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Article

Application of Successful EU Funds Absorption Models to Sustainable Regional Development

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Abstract: The research paper comprehensively and consistently addresses all relevant theoretical areas related to the topic and includes an extensive empirical analysis of the absorption of EU funds and their impact on the sustainable development of Croatia, Slovenia, Hungary, and Poland. The analysis aims to investigate the efficiency of the absorption of funds from the EU, the impact of these funds on regional development of countries, and the reasons for such impacts. The "Regional Development Model Based on EU Funds" was tested with the aim of applying the model to the Republic of Croatia, countries in the region, and other European countries, to achieve a higher level of absorption of financial resources from the available EU funds. Data for the empirical analysis were collected using a highly structured survey questionnaire completed by a sample of 244 respondents involved in the preparation and implementation of EU-funded projects. The contribution of economic science in theoretical terms arises from the development of scientific knowledge and ideas about the importance of increasing the number of development projects that will increase the absorption of funds from the European Union, thereby increasing economic activities in Croatia and the region. The expected contribution of economic science in the applied sense is based on the formulation of the "Regional Development Model Based on EU Funds", which is based on the application of knowledge, good practices, and stakeholder experiences, considering relevant indicators from available sources. The greatest contribution is demonstrated through testing the "Regional Development Model Based on EU Funds", which is applicable to the Republic of Croatia, countries in the region, and other European countries over a longer period. Finally, research into the impact of EU funds on the regional development of recipient countries is considerably less represented and very modest, and is only in the "upswing" of systematic scientific research. The research aims to fill the gaps in research and to encourage the thinking of key stakeholders responsible for regional development, who should eventually realize the importance of defining a regional policy aimed at EU funds as a key to regional development and reducing regional disparities within countries.

Keywords: sustainable regional development; EU funds; development projects; absorption

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1. Introduction

The European Union (EU) has a long-standing commitment to sustainable development, recognizing its importance in achieving social, economic, and environmental goals. EU funds play a significant role in advancing sustainable development in member states, directly and indirectly impacting various aspects of society. The impact of EU funds on sustainable development is substantial, touching upon various aspects of social, economic, and environmental well-being. These funds play a critical role in supporting member states' efforts to achieve a more sustainable and prosperous future, while also contributing to global sustainability goals such as the United Nations' Sustainable Development Goals (SDGs).

The application of successful EU funds absorption models to sustainable development is important for several reasons. By effectively utilizing EU funds, member states can promote sustainable development and address various economic, social, and environmental challenges. Efficient absorption of EU funds ensures that resources are allocated optimally and used effectively to address sustainable development priorities. This can lead to positive economic growth, job creation, and improved living standards for citizens. EU funds often support research and development projects, technology transfer, and innovative solutions to sustainable development challenges. By absorbing funds effectively, member states can foster innovation in key areas, such as renewable energy, waste management, and sustainable agriculture. EU funds aim to reduce economic disparities among regions by supporting less-developed areas. By applying successful absorption models, countries can ensure that funds reach these regions and contribute to sustainable development goals, such as poverty reduction and social inclusion. Effective EU funds absorption can attract further investments from both public and private sectors, amplifying the impact on sustainable development. This could lead to the establishment of new businesses, infrastructure improvements, and increased competitiveness. Applying successful absorption models requires strong coordination among various stakeholders, including national and regional authorities, private sector entities, and non-governmental organizations. This can lead to better policy coherence and the establishment of integrated approaches to sustainable development. Implementing and managing EU-funded projects requires administrative and technical capacity. By applying successful models, member states can strengthen their institutions, improve governance, and develop better project management skills, ultimately benefiting the overall sustainable development efforts. Successful absorption models often include robust monitoring and evaluation mechanisms, enabling member states to track the progress of funded projects and measure their impact on sustainable development. This feedback loop can inform future policy decisions and improve the effectiveness of EU funds.

The main advantage of EU funds is that they represent financial resources that do not need to be repaid and are part of the total investment, thereby directly influencing the economic growth of a certain country (Vukašina et al. 2022). In their study, Florkowski and Rakowska (2022) emphasize that co-financing of projects funded by EU funds has a significant impact on the further development of individual regions, enabling the implementation of multiple development projects. The research conducted by Walesiak and Dehnel (2023) confirms the effects of EU funds on individual regions, where improvements in the level of social cohesion and reduction in regional inequalities are evident. Management and strategic planning are the key to success, and projects and development have no place for politicization and promotion (Šostar 2021a).

This research deals with the development of an applicable development model for the absorption of EU funds applicable to the Republic of Croatia as well as other countries in the region. The reason for conducting this type of research is the existence of limitations and challenges faced by countries at all levels in absorbing EU funds. It is also crucial to determine the impacts on the regional development of individual countries due to the funds and implemented development projects. This research includes respondents who are experts in the preparation and implementation of projects from EU funds. The area covered by the research focuses on Croatia, Slovenia, Hungary, and Poland. The emphasis is on applying the developed model to the Republic of Croatia, as a relatively new EU member state that is still in the process of adapting its policies and procedures. The shared history of the development of the former common state, which included both Slovenia and Croatia, led them through the same developmental phases. Slovenia had access to EU pre-accession funds, which it utilized until its entry into the EU in 2004. After that period, it accessed funds available to EU member states. Since Croatia only joined the EU in 2013, it is evident that it is undergoing the same processes but with a time lag. Due to these reasons (shared history, people's mentality, and similarities), Slovenia has been chosen as an excellent country for conducting this research. As a country selected in the research

sample, Hungary, like Slovenia, used pre-accession funds until 2004 when it also became a full member of the EU and started using structural and cohesion funds. The reason for its selection lies in the fact that it was necessary to analyze the problems and achievements in the absorption of EU funds and the implementation of projects in a country that joined the EU at the same time as Slovenia, but on the other hand, does not share a common history and similarities with Croatia. Hungary shares a border with Croatia and the two countries are geographically very close, so this comparison was needed. On the other hand, Poland also became a full member of the EU in 2004, just like Slovenia and Hungary, but their degree of development and the impact of EU funds differ significantly. Poland has been the most successful in the EU in absorbing funds from the EU funds.

This paper is organized as follows: After the introduction, Section 2 introduces the theoretical framework of EU funds and the proposed approach to define a model of regional development based on absorbed EU funds. It also provides the hypotheses and methods; ANOVA (analysis of variance); coefficient data of the suitability index of the regression model; and regression beta coefficients for predictor variables. Section 3 presents materials and methods used in the research process. Section 4 presents results and a discussion. Section 5 discusses the conclusions.

1.1. Problem Statement

European Union (EU) funds, as an accessible source of financing for various project ideas and a factor with the potential to contribute to sustainable local, regional, and national socio-economic development, are becoming an increasingly prevalent topic of discussion in both professional and scientific circles. The Republic of Croatia follows the trend of other countries, in which stakeholders have behaved similarly: as the number of EU funds increased in content and scope, more stakeholders became involved, on one hand, in the preparation and implementation of projects, and on the other hand, in expert discussions on various issues related to EU funds in various ways. Stakeholders who deal with the preparation and implementation of projects financed through EU funds are mainly focused on a single clearly defined goal, which is to achieve as much funding as possible through as many projects as possible. Some countries are extremely successful in implementing many projects through EU funds financing. When entering a particular project, it is essential to decide which project to choose. To ensure the quality of the decision-making process is as high as possible, it is necessary to recognize the need for decision making and be aware of the time constraints that exist when making decisions. Selecting the most successful model for absorbing EU funds is undoubtedly the foundation for increasing economic activities and, ultimately, the regional development of countries. This research deals with the causes of the lower success of certain countries in absorbing funds from EU funds and the development of a unique model for efficiently attracting funds from EU funds applicable to the Republic of Croatia and other countries.

1.2. Significance of the Study

The application of successful EU funds absorption models to sustainable development is significant for several reasons. By effectively utilizing EU funds, member states can promote sustainable development and address various economic, social, and environmental challenges. The idea of the EU support program is to improve regional and local infrastructure networks (transportation, energy, and environment), including social infrastructure, as well as to support the private sector, and health and education sectors (Ristanović and Tošović-Stevanović 2016).

