

## Review of dissertation work

Dissertation: EFFICIENCY OF THE PUBLIC SECTOR SUPPORT SYSTEMS FOR CREATING INNOVATIVE MILIEU

Author: Solomon Gyamfi

The subject of the work is a current and very important topic, especially in the current period of deteriorating public finance deficits and at the same time the growing need for innovation to maintain competitiveness. In general, the author has shown a considerable overview of the theme and the work is based on current knowledge at the international level.

The conceptual framework part includes an overview of the most important theoretical approaches to innovation activities as well as public support policies. The whole part is processed at a very good level, using extensive and up-to-date scientific research. I have some reservations about the structure and clarity of this section. In some sections, better structuring or table overviews (such as a overview table for typologies of support activities) would help to readability of this section.

Thesis seeks to explore how SMEs innovative activity fuels the attraction of public support systems in the creation of an innovative environment for SMEs innovation, and to measure how efficient the financial and nonfinancial Public Support systems and framework conditions facilitate the innovation performance of SMEs in some selected countries in the European Union. This objective is further divided into two sub-objectives and research questions. Objective 1 represents an interesting new perspective on the issue of promoting innovation.

The author also has a good overview of appropriate and used research methods and these methods are at the level of current scientific knowledge. In the methodology, I expected more discussion about selection of explanatory variables, especially for the first part of the research.

In terms of the contribution of the work to the new knowledge and practice, the work seeks to shed more light on the relationship between innovation and its support, while in addition to the traditional view of the impact of support on companies' innovation performance, it also deals with the opposite side. An interesting added value is that the author pointed out the very weak impact of support on building partnerships, which is one of the important factors for the creation and implementation of innovations.

In addition to examining the relationship between innovation and support, the author also examined the technical efficiency of both public financial support and framework conditions in inducing SMEs innovation collaborative activities by DEA analysis. Here, the results are quite surprising and indicate the high input efficiency of most countries except the Scandinavian ones, which probably does not correspond to reality, so I would expect more discussion about the reasons for this result as well as possible methodological problems of such measurement.

The work is also interested in terms of added value for practice in the field of supportive innovation policy and some conclusions of the work can be used to shape these policies in the future.

Formally, the work is processed at the required level. Linguistic and graphic design are adequate and appropriate. The scope of work corresponds to the requirements for the dissertation.

I have two questions for discussion:

First, one of your results is that local funds do not have such a positive effect as EU or national funds. Could one of the explanations be the smaller size of support? How do you think information on the amount of support could change the overall picture of the research?

Second, you stated "SMEs innovation collaboration must ensure benefits for not only the firm, but the society as a whole". How do you think this can be achieved?

In addition to the work itself, the overall publishing activity of the doctoral student is very extensive, focusing on areas related to the work itself. Most publications are proceedings of scientific conferences, but the doctorand has also published in international indexed journals. The publishing activity is above average and exceeds the requirements for doctoral studies.

In conclusion, I state that the dissertation thesis is prepared at a good level and meets the conditions for a dissertation, so I, after a successful defence, recommend the award of the title of philosophiae doctor (PhD.)

Bratislava, 26<sup>th</sup> August 2021

doc. Mgr. Miroslav Šipikal, PhD.

## **Opponent Report on Doctoral Dissertation**

**Title:** Efficiency of The Public Sector Support Systems for Creating Innovative Milieu

**Author:** Ing. Solomon Gyamfi

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

The dissertation thesis deals with the current topic of evaluating the efficiency of public support in creating an innovative environment. This is undoubtedly a valuable contribution to the discussion about targeting public funds towards private businesses. In particular, efforts to confirm some of the key assumptions associated with policy support for innovation should be commended.

### **Aims and research questions**

The author has defined two aims in his work. The first aim is to "determine the role of SMEs innovation activities in attracting public financial support." The second aim is closely connected with the first one: "to measure the efficiency of financial and nonfinancial PSS (Public Support System) in facilitating collaboration networks for SMEs innovation performance in selected EU countries". It can be stated that both aims were fulfilled in the thesis. Each of the aims was supplemented by a research question: "How does the role of SMEs innovation activities stimulate the provision of public financial support?" and "Does financial and nonfinancial PSS effectively promote the innovation performance of SMEs?" The questions formulated in this way seem redundant because the fulfillment of the aims already includes answers to these questions.

### **Content and structure**

The thesis is divided into four chapters. Its structure is logical; the author proceeds from the theoretical basis through the methodological framework to the results, discussion and conclusion. I have some reservations about the titles of the main chapters, which are very technical. This is especially valid for the first chapter (Conceptual framework), which could be divided into several parts according to the key factual content.

This comment does not affect the quality of the first chapter as a whole. The author works with quality foreign literature supplemented with Czech sources (these are significantly limited to the student's workplace). The reader is continuously acquainted with all important concepts. All arguments are supported by relevant citations. It is quite obvious that the author is well informed about the topic and has the necessary basic knowledge for the processing of quality scientific work.

The second part of the text is devoted to the aims and methodology of the dissertation thesis. The author identifies as one of the starting points the conclusions of PhD students from his workplace (Henry Junior & Odei, 2019), who, according to him, clearly suggest that there exist inefficiencies and inefficiencies in the support systems of the public sector. As part of the dissertation defence, the student should explain why this conclusion influenced him so much. In addition to the aims and research questions, the methods used are presented in this chapter. I have no reservations about their selection and application. Although

I generally consider the DEA method to be a procedure that often leads to excessive simplification, the author certainly defends its use. Subsequently, the hypotheses marked 1a, 1b, 2, 3a, 3b and 4 are also defined. Acceptance or rejecting hypotheses (Tables 13 and 14, p. 91 and 94) lead to several questions. Hypotheses 2 and 4 are rejected, which seems incomprehensible, especially in the case of hypothesis 4. In the case of hypotheses 1 and 3, which are alternatively defined as a and b, hypothesis 1a is rejected for 2012 and confirmed for 2019 it is confirmed. The results for hypothesis 3a are vice versa. It is certainly no coincidence that, like Hypothesis 4, SMEs innovation activities are of interest to these two hypotheses. Can you explain what the main cause of these results is? Are these conclusions influenced primarily by the choice of indicators or by some fluctuations at the level of specific countries?

