

## SUMMARY OF THE PHD THESIS

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### **Fiscal Instruments of Environment Protection in Poland**

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State of natural environment constitutes a fundamental condition for socio-economic development; however, ongoing civilizational progress, particularly since the Industrial Revolution, has led to the intensive exploitation of natural resources and the degradation of ecosystems, the effects of which are now largely irreversible. In response to the growing ecological crisis, the importance of environmental protection in public policies has increased, especially in the area of public finance, whose instruments enable both the redistribution of resources and the internalization of environmental costs. The achievement of environmental objectives, however, requires a comprehensive and long-term approach, as the effects of protective activities are difficult to measure unambiguously and often become visible only after many years. Contemporary fiscal systems, including the Polish system, are characterized by significant institutional inertia and historical conditioning, which means that changes are usually reactive and sectoral in nature, and fiscal instruments do not form a coherent, integrated mechanism supporting environmental objectives at the level of the entire economic system.

In Poland, a desirable direction of change appears to be a pro-environmental fiscal reform, elements of which concerning the tax system were already postulated at the turn of the 20<sup>th</sup> and 21<sup>st</sup> centuries. At the same time, in subsequent years the fiscal system underwent gradual transformations resulting both from institutional conditions and from legal integration processes within the European Union, which significantly changed the context of its functioning. In this respect, there remains a noticeable lack of research that would comprehensively combine: (1) analysis of the Polish fiscal system in an international perspective, (2) assessment of its pro-environmental potential in institutional terms, and (3) empirical verification of the relationship between fiscal instruments and the state of the environment. This dissertation attempts to fill this research gap by integrating a systemic and empirical approach.

In order to address the identified research gap, the main aim of the dissertation was formulated as demonstrating that a pro-environmental transformation of the Polish fiscal system is both desirable and possible. The study identifies several specific objectives necessary to achieve the main aim:

1. identification of the natural environment as a public good,
2. systematization of the directions of development of green public finance and identification of corresponding fiscal policy instruments,
3. development of a research methodology for assessing the fiscal policy of the state and local government units in the area of environmental protection,
4. assessment of tax-based fiscal instruments of environmental protection in Poland in comparison with other European Union member states,
5. assessment of fiscal activities of local government units in the area of environmental protection, taking into account the relationship between environmental revenues and expenditures and the state of the environment.

To operationalize the research objectives, hypotheses were formulated and assigned to particular stages of the analysis.

1. The natural environment is a public good and should be protected by the state.
2. The fiscal system in Poland uses tax instruments to a moderate extent in achieving environmental protection objectives compared to other EU countries.
  - a. The structure and scope of environmental taxes and fees in Poland are similar to those used in other EU countries.
  - b. The scope of tax preferences in non-environmental taxes in Poland is similar to solutions applied in other EU member states.
  - c. Municipalities in Poland pursue an active pro-environmental policy using tax instruments.
3. The condition of the local environment does not significantly influence the use of environmental fiscal instruments by local authorities.

The content and structure of the dissertation were subordinated to the defined specific objectives and verification of the hypotheses. The dissertation consists of five chapters, and its structure was designed to ensure coherence between the partial objectives and the organization of individual parts of the study. The adopted structure is sequential, moving from theoretical considerations to empirical analyses, which enables consistent achievement of research objectives and hypothesis verification. The first hypothesis, concerning theoretical issues, was verified in chapter I, while the second and third hypotheses were verified in the empirical chapters (IV and V).

Chapter I is devoted to the relationship between the natural environment and the state. It identifies the natural environment as a public good and determines the rationale for state

intervention in its protection, along with the scope of instruments used. This chapter fulfils the first specific objective and forms the basis for verification of the first hypothesis.

Chapter II addresses public finance in environmental protection. It defines the place of sustainable public finance in financial sciences, characterizes the theoretical foundations and mechanisms of environmental levies, and identifies the importance of public environmental expenditures in contemporary institutional conditions. This chapter fulfils the second specific objective.

Chapter III develops the research approach adopted in the dissertation. It describes the research procedure and constitutes its first stage, fulfilling the third specific objective. The research period for empirical analyses was set as 2010–2024. In the section concerning local government policy, a literature review was used to identify indicators for its assessment. Furthermore, categories of environmental revenues and budget expenditures were defined for use in subsequent empirical analyses. Their preliminary research, combined with verification of local government administrative tasks in environmental protection, formed the basis for selecting the research population.

Chapter IV is empirical and includes an analysis of Poland's pro-environmental tax policy compared to other EU member states in 2010–2024. This chapter, constituting the second stage of the research process, serves the fourth specific objective and the verification of the second hypothesis. Its structure follows the author's classification of pro-environmental tax instruments. The first part compares the scope, potential environmental impact, and fiscal significance of different subcategories of environmental taxes and fees in Poland and other EU countries. The second part analyses mechanisms supporting environmental protection within non-environmental taxes. To complement the assessment, a third part analyses local policy instruments, focusing on Poland and not directly comparing other EU countries.

Chapter V is devoted to the analysis and evaluation of environmental fiscal instruments at the local level. This chapter, constituting the third stage of the research process, fulfils the fifth specific objective and enables verification of the third hypothesis. It analyses trends in the share of investment expenditures in environmental spending and examines relationships between environmental revenues and expenditures and the state of the environment. For this purpose, a composite integrated indicator of local environmental condition was developed. The adopted approach to expenditure analysis results from limited international comparability, which led to the exclusion of a broader comparative analysis at EU level. Due to significant institutional and competence-based differences, the analysis was limited to the local level and conducted using two approaches.