This research will provide a systematic and comprehensive review and analysis of existing knowledge in the field of research, which relates to the specificities of regional development under the influence of EU funds. The expected contribution to economic science in a theoretical sense stems from the development of scientific knowledge and thought on the importance of increasing the number of development projects that will improve the absorption of funds from the European Union, thus increasing economic

activities in Croatia and the region. The expected contribution to economic science in an applied sense is based on formulating the "EU Funds-based Regional Development Model," which is based on the application of knowledge, the adoption of good practices and experiences of stakeholders, and considering relevant indicators from available sources. The research itself will be conducted in four European countries (Croatia, Slovenia, Hungary, and Poland), which adds value to the scientific contribution based on different regional backgrounds. The most significant contribution will be through testing the "EU Funds-based Regional Development Model," which will be applicable to the Republic of Croatia, countries in the region, and other European countries over an extended period. Finally, research on the impact of EU funds on the regional development of beneficiary countries is significantly less represented and very modest, and only relates to the "rise" of systematic scientific research. This study aims to fill gaps in the research sense and stimulate the thinking of key stakeholders responsible for regional development, who should eventually understand the importance of defining regional policy focused on EU funds as the key to regional development and reducing regional differences within states. The mentioned research provides a basis for further scientific research in the field of EU funds absorption with the aim of balanced regional development.

2. Literature Review

The field of EU funds is an interdisciplinary area that involves researchers from various backgrounds, including economics, public policy, regional development, and sustainable development. Smart planning is the key to success, especially considering the limited financial and human resources (Šostar 2021a). Attitudes towards EU institutions can potentially influence the reduced number of project applications for EU funds. In their research, Crepaz and Hanegraaff (2022) prove that the impact is almost negligible. Crescenzi et al. (2020) show in their research that love for the EU cannot be bought, which is proven by the exit of the United Kingdom from the EU despite the EU funds which had a significant impact on their development.

In their research, Ciani and De Blasio (2015), suggest that EU funds have a limited impact on local employment measures, population, and household product prices. In their studies, Destefanis and Di Giacinto (2023) and Arbolino and Di Caro (2021) discuss the impact of EU funds on GDP, promoting regional resilience, and significant effects of the same during the COVID-19 pandemic. Álvarez-Martínez and Polo (2017) confirm in their research that EU funds have a short-term effect on economic development. Charasz and Vogler (2021) emphasize that EU funds have a long-term effect on local and state capacities and that the funds contribute to reducing bureaucracy. By analyzing two regression models, Kalfova (2019) concluded that quality state governance is important for the implementation of EU regional policy. In their research, Jasińska-Biliczak and Krzysztof (2020) suggest ways to measure the impact of EU funds on the regional development of a particular region, outlining efficiency evaluation criteria (examination of the provisions of the Opole Voivodeship Regional Development Program in terms of its consistency with the concept of sustainable development; assessment of the consistency of the governance structure and development capital; examination of the effectiveness of projects co-financed in the scope of public aid; research on the effectiveness of the contribution to co-financing development projects from the resources of the Opole Voivodeship Regional Development Program). In conclusion, they suggest that countries should adopt Poland's model of monitoring and evaluating the regional development system and EU funds, as Poland is a significant factor in absorbing EU funds.

Durand and Espinoza (2021) highlight that the role of fiscal authority in supporting an individual economy is a key factor and that, due to the newly approved EU recovery instrument, significant improvement of economic damage caused by the COVID-19 pandemic can be achieved. Codogno and van den Noord (2021) and Butkus et al. (2020) note that EU funds have a direct impact on the economic growth of the recipient country. They speak about the importance of responding before a potential crisis arises with a mechanism for

ready reaction in the future. In addition, during the financial crisis, EU funds significantly helped in maintaining employment and economic activities (Crescenzi and Giua 2018). Dicharry (2020) and Fratesi and Perucca (2018) noted that EU funds influence the economic growth of individual regions, but not at the same pace. On the other hand, Moreno (2020) noted that the financial crisis led to a decrease in investment and the absorption of funds from EU sources. When we observe the impacts of EU funds on the Greek economy, a positive effect of the funds on real GDP and disposable income is noticeable, while the effect is somewhat less on investments. The financial crisis revealed the instability of the Greek economy (Kechagia and Kyriazi 2021). Bostan et al. (2022) show in their study how EU funds are directly linked to an increase in the number of employees in companies in the medium and long term. Darvas et al. (2021) in their study find that the most successful regions have projects with longer durations, focusing on inter-regional co-financing and with a lower share of national co-financing. Less developed regions tend to grow and develop faster due to more efficient absorption of funds from EU sources (Antunes et al. 2020). Mugambi et al. (2021) assert that the efficiency in energy spending is uneven across regions in Spain, which is directly related to the criteria for allocating EU funds.

Although the United Kingdom is no longer a member of the EU, it is necessary to note that when using EU funds, it had a large share (direct and indirect) of funds that contributed to the economic growth of the country, especially less developed regions (Di Cataldo and Monastiriotis 2018). Sánchez and Jiménez-Fernández (2023) highlight that regions of EU member states are far more vulnerable due to the COVID-19 pandemic, and that this also affects their absorption of funds from EU sources. Human resources are the key to the success of every country, including in the planning and implementation of regional policies, with an emphasis on EU funds (Devčić and Šostar 2015; Veron and Sergejeff 2021).

In the context of the efficiency of EU funds, Melecký (2018) believes it is necessary to put the co-financing activities of projects in a broader context to understand the aforementioned. Following this, Šelebaj and Bule (2021), in their research, conclude that support from EU funds has a strong positive impact on almost all business indicators of companies and other project applicants. In addition, Muraközy and Telegdy (2023) emphasize the impact of EU funds on company inputs, workforce productivity, and capital intensification.

Lutringer (2023) and Wolleghem (2020), in their studies, highlight the reasons for insufficient absorption of funds from EU funds, emphasizing time and accounting mechanisms, administrative and financial capacities, and the nature of the funds themselves as the main limiting factors. Kersan-Škabić and Tijanić (2017) emphasize that the key to good absorption is investment in human resources, decentralization, investments, institutional framework, and infrastructure development. One of the problems, as pointed out by Medve-Bálint and Šćepanović (2020), is that a large share of EU funds is absorbed by foreign companies that take money out of the country. There are several studies that demonstrate the relationship between the quality of public administration and the absorption capacity of projects funded by EU funds (Baun and Dan 2017; Terracciano and Graziano 2016). In their research, Mendez and Bachtler (2022) emphasizes that regional government does not have an influence on the administrative performance of EU funds.

Fidrmuc et al. (2019) and Bourdin (2019) confirm that there is a significant impact of non-refundable funds on a certain area, emphasizing a greater impact in larger centers than in the periphery. Blouri and von Ehrlich (2020) use a general equilibrium model to assess the impact on wages, productivity, and infrastructure. Crucitti et al. (2023) notes that research should not only be guided by the amount of absorbed financial resources, but also by the way these resources are distributed. In his study, Hagemann (2019) highlights the importance of capacity, emphasizing that poor capacities strongly affect absorption power and the inability to reduce regional inequalities.

Although Poland's approach to EU funds has changed over the years, institutional capacities and efficient management have played a key role in the high level of absorption of funds from EU sources (Baschieri 2021). According to the study by Jagódka and Snarska

(2023), all regions in Poland have decided to develop human capital and innovation, which significantly increased the efficiency of EU funds. Murzyn (2018) noted that the smart growth of regions in Poland has significantly increased due to the use of EU funds. Marcu et al. (2020) conducted a study in Romania where they highlight poor capacities at the start of using funds from EU sources due to a lack of experts in the field, while over time the situation stabilized. Progress in the absorption of funds from EU sources occurred due to the growth of knowledge and experience, and an increase in transparency and information and communication systems. The creation of a new region in Hungary (Budapest Region and Pest County Region) in 2020 brought about changes that the administration was unprepared for. Specifically, the changes happened so quickly that it directly affected the level of absorption of EU funds (Szabó et al. 2021). Additionally, the role of national authorities is an important factor in absorbing EU funds, with an emphasis on investing in human resources and the development of quality projects that will lead to an increase in the utilization of funds (Barković and Šostar 2013; Andrlić et al. 2018).

