

Opinion review

**The Triple Helix Model: Factors Influencing SMEs' Innovation Activities in
Selected EU Countries.**

Dissertation thesis

Author: Mgr. Samuel Amponsah Odei,

Supervisor: doc. Ing. Jan Stejskal, Ph.D.

Institution: The University of Pardubice, Faculty of Economics and Administration

Theoretical background and topicality of the thesis:

Several studies have shown that numerous universities are transforming themselves to entrepreneurial, by adopting third university mission (commercialisation of research, licensing, spin-off firms, knowledge transfer) and building cooperation with private and public institutions within regions. Following the triple helix model (Etzkowitz and others), three key stakeholder categories can be recognised: university, industry, and government. Hence, two approaches are met, the strategic management of universities and regional development theory. It is assumed, academic knowledge and technology can be transferred to industry within triple helix networks and to boost the regional innovation capacity.

Thus, technology transfer offices, science parks and incubators have been established at universities to serve as an interface between academia and the business sector. Changes in universities are typically measured only in a simplified way by patenting, licensing and generation of spin-off companies. The Dissertation thesis instead looks at the collaboration from the other side, analysing the factors influencing a firm's choice of universities as collaborating partners. This has a very good sense because, on the side of companies, there can be many barriers, prejudices, missing information, negative experience, why to leave the university out of innovative cooperation.

Objectives, methodology and results:

The selection of the logistic regression factors was based on previous studies, firm size, funding, innovation activities and internationalisation. The method was used individually for each of the countries. This raises the question of whether causality should not be universally valid. Although it can be accepted, that the country environment certainly influences the collaboration between universities and companies, HEI's position in legislation or corporate perception. Therefore, it is imperative to explain particularly why the results are dissimilar in the countries of interest. The EU funding role is a fairly motivating factor, and collaboration with universities can be only formal and motivated by access to external resources. For example, the Czech Republic already has had experience of creating artificial clusters motivated only by drawing external resources from the EU funds.

The second objective is dealing with the factors that drive the firm's innovations in the Visegrad Group of countries, considered as less innovative in the European Union. Rationally, the firm-level innovation activities data from the Eurostat Community Innovation Survey is employed. Factors influencing firms' innovations (product, process, organisational and market) in Visegrad countries are subjected to analysis. The author points out different types of correlations and dependencies resulting from empirical research. However, the stronger conclusion of the research with a higher explanatory power is missing, specifically related to Visegrad countries.

The second source of data is the Higher Education Business & Community Interaction Survey, which is collecting data on knowledge transfer activities from universities to industries in the UK and Wales. The United Kingdom has a sufficiently rich and complete statistical database, while there is also a sufficient mass of academic spin-off companies enabling to recognise the critical factors of HEI spin-off performance. In the last third part, the view of collaboration from the side of universities returns, after all, representing a standard research question, namely the factors influencing academic collaboration with industries. The effects of the role of supporting infrastructure, funding, incentives, TTO governance on the number of spin-offs created enters the econometric model. This is reasonable given the so far little developed academic entrepreneurship in Visegrad countries. In addition, the results make it possible to make recommendations based on experience in the UK and Wales.

Significance of the dissertation thesis:

In the dissertation thesis, the author is focusing on knowledge spill-overs among the regional innovation players in a triple helix, defined as University-Industry-Government cooperation within regional innovation systems. The main point addressed is the collaboration firms and universities and the relationship of the collaboration with regional innovation performance. The thesis is very attentive in the approach, answers some research questions of the broader topic and certainly fulfils the set goals. There remain some open questions for the future, to understand better the reasons why universities and industries collaborate or not, what less visible factors hindering university-industry collaboration exist and also what is the role of the context of collaboration expressed in terms of regional versus national innovation systems.

Methodology and research process is well designed, explained and transparent, including the choice, justification of the regression models.

