

**SVEUČILIŠTE U RIJECI, EKONOMSKI FAKULTET
DOKTORSKI STUDIJ EKONOMIJE I POSLOVNE EKONOMIJE
I. Filipovića 4, 51 000 Rijeka**

Referada za poslijediplomske studije i doktorate

U Rijeci, 7. ožujka 2025. godine

EKONOMSKI FAKULTET RIJEKA

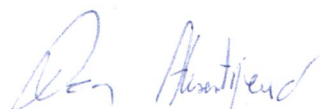
Primljeno	07-03-2025
Kl. ozn.	643-03/25-05/1
Uz. br.	141-01-25-001
Org. jed.	01

Zahtjev za ocjenu doktorskog rada

Poštovani članovi Fakultetskog vijeća i Povjerenstva za poslijediplomske studije i doktorate, sukladno članku 35. Pravilnika o doktorskome studiju Ekonomija i poslovna ekonomija (pročišćeni tekst), Ekonomskog fakulteta u Rijeci od 20. ožujka 2023. godine podnosim svoj zahtjev za ocjenu doktorskog rada s naslovom **UTJECAJ KLJUČNIH EKONOMSKIH ČIMBENIKA NA RAZVOJNE MOGUĆNOSTI HRVATSKIH OTOKA**. Zahtjevu prilažem:

1. Odluku Fakultetskog vijeća o prihvaćanju teme doktorskog rada
2. Odluku Fakultetskog vijeća o prihvaćanju prikaza rezultata istraživanja
3. 4 spiralno uvezana primjerka doktorskog rada
4. pisanu suglasnost mentora i komentora da rad zadovoljava kriterija doktorskog rada
5. indeks
6. kratak sažetak rada (300-500 riječi) te pet ključnih riječi
7. prošireni sažetak (minimalno 5000 riječi) na engleskom jeziku
8. naslov doktorskog rada, kratak sažetak doktorskog rada (300-500 riječi) te pet ključnih riječi na engleskom i hrvatskom jeziku
9. PDF verziju rada na mediju CD-u s imenom, prezimenom i OIB-om
10. izvješće o izvornosti (Turnitin), potpisano od strane mentora
11. životopis na standardiziranom obrascu u 2 primjerka (Europass)

S poštovanjem,


Dea Aksentijević, mag. oec.

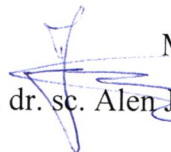
**SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET
POVJERENSTVU ZA POSLIJEDIPLOMSKE
STUDIJE I DOKTORATE**

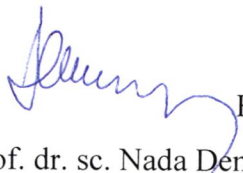
Rijeka, 4. ožujka 2025. godine

Predmet: Pismena suglasnost mentora i komentora da rad zadovoljava kriterije doktorskog rada

Poštovani,

dajemo suglasnost Dei Aksentijević, studentici doktorskog studija Ekonomije i poslovne ekonomije za pokretanje postupka ocjenjivanja doktorskog rada pod naslovom „**Utjecaj ključnih ekonomskih čimbenika na razvojne mogućnosti hrvatskih otoka**“.

 Mentor:
Prof. dr. sc. Alen Jugović

 Komentorica:
Prof. dr. sc. Nada Denona Bogović

Izvješće o provedenoj provjeri izvornosti studentskog rada

Opći podatci o studentu:

Sastavnica	Ekonomski fakultet u Rijeci - EFRI
Studij (zaokružiti ili podebljati)	Preddiplomski / Diplomski / Poslijediplomski
Vrsta studentskog rada (zaokružiti ili podebljati)	Završni / Diplomski / Završni specijalistički / Doktorski
Ime i prezime studenta	Dea Aksentijević
JMBAG	

Podaci o radu studenta

Identifikacijski br. podneska	2594361728
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Podudarnost studentskog rada:

PODUDARNOST

Ukupno	17%
Izvori s interneta	17%
Publikacije	2%
Studentski radovi	2%

Izjava mentora o izvornosti studentskog rada

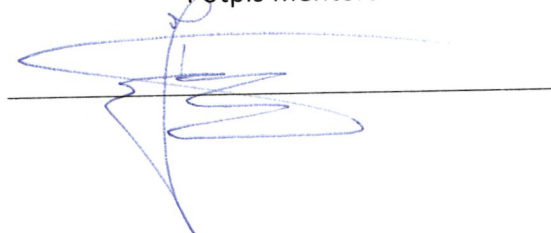
Mišljenje mentora

Datum izdavanja mišljenja	3.3.2025.
Rad zadovoljava uvjete izvornosti	DA / NE
Obrazloženje mentora (po potrebi dodati zasebno)	

Datum

3.3.2025.

Potpis mentora



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Ivana Filipovića 4
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NASLOV TEME DOKTORSKOG RADA

**UTJECAJ KLJUČNIH EKONOMSKIH ČIMBENIKA NA RAZVOJNE
MOGUĆNOSTI HRVATSKIH OTOKA**

(na hrvatskom jeziku)

**THE IMPACT OF KEY ECONOMIC FACTORS ON THE
DEVELOPMENT OPPORTUNITIES OF CROATIAN ISLANDS**

(na engleskom jeziku)

Potpis doktoranda:


Dea Aksentijević



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Hrvatska

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KLASA: 643-01/24-01/66
URBROJ: 2170-1-41-09-24-4

U Rijeci 3. rujna 2024.