Darvas et al. (2019b) discuss in their research the importance of reducing corruption in a country to access EU funds more easily and to properly direct these resources. Darvas et al. (2019a) highlight in their research the negative correlation between the share of projects under the management of local entities and economic growth, which means that local needs should be raised to a higher level to be linked with the allocation of financial resources from EU funds. Lădaru et al. (2018) show differences in operational programs from which EU fund competitions are announced. Differences are visible at various levels of fund absorption efficiency, indicating that something was wrongly planned in the programming process at higher levels, which is often a misalignment with the needs on the ground.

In their research, Maleković et al. (2018) and Šostar et al. (2018) note the strong impact of EU funds on regional development in the Republic of Croatia. The obtained funds accelerated the processes of institutions and individuals to adapt to European legislation and build capacities, although administrative obstacles are visible and affect the loss of part of the funding. In the study by Bańkowski et al. (2022), administrative barriers were also highlighted as a bottleneck in the absorption of EU funds. The fact that a larger number of projects does not necessarily mean greater economic growth of a particular region should certainly be considered, and it is important to properly direct funds from EU funds to those areas that contribute most to growth (Devčić and Šostar 2012).

Every crisis impacts the efficiency of EU funds for a particular environment or investment. Correctly directed funds in the case of any market anomalies are the key to success. The COVID-19 pandemic has significantly affected the crisis worldwide, while the EU tries to finance further development of its regions with strong recovery mechanisms (Sakkas et al. 2021). Several studies have investigated the results of the Recovery Plan for Europe as a whole, as well as those of specific countries (Bankòwski et al. 2021; Pfeiffer et al. 2021; Picek 2020).

When speaking of conducted research related to EU funds and their impact on the regional development of certain countries, few authors have taken up the challenges these countries face. According to Kersan-Škabić and Tijanić (2017), it is evident that some studies have attempted to capture the comprehensive relationship between administrative capacities, political governance, and the implementation of projects funded by the EU. Cunico et al. (2021) emphasize that there is no adequate model for monitoring and analyzing the impact of EU funds on regional development, and that this depends on a range of factors. Conversely, Maras (2022) confirm that there is a significant connection between European funding and reduction in regional disparities, especially when including regional and local authorities in the processes (Marcu et al. 2020). We can agree that there are a large number of variables that need to be measured in order to assess the impact of EU funds on the regional development of a particular country, but the position is that there are a number of ways in which this can be measured, such as economic growth models, regional development models, impact assessment models, multi-criteria decision analysis (MCDA), econometric models, panel data analysis, spatial analysis, and simulation models. When

we talk about the capacities necessary for attracting and utilizing funds from the European Union, they are divided into three categories: administrative capacities, financial capacities, and macroeconomic capacities (Šostar 2021b).

Administrative capacity primarily refers to the ability of stakeholders individually, but even more so the ability of the system, to carry out tasks related to the preparation and implementation of all prescribed and entrusted procedures related to the funds of the European Union. In their research, Țigănașu et al. (2018) prove that high-quality institutional management, as a leading dimension of administrative capacity, has a positive impact on the absorption rate of funds from EU funds.

Financial capacities refer to the abilities of stakeholders and the system to fully finance these procedures. Macroeconomic capacity relates to the limitation whereby a country is constrained by the amount of funds it can draw from the structural funds. According to Aivazidou et al. (2020), less successful local authorities need to change their strategic focus and prioritize strengthening their administrative capacities rather than increasing the absorption of funds from EU sources. Due to capacity limitations, Madeira et al. (2021) emphasize the importance of following a smart specialization strategy and focusing on areas that will bring us the most benefits in financing regional development. A very interesting study presented by Incaltarau et al. (2020) highlights the role of the government in reducing corruption to increase the absorption of funds from EU sources, which have a direct impact on the regional development of specific regions.

There is research on methods of measuring the impact of EU fund resources on the macroeconomic indicators of recipient countries. Two approaches are mentioned: the econometrics approach and the simulation model approach. Among the simulation models, the HERMIN, HERMES, QUEST II, and ECOMOD models appear (Bradley et al. 2022; Surubaru 2021; Piątkowski 2020; Roeger et al. 2022). The macroeconomic effects of EU funds are visible in employment, infrastructure development, GDP changes, and personal consumption. As Poland has historically been the most successful country in attracting funds from the EU, it is important to analyze what it has done to be successful (Szlachta 2004).

It is evident that the effect of EU funds is greater in some regions and smaller in others. In the poorest regions, the spillover effect does not contribute to reducing regional inequalities but represents a great opportunity for the future period (Maras 2022). It has also been proven (Aiello et al. 2019) that less developed regions require more financial resources due to having higher administrative and bureaucratic challenges, particularly due to the lower level of capacity of local authorities.

3. Research Objectives and Hypothesis

The subject of the research is the absorption of funds from EU funds and their impact on the regional development of Croatia, Slovenia, Hungary, and Poland. The analysis aims to investigate the efficiency of absorbing EU funds, the impact of these funds on the regional development of the countries, and the reasons for such impacts. Each country has its own approach to regional development and different regional policy priorities. However, all countries belonging to the eurozone have a common, shared goal, which is evident in balanced regional development with positive microeconomic and macroeconomic indicators. EU funds are the right path to success, including the human and material potentials of each of these countries. The following research hypotheses (Figure 1) are presented: H1: There is a cause-and-effect relationship between the absorption of European Union funds and the sustainable regional development of beneficiary countries; H2: Investing in human resources significantly increases the utilization of available European Union funds; H3: Strengthening material resources significantly increases the utilization of available European Union funds.

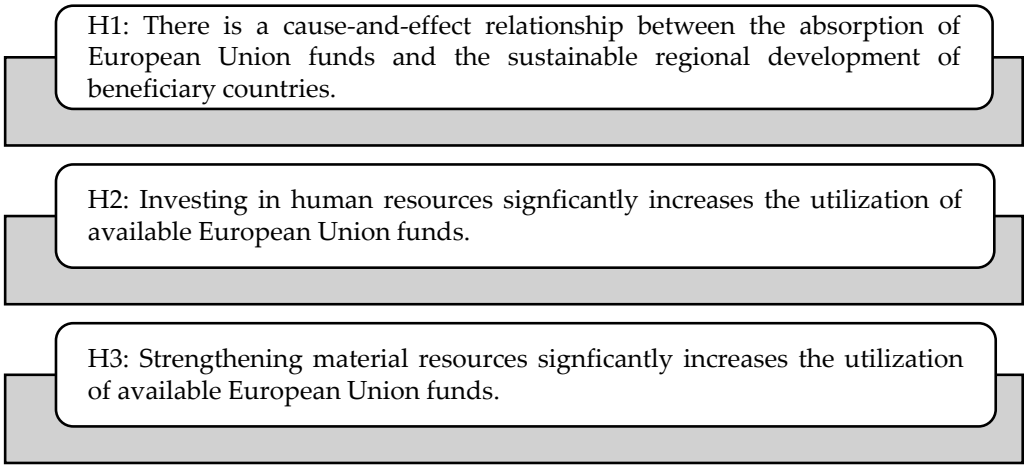

Figure 1. Hypotheses of the study.

As the research is comprehensive and includes several factors on which the efficiency of absorption of EU funds and their impact on regional development depend, it is necessary to mention that the focus of the research hypotheses is not only human and material resources as instruments of increasing absorption. It is important to maintain sustainable regional development by investing in different dimensions in the analyzed countries because of their differences and different approaches to the same problem. Thus, in some countries, the focus will be on human capacities, while in other countries, the focus may be on investing in infrastructure.

The purpose of the research is to familiarize the attitudes of key stakeholders involved in the preparation and implementation of projects from EU funds in Croatia, Slovenia, Hungary, and Poland regarding the level of absorption of funds from EU funds, their impact on regional development, and the reasons for such impacts, through testing the "EU Funds-based Regional Development Model." Based on the conducted research, the aim is to confirm the "EU Funds-based Regional Development Model," which would be applicable to the Republic of Croatia. The conducted research would be applicable to the Republic of Croatia, countries in the region, and other European countries. In fact, the work aims to increase the absorption of EU funds that are available and will become available to the Republic of Croatia. The main reason for choosing the mentioned countries is that they are EU members and have gone through the same processes as the Republic of Croatia. They had access to the same EU funds that Croatia has now, and they receive funds from structural and cohesion funds that Croatia received. Hungary and Slovenia are ideal candidates because their geographical location, historical heritage, and mentality are similar to those of the Republic of Croatia. Poland was chosen because it is the country that most effectively uses EU funds, having the highest level of utilized funds available to it through past EU programming periods. As a result, Poland was the only EU country not affected by the global financial crisis in 2008.