The third (The role of SMEs innovation activities in attracting public financial support) and the fourth (Measuring the efficiency of financial and nonfinancial PSS in facilitating collaboration networks for SMEs innovation performance) chapter pay attention to the implementation of individual methods and presentation of results. The presented discussion is of very high quality, and all conclusions are supported by relevant arguments. Both chapters are closed by the section Conclusion and implication, which increases the clarity of the text and highlights the key results of the whole work.

#### **Formalities**

Formally, the dissertation is at a good level. All tables are very clear; however, some scanned images are of lower quality. Working with literature (257 resources in total) corresponds with the rules and the usual standard. Typos and other technical shortcomings occur in an acceptable number and do not reduce the quality of work.

#### **Questions for explanation at defence:**

Important questions are mentioned in the previous sections of this report, especially in the Content and structure section.

To what extent do the results and conclusions of the thesis affect the fact that data are collected for individual states? The EU's public support system is based on an assessment of regional performance. If the evaluation were carried out at the level of the regions receiving this selective support, would the results be different?

#### **Overall assessment**

Despite the above comments, the thesis meets the standards required for dissertations. The author has demonstrated the ability of analytical and synthetic creative work in the field of research. I recommend the dissertation thesis for defence. After a successful defence, I recommend to confer Ph.D. title on Solomon Gyamfi.

.....  
doc. Ing. Vladimír Žitek, Ph.D.

Brno, 20/08/2021

## **Opinion review on the dissertation thesis:**

**Title:** Efficiency of the Public Sector Support Systems for Creating Innovative Milieu

**Author:** Ing. Solomon Gyamfi

**Supervisor:** prof. Ing. Prof. Jan Stejskal, PhD.

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

### **Theoretical background and topicality of the thesis:**

Public support systems reflect the view that government interventions should correct market failures in domains featuring positive or negative externalities. It is clear that the innovation capability of firms depends on the environment in which the firm operates. An innovation-inducing environment is considered to be an innovation milieu, which is a set of informal physical and social relationships within a limited shared geographic context, with innovation capability based on synergy and collective learning. There is a wide stream of literature examining the localisation of firms and innovation in the form of industrial districts, innovation environments or industrial clusters. The key question is whether a functioning innovation environment is self-organising and evolutionary; or if the creation of a productive innovation ecosystem can also be fostered and supported through public support and public incentives. Intangible factors and the influence of environment and context on innovation are the subject of current research around the world. Therefore, the dissertation is thematically interesting, advanced and worthwhile.

The theoretical overview allows the reader a good orientation in the concepts important for the authors' own research.

### **Methodology and results:**

The research used two different datasets - the European Community Innovation Survey CIS and the European Innovation Scoreboard (EIS) 2020. A natural guiding question is to measure the effectiveness of financial and non-financial public support systems and framework conditions facilitating collaborative networks for the innovation performance of SMEs.

Before that, however, the first part of the research raises the question of what is the role of SMEs' innovation activities in obtaining public financial support. The author refers to a source of inspiration for the analysis, but article this is not included in the reference list (Bellucci et al., 2019). This part about the variables (3.1) is rather incomprehensibly explained. The very key idea of three models to identify the determinants that attract public financial support is

peculiar. The initiative to get financial support is more on the side of the SMEs themselves who seek it, rather than the government examining the SMEs and offering support accordingly. The dependent variable is not obvious, nor is the type of econometric model (logistic regression?). Propensity or probability to attract funding is mentioned, thus, I implicitly assume that it is a dichotomous dependent variable.

I consider to be the most important the section on public support efficiency in facilitating collaboration networks for SMEs innovation performance. The method used was Data Envelopment Analysis (DEA) to estimate relative efficiency, with EU countries as the units of analysis. The method used was Data Envelopment Analysis (DEA) to estimate relative efficiency, with EU countries as the units of analysis. Again, the model and results are difficult to understand. The description of the DEA model is fragmented in three different subsections and the reader is forced to piece together complex information.

DEA analysis is supplemented by a Partial Least Square Structural Equation Model that examines the interdependencies between financial support, linkages and framework conditions and consequently the impact on SME innovation activities. This part is probably the most understandable and interpreted.

#### **Comments and Questions:**

Ing. Solomon Gyamfi has used several advanced econometric methods, demonstrating his skills in working with data and using methods and software. As a result of the empirical analysis, the models are more data-driven and thus the interpretation of the results suffers to some extent. The theoretical part is not sufficiently linked to the empirical analysis and the innovation milieu thesis has gradually disappeared from the thinking. For the reader the dissertation is not very reader-friendly and at several points in the text clarity is critical. Ideally, the text should be edited, simplified with the reader in mind.

#### **Statement:**

The PhD. student demonstrated his capacity to develop a theoretical concept, to choose appropriate econometric methods to work with the data. Thus, the thesis meets the requirements of the dissertation. I recommend submitting the presented dissertation for the defence and to award Ing. Solomon Gyamfi the Ph.D. degree.

Košice, 03.08. 2021

Oto Hudec