EKONOMSKI FAKULTET RIJEKA

Primijeno	04-09-2024
Kl. ozn.	643-01/24-12/8
Ur. br.	141-01-24-001
Org. jed.	01

POTVRDNICA

Potvrđujem da je predloženi naslov doktorskoga rada

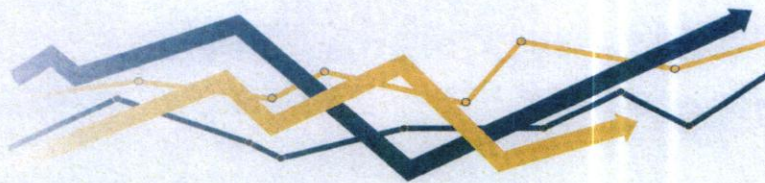
**Utjecaj ključnih ekonomskih čimbenika
na razvojne mogućnosti hrvatskih otoka**

pristupnice Dee Aksentijević, mag. oec.

u skladu s normama hrvatskoga standardnog jezika.

Vlastelić

izv. prof. dr. sc. Anastazija Vlastelić
ovlaštena lektorica



KLASA: 643-03/24-03/02

URBROJ: 141-07-24-006

Rijeka, 23. travnja 2024. godine

Temeljem članka 11. i čl. 33 Pravilnika o doktorskom studiju Ekonomije i poslovne ekonomije Ekonomskog fakulteta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta u Rijeci na 300. sjednici održanoj 22. travnja 2024. donijelo je

ODLUKU

Prihvaća se tema dokorskog rada doktorandice Dee Aksentijević, mag. oec., pod naslovom

„Utjecaj ključnih ekonomskih čimbenika na razvojne mogućnosti hrvatskih otoka“.



DOSTAVITI:

1. doktorandici
2. mentoru i komentorici
3. pismohrana



SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET

KLASA: 643-03/21-02/007
URBROJ: 2170-57-07-21-002

Rijeka, 25. svibnja 2021. godine

Na temelju članka 11. st. 1. podst. 3. i članka 13. st. 1. i 2. Pravilnika o poslijediplomskom sveučilišnom studiju (doktorskom studiju) Ekonomija i poslovna ekonomija i članka 36. Statuta Ekonomskog fakulteta Sveučilišta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta Sveučilišta u Rijeci je na 250. sjednici održanoj 24. svibnja 2021. godine donijelo

ODLUKU

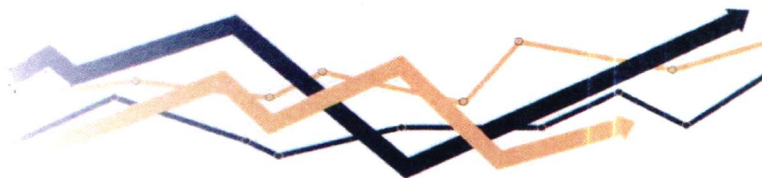
Prof. dr. sc. Alen Jugović s Pomorskog fakulteta Sveučilišta u Rijeci imenuje se za mentora te prof. dr. sc. Nada Denona Bogović za komentoricu doktorandici Dei Aksentijević, mag. oec.



Prof. dr. sc. Alen Host

Dostavlja se:

1. Dea Aksijentijević, mag. oec.
2. Mentoru i komentorici
3. pismohrana



KLASA: 643-03/24-04/006
URBROJ: 141-07-24-004

Rijeka, 17. prosinca 2024. godine

Temeljem članka 11. Pravilnika o doktorskom studiju Ekonomija i poslovna ekonomija Ekonomskog fakulteta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta u Rijeci na 314. sjednici održanoj 16. prosinca 2024. godine donijelo je

O D L U K U

Prihvaća se prikaz rezultata istraživanja dokorskog rada doktorandice Dee Aksentijević, mag. oec., pod naslovom:

„Utjecaj ključnih ekonomskih čimbenika na razvojne mogućnosti hrvatskih otoka“.



1 DEKAN
Prof. dr. sc. Saša Drezgić

DOSTAVITI:

1. doktorandici
2. mentoru i komentorici
3. pismohrana

LONG ABSTRACT

Islands are part of the mainland surrounded by the sea. As geographical units with unique development characteristics, they face numerous challenges. Economic policymakers need to continuously improve and adapt island development policies, measures, and objectives to avoid significant regional disparities and inequalities in the national economy and ensure the unhindered development of islands. Island territories are an essential resource for any economy of which they are a part, as tourism demand is often higher than in coastal areas and they also offer significant development opportunities in the production of Mediterranean crops, livestock, fishing and specific industries such as fish processing, shipbuilding and stone extraction and processing. For these reasons, the islands are increasingly the subject of scientific and professional research.

International and Croatian scientists dealing with the development of islands point out that islands require a special and adapted methodology of study, research and planning due to their development peculiarities (McCall 1994; Baldacchino 2006; Starc 1992; Šimunović 1994). Starc (1992, p. 121) explains this by the fact that islands, with their ecosystem, social and communicative characteristics and their economy, have proven to be a very complex subject of research that requires a comprehensive interdisciplinary approach.

The theoretical basis of regional development in scientific research often finds its initial hypotheses in theories of economic growth and in models that their proponents have developed and applied to investigate the influence of economic factors on economic development. Within the framework of regional development theory, island regions are analysed as heterogeneous economic units that are subject to dynamic interactions between internal development factors and external market and political influences. Classical economic paradigms such as neoclassical growth theory emphasize the role of short- and medium-term labor and capital accumulation and long-term technological progress as the main determinants of economic growth. However, the application of these models to island economies entails numerous limitations, as they cannot be adequately integrated into national and global economic flows due to their peripheral location. The endogenous growth theory provides a more appropriate analytical framework for understanding island development as it points to the importance of internal development factors such as human capital, innovation and institutional capacity, which play an important role in strengthening the competitiveness and resilience of island economies. The divergence between neoclassical and endogenous growth theories is particularly pronounced when examining the regional development of island economies, as the structural characteristics of these areas limit

their ability to spontaneously converge with the development trends of more developed regions. The contribution to understanding the development of island economies is also evident in the teachings of the economists of the new economic geography, which emphasize the role of agglomeration, market forces and spatial interactions in regional development. Within the framework of the new economic geography, researchers emphasize that the spatial concentration of economic activities can contribute to the creation of positive externalities, but also increases inequalities between developed and underdeveloped regions. Although it is not a regional development theory, the "Tourism-Led Growth" hypothesis, which emphasizes the role of tourism exports for economic growth, must be mentioned when examining island economies. The argumentation of this hypothesis emphasizes the multiplicative effects that tourism has on the economy, in addition to the direct effects visible through the increase in employment, investment and the export of services. Despite the negative effects, such as seasonality and excessive specialization of the economy, it is undeniable that tourism activities play a very important role in the development of the island economy.