4. Methodology of Research

Given the established hypotheses, secondary data will be systematically researched using scientific literature in the fields of economic and regional development as well as EU funds. The deductive method will be used, where hypotheses will be attempted to be proven, and the inductive method, through which general conclusions will be reached. Abstract methods will be used to separate the essential from the non-essential, and the classification method will be applied using specialization and generalization methods. In addition, the systematic analysis method and synthesis method will be used, as well as the dialectical approach, meaning that phenomena will be observed as a dynamic rather than a static approach. In addition, based on the developed "EU Funds-based Regional Development Model," these phenomena will also be examined through a questionnaire,

as well as using existing statistical indicators to test the applicability of the model to the Republic of Croatia. Primary research will be conducted in four countries (Croatia, Slovenia, Hungary, and Poland), while the respondents will be key stakeholders in these countries involved in the processes of preparation and implementation of projects from EU funds. The total number of respondents will initially be 400 experts in the preparation and implementation of projects from EU funds in Croatia, Slovenia, Hungary, and Poland. The selected sample is based on an internal database of experts in project preparation and implementation in Croatia, Slovenia, Hungary, and Poland, which consisted of a total of 400 experts (100 per each individual country) who participated in the preparation or implementation of at least 5 projects each. The survey questionnaire was prepared in the Lime Survey program and was sent via email to 100 experts in each country from the mentioned internal database. A total of 244 respondents responded to the survey (69 from Croatia, 62 from Slovenia, 62 from Hungary, and 51 from Poland). The used internal database is a document that contains personal data of respondents (first name, surname, and e-mail) and cannot be part of a publicly published document due to the protection of personal data and the anonymity of the respondents themselves. Furthermore, the internal database is the result of the author's long-standing work on this research, following 15 years of participation in the preparation and implementation of projects funded by EU funds in the Republic of Croatia.

All respondents are employed in institutions dealing with the preparation and implementation of projects from EU funds or work as consultants in the preparation of documentation for attracting EU funds. These are individuals who possess knowledge, experience, and expertise in the field of preparation and implementation of development projects, and they are positioned as being key to regional development in each country. Respondents participated in the study by defining their experiential attitudes, where their perception of the researched issue was recognized.

During the processing of data obtained from the questionnaire, the ANOVA (analysis of variance) method was used as a method of linear modeling to estimate the relationship between fields. ANOVA was used to test if the means change across input categories. Based on this, the research hypotheses were analyzed for pre-defined variables that were tested through coefficient data of the suitability index of the regression model and regression beta coefficients for predictive variables.

The ANOVA model was chosen because of its ability to conduct simultaneous multiple comparisons between regions, i.e., countries, allowing us to discern differences. It helps in testing the established hypotheses and can also be used to analyze interaction effects. In the case of multiple comparisons, the risk of making an error is high, while ANOVA assists in controlling the error, enhancing the integrity of the research (Fisher 1925). Coefficient data of the suitability index of the regression model were also used to estimate how well the regression model fits the data (Galton 1885). Regression beta coefficients for predictive variables were employed to observe the impact of each variable on the corresponding variable (Yule 1911).

Before carrying out the research procedure (secondary and primary), a "Model of regional development based on EU funds" was created.

The Figure 2 shows a model of regional development based on EU funds. Key areas are defined as follows: human resources, material resources, the level of EU fund absorption, regional autonomy, and regional development. Indicators are set for each area and further elaborated through a series of questions posed to respondents for the purpose of examining the above-mentioned model. The indicators are divided as follows:

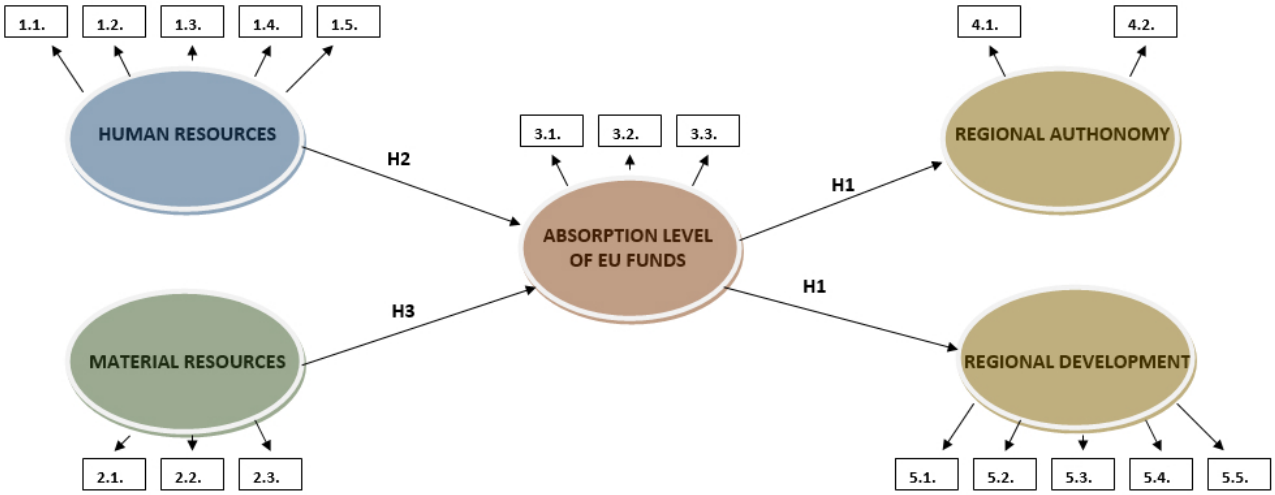

Figure 2. Model of regional development based on EU funds.

Human resources

1.1. Education at all levels in project preparation for EU funds
1.2. Awareness of financing opportunities from EU funds
1.3. Creativity of key people in preparing projects for EU funds
1.4. Motivation of key people in preparing projects for EU funds
1.5. Team collaboration in preparing projects for EU funds

Material resources

2.1. Financial capacities for co-financing projects from EU funds
2.2. Alignment of strategic documents with development needs
2.3. Level of technological readiness for implementing projects from EU funds

Level of EU fund absorption

3.1. Number of prepared projects for EU funds
3.2. Contracting rate of funds from EU funds
3.3. Number of successfully implemented projects from EU funds

Regional autonomy

4.1. Regional competitiveness index
4.2. Level of financial dependence on centralized state resources

Regional development

5.1. Level of consumption
5.2. Number of investments
5.3. Unemployment rate
5.4. Population size
5.5. Level of competitiveness

Within the "Model of regional development based on EU funds", hypotheses were set that needed to be confirmed. The model was then tested with statistical analysis of the questionnaire applied in these countries and available secondary data. The hypotheses were proven, and the model was confirmed as applicable in Croatia and EU member and candidate countries.

5. Results and Discussion

By analyzing survey questionnaires in Poland, Slovenia, Hungary, and Croatia, we tested the proposed "Model of Sustainable Regional Development Based on EU Funds".

Table 1 lists the results of the descriptive analysis by scales described under the instruments. The data presented are shown for each scale and for respondents within each country.

Table 1. Descriptive data by scales and by countries of origin of the respondents.

