

Abstract of the doctoral dissertation written under the scientific guidance of
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**PUBLIC AID FOR RESEARCH, DEVELOPMENT AND INNOVATION AS A DETERMINANT OF
THE ECONOMIC SITUATION OF ENTERPRISES**

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The basic research problem undertaken in the dissertation is to identify the relationships between public aid for research, development and innovation and the economic situation of enterprises, with particular emphasis on their profitability.

The research model adopted in the dissertation assumed that one of the most important stimulants of the economic situation of the enterprise is conducting research and development and innovative activities. Its high importance for the European Union policy has been emphasized in horizontal documents and the Europe 2020 strategy. Particular emphasis has been placed on improving the conditions for conducting research and development activities and increasing investment in research and development to the level of 3% of GDP. The reorientation of the European Union's policy, focused on investments in modern technologies and research and development, was reflected in numerous domestic and foreign aid programs. It has been shown that the number of available programs and the amount of funding are really significant, which encourages to apply for them.

Meanwhile, the analysis of the literature, experience and conversations with entrepreneurs showed the lack of sufficient own resources as the main barrier to conducting research and development and innovative activities. Moreover, many entrepreneurs do not have sufficient knowledge and awareness of how to use the available aid programs.

The research problem was defined in the form of a question defining the quality and extent of certain unawareness, which is solved thanks to author's own creative activity and previous research knowledge: **can obtaining public aid for research, development and innovation determine the economic situation of enterprises?** An affirmative answer is expected to this question, which will be reflected in the hypothesis: **obtaining public aid for research, development and innovation determines the economic situation of enterprises.** Therefore, it should be emphasized that this hypothesis is a kind of assumption that aims to explain the studied phenomenon in an empirical form. After verification, side research questions were

resolved, five of which constitute a set of open-ended answers, and two of them measure the level of correlation between the studied phenomena.

The main goal of the doctoral dissertation was to determine the links between public aid for research, development and innovation and the economic situation of enterprises making up the Aviation Valley cluster. Additionally, the following sub-goals were defined:

1. Identification and evaluation of forms and types of public aid for research and development activities, with particular emphasis on funds from the European Union.
2. Identification of the most important stimulants and barriers to public aid for research, development and innovation in the Aviation Valley.
3. Identification of sources of fundraising by the Aviation Valley companies.
4. Identification of the relationship between the amount of state aid granted for research, development and innovation, and the size and type of beneficiary in the Aviation Valley.
5. Determining the non-financial results of supporting the Aviation Valley cluster from public aid for research, development and innovation.
6. Development of recommendations for the economic policy of Poland in the field of support for the Aviation Valley cluster and determination of guidelines for the regional policy in the field of assessing and allocating funds for research and development projects.

The dissertation was carried out on the basis of a case study of a unit that obtains significant funds for research and development and innovation, and is assessed as standing out from the rest of the country. It was hypothesized that the Aviation Valley, which is characterized by clear innovation and incurring high expenditure on research and development, being a specific driving force for the development of south-eastern Poland, should be at least characterized by a good or at least improving economic situation. Enterprises operating within its framework carry out various investments, provide various products and services that require constant research on their production, and as a result obtain significant public aid for their financing, which should be reflected in the economic situation of associated entities.

The dissertation consists of four chapters. The first one is devoted to the structure of the entire dissertation. It deals with introductory issues, justifies the selection of a topic and indicates the stages of empirical research. The methodological assumptions were emphasized, a detailed analysis of the current state of knowledge in the studied topic was made, the identified research gap was identified and the selection of the research sample was justified. Finally, the data collection procedure and the scope of the research were also defined.

Chapter II describes what state aid is, characterizes the available types and forms of state aid, and specifies the rules for applying and procedures to be followed in the event of granting state aid. The following sub-chapters focus strictly on state aid related to research and development and innovation. The available government support instruments for R & D & I activities, managed by the NCN, NCBiR, PARP, as well as the European Union Operational Programs in this area, are listed in detail.

Chapter III is devoted to the determinants of the economic situation of enterprises. An answer was given to the question what the economic situation of an economic unit is and its most important elements were presented. Possible ways of measuring this situation were shown, in order to emphasize the high importance of profitability in the next section and present the indicators selected for the analysis. Additional internal (microeconomic) and external (macroeconomic) determinants of the economic situation of enterprises were indicated, and the importance of research and development and innovation in the development and improvement of the economic situation was described in detail. At the same time, the concepts of research and development and innovation were defined. The statistical data in Poland on this activity in 2010-2017 is characterized in detail, and the determinants and limitations of conducting research and development activity in the context of the economic situation of enterprises are described. The strategic dimension of obtaining public aid for research and development and innovation in an enterprise from the point of view of its economic situation was presented, as well as innovation networks were characterized, with particular emphasis on the conditions of entities operating within clusters.