In the last few decades, interest in the study of regional development has increased, as evidenced by the growing number of works in which different economic models are applied to a selection of different regions. Among these works, there are also an increasing number of scientific studies that include island regions in their sample. Since there is no official classification of Croatian islands as micro-regions and they are not recognized as separate statistical and territorial units, there is no systematically aggregated data for islands as a whole. As a result, they have been neglected in scientific works with more complex economic models.

The development of island economies takes place in a complex environment of dynamic economic, social and environmental change, where traditional growth models cannot fully explain the specificities of their development paths.

Island regions face numerous challenges, including geographical isolation, limited availability of resources, asymmetric integration into international market flows and significant economic dependence on the tourism sector, which is subject to seasonal fluctuations. Identifying development trends and a multidimensional assessment of an island's development potential requires the application of additional quantitative methods in addition to existing economic models. The analysis must include those factors that the multidisciplinary approach to regional development recognizes as additional to economic growth theories.

In the doctoral dissertation, the main scientific hypothesis reflecting the fundamental research problem is established, while auxiliary hypotheses are defined to enable a more detailed analysis of the influence of the main economic factors on the islands' development.

The main scientific hypothesis tested in this doctoral dissertation is:

By applying appropriate scientific methods, it is possible to identify the key development factors and the intensity of their influence on the development of the island, which represents a significant basis for the formation of appropriate development policies.

Auxiliary hypotheses are:

PH1: *There is a positive relationship between human capital and the economic development of the island.*

PH2: *Transportation connectivity has an impact on the economic development of islands.*

PH3: *Tourism has a significant impact on the development of islands, but those islands with a more complex economic structure are more developed.*

PH4: *Economic policy measures can influence the development of islands.*

The purpose of the doctoral dissertation is to provide a comprehensive, scientifically based analysis of the development of island economies, to expand the existing knowledge on the influence of key economic factors and to propose a methodological framework for determining the development opportunities of islands, taking into account current scientific, theoretical and applied knowledge.

Croatia is a country that has more than a thousand islands, islets and reefs in its territorial jurisdiction, making it one of the richest island countries in the world. The analysis and assessment of the situation showed that their economies are predominantly driven by tourism. In recent years, agriculture, forestry, fishing and manufacturing industries have been gradually abandoned and the number of entrepreneurs and employees in the service sector is increasing.

Between the 2011 and 2021 censuses, a population decline of 3.9% was recorded. Although 18 islands recorded an increase in population during this period, it can be said that this was mainly due to the return migration of retirees or inactive people. At the same time, there is a decline in the labor force and human capital, which may have long-term negative consequences for the

islands' economic activity, but also for their gradual demographic decline. The islands are characterized by an extremely uneven population distribution. The population density is 37.4 inhabitants/km², which differs significantly from the average for the Republic of Croatia, which is 68.4 inhabitants/km².

Weaker transport connections, inadequate energy supply, weak and insufficient water supply and drainage capacities, as well as a still poor digital infrastructure on most islands, are among the fundamental development problems and require systematic investment. The superstructure of the Croatian islands is characterized by a relatively small number of secondary schools and a meager educational offer, a lack of medical staff and poorly equipped health facilities with a limited offer of specialized services, insufficient capacity of homes for the elderly and a small number of social welfare centers with qualified staff.

The cultural heritage of the islands, which makes up 17.73% of the cultural heritage of the Republic of Croatia, is the starting point for the promotion of island destinations. Civil society also plays an important role in the development of society and the island community. Island associations make up 4.1% of registered associations in the Republic of Croatia. Banking, postal and legal services for the population of larger islands are available on the island itself, while the inhabitants of smaller islands are forced to travel to the mainland.

The protection of natural resources and the environment is one of the greatest challenges for the islands, as this is where their greatest potential lies. Although there are individual islands with relatively well-developed recycling systems, most islands still rely solely on waste disposal. The cost of waste disposal is much higher on the islands than on the mainland, and the above-mentioned problem is exacerbated by the increased volume of waste produced during the tourist season. The rate of separately collected waste is only 20.84%.

In the analysis of empirical research on factors influencing the economic development of islands, it was found that researchers most often use gross domestic product, gross domestic product per capita or their rates of change as dependent variables. Since in Croatia gross domestic product is calculated only at the national and county level, the doctoral dissertation used income per capita and the change in income per capita as the most credible substitutes. Among the most frequently used independent variables in empirical research, the indicators for the impact of tourism and unemployment as well as human capital on economic growth stand out. The authors also frequently use indicators of imports and exports as well as inflation. However, it is very difficult for Croatian islands to find indicators that can credibly replace

them. Exports in island areas can be partially analysed through the prism of exports of tourism products, which in this study are represented by the number of overnight stays per bed. Inflation, even when measured by a variable calculated at the national level, is not a suitable indicator for island economies, as the high transaction costs significantly affect their price dynamics. The impact of economic factors on the development of islands is usually investigated using panel data analysis and the application of static and dynamic models (OLS, FEM and GMM).