	Country	Number	Arithmetic Mean	Standard Deviation	Min	Max
Education at all levels in the preparation of projects for EU funds	Poland	51	17.4118	1.73409	14.00	20.00
	Slovenia	62	5.8065	2.04730	4.00	15.00
	Hungary	62	6.3871	1.94477	4.00	12.00
	Croatia	69	7.5217	2.96850	4.00	19.00
	Total	244	8.8648	4.98827	4.00	20.00
Awareness of funding opportunities from EU funds	Poland	51	13.2353	1.64424	9.00	15.00
	Slovenia	62	4.9516	1.55160	3.00	11.00
	Hungary	62	5.9516	2.47894	3.00	15.00
	Croatia	69	6.6087	2.00893	3.00	13.00
	Total	244	7.4057	3.63614	3.00	15.00
Creativity of key individuals in preparing projects for EU funds	Poland	51	17.8235	1.51929	15.00	20.00
	Slovenia	62	6.8710	1.47641	4.00	9.00
	Hungary	62	7.0323	1.81042	4.00	12.00
	Croatia	69	8.8116	2.98661	4.00	18.00
	Total	244	9.7500	4.71917	4.00	20.00
Team collaboration in the preparation of projects for EU funds	Poland	51	9.8235	0.38501	9.00	10.00
	Slovenia	62	3.2742	0.77183	2.00	4.00
	Hungary	62	3.5161	1.06728	2.00	7.00
	Croatia	69	4.6377	1.50461	2.00	8.00
	Total	244	5.0902	2.70803	2.00	10.00
Motivation of key individuals in preparing projects for EU funds	Poland	51	16.8235	2.38081	13.00	20.00
	Slovenia	62	6.5806	1.81567	4.00	12.00
	Hungary	62	6.8226	2.04478	4.00	13.00
	Croatia	69	9.4493	2.79988	5.00	18.00
	Total	244	9.5943	4.52648	4.00	20.00
Financial capacities for co-financing projects from EU funds	Poland	51	9.2353	1.12407	7.00	10.00
	Slovenia	62	3.2903	0.83739	2.00	5.00
	Hungary	62	3.1935	0.80650	2.00	4.00
	Croatia	69	3.5362	1.44079	2.00	9.00
	Total	244	4.5779	2.63681	2.00	10.00
Alignment of strategic documents with development needs	Poland	51	9.6471	0.48264	9.00	10.00
	Slovenia	62	3.0484	0.85751	2.00	5.00
	Hungary	62	3.4355	1.31350	2.00	7.00
	Croatia	69	4.6957	1.83355	2.00	10.00
	Total	244	4.9918	2.78590	2.00	10.00

Table 1. *Cont.*

	Country	Number	Arithmetic Mean	Standard Deviation	Min	Max
Level of technological readiness for the implementation of projects from EU funds	Poland	51	9.1176	0.84017	7.00	10.00
	Slovenia	62	3.2258	0.87627	2.00	4.00
	Hungary	62	3.5806	1.34954	2.00	7.00
	Croatia	69	4.4638	1.59576	2.00	9.00
	Total	244	4.8975	2.54057	2.00	10.00
Number of prepared projects for EU funds	Poland	51	4.5294	0.61165	3.00	5.00
	Slovenia	62	1.4677	0.50303	1.00	2.00
	Hungary	62	1.4194	0.49748	1.00	2.00
	Croatia	69	1.3623	0.83966	1.00	5.00
	Total	244	2.0656	1.41850	1.00	5.00
Contracted funds rate from EU funds	Poland	51	9.2941	0.75615	8.00	10.00
	Slovenia	62	3.3387	0.90433	2.00	6.00
	Hungary	62	3.4194	0.73659	2.00	5.00
	Croatia	69	3.4348	1.49979	2.00	9.00
	Total	244	4.6311	2.61902	2.00	10.00
Number of successfully implemented projects from EU funds	Poland	51	13.7647	1.22618	10,00	15,00
	Slovenia	62	4.9355	1.37746	3.00	9.00
	Hungary	62	4.9839	1.16636	3.00	8.00
	Croatia	69	6.6812	2.28481	3.00	12.00
	Total	244	7.2869	3.77664	3.00	15.00
Regional competitiveness index	Poland	51	27.1176	2.24185	24.00	30.00
	Slovenia	62	10.8548	1.99052	6.00	14.00
	Hungary	62	11.5323	4.76228	8.00	30.00
	Croatia	69	13.0435	5.85972	6.00	28.00
	Total	244	15.0451	7.52896	6.00	30.00
Level of financial dependence on centralized state funds	Poland	51	25.9412	2.23080	23.00	30.00
	Slovenia	62	10.2097	2.33391	6.00	18.00
	Hungary	62	11.1129	2.48342	7.00	19.00
	Croatia	69	13.7536	4.83372	6.00	24.00
	Total	244	14.7295	6.75867	6.00	30.00
Level of personal consumption	Poland	51	8.5882	0.98339	7.00	10.00
	Slovenia	62	3.3871	0.91176	2.00	6.00
	Hungary	62	3.8387	0.63229	2.00	5.00
	Croatia	69	5.0870	1.89224	2.00	10.00
	Total	244	5.0697	2.28415	2.00	10.00
Level of state consumption	Poland	51	5.2353	0.95054	4.00	7.00
	Slovenia	62	3.3065	1.12481	2.00	8.00
	Hungary	62	3.6129	1.61301	2.00	9.00
	Croatia	69	4.3478	2.31254	2.00	10.00
	Total	244	4.0820	1.77820	2.00	10.00

Table 1. *Cont.*

	Country	Number	Arithmetic Mean	Standard Deviation	Min	Max
Number of investments	Poland	51	9.1765	0.79261	8.00	10,00
	Slovenia	62	3.3226	0.84493	2.00	4.00
	Hungary	62	3.8387	0.70580	2.00	5.00
	Croatia	69	2.8696	1.38174	2.00	9.00
	Total	244	4.5492	2.60295	2.00	10.00
Unemployment rate	Poland	51	5.8824	0.90878	4.00	8.00
	Slovenia	62	5.5161	0.97075	2.00	6.00
	Hungary	62	5.2258	0.87627	2.00	6.00
	Croatia	69	5.6522	1.23462	2.00	10.00
	Total	244	5.5574	1.03875	2.00	10.00
Population	Poland	51	7.9412	0.64535	7.00	9.00
	Slovenia	62	3.9194	0.87400	2.00	6.00
	Hungary	62	3.9516	1.01509	2.00	7.00
	Croatia	69	4.0435	1.91307	2.00	10.00
	Total	244	4.8033	2.04331	2.00	10.00
Level of competitiveness	Poland	51	9.0588	0.73244	8.00	10.00
	Slovenia	62	3.6129	0.66171	2.00	5.00
	Hungary	62	3.6290	0.90958	2.00	6.00
	Croatia	69	2.8406	1.38928	2.00	10.00
	Total	244	4.5369	2.55045	2.00	10.00

In Table 2, the ANOVA (analysis of variance) is presented, which shows whether the differences between individual groups are statistically significant. The F-ratio must be significant if there are differences. The last column contains the confidence coefficient. If it is less than 0.05, meaning 5%, then there are differences. It is clear that all scales are different from one another, and further analysis using the post hoc test showed that Poland has statistically significantly higher results on all scales compared to Slovenia, Croatia, and Hungary. This data speaks of clear differences between countries in various aspects and processes that are important for attracting funds from EU sources.

Table 2. ANOVA results for all scales within the survey according to the amounts of respondent scores from Croatia, Slovenia, Hungary, and Poland.

		Sum of Squared Deviations	df	Mean Squared Deviation	F	Sig.
Education at all levels in the preparation of projects for EU funds	Between groups	4,810,579	3	1,603,526	311,375	0.000
	Within groups	1,235,957	240	5150		
	Total	6,046,537	243			
Awareness of financing opportunities from EU funds	Between groups	2,281,511	3	760,504	195,981	0.00
	Within groups	931,321	240	3881		
	Total	3,212,832	243			