The last chapter, i.e. the fourth chapter, presents the results of empirical research. Firstly, the intricate history of the Polish aviation industry in Podkarpackie voivodeship is described and the studied cluster is characterized in detail. The results of surveys conducted among entrepreneurs of the Aviation Valley were included, in which they indicated the factors determining their decision to obtain public funding and the barriers that prevent them and / or may prevent them. It was the financial factors that turned out to be the most important group of determinants. In turn, among the barriers to obtaining public funds for research, development and innovation, the group of administrative and legal factors was the most frequently mentioned bureaucratic burden related to the settlement of subsidies and taxes (including the amount of necessary documentation) as well as the time-consuming and complicated administrative procedures connected with obtaining the funding. The

determinants and barriers identified in relation to the above have additionally confirmed that the motivator for entrepreneurs, which prompts them to obtain public aid, is the desire to be competitive, innovative and outperform other entrepreneurs, and at the same time the lack of sufficient knowledge and the complexity of legal procedures may be the factor that effectively discourages them to try to obtain this aid.

Then, the structure of public aid obtained by the Aviation Valley was described, with a detailed analysis by voivodships, size, legal forms, type of beneficiary and sources of acquisition. The analyzed enterprises belonging to the Aviation Valley, which obtained public aid, received on average almost PLN 4 million for research, development and innovation as well as de minimis aid. The funds obtained from mixed sources were definitely dominant. Although the largest amount of allocated funds came from domestic sources, specific subsidies were granted in small amounts, so as a result they constituted a lower percentage in terms of amounts than foreign and mixed funds.

The non-financial results of supporting the Aviation Valley cluster with the public aid for research, development and innovation were also characterized, the most important of which are: achieving a leading position in implementing new products / services, convincing customers about the modernity of manufactured products and services, distinguishing themselves from competitors and implementing various types of product, process, marketing or service innovations.

Then, the relationship between state aid and profitability was described, and the most important achievements of the Aviation Valley were characterized and summarized, thus emphasizing its high importance on the international arena. The characteristics of the most important achievements of the Aviation Valley showed the key success factors, such as: a strong scientific base, the presence of a highly qualified, educated and experienced workforce, associated with the aviation industry for many years. The most important recommendations for the economic policy of Poland in the field of supporting the Aviation Valley cluster were also developed and guidelines for the regional policy in the field of assessing and awarding funds for research and development projects were established.

A detailed analysis of the profitability of the associated enterprises, carried out with the Mann Whitney U test, showed that the results of the 2010-2017 ROA, ROE, MWO and RDO are not statistically significantly differentiated due to the R & D & I 2010-2017 support. The relationship between obtaining public aid for research, development and innovation and the

profitability of individual units has not been confirmed. However, paying attention to the positive and negative results of individual indicators, it can be noticed that institutions obtaining R & D & I aid slightly more often obtained positive results on ROE, ROE, MWO and RDO. Not all enterprises receiving significant public aid for research, development and innovation improved their economic situation. In some cases, the opposite effect was observed, which raises questions about the effectiveness of state aid.

At the end of the dissertation, conclusions from the conducted research and analyzes were presented. It addresses the research questions posed in the introduction, verifies the research model used, and highlights the implications for the theory and practice of finance.

The implementation of the presented research made it possible to fill the research gaps. The obtained results should encourage other authors to further deepen their research in this aspect. An interesting direction for further research may be taking into account a wider range of indicators for assessing the economic situation of an enterprise in order to assess the effectiveness of pro-innovation and cluster policies. The issue seems also important as there are currently no efficient procedures in this area in Poland. The multitude of indicators for assessing the economic situation of an enterprise available in the literature significantly hampers their comparability. Enterprises publishing indicators often base their calculations on various mathematical formulas. In turn, the procedures for assessing the effectiveness and efficiency of pro-innovation policy are highly dispersed. A large number of entities providing support, the lack of stability of legal provisions and their transparent assessment are factors that may have an impact on unjustified cases of granting state aid. It is therefore necessary to periodically monitor it and make the necessary adjustments, while maintaining the clarity and stability of the procedures in force.

Conclusions and recommendations will be important for the further development of the Aviation Valley. This doctoral dissertation is not only a contribution to the development of scientific literature on innovation clusters, but also has a number of practical applications, which are discussed in the end. The above-mentioned practical implications may contribute to generating positive effects for the Aviation Valley, the entire Podkarpackie Voivodeship, as well as other enterprises operating in clusters throughout Poland.