The broad scope of issues required the use of diverse research methods, including critical and normative literature analysis, analysis of national and international legal acts, descriptive analysis, typological-comparative analysis, analysis of dynamics and structures of phenomena, econometric trend analysis, correlation analysis, panel data analysis, and descriptive-statistical methods. Inference was conducted using both deductive and inductive methods depending on the stage of analysis.

The research material used in national and international analyses came from Eurostat and European Commission databases, as well as financial reports of public finance sector entities. Legal databases such as LEX, the Internet System of Legal Acts, and EUR-Lex were also used. At the local level, data sources included regional official journals, budget reports of local government units, and the Local Data Bank of the Central Statistical Office of Poland. The legal status considered includes regulations in force as of 31<sup>st</sup> December 2024, with commentary incorporating changes introduced up to the completion of the dissertation.

The conclusions presented in the first chapter allow for positive verification of the first research hypothesis. The contemporary environmental crisis provides grounds for strengthening and expanding environmental protection instruments. There is a need for a paradigm shift in economic sciences, according to which the good condition of the natural environment is treated as a fundamental condition of human well-being and an integral element of socio-economic development. This also underpins the further evolution of state functions toward greater consideration of ecological complexity in decision-making processes.

An important contemporary development is the growth of literature on sustainable public finance. Particularly significant are research directions concerning the role of the public sector in financing environmental protection and the interdisciplinary approach to the natural foundations of public finance. The development of fiscal instruments aimed at environmental objectives remains a key element of this research. Although environmental expenditures are relatively low in the structure of public spending, their broad institutional scope can be observed, linked to processes of debudgeting in the public sector, as well as partial recentralization in this area. At the same time, Central and Eastern European countries allocate European funds to environmental protection to a significantly greater extent than high-income Western European countries. The importance of EU funding supporting environmental objectives is increasing in each successive multiannual financial framework.

Based on literature review and empirical research, a set of indicators was selected for evaluating fiscal policy in environmental protection in the subsequent parts of the dissertation. Criteria for selecting the research population were also defined, taking into account the

competencies of local authorities and data availability. The adopted methodological framework formed the basis for empirical analyses conducted in subsequent chapters.

In the empirical section concerning environmental taxes, the second hypothesis was partially confirmed. This result was based on verification of three sub-hypotheses: 2a was confirmed, while 2b and 2c were rejected.

Despite general similarities in the structure and scope of the Polish fiscal system compared to other EU countries, there remains significant potential to expand taxation and improve fiscal efficiency in many environmental tax subcategories. It was shown that in consumption and income taxes in Poland, mechanisms supporting environmental objectives are used to a limited extent, while in property taxation existing solutions are largely passive.

The development of a more proactive policy in property taxation as well as environmental taxation of transport and tourism is largely left to municipal authorities; however, the research did not identify active fiscal policy in this regard.

The second empirical part of the dissertation examined fiscal policy at the local government level, with particular emphasis on environmental expenditures. In this section, the third hypothesis was confirmed. Analyses showed no significant relationship between environmental revenues and the state of the environment.

Regarding environmental expenditures, an inverse relationship to expectations was observed: worsening environmental conditions were associated with a decrease in expenditure levels and a simultaneous increase in the share of investment expenditures, although this relationship was bidirectional.

Moreover, trend analysis of the share of investment expenditures in environmental spending, independent of environmental condition, indicates systemic phenomena conducive to an initial phase of investment intensification followed by a shift toward organizational, operational, and supervisory activities.

Cross-sectional analyses indicate inconsistency in the fiscal system in achieving environmental objectives. On the one hand, fiscal instruments with pro-environmental potential exist on both the revenue and expenditure sides; on the other hand, their application is fragmented and insufficiently linked to actual environmental conditions. Empirical results confirm that fiscal mechanisms correlate only to a limited extent to changes in environmental quality, which is reflected in both the structure of environmental revenues and the direction of public spending. Consequently, the Polish fiscal system does not currently function as a coherent tool of environmental policy but rather as a set of dispersed and unevenly effective

solutions. The lack of clear links between fiscal instruments and environmental conditions indicates the need for better integration and orientation toward measurable ecological outcomes.

The study contributes to public finance and ecological economics by integrating theoretical and empirical approaches to analysing the environmental function of the fiscal system. Key contributions include the development of an original classification of pro-environmental fiscal instruments enabling comparative analysis, and the construction of an integrated local environmental condition indicator. The study also systematizes global literature on sustainable public finance and Polish research on the intersection of environmental protection and local fiscal policy. Another important contribution is the multi-dimensional empirical analysis comparing Poland with other EU countries (2010–2024) and examining relationships between fiscal instruments and environmental condition at the local level. The dissertation also combines institutional analysis with quantitative methods, including trend and panel data analysis, enabling a more comprehensive assessment of fiscal instruments in environmental protection.

The results and identified systemic limitations indicate the need for stronger integration of fiscal and environmental policy through expanded environmental taxation, greater differentiation of tax rates and preferences depending on environmental impact, and increased allocation of resources to environmental purposes. An important direction of required change is also strengthening the role of local governments through partial decentralization of environmental fiscal policy and development of local institutional capacity for more effective identification and mitigation of environmental problems. These reforms should be complemented by the implementation of a green budgeting classification enabling assessment of the environmental impact of public expenditure. At the international level, further harmonization of environmental tax methodologies, improvement of statistical data quality, and consideration of VAT as a potential environmental policy instrument remain justified.

The research conducted in the individual chapters of the dissertation achieved the successive specific objectives. The obtained results empirically confirm the validity and feasibility of a pro-environmental transformation of the fiscal system in Poland and provide a coherent summary of the main objective of this dissertation. Thus, the dissertation contributes to the broader debate on the development of modern fiscal systems in the context of growing environmental challenges.