Table 2. *Cont.*

		Sum of Squared Deviations	df	Mean Squared Deviation	F	Sig.
Creativity of key people in the preparation of projects for EU funds	Between groups	4,356,884	3	1,452,295	330,422	0.00
	Within groups	1,054,866	240	4395		
	Total	5,411,750	243			
Team collaboration in the preparation of projects for EU funds	Between groups	1,514,840	3	504,947	453,585	0.00
	Within groups	267,176	240	1113		
	Total	1,782,016	243			
Motivation of key people in the preparation of projects for EU funds	Between groups	3,706,203	3	1,235,401	232,979	0.00
	Within groups	1,272,629	240	5303		
	Total	4,978,832	243			
Financial capacities for co-financing projects from EU funds	Between groups	1,402,733	3	467,578	391,295	0.00
	Within groups	286,788	240	1195		
	Total	1,689,520	243			
Alignment of strategic documents with development needs	Between groups	1,495,631	3	498,544	306,519	0.00
	Within groups	390,353	240	1626		
	Total	1,885,984	243			
Level of technological readiness for implementation of projects from EU funds	Between groups	1,202,050	3	400,683	262,464	0.00
	Within groups	366,389	240	1527		
	Total	1,568,439	243			
Number of prepared projects for EU funds	Between groups	391,771	3	130,590	322,511	0.00
	Within groups	97,180	240	0.405		
	Total	488,951	243			
Rate of contracted funds from EU funds	Between groups	1,402,275	3	467,425	424,083	0.00
	Within groups	264,529	240	1102		
	Total	1,666,803	243			
Number of successfully implemented projects from EU funds	Between groups	2,837,030	3	945,677	360,895	0.00
	Within groups	628,888	240	2620		
	Total	3,465,918	243			
Regional competitiveness index	Between groups	9,563,211	3	3,187,737	181,668	0.00
	Within groups	4,211,293	240	17,547		
	Total	13,774,504	243			
Level of financial dependence on centralized state funds	Between groups	8,554,029	3	2,851,343	268,771	0.00
	Within groups	2,546,119	240	10,609		
	Total	11,100,148	243			
Level of personal consumption	Between groups	900,888	3	300,296	196,417	0.00
	Within groups	366,928	240	1529		
	Total	1,267,816	243			
Level of state spending	Between groups	123,645	3	41,215	15,343	0.00
	Within groups	644,716	240	2686		
	Total	768,361	243			

Table 2. *Cont.*

		Sum of Squared Deviations	df	Mean Squared Deviation	F	Sig.
Number of investments	Between groups	1,411,237	3	470,412	480,067	0.00
	Within groups	235,173	240	0.980		
	Total	1,646,410	243			
Unemployment rate	Between groups	12,928	3	4309	4149	0.07
	Within groups	249,269	240	1039		
	Total	262,197	243			
Population	Between groups	635,413	3	211,804	134,073	0.00
	Within groups	379,145	240	1580		
	Total	1,014,557	243			
Level of competitiveness	Between groups	1,345,421	3	448,474	457,534	0.00
	Within groups	235,247	240	0.980		
	Total	1,580,668	243			

The variable "Education at all levels in the preparation of projects for EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 311.375, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of education for project preparation for EU funds, while Slovenia has the lowest.

The variable "Awareness of funding opportunities from EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 195.981, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of awareness of funding opportunities from EU funds, while Slovenia has the lowest.

The variable "Creativity of key persons in the preparation of projects for EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 330.422, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of creativity in project preparation, while Slovenia has the lowest.

The variable "Team cooperation in the preparation of projects for EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 453.585, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of team cooperation for project preparation for EU funds, while Slovenia has the lowest.

The variable "Motivation of key persons in the preparation of projects for EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 232.979, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of motivation for EU fund preparation, while Slovenia has the lowest.

The variable "Financial capacity for co-financing projects from EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 391.295, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant. It was recorded that Poland has the highest level of financial capacity for co-financing projects from EU funds, while Hungary has the lowest.

The variable "Alignment of strategic documents with development needs" is statistically significantly different between the selected countries in which the research was conducted (F = 306.519, df = 3, 240, $p < 0.05$). It is visible that $p < 0.05$, which is significant.

It was recorded that Poland has the highest level of alignment of strategic documents with development needs, while Slovenia has the lowest.

The variable "Level of technological preparedness for the implementation of projects from EU funds" is statistically significantly different between the selected countries in which the research was conducted (F = 262,464, df = 3, 240, $p < 0,05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest level of technological readiness for the implementation of projects from EU funds, while Slovenia has the lowest.

The variable "Number of projects prepared for EU funds" differs significantly between the selected countries in which the research was conducted (F = 322.511, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest number of prepared projects for EU funds, while Croatia has the lowest.

The variable "Contracted funds rate from EU funds" differs significantly between the selected countries in which the research was conducted (F = 424.083, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest rate of contracted funds from EU funds, while Slovenia has the lowest.

The variable "Number of successfully implemented projects from EU funds" differs significantly between the selected countries in which the research was conducted (F = 360.895, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest number of successfully implemented projects from EU funds, while Slovenia has the lowest.

The variable "Regional Competitiveness Index" differs significantly between the selected countries in which the research was conducted (F = 181.686, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest regional competitiveness index, while Slovenia has the lowest.

The variable "Level of financial dependence on central state funds" differs significantly between the selected countries in which the research was conducted (F = 268.771, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest level of financial dependence on central state funds, while Slovenia has the lowest.

The variable "Level of personal consumption" differs significantly between the selected countries in which the research was conducted (F = 196.417, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest level of personal consumption, while Slovenia has the lowest.

The variable "Level of government spending" differs significantly between the selected countries in which the research was conducted (F = 15.343, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest level of government spending, while Slovenia has the lowest.

The variable "Number of investments" differs significantly between the selected countries in which the research was conducted (F = 480.067, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest number of investments, while Slovenia has the lowest.

The variable "Unemployment rate" differs significantly between the selected countries in which the research was conducted (F = 4.149, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that unemployment rates are very close in the examined countries, with the perception of high unemployment being the highest in Poland and the lowest in Hungary.

The variable "Population size" differs significantly between the selected countries in which the research was conducted (F = 134.073, df = 3, 240, $p < 0.05$). It is evident that $p < 0.05$, which is significant. It has been recorded that Poland has the largest population, while Slovenia has the smallest.

The variable "Level of competitiveness" differs significantly between the selected countries in which the research was conducted (F = 448.474, df = 3, 240, $p < 0.05$). It is

evident that $p < 0.05$, which is significant. It has been recorded that Poland has the highest level of competitiveness, while Croatia has the lowest.

The main reason for this is the fact that Poland's awareness of the importance of EU funds was far greater than that of everyone else. Immediately after signing the pre-accession agreement, Poland had a strong campaign on the importance of EU funds and significant investments in educating the entire regional development system for the preparation and implementation of projects according to EU methodology. In addition, strong public information campaigns were conducted and potential project stakeholders were approached, considering the future of co-financing projects from EU structural funds. Teams at all levels were prepared to work on projects, significant importance was placed on motivating people, and capacities were prepared for financing large projects. Regional development policy was moving towards adapting to the current situation and needs of Poland on the one hand, and EU legislation on the other. As a result, Poland achieved the best results in terms of the number of successfully co-financed and implemented projects from EU funds, which had a huge impact on investments, consumption, and competitiveness, and thus influenced the regional development of the country. Poland's preservation from the financial crisis that recently affected the whole world is mainly due to these reasons. Poland is the only EU country that had growth in GDP per capita during the crisis.

In the continuation of the analysis, the results indicate the interconnection of different aspects of attracting EU funds.

As part of the first hypothesis, which states that there is a cause-and-effect relationship between the absorption of European Union funds and the regional development of beneficiary countries, a hierarchical regression analysis was used.

From Table 3, it can be seen that the adjusted R^2 for the second step of the analysis is 0.767, which means that the model explained approximately 77% of the variance, and that the F-ratios are statistically significant. From Table 4, it can be seen that the number of prepared projects for EU funds is a better predictor than the number of successfully implemented projects from EU funds. The beta coefficient of the "Number of prepared projects for EU funds" is $\beta = 0.602$, $t = 10.283$, $p < 0.01$, and the beta coefficient for the "Number of successfully implemented projects from EU funds" is $\beta = 0.219$, $t = 3.101$, $p < 0.05$. These data support the posited hypothesis that there is a cause–effect relationship between the absorption of European Union funds and the regional development of recipient countries (HYPOTHESIS 1 ACCEPTED). For a more precise explanation of the hypothesis, it should be noted that regression analysis is an indicator of correlation, not a cause–effect relationship. However, since it can be logically assumed that the direction in this case is cause–effect, we confirm the hypothesis in this way with the remark that it is about the assumed direction of influence.

Table 3. Coefficient data of the suitability index of the regression model.

Model	R	Adjusted R2	Change Statistics				
			Change in R2	Change in F Ratio	df1	df2	Change in R2
1	0.862 a	0.741	0.742	696,931	1	242	0.000
2	0.877 b	0.767	0.026	27,290	1	241	0.000

Note: a, b mean the steps of analysis. a is the first step and b is the second step.