Comments and questions:

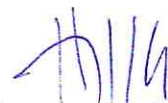
1. Explain the differences in the results of logistic regression in different countries. Is there any hidden factor that has caused differences between countries?
2. The UK has a long tradition in bottom-up initiated entrepreneurship. Therefore, the academic entrepreneurship in the Anglo-Saxon environment works on sound foundations. Visegrad countries are in a different situation, new elements of academic entrepreneurship are implemented from top to bottom, with the use of considerable EU funding and implemented as foreign elements into a different environment. How do you think this context would affect entrepreneurialism, for example, at universities in the Czech Republic?

Statement:

I consider the work very beneficial and processed in a proper way. Triple helix and innovative collaboration are one of the most topical issues, and the thesis potential can be used not only in future research activities but also in the proposals for implementation of regional innovation policy. The PhD. student's abilities are demonstrated by the list of his scientific and research activities and participation in research projects. In his work, the author has demonstrated his creative abilities and professional expertise, and the thesis meets the

requirements of the dissertation. I recommend submitting the presented dissertation for the defence and to award Mgr. Samuel Amponsah Odei the Ph.D. degree.

Košice, 18.05. 2019

A handwritten signature in blue ink, consisting of stylized, overlapping letters that appear to be 'H', 'H', and 'H'.

prof. RNDr. Oto Hudec, CSc.

Dissertation review

The dissertation thesis authored by Mgr. Samuel Amponsah Odei titled "THE TRIPLE HELIX MODEL: FACTORS INFLUENCING SMES' INNOVATION ACTIVITIES IN SELECTED EU COUNTRIES", completed at the Faculty of Economics and Administration of the University of Pardubice under the supervision of Assoc. prof. Jan Stejskal, Ph.D. The topic of this dissertation thesis in my view is interesting and also of importance.

Innovation is becoming an important part of the strategic intentions of various economic actors, including the public. Those with public policy can significantly influence innovation environments (systems) and thus encourage / facilitate the situation of businesses, scientific institutions, universities and other ancillary entities. The triple-helix approach has been applied in a completely natural way; therefore it is logical that this topic is also the subject of the doctoral research.

The first chapter provides a conceptual framework for the entire dissertation. The author builds on the endogenous growth theory and its causes. It complements the theory of innovative systems, especially at national and regional levels. These assumptions result in a triple-helix approach. It is based on and provides a definition of university-industry-government (U-I-G) cooperation. Here we have to appreciate that the author has worked with new and up-to-date literature. He has prepared an interesting literature review on U-I-G cooperation in practice. Relatively simplified description in chap. 1.6 can be criticized. The author should have worked with the in-depth definitions more and have the ambition to bring his own definition or other added value to contribute to broadening theoretical knowledge.

Section 1.7 is interesting, which documents the benefits of U-I-G collaboration from different perspectives of individual subjects. I think that these benefits should be the subject of further research.

Sections 1.8-1.10 provide additional important information about used concepts. These sections are handled very carefully, including a focus on public finances. Here I appreciate Table 3, which provides an overview of public finance studies.

The second chapter of the dissertation discusses factors that influence U-I-G collaboration. It is a logical build-up of theoretical information from the first section and contains important research input and theoretical information for the dissertation.. This section can be seen as a discussion of determinants and factors that can influence U-I-G cooperation in regions (Table 4, including foreign studies). Based on this, the author of the dissertation chose a suitable determinant for his research.

I find the goals of this dissertation satisfactory. Partial objectives are combined with research questions and hypotheses, making it difficult to understand the intention of the dissertation. I think the author should have chosen either research questions or hypotheses. However, this combination facilitates evaluation, as it is clear whether the questions and hypotheses have been answered.

In my opinion, the main goal and semi-goals are ambitious and suitable for the dissertation research. For obvious reasons, these targets focus mainly on selected aspects of the issue - determinants of manufacturing firms' cooperation with universities, firms' innovation performance and various

factors determining them. Increased attention is paid to the role of universities in a vast set of European countries.

Individual procedures, methods, determinants and country selection is duly justified by the author and I have no reservations about it.

The aim of the dissertation was achieved by elaborating Chapter 4. The author followed his research process (Fig. 4) and pursued main objectives. He used the described methods and primary data from Eurostat, resp. other sources and has obtained an extensive set of results. All results are duly justified. I would expect the author to focus on explaining the discrepancies in the discussion. However, it is understandable that in such many countries it is not possible to make a comprehensive statement. I appreciate the author's efforts to summarize the results and define practical implications (e.g. in Chapter 4.1.3).