In the empirical part of the doctoral dissertation, the impact of human capital, economic policy measures and tourism on the economic growth of islands were investigated using panel data analysis through three econometric models. Two control variables that were found to be related to economic growth (unemployment and population movement) were also included in the models to make the results as credible as possible.

In the first step, the results of the fixed and random effect models were compared. Based on the obtained results, it was determined that the variable economic policy was not significant in the observed models. The variables unemployment, human capital and population movement are significant at the 1% significance level, while the tourism variable is significant at the 5% level. All variables satisfy the sign by the initial assumptions of the model. It was found that in both observed models human capital has the highest coefficients, and the most significant influence on the dependent variable, while the tourism variable has the smallest influence.

By performing the Hausman test, the fixed effect model and the random effect model are compared with each other. Based on the results obtained, it was found that the p-value (0.1045) is greater than 0.05, therefore the null hypothesis that the difference in coefficients between the fixed effects and random effects estimators is not consistent is rejected. This implies that the random effects model is more appropriate and efficient.

Despite the satisfactory results obtained by applying the random effects model, generalized Method of Moments (GMM) i.e. a two-stage GMM estimator was also applied due to the potential occurrence of endogeneity in the model and the nature of the model, which includes dynamic economic phenomena.

Before interpreting the results of the dynamic panel, it was important to note the results of the autocorrelation test and to check the model's validity. Based on the results of the Arellano-Bond test for serial correlation in the first differences of the residuals, the hypothesis of the absence of first-order serial correlation was rejected in all model variants. This hypothesis could not be rejected for higher levels, which is desirable for the validity of the model and ensures the

exclusion of the presence of a serial error correlation of the residuals. The initial null hypothesis when applying the Hansen test in the GMM model is that the instruments are valid, i.e. that the instruments are not correlated with the stochastic error of the model, which is confirmed by a p-value of more than 0.05. If the p-value of the Hansen test is less than 0.05, the null hypothesis that the instruments are valid is rejected and it is then necessary to limit the number of instruments. An extremely high p-value indicates that the model has certain problems (Roodman 2009).

Based on the results obtained, it was concluded that all variables included in the model are significant. The results show that the variables lagged value of income per capita, human capital and unemployment are significant at 1%, while the variables tourism, population movement and economic policy are significant at 5%. All the results obtained satisfy the initial assumptions about the influence of the independent variables on the dependent variable.

The coefficient for the variable lagged value of income per capita was positive and was 0.501. This means that if the income per capita in period $t-1$ (last year) increased by 10%, then the per capita income in period t (the observed year) will be 5.01% higher, provided that the values of the other variables remain unchanged. This result also demonstrates the dependence of economic growth on previous values, which can confirm the dynamic nature of economic phenomena.

The positive impact of human capital on the island's economic growth was confirmed, and the results show that a 10 % increase in human capital causes a 3.62% increase in per capita income on the islands. It is important to emphasize that in this analysis the indicator of the proportion of the highly educated population was used as an indicator of human capital, which was selected based on a review of previous studies and the indicators most commonly used in them to determine the level of development, as well as modern economic theories. Based on the results obtained, the auxiliary hypothesis **PH1** was confirmed: *"There is a positive relationship between human capital and the economic development of the island."*

When examining the effects of economic policy on the economic growth of the islands, it was found that if the share of aid increases by 10 percentage points at a significance level of 5%, per capita income also increases by 0.67%. The results confirm the auxiliary hypothesis PH4 that economic policy measures can influence the development of the islands. Furthermore, a comparison of the results obtained with the GMM model with the results of the static models FE and RE shows that economic policy's effects are only significant in the dynamic panel.

Although an extremely high share of aid in total budget revenues is not considered positive, it is important to emphasize that in this case aid also includes aid based on the transfer of EU funds, so the expected impact on per capita income was positive. The theory of endogenous growth emphasizes the role of public policy in stimulating long-term growth and development, especially in the areas of infrastructure development, human capital and knowledge (Karaman Aksentijević et al. 2019).

The coefficient for the "tourism" variable was 0.00159, so that at a significance level of 5%, an increase in overnight stays by 10 percentage points leads to an increase in income per capita by 0.0159%. Although the first part of the auxiliary hypothesis **PH3**: "*Tourism has a significant impact on the development of the island...*" was confirmed, a slightly more significant impact of tourism on the island's economic growth of the island was expected. This could also be a result of unregistered guest overnight stays and unreported income from island rentals. A possibly weaker result of the actual impact may also result from the choice of a less favorable indicator, therefore a second indicator (tourist arrivals) is used in the following model. However, overnight stays per bed are not only an indicator of the level of tourism activity on the island, but also a good indicator of the island's exports.

The control variables, unemployment and population movement, were statistically significant and have the expected sign. At a significance level of 1%, if unemployment increases by 10%, income per capita will decrease by 0.989%. If the island's population rises by 10 %, income per capita will decrease by 0.272 % at a significance level of 5 %. The last result does not indicate a negative impact of population growth on development, but is a consequence of the fact that the denominator of the dependent variable of income per capita contains the number of inhabitants.

Comparing the results obtained with the initial expectations of the model, which were defined by the results of previous studies, it can be concluded that the existing tendencies of the influence of the key economic factors on the development of islands in The Republic of Croatia are very similar to other islands worldwide and Europe.