According to Table 4, the number of prepared projects is more significant than the number of successfully implemented projects. Of course, both variables are extremely important predictors for regional development, but the data show that the overall project capacity with which a country competes for EU funds is also extremely important. The assumption is that countries with a larger number of projects have a wider choice and greater opportunities to choose more projects that meet the criteria of EU funds from a larger number of projects.

Table 4. Regression beta coefficients for predictor variables "Number of prepared projects for EU funds" and "Number of successfully implemented projects from EU funds" in relation to the criterion variable "Regional development".

	Model	Standardized Coeff.	t	Significance
		Beta		
1	(Constant)		9101	0.000
	Number of prepared projects for EU funds	0.862	26,399	0.000
2	(Constant)		4578	0.000
	Number of prepared projects for EU funds	0.602	10,283	0.000
	Number of successfully implemented projects from EU funds	0.219	3101	0.002

To test Hypothesis 2, which states that investing in human resources significantly increases the utilization of available European Union funds, a hierarchical regression analysis was also conducted. From Table 5, the adjusted R^2 for the fourth step of the analysis is 0.847, which means that the model explained approximately 85% of the variance, and that the F-ratios are statistically significant.

Table 5. Coefficient data of the suitability index of the regression model.

Model	R	Adjusted R2	Change Statistics				
			Change in R2	Change in F Ratio	ss1	ss2	Significance of Change in F Ratio
1	0.893 a	0.796	0.797	949,178	1	242	0.00
2	0.915 b	0.837	0.41	61,481	1	241	0.00
3	0.920 c	0.844	0.08	12,643	1	240	0.00
4	0.922 d	0.847	0.04	5892	1	239	0.16

Note: a, b, c, d mean the steps of analysis. a is the first step, b is the second step, c is the third step and d is the fourth step.

In the Tables 6 and 7, the variable "Education at all levels in the preparation of projects for EU funds" was proven to be a statistically significant predictor of the criterion variable "Number of successfully implemented projects from EU funds"—the regression coefficients of the hierarchical regression analysis are $\beta = 0.401$, $t = 6.704$, $p < 0.05$. The other beta coefficients are $\beta = 0.214$, $t = 3.178$, $p < 0.05$, for the variable "Creativity of key people in the preparation of projects for EU funds", $\beta = 0.205$, $t = 3.209$, $p < 0.05$ for the variable "Team collaboration in the preparation of projects for EU funds ", and $\beta = 0.147$, $t = 2.427$, $p < 0.05$ for the variable "Motivation of key people in the preparation of projects for EU funds".

As we can see according to the beta coefficients, education at all levels in the preparation of projects for EU funds is the most important predictor, but creativity, team collaboration, and motivation of key people in the preparation of projects for EU funds are also very important. Based on these results, it can be claimed that HYPOTHESIS 2 IS ACCEPTED, i.e., this research has determined that the level of utilization of available EU funds can be significantly increased by investing in human resources.

As part of Hypothesis 3, the claim that strengthening material resources significantly increases the utilization of available European Union funds was examined. The hypothesis was also tested by hierarchical regression analysis. The model is also significantly explained; the adjusted R2 is 0.844 or almost 85% of the variance. The measures "Level of technological readiness for the implementation of projects from EU funds", "Alignment of strategic documents with development needs", and "Financial capacities for co-financing projects from EU funds" were taken as predictor variables, while the criterion variable was "Number of successfully implemented projects from EU funds".

Table 6. Regression beta coefficients for predictor variables "Education at all levels in the preparation of projects for EU funds", "Creativity of key people in the preparation of projects for EU funds", "Team collaboration in the preparation of projects for EU funds", and "Motivation of key people in the preparation of projects for EU funds" in relation to the criterion variable "Number of successfully implemented projects from EU funds" (own elaboration).

Model		Standardized Coefficients	t	Significance
		Beta		
1	(Constant)		5810	0.000
	Education at all levels in the preparation of projects for EU funds	0.893	30,809	0.000
2	(Constant)		2168	0.031
	Education at all levels in the preparation of projects for EU funds	0.544	10,563	0.000
	Creativity of key people in the preparation of projects for EU funds	0.404	7841	0.000
3	(Constant)		2013	0.045
	Education at all levels in the preparation of projects for EU funds	0.436	7427	0.000
	Creativity of key people in the preparation of projects for EU funds	0.296	5032	0.000
	Team collaboration in the preparation of projects for EU funds	0.227	3556	0.000
4	(Constant)		1307	0.192
	Education at all levels in the preparation of projects for EU funds	0.401	6704	0.000
	Creativity of key people in the preparation of projects for EU funds	0.214	3178	0.002
	Team collaboration in the preparation of projects for EU funds	0.205	3209	0.002
	Motivation of key people in the preparation of projects for EU funds	0.147	2427	0.016

Table 7. Data on the coefficient index of the suitability of the regression model.

Model	R	Adjusted R2	Change Statistics				
			Change in R2	Change F Ratio	df1	df2	Change in R2
1	0.881 a	0.775	0.776	839,446	1	242	0.000
2	0.912 b	0.830	0.055	78,838	1	241	0.000
3	0.920 c	0.844	0.015	23,206	1	240	0.000

Note: a, b, c mean the steps of analysis. a is the first step, b is the second step and c is the third step.

According to Table 8, HYPOTHESIS 3 IS ACCEPTED, i.e., it has been determined that there is a statistically significant correlation between certain aspects of existing material resources and the quantity, i.e., number of projects from EU funds. The most important aspect of material resources relates to the "Level of technological readiness for the implementation of EU fund projects" whose beta coefficient is $\beta = 0.432$, $t = 8.642$, $p < 0.01$, followed by "Alignment of strategic documents with development needs" $\beta = 0.315$, $t = 6.462$, $p < 0.01$, and "Financial capacities for co-financing projects from EU funds" $\beta = 0.232$, $t = 4.817$, $p < 0.01$.

Table 8. Regression beta coefficients for predictor variables "Level of technological readiness for the implementation of EU fund projects", "Alignment of strategic documents with development needs", and "Financial capacities for co-financing projects from EU funds" in relation to the criterion variable "Number of successfully implemented projects from EU funds".

	Model	Standardized Coefficients	t	Significance
		Beta		
1	(Constant)		3500	0.001
	Level of technological readiness for the implementation of projects from EU funds	0.881	28,973	0.000
2	(Constant)		2501	0.013
	Level of technological readiness for the implementation of projects from EU funds	0.542	11,669	0.000
	Alignment of strategic documents with development needs	0.412	8879	0.000
3	(Constant)		2300	0.022
	Level of technological readiness for the implementation of projects from EU funds	0.432	8642	0.000
	Alignment of strategic documents with development needs	0.315	6462	0.000
	Financial capacities for co-financing projects from EU funds	0.232	4817	0.000

According to Marcu et al. (2020), the means to improve the absorption of funds from the EU are to increase administrative capacities, improve project quality, better coordinate among institutions, and involve regional and local stakeholders in governance. Wolleghem (2020) and Aivazidou et al. (2020) also confirm in their research the importance of capacity over preferences, particularly regarding the assertion that decentralization, strategic planning, and financial capacities play a positive role in the utilization of EU funds. This emphasizes that simplifying rules and procedures would increase absorption and implementation of the funds. Biedka et al. (2021) emphasize the importance of investing in human resources as a key driver of regional development and ensuring high-quality project application and implementation. Pîrvu et al. (2019) emphasize the importance of changing the strategic orientations of EU cohesion policy and directing funds towards innovation, as well as social and environmental strategies. The results of the research conducted by Šostar (2021b) emphasize the importance of human resources, not only in regional planning, but also in the preparation and implementation of projects funded by EU funds. People are a very important factor; in the end, a higher level of education means a larger number of projects. It has been proven that many countries have problems due to the low level of education regarding the preparation and implementation of projects from EU funds. People are a form of wealth and investing in human resources is investing in the future. Problems that arise during the preparation of projects for EU funds are also problems of financial capacity. It is often the case that less developed countries, regions, cities, or villages have low annual budgets with insignificant financial resources allocated for co-financing projects. The underdeveloped regions that need investment in development and technology suffer the most. Compliance of strategic documents with the projects to be applied for is the basis for quality planning. Large bureaucracy and administration are visible, and it is necessary to minimize this in compliance with the laws and regulations and rules of the tender. The study of Šostar and Marukić (2017) explains how poor implementation of public procurement procedures leads to the return of money from already funded projects, which is a direct consequence of insufficient investment in human resources.