The second objective focused only on selected sample of countries. The author based his research model on the results of the first goal. I consider the bottleneck right. Similarly, the third part (4.3) is more narrowly focused on the UK case study. The author answered all the research questions and hypotheses respectively. . The results are substantiated by a large amount of data analysis, justifications, discussions with previous studies and comparison of results.

The conclusion of the dissertation is devoted to summaries and benefits. In my opinion, this is a useful dissertation that has expanded contemporary scientific knowledge.

Conclusion

Based on the evaluation of the presented thesis, I note that the dissertation is processed in a corresponding way. It brings scientific knowledge and therefore I recommend it for the defence and after a successful defence, I recommend awarding a Ph.D. degree to Mgr. Samuel Amponsah Odei.

In Banská Bystrica, May, 20, 2019.



prof. Ing. Helena Kuvíková, PhD.

Matej Bel University in Banská Bystrica
Faculty of Economics

Opponent's Report

Thesis: “ The Triple Helix Model: Factors Influencing SMES' Innovation Activities in Selected EU Countries”

Author: Mgr. Samuel Amponsah Odei

Supervisor: Assoc. prof. ing. Jan Stejskal, Ph.D., Faculty of Economics and Administration, University of Pardubice

Opponent: prof. ing. Jaroslav Macháček, CSc., Faculty of National Economy and Public Administration, University of Economics in Prague.

Date of Opponency: 20. 6. 2019

The approach to the research dealing with innovation processes, based on triple helix model, represents advanced procedures serving analysis of relations among firms, universities and government in terms of assessing and using their collaboration potential in this area. It has to be pointed out that this area involves multitude of issues receiving much attention from the part of respective professional community. The thesis presented has been conceived and elaborated so as to contribute substantially to the progress of knowledge in this domain.

Conception of the evaluated study indicates the efforts to examine substantial parts of the theme selected for dissertation in a way enabling arriving at findings extending theoretical background of the observed issues as well as the methodological base for their exploration. Structure of the thesis has been balanced in terms of presence of theoretical survey and argumentation involving description of the appropriate part of state of arts, rationale of methods to be applied in this field of research, analysis of empirical data and conclusions uniting and combining new knowledge acquired in all the mentioned constituents of the study.

In comparatively extensive – with regard to the capacity of the whole thesis – theoretical and conceptual part (p. 11 – 51, chapters 1 and 2) the author explains substance of triple helix concept on the background of existing national and regional innovation system and draws attention to the endogenous form of economic growth. He deals thoroughly with terms, processes and phenomena being of key importance for understanding the examined issues and also very briefly evaluates benefits and utilities that studied collaboration brings. The respective theoretical reasoning is

supported by multitude of references which also create the framework for notion of state of arts in the studied area. Necessary to note, though, that the relations observed within the triple helix model have been in the presented thesis confined to “firms – universities dimension” with government involved only implicitly in some context or left aside.

Also second chapter has to be interpreted as a theoretical treatise. It is marked with thoroughness as for description and evaluation of factors influencing or/and inducing collaboration in question. This part provides a base for constituting hypotheses (p. 55) and research questions (p. 54 – 55) and also for the assessment and selection of appropriate methodological approach as well as for the design of analysis and verification of its outcomes. In relation to the other components of the study, this part assumes position of resourceful section on the one hand and of relatively autonomous explication on the other. Naturally, not all or most of the propositions presented there can find application in the analytical part. But number of them have been projected into subsequent reasoning.