Subsequently, a simple linear regression with the OLS estimator was used to examine the influence of transport connectivity, tourism and population movement on the island's economic growth. The main purpose of the model was to test the auxiliary hypothesis **PH2**: "*Transportation connectivity has an impact on the economic development of islands.*". The inclusion of the variable "population movement" is justified by its important role in the

dynamics of island economies, as migration trends have a direct impact on available human capital and the labor market. Tourism was included in the model as it plays an important role as a driver of economic activity on the islands. In this model, the impact of tourism was expressed in terms of tourist arrivals, which reflect the dynamics of tourist flows. As tourism, along with transport connectivity, is the most frequently cited determinant of island development, the results were also used to compare the importance of the impact of the variables mentioned. The model results indicate a positive impact of transport connectivity and tourism on the economic development of islands, whereby the intensity of the impact of transport connectivity is somewhat more pronounced. Therefore, transport accessibility directly impacts the number of tourists visiting the islands, which is why good transport connectivity is a prerequisite for tourism development. The variable "population movement" was not statistically significant.

Comparing the results of all the above models with the expected initial assumptions, it can be concluded that the existing trends in the influence of key economic factors on the development of islands in the Republic of Croatia are in line with the trends on other islands worldwide and in Europe.

Island development follows the assumptions of regional development theories that base their starting points on economic growth models. The research shows the importance of economic policy measures, human capital and geographical proximity (transport connections) for economic growth, which are key assumptions of endogenous growth theory. The Lucas model extends the endogenous growth models that emphasize the correlation between geographical proximity and the process of knowledge diffusion as essential variables for growth. Direct interactions between people require geographical proximity and good transportation connections. The findings confirm the assumptions of the endogenous growth theory and indirectly expand the theory of new economic geography, which deals with the question of how transaction costs and investment-induced returns shape economic spatial structures.

The applied models also show the influence of tourism on the economic growth of islands. The tourism variable in the first three models is expressed by the number of overnight stays per bed, as this is the most appropriate indicator of tourism product export that could be calculated and applied in the panel data analysis. The obtained results are consistent with the "tourism led-growth" hypothesis, which is derived from the export-led growth hypothesis and examines whether tourism stimulates economic expansion and vice versa. Although only the impact of tourism on economic growth were examined in this dissertation, it would certainly be

interesting for future research to investigate whether there is a two-way relationship, as the other analyses conducted in the doctoral dissertation partly indicate that there is a reciprocal relationship.

To determine whether more developed islands have a more complex economic structure, the HHI index and the Ogive index were calculated. The index results show that the conclusions are inconsistent with part of the initial auxiliary hypothesis **PH3**: "*...islands with a more complex economic structure are more developed*", which was derived from economic theories of diversification. Several scientists have come to similar conclusions in studies on other islands.

Analyzing the results in a broader context, it was possible to establish a correlation between their size and economic diversification on certain islands. On the northern Adriatic islands, especially on Lošinj, but also on Rab, this pattern is somewhat less pronounced, as their economic structure includes a large proportion of employees in the accommodation and food service industry and in the service sector. Together with Brač, Hvar and Krk, these are also the islands with the largest number of employees on the island, as they are home to large companies that are closely related to tourism. This significantly undermines the diversification of the islands' economic structure, even though they have a higher proportion of employees in other sectors compared to other islands. Based on the analysis conducted, the second part of the auxiliary hypothesis **PH3** was rejected, according to which the islands with a more complex economic structure are more developed. Although the conclusions from the previous analysis are inconsistent with the initial auxiliary hypothesis, which was defined in accordance with the economic theories of diversification, some authors have reached similar conclusions. Prasad (2003), for example, used time series data to analyze the economic structure of island states. The results of the analysis show that island countries pursuing strategies based on the service sector or the export of "light" products were more successful in achieving the set development goals, which led to an improvement in the welfare of their population. In contrast, the promotion of agriculture had a negative impact on the development and prosperity levels of island states. Islands and island states need international support and a specific structural change that deviates from traditional development directions (Bolesta 2020). These changes should focus on building resilience and must not follow the typical sequence of agriculture, industry and services, as traditional production is often not sustainable for small island states and regions.

Assessing the level of development achieved by islands is important for formulating targeted measures and policies. It represents the starting point for research into development problems.

It is then further deepened through a more detailed analysis and the consideration of specific thematic indicators, depending on the research interest. In the dissertation, the development level of 18 islands is calculated on the basis of 15 indicators, which are categorized according to the economic, social, suprastructural, infrastructural and environmental dimensions. The islands were ranked and then divided into groups according to the level of development achieved. Based on the results of the analysis, the following development groups were defined: Development Group A (Krk, Cres, Lošinj, Rab, Pag and Brač), Development Group B (Šolta, Korčula, Hvar and Murter), Development Group C (Mljet, Dugi otok, Vis, Vir and Čiovo) and Development Group D (Pašman, Lastovo, Ugljan). The ranking determined that the islands of Šolta and Mljet should belong to the lower groups despite their higher level of development. The island of Šolta should not belong to the group of the most developed islands due to the extremely high aging index and the apparent picture of a diversified economic structure resulting from the low number of people employed on the islands. The island of Mljet does not have adequate pre-school education and care institutions, and social and health care facilities need renovation and investment. Mljet does not have an established sustainable waste management system, and there are several illegal landfills on the island, which is a particular problem as a large part of the island is also a national park. Due to the lower rating of the mentioned segments, Šolta and Mljet were therefore transferred to other groups to be able to form more precise and applicable development guidelines in the further course of the analysis. The defined island development groups were used for the analysis of development opportunities and the creation of development guidelines. By extending the results from the determination of the level of development with the results of the analysis of development opportunities, it is possible to obtain a complete picture of how economic policy makers should act and influence the development and development opportunities of the Croatian islands. The development assessment indicates in which area of development (economic, social, infrastructural and superstructural or environmental) a particular island group is better or worse off than others. However, its application alone does not allow a complete assessment of the area in which the islands need to make the greatest progress. By taking into account some additional indicators, of which those related to the impact of economic policies dominate, it is possible to obtain a more comprehensive picture of the area in which the islands should achieve the best results and the area in which action needs to be intensified. Accordingly, this doctoral dissertation identifies development dimensions that represent development scenarios and offers appropriate criteria, aligned with development priority-based criteria which can be used to determine the islands' development opportunities. The development dimensions were modified from the National

Island Development Plan 2021-2027. and previous scientific research in this area and adapted to the needs of the dissertation. The defined dimensions of development are: Dimension 1: "Improving the quality of life on the islands", Dimension 2: "Developing the island economy", Dimension 3: "Improving island ecological sustainability and resource optimization" and Dimension 4: "Improving transport connectivity and mobility of the islands".

