based, on the one hand, on small companies, often operating illegally, the financial resources of which prevent innovative activities. On the other hand, certain industries

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are strongly dominated by large supranational corporations, using innovations created in "parent" companies, based outside our country and using the instrument of transfer prices in settlements. Therefore, objectively speaking, there are no actual funds for investments in the development of innovations, science and research.

4. CONCLUSION

Understanding changes universities currently go through requires the analysis of changes taking place in the economies of countries. This article describes the basic types of economies which - in our opinion – have so far determined the shape of universities. However, currently, in

the conditions of growing globalization, such logic for the development of universities seems to be outdated. We believe that a contemporary university, especially in post-communist countries, should focus on education not only to satisfy the needs of the local market but also the global market, typical of innovative economies. Such approach makes it possible to reformulate the formula of the university and prepare new strategies based on entrepreneurship and innovations. The example of the Wrocław University of Technology proves that the selection of such development path may be achieved, regardless of the course of processes in the economy itself.

REFERENCES

- [1] *Encyklopedia*, Wyd. Naukowe PWN, Warszawa 2013.
- [2] GIBB, A.A., *Developing the Entrepreneurial University of the Future. Key Challenges, Opportunities and Responses*, OECD, Paris 2013.
- [3] Heinnovative: The entrepreneurial higher education institution. *A review of concept and its relevance today*, https://heinnovate.eu/intranet/tef/downloads/HEInnovate_Analytical%20paper.pdf (accessed on: June 1, 2015)
- [4] SINGER S., AMOROS J. E., MOSKA D., *Global entrepreneurship Monitor 2014 Global Report*, <http://www.babson.edu/Academics/centers/blank-center/global-research/gem/Documents/GEM%202014%20Global%20Report.pdf>, (accessed on: June 1, 2015).
- [5] *Sprawozdanie Rektora Politechniki Wrocławskiej za rok 2012*, Documents of the Wrocław University of Technology, Wrocław 2013.
- [6] *Więcej pieniędzy dla nauki*, <http://www.nauka.gov.pl/aktualnosci-ministerstwo/wiecej-pieniedzy-dla-nauki.html> (accessed on: June 1, 2015).
- [7] WISSEMA, J. G. *Uniwersytet Trzeciej generacji. Uczelnia XXI wieku*, Wyd. ZANTE, Zębice 2009.
- [8] WISSEMA, J. G., *Technostarterzy. Dlaczego i jak?*, PARP, Warszawa 2005.

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ⁱ S. Singer, J.E. Amoros, D. Moska, *Global Entrepreneurship Monitor 2014, Global Report* <http://www.babson.edu/Academics/centers/blank-center/global-research/gem/Documents/GEM%202014%20Global%20Report.pdf> (accessed on June 1, 2015).

ⁱⁱ J.G. Wissema, *Uniwersytet Trzeciej Generacji. Uczelnia XXI wieku*, Wyd. ZANTE, Zębice 2009, pp. 16-34, J.G. Wissema, *Technostarterzy. Dlaczego i jak?*, PARP, Warszawa 2005, p. 60.

ⁱⁱⁱ *Encyklopedia*, Wyd. Naukowe PWN, Warszawa 2013, p. 45.

^{iv} A.A. Gibb, *Developing the Entrepreneurial University of the Future. Key Challenges, Opportunities and Responses*, OECD, Paris 2013, Heinnovative: *The entrepreneurial higher education institution. A review of concept and its relevance today*, p.3.

^v *Więcej pieniędzy dla nauki*, <http://www.nauka.gov.pl/aktualnosci-ministerstwo/wiecej-pieniedzy-dla-nauki.html> (accessed on: June 1, 2015).