The objective(s) of the study have been unusually defined only as far as in the middle of the total text. This part has been conceived, however, with all the carefulness and awareness of the complexity of subject matter being looked into. Albeit that the main comprehensive aim has not been explicitly phrased, the “specific objectives” (p. 52 and 54) represent the purpose of the research having been implemented and its outcome in the form of thesis sufficiently. They give rise to research questions and to six hypotheses connected with them. All the research process has been illustratively shown in the figure 4. Proper attention has been paid to the nature and sources of data and possibilities of their processing. Selection of methodological instruments and procedures has proved to be adequate to the subject matter examined and to the objectives of the research. Beside comparative and explanation proceedings, the formal procedures have been used for the elaboration of specific issues of the studied thematic area, namely logistic and prohibit regression and partial least squares structural equation modelling. Deliberation over methodological approach has been supported by many references to important publications in this field. Characterization of the mentioned procedures that forms part of chapter 3 should not be deemed redundant because it provides opportunity for authentication of application results.

Key section of the study is represented by the chapter four which has been conceived as a fusion of foregoing theoretical assertions with interpreted findings arisen from empirical part, concerning particular selected EU countries and Norway. (Impossible to disregard that titles of chapters two and four are similar (factors, determinants), nearly identical by their sense.) The author defines four major (comprehensive) variables (p. 68), creates two large surveys of obtained parameters and interprets the results mainly in terms of significance of particular factors for “firms – universities innovation relations” in individual countries. This issue can be looked at also in an inverse way: how many and which countries prove the impact of particular factors to support this relations. Conclusions and practical implications do not comprise remarkably significant impacts but do indicate which factors should be primarily considered when assessing these relations in reality.

A minor note has to be presented in connection with table 6 (p.69): Instead of adjective “local” the terms “domestic” or “national” are recommended to use, as “local” has specific meaning with regard to regional analysis.

In the chapter 4.2 author addresses the issues examined in relation to Visegrád countries, with exclusion of Poland, due to the deficiency of data. He applies more variables (10 and 19) sorted out and presented in tables 8,9 and 10. In a similar way, he thoroughly assesses and interprets obtain results. He elaborately describes some of procedures of data processing. However, as data have not been arranged on the basis of individual countries, the resulting parameters and their interpretation relates to the whole group of countries, not to its individual members. This fact notwithstanding, the knowledge following from the respective analysis provides number of indications as for the position of observed factors in this formation of states. Nonetheless, stronger systematic approach in terms of data handling and arrangement would be good for the presentation of results.

Case study focused on the universities in England and Wales and their aptitude for collaboration forms sub-chapter 4.3. Availability of necessary data arises also from author’s participation in a project dealing with these issues. Six hypotheses have been set up for this case of analysis and in closing part of this chapters all of them have been answered.

Conclusion of the whole thesis has been devised so as to present the findings considered the most substantial and authentic. Some of them may sound rather generally shared, but their value arises from original processing of data through

appropriate procedures, verified and made plausible on the ground of advanced analytic methods. The results of the research are transferable into real economic developments. As a part of Conclusion, a carefully made survey of major contributions of assessed thesis to the progress in the respective field of research has been presented as well as listing of practical implications of new knowledge for policy makers.

It should be noted that the chapters and some sub-chapters have been equipped by summary and some of them with “practical implications”. Wording in the thesis is very good but for some minor formulation inconsistencies (e.g. p. 103, last sentence and some other). What certainly has to be changed - considering potential publication of the whole study or its parts - is the bibliography covering currently 34 pages corresponding to the fourth part of the thesis and bringing 424 items. The extent of list is excessive and disproportionate to the size of study. The bibliography should be confined to publications having direct relation to the thesis, primarily to numerous references in its text, which represent one of its strong merits.

The following questions may become part of oral discussion within defence procedure:

- a) Considering successful application of triple helix model, is there any estimation of a “threshold size” of a firm – with regard to particular industries and sorts of economic activity?
- b) Which way has been followed to accumulate, sort out and process data in the chapter 4.2 ?
- c) What involves the reference to the NACE system - codes 10 – 33 (p.76)
- d) Identify five publications most important for the elaboration of thesis – out of the present bibliography forming its closing part.

Conclusion of the report:

The thesis submitted represents an outcome of systematic long-term study and very good advanced research activities. It exploits extensive amount of resources and information stocks, proves author's capacity for scientific work and contributes to the progress in the respective research field and professional areas.

I recommend the thesis for the final defence proceeding and propose - in case of successful oral process – granting the Ph.D. degree.

Prague, 1.6.2019



Jaroslav Macháček