As part of the dissertation, a qualitative study was conducted with the aim of gaining a better insight into the issues of development of the Croatian island territory, determining development criteria and development priorities and defining the importance of individual priorities for scenarios i.e. development dimensions that serve to determine the development opportunities of islands. The research was conducted by means of a questionnaire among experts. The questionnaire was answered by members of the academic community, representatives of local self-government units of islands, coastal areas, line ministries, directors of port authorities and representatives of island associations, public and private companies that are directly or indirectly involved in shaping island development policies. The results of the open-ended questions show that the experts believe that improving the quality of life of islanders should be a priority in island development approaches and that this can be achieved primarily through better housing conditions for islanders, improved infrastructure and the availability of social and health services. It emphasizes the need for an integrated approach that enables the sustainable development of island communities by improving living conditions, strengthening social cohesion, and ensuring equal access to basic services despite geographical constraints. The evaluation of the development criteria and their importance for the individual dimensions of island development served to determine the weighting values in the examination of the development scenarios. The multi-criteria analysis was used to examine each of the defined scenarios, i.e. the development dimensions for the previously defined development groups.

The results show that development groups A and B achieve positive trends in all dimensions. The best results in all proposed dimensions are achieved by group A, the worst by development group D, which shows a negative trend in all dimensions. It is interesting to note that Development Group C achieved better results than Development Group B in the dimensions "Improving island ecological sustainability and resource optimization" and "Improving transport connectivity and mobility of the islands", even though it included lower-rated islands in the development assessment. Based on a comparison of the ranking of island groups B and C with the results of the last empirical part, it can be concluded that the better ranking of group B in the development assessment is due to a stronger economy. This may also be related to the

fact that the islands in group B are generally larger in terms of area, which consequently offers them more space and creates the prerequisites for economies of scale in primary and secondary activities, but also for greater tourism capacity, which naturally gives them an advantage over group C. When determining the level of development, the individual islands in group B show a better development of infrastructure and a higher level of superstructural equipment, which provides them better prerequisites for development in all dimensions.

Despite positive trends in all development dimensions, development group A achieves the worst results in dimension 2 "Developing the island economy" and then in dimension 4 "Improving of island transport connections and mobility". The long-term sustainability of the island economy cannot be guaranteed if one relies exclusively on tourism, which is extremely seasonal and causes considerable environmental pollution. Nevertheless, the islands in development group A are characterized by a high level of specialization in tourism, although the level and form of this specialization varies from island to island. Future guidelines and measures for the development of this group of islands must include incentives to maintain the activities for which the islands are traditionally known. It is particularly important to inform the younger population and encourage them to become entrepreneurs in these areas. To ensure a sustainable transportation system, road and port infrastructure needs to be improved and the development of multimodal transport promoted, which would improve the islands' connectivity and reduce seasonal traffic congestion. Given the lower road density compared to other development groups, it is necessary to expand and modernize the transport network to ensure better accessibility and functionality of island transport.

Development group B showed the weakest performance in development dimension 1 "Improving the quality of life on islands". Despite the positive results in this dimension, the leading priority of development on these islands should be to improve the quality of life on the islands. The condition of the islands in this development group requires higher allocations for health, social, and educational services and for improving existing municipal infrastructure. Considering the high proportion of the elderly population, it is important to promote the construction of retirement and nursing homes on the islands, as there is no home on the island of Šolta, for example, which has a very elderly population.

Development group C only showed a negative trend in dimension 2 "Developing the island economy". This is a consequence of the islands' strong dependence on tourism activities, which are characterized by seasonality. An urgent need for the development of the islands in group D in all dimensions was also identified, as the islands are accompanied by numerous negative

trends. The development of this group should take into account the ecological aspects, which are currently the biggest challenge for them.

It can be concluded that the development potentials are not equally distributed across the islands, resulting in regional disparities and uneven development, with certain island centers showing somewhat more dynamic development and greater functional connectivity with the environment, while the peripheral parts are mostly stagnating or lagging behind in their development. Sustainable development of Croatian islands will not be achievable without adaptation to global economic and environmental trends, which is why it is necessary to develop new and more innovative mechanisms for resource management, reduce dependence on the tourism sector, which is characterized by fluctuations, and encourage the development of new forms of economic activities based on knowledge and technology.

Based on the overall analysis conducted in the doctoral dissertation, the scientific hypothesis was confirmed: *“By applying appropriate scientific methods, it is possible to identify the key development factors and the intensity of their influence on the development of the island, which represents a significant basis for the formation of appropriate development policies.”*

The key contribution of this dissertation is the creation of a comprehensive methodological framework for analyzing the development of island economies, which takes into account the results from the application of theoretical growth models at the level of the entire archipelago in order to identify general development trends, assess island development according to economic, social, infrastructural, suprastructural and environmental indicators, and determine development opportunities according to defined scenarios derived from the development dimensions. In addition, expert opinions on the importance of individual development priorities and their significance for the defined development dimensions are also integrated. The application of such an approach enables a holistic approach to the strategic management of the development of island regions.

In theoretical terms, the contribution of this dissertation is visible in the field of development theory research by measuring the impact of key economic factors on the development of islands as areas with specific development problems. The contribution can also be seen in the determination of the development groups of islands, the definition of the criteria for determining the development opportunities of islands and the determination of their significance in relation to various dimensions of island development.