6. Conclusions

The European Union's regional policy is designed to reduce economic and social disparities between member states by supporting regional development. The European Union implements its regional policy through cohesion policy. By co-financing projects in the areas it covers, the development of individual regions is encouraged. However, it does not necessarily mean that more approved funds from EU funds result in greater regional development. Therefore, we need to measure the real effects and impacts of attracted funds on regional development within each fund-using country. EU funds have had a strong impact on the regional development of fund-using countries. The best example is the economic crisis (2008), which affected most European and other countries, thereby drastically reducing investments and leading to a decline in standards in these countries. Poland, as a country that has directed all its resources to exploit the funds available through development projects, was one of the few countries that managed to avoid the crisis, and experienced slight GDP growth.

To identify the main problems that countries face in absorbing EU funds, to determine the differences in the approach to regional policy, and to establish successful models of absorption of EU funds, research was conducted in Croatia, Poland, Hungary, and Slovenia. For this purpose, a unique "EU Fund-Based Regional Development Model" was established, within which hypotheses were set that needed to be confirmed. Then, the model was tested by statistical analysis of the conducted questionnaire in these countries and available secondary data. The hypotheses were proven, and the model was confirmed as applicable in Croatia and member countries, as well as candidate countries of the EU.

The research results show the importance of human resources, not only in regional planning, but also in the preparation and implementation of projects financed from EU funds. People are a very important factor; ultimately, a higher degree of education means a larger number of projects. It has been proven that many countries have problems due to a low level of education for the preparation and implementation of projects from EU funds. The degree of readiness of projects is important when issuing public calls for project delivery. Only those with completely prepared documentation can apply for the competition. The competition itself lasts a very short period, which means that if the project is not ready or in the final phase of readiness at the time of the competition announcement, there is a high probability that it will not be able to apply for the competition. In this way, a large part of the funds allocated for a particular country remains unused. To ensure that a larger number of the projects are ready on time, it is crucial to have a satisfactory number of people at all levels educated for the preparation and implementation of projects financed from EU funds. In addition, there is a great need to provide information about the possibilities of financing projects with EU funds. Indeed, many potential applicants are not at all aware of the possibility of financing their projects. They either have not heard of any possibilities, or have heard about some information, but not enough, or have heard enough but do not trust and are skeptical about it. Therefore, it is important to inform the public daily through various media about the possibilities of financing projects from EU funds. Here, the connection between the level of education and information can be emphasized, because it is not a rare case that people who should convey information about current competitions from EU funds do not have enough information themselves or are late in conveying this to target groups. For this reason, it is important to adequately educate these people and "push" a policy of daily information transfer to potential users of EU funds. Sometimes it is not enough to just educate people for the preparation and implementation of projects from EU funds. People who deal with this work must have an appropriate degree of creativity. Insufficient creativity can turn a high-quality project idea into an average project, while a creative person can turn an average idea into a quality project. For this reason, it is necessary to select individuals who fit the profile of people who have the potential to be successful in project management so that the emphasis of projects is placed not only on quantity but also on quality. In the preparation and implementation of projects financed from EU funds, it is important to work as a team. Many projects require

gathering all stakeholders who directly or indirectly have some influence on the project or will, in turn, be directly or indirectly affected by it and their environment. It is necessary to "gather minds" and present the best possible solution to the satisfaction of all stakeholders. When preparing projects, it is important that project partners, in addition to the applicant, participate actively and that their needs and resources are maximally utilized by involving them in all processes of the application and implementation of projects. For the entire project to function, it is necessary to work as a team from the beginning to the end of the project implementation. Often, such team cooperation leads to cooperation of the same partners in the future, which is an indicator of quality and satisfying teamwork. All of the above is important in the processes of preparation and implementation of projects financed from EU funds; however, if the persons responsible for initiating regional activities through the preparation and implementation of projects financed from EU funds are not motivated enough, the projects will not be of high enough quality, their number will be insufficient, and all this will ultimately lead to poor absorption of EU funds. A relevant question is about how to motivate an individual. The preparation and implementation of projects is a very complex process, requires a lot of knowledge, skills, and experience, and should certainly be adequately paid. The individual is also motivated by the environment in which they work. Interpersonal relationships, a workspace, and an organized reward system are all factors that lead to the satisfaction of an individual who thus increases the quality, speed, and efficiency of their work.

Problems that arise during the preparation of projects for EU funds are problems of financial capacity. It is often the case that less developed countries, regions, cities, or villages have low annual budgets with insignificant financial resources allocated for co-financing projects. Those experiencing the greatest "suffering" are those underdeveloped regions that most need investment in development and technology. Projects that the EU co-finances through available funds must mostly be co-financed by the applicant and partners on the project in a certain percentage. These percentages range between 10 and 50% of the total value of each project. This, at the very start, creates limitations that are practically unsolvable. In the end, this problem leads to the absorption of funds for investment and development projects only by those regions that are already sufficiently developed and have a large amount of funds at their disposal. Those small, underdeveloped regions, without financial capabilities, are again forgotten. Thus, the differences between the regions deepen. This problem encompasses most countries, some more, some less, and the only solution is the involvement of state authorities through regional development policy and co-financing policy of projects crucial for the development of a particular region. Strategic documents are sometimes made "spontaneously", without any concrete direction of development, without an idea, and without a real desire to achieve a satisfactory level of development. Strategic documents are prepared without consulting the "little man", and without lower levels where problems exist, which often leads to creating wrong development priorities with measures that cannot help those most in need. These strategic documents often end up in "drawers", without real application, with "wandering", many unknowns, and without problem solving. Development strategies should represent the real state and analyze the current situation for given goals over a certain period. Such documents must be aligned with strategic documents at the national and EU levels, and the content must be focused on addressing pressing issues and balanced, sustainable development of regions and the country. However, pressure must be exerted on the implementation of these documents and the sanctioning of disinterested actions. Proactivity in their realization is the key to success for the beneficiaries. The research also showed the relationship between applied projects, approved projects for financing, and truly implemented projects for which funds have been fully paid. Many prepared and applied projects do not necessarily mean a high level of absorption of EU funds. Here, the relationship between quality and quantity can be observed. As EU funds are associated with very large financial resources, "instant consultants" often appear in the process of project preparation and implementation. These are individuals without sufficient knowledge, skills, and experience in project preparation

and implementation, with an emphasis on hyper-production and a low degree of quality. These projects are rarely approved for financing, but this type of "consultant" charges well for their service. Another situation that arises is that projects are approved for financing, but they are very difficult or impossible to implement, and when the first major problem arises in implementation, funds must be returned to the EU. All the above directly influence the regional development of a particular country and the reduction in regional differences within it. However, the question arises as to why some countries are more successful in absorbing funds from EU funds than others. The best positive example is Poland, as a country that has used the most of the EU funds. One of the reasons for this is that Poland had a vision. Regional policy, which was designed at national levels, served the absorption of financial resources from EU funds. Preparations started years before accession, so Poland was ready for EU funds. Significant efforts were made to prepare institutions, organizations, and entrepreneurs for the incoming funds. A strong information campaign, coupled with a series of workshops and educational cycles, strengthened institutional and human capacities. Projects began to be prepared in advance, with an emphasis on the highest degree of readiness of project documentation when funds become available. The result of this is many quality projects ready for implementation at the moment of the announcement of the competition. The implemented projects covered all areas of development, which is the result of striving for uniform regional development. Large financial resources obtained from the EU through projects have stimulated investments, increased consumption, and raised the level of competitiveness of the Polish economy to a very high level. This is relevant to the fact that Poland is the only EU country that saw an increase in economic activity during the financial crisis, which recently engulfed the entire world. Despite this, Poland recorded growth, which is certainly the result of a large financial "injection" by the EU through project financing.

In this paper, a unique "Model of regional development based on EU funds" was established, and it was proven that the model is functional and applicable to the Republic of Croatia, as well as other EU countries over a longer period. As there is a cause-and-effect relationship between the absorption of EU funds and the regional development of beneficiary countries, it is crucial to invest in human and material resources to raise the level of absorption to a high level.

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