In applied terms, the contribution can be seen in the categorization of islands taking into account key groups of island development indicators and in the creation of possible development guidelines for island areas.

The research findings will be of use to all researchers dealing with the issues of regional and island development and to public policy makers.

The main limitations of this doctoral dissertation arise from the lack of statistical databases in which data on islands could be found as complete spatial units; the data are mainly collected at the level of cities and municipalities. Therefore, the data had to be aggregated and recalculated to obtain certain relevant indicators. Moreover, the data were collected from different sources and some of these sources show different values for some parameters for the same observation years. Therefore, they can be said to be quite indicative, as it is obvious that each source collects and summarizes the data in a different way, which can lead to potential errors in certain values. However, for the purposes of this dissertation, they were sufficient to draw the main conclusions about the trends and impacts of key factors on island development possibilities.

The next limitation of the research arises from the fact that the conclusions and development guidelines are proposed on the basis of a sample of 18 islands, while according to the 2021 census, there are a total of 52 inhabited islands in the Republic of Croatia. This also results from the previously mentioned limitation of data availability. The sample includes 47 island local government units, and due to the impossibility of extracting data related only to islands, coastal-island local government units were excluded from the analysis. Although more than 94% of the island population lives in island local government units, the dissertation remains partially limited for islands not included in the analysis.

Future research could be based on the application of the proposed methodological framework to a sample of other European and world islands. An extension in the form of including additional variables not considered in this dissertation in the panel data analysis is also possible.

One of the proposals for future research is to investigate the impact of tourism on the development of the islands by implementing more variables or constructing a variable that will represent the complexity of the tourist offer in order to determine the impact of the presence of greater tourist capacity and the diversity of the tourist accommodation offer on the islands. Considering that the "tourism-led growth" hypothesis emphasizes a bi-causality between tourism and economic growth, the proposal for future research also includes investigating the impact of economic growth on tourism development.

The scope for further research is also evident in the development of the suprastructural assessment by including quantitative indicators rather than qualitative ones in the analysis. Considering the complexity and scope of this research, a qualitative indicator was used in the dissertation for practical reasons, but by developing the suprastructure and analyzing it in detail, it is possible to obtain several valuable conclusions that would be of great importance for the formulation of future development guidelines.

Based on the findings from this dissertation and the results obtained especially in the last part of the empirical research, it is possible to prepare a series of professional studies analyzing various development problems of individual islands and proposing appropriate solutions.

Keywords: economic development, Croatian islands, development factors, development policy measures, island development priorities

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SAŽETAK

Svjetski i hrvatski znanstvenici, koji se bave istraživanjem otočnog razvoja navode kako izučavanje otoka kao područja s razvojnim posebnostima, zahtijeva specifičnu i prilagođenu metodologiju proučavanja, istraživanja i planiranja. Osnovni cilj ove doktorske disertacije je identificirati i odrediti utjecaj ključnih ekonomskih čimbenika na razvoj i razvojne mogućnosti otoka te predložiti smjernice njihovog budućeg razvoja polazeći od teorijske razrade razvojne problematike otočnog područja te provedenog empirijskog istraživanja. Analizom teorija ekonomskog razvoja te dosadašnjih znanstvenih istraživanja otoka, utvrđeno je da su ekonomski čimbenici koji utječu na njihov razvoj vrlo slični onima koji se identificiraju u analizama regionalnog razvoja, pri čemu se nešto veći naglasak stavlja na turizam.

Provedbom panel analize podataka na uzorku od 18 hrvatskih otoka, utvrđen je pozitivan utjecaj turizma, ljudskog kapitala i mjera ekonomske politike na gospodarski rast kao jednu od komponenti razvoja. Uz spomenute varijable, u model su uvrštene i dvije kontrolne varijable za koje je utvrđeno da su povezane s gospodarskim rastom (nezaposlenost i kretanje stanovništva) kako bi rezultati bili što vjerodostojniji.

Potom je istražen utjecaj prometne povezanosti, turizma i kretanja stanovnika na ekonomski rast. S obzirom na minimalne promjene u kretanju pokazatelja prometne povezanosti tijekom godina, u analizi je korišten vremenski presjek i jednostavna linearna regresija sa OLS procjeniteljem.

Analizom gospodarske strukture otoka te izračunom Herfindahl-Hirschmann indeksa i indeksa ogive, u disertaciji se utvrdila uloga pojedinih sektora u otočnim gospodarstvima. Istraženo je na koji način sektori doprinose i ograničavaju ekonomski razvoj te imaju li razvijeniji otoci složeniju gospodarsku strukturu. Također, analizirano je kako sektori i pojedine gospodarske djelatnosti mogu oblikovati ekonomske izazove i razvojne prilike otoka, nudeći pritom dublje razumijevanje dinamike njihovog razvoja.

Rezultati pokazuju da su postojeći trendovi utjecaja ključnih ekonomskih čimbenika na razvoj otoka u Republici Hrvatskoj u skladu s trendovima na drugim svjetskim i europskim otocima.

Nakon dijela istraživanja u kojem se nastojalo doći do općih spoznaja o utjecaju ključnih ekonomskih čimbenika na razvoj otoka, otoci su rangirani na osnovu 15 pokazatelja primjenom višekriterijske analize. Dobiveni kompozitni indeksi poslužili su kao podloga za grupiranje otoka u 4 razvojne skupine s obzirom na dostignutu razinu razvijenosti.

U posljednjem dijelu empirijskog istraživanja provedeno je anketno ispitivanje eksperata s ciljem evaluacije važnosti pojedinih kriterija unutar definiranih razvojnih dimenzija otoka. Rezultati anketnog upitnika omogućili su određivanje relativne važnosti pojedinih kriterija za svaki od razmatranih razvojnih scenarija. Slijedom toga, provedena je analiza razvojnih potreba otoka. Primjenom višekriterijske analize procijenjene su razvojne mogućnosti otočnih razvojnih skupina te je time osigurana znanstveno utemeljena osnova za oblikovanje strateških razvojnih smjernica i ciljanih politika.

Na temelju teorijskih spoznaja i dobivenih rezultata, formulirane su smjernice za razvoj otoka koje mogu doprinijeti ubrzanom i uravnoteženom gospodarskom i društvenom napretku, uz istovremeno očuvanje ekološke ravnoteže.

Ključne riječi: Ekonomski razvoj, hrvatski otoci, čimbenici razvoja, mjere razvojne politike, prioriteti otočnog razvoja



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Zavodski projekt
Zavod za logistiku i menadžment u pomorstvu i prometu, Pomorski fakultet u Rijeci, Sveučilište u Rijeci

[11/2020] **Evaluacija strategije upravljanja kadrovima 2021. - 2023. Jadrolinije i prijedlog mjera za njezino unaprjeđenje**

stručni projekt

[11/2020] **"Analiza početnih koncesijskih naknada (stalni i promjenjivi dio) luka posebne namjene"**

određivanje visine početno propisanih stalnih dijelova koncesijskih naknada za luke

[10/2020 – 11/2020] **"Izrada priručnika i predložka studije gosodarske opravdanosti za koncesiju na pomorskom dobru"**

Izrada grafičkih prikaza vezanih uz dinamičku ocjenu efikasnosti projekata i razrada priručnika

[2017 – 2018] **Projekt "Hrana i zajednica"**

Europski projekt Udruge CeKaDe i Ekonomskog fakulteta Sveučilišta u Rijeci

[2012 – 2014] **Comenius "WATER: LIFE, THREAT, INSPIRATION"**

KONFERENCIJE I SEMINARI

[2024] **My First Conference 2024**

- članica organizacijskog odbora

[2022 – 2024] **International Conference on Sustainable Transport – SUTRA**

- članica znanstvenog odbora konferencije „International Conference on Sustainable Transport -SUTRA 2024"
- članica organizacijskog tima konferencije „International Conference on Sustainable Transport – SUTRA 2022"
- autor na 2 sažetka

[2023 – 2023] **16th Baška GNSS Conference – Global Navigation Satellite Systems and Green Navigation and Smart Systems 2023**

- članica organizacijskog odbora

[2018] **"How to master like a pro"**

- panelist na konferenciji

[2018] **Ekonomska politika Hrvatske 2019.**

- predstavnik studenata Ekonomskog fakulteta/ panelist na konferenciji

[2016 – 2018] **Focus On konferencija**

- sudjelovanje u organizaciji konferencije u 2017., 2018. i 2019. godini

[2015 – 2018] **Inspire me konferencija**

- sudjelovanje na konferenciji 2016. godine
- od 2017. godine sudjelovanje u organizaciji Inspire me koferencije u Rijeci, Zagrebu i Puli

[2015 – 2017] **Career Booster**

- sudjelovanje na konferenciji 2016.
- sudjelovanje u organizaciji 2017. i 2018. godine

Ostalo

Sudjelovanje u brojnim aktivnostima u organizaciji Centra za karijere i Ekonomskog fakulteta Sveučilišta u Rijeci (Predstavljanje poduzeća KPMG 2018., Predstavljanje poduzeća JANAF 2018., Bina Istra 2018., "Priprema, pozor, revizor" pwc radionica 2017. ...)

MREŽE I ČLANSTVA

Članstva

- Članica Povjerenstva za znanost i doktorate Ekonomskog fakulteta u Rijeci od 2024. godine
- Članica Odbora za kvalitetu Pomorskog fakulteta u Rijeci od 2024. godine
- Članica Studentskog zbora Ekonomskog fakulteta u Rijeci u akademskoj godini 2019./ 2020.
- Predstavnica studenata u Fakultetskom vijeću u akademskoj godini 2019./2020.
- Predstavnica studenata u Povjerenstvu za nastavu u akademskoj godini 2019./2020.
- Predstavnica studenata u Odboru za razvoj cjeloživotnog učenja u akademskoj godini 2019./2020.
- Predsjednica Studentskog zbora Ekonomskog fakulteta u Rijeci u akademskoj godini 2018./ 2019.
- Predstavnica studenata u Fakultetskom vijeću u akademskoj godini 2018./2019.
- Predstavnica studenata u Etičkom povjerenstvu u akademskoj godini 2018./2019.
- Predstavnica studenata u Stegovnom povjerenstvu u akademskoj godini 2018./2019.
- Članica Povjerenstva za žalbe na evaluaciju projekata na Sveučilištu u Rijeci izabrana od strane Studentskog zbora Sveučilišta 2017./2018.
- Članica Povjerenstva za evaluaciju projekata na Sveučilištu u Rijeci izabrana od strane Studentskog zbora Ekonomskog fakulteta 2017./2018.
- Članica International Advisory Board for study program International Business do 2023. godine
- Članica Studentskog lider kluba SKL- klub najboljih studenta Hrvatske (2018. - 2020.)
- Članica "Start – up" udruge (2017. - 2020.)

OSTALE VJEŠTINE

Digitalne vještine

- Korištenje paketa Microsoft Office
- Korištenje Windows i MacOS operativnih sustava
- Osnove poznavanja programa Statistica, STATA i Visual PROMETHEE Academic
- Korištenje aplikacije F4B u području nabave
- Korištenje programa Canva, FreeCam i Lumen5

VOZAČKA DOZVOLA

Automobili: B

VOLONTIRANJE

- [2021 – 2023] **Moje mjesto pod suncem - CeKaDe**
- [2016 – 2018] **Start- up udruga**
- [2017 – 2018] **EFRI buddy**