EMPIRICAL IDENTIFICATION OF THE TOURISM SECTOR: A COMPARATIVE BUSINESS ANALYTICS APPROACH FOR NORTH MACEDONIA AND ALBANIA

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Abstract

The Republic of North Macedonia and the Republic of Albania, as two neighbouring developing countries with similar geographical features and shared ambitions for sustained European integration, present a compelling case for comparative tourism analytical research. This paper conducts an in-depth analysis of the development features of tourism sectors in both countries, focusing on the influence of economic indicators and institutional quality on the number of international tourist arrivals over the period 2000–2021. Utilising the three fundamental phases of business analytics—descriptive, diagnostic, and predictive—the research employs data mining and visualisation techniques applying tools such as Microsoft Excel and Power BI. A combination of simple and multiple linear regression models was used to identify statistically significant variables influencing tourism growth.

Results indicate that, in the case of Albania, the strongest predictive model includes CO_2 emissions, population growth, and renewable energy consumption, collectively explaining 90% of the variance in tourist numbers. On the other hand, the most effective model for North Macedonia includes GDP per capita, forest area, and renewable energy, accounting for 67% of variability. These empirical findings suggest that Albania's more consistent and strategic institutional planning has positively influenced tourism development, while fragmented or inconsistent policy implementation in North Macedonia might have limited its growth potential. The study concludes that institutional effectiveness, infrastructure development, and availability of high-quality and continuous data are crucial prerequisites for building sustainable and resilient tourism sectors in both countries. This research contributes to the growing body of regional tourism literature and offers practical recommendations for policymakers.

Key words: tourism, developmental policy, business analytics, regression analysis, economic indicators

JEL Classification: L83, O11, Q56, R11, C38

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1. Introduction

Tourism accounts for around 10% of global GDP and remains among the fastest-growing industries worldwide (UNWTO, 2022). Beyond its economic contribution, tourism stimulates infrastructure, fosters cultural exchange, and strengthens international visibility. These multidimensional effects make tourism particularly relevant for developing and transition economies, where this sector often serves as a mechanism for diversification and sustainable regional growth (Eugenio-Martin, Morales & Scarpa, 2004; Seetanah, 2011).

This analytical study focuses on two Western Balkan economies, namely North Macedonia and Albania, which share similar geographic and socio-economic characteristics but have followed markedly different tourism trajectories. Both countries possess diverse natural and cultural assets, from mountain landscapes and lakes to UNESCO-protected heritage sites and vibrant local and regional traditions. However, while they share comparable starting conditions and principal European integration aspirations, their policy design, institutional quality, and investment continuity differ substantially. These contrasts provide a compelling framework for analysing how structural and institutional determinants influence tourism current and future development.

North Macedonia's tourism has evolved gradually and inconsistently, reflecting sporadic policy coordination and limited institutional continuity. In contrast, Albania's tourism sector expanded at a faster pace and more consistently, supported by targeted investments and clearer strategic and policy positioning. Such structural divergence leads to critical analyses with an empirical assessment of how institutional quality and economic fundamentals jointly shape tourism performance in Western Balkans.

The study conducts a comparative, data-driven analysis of tourism dynamics in North Macedonia and Albania over the period 2000–2021. It practically operationalises the three analytical phases of business analytics, i.e. descriptive, diagnostic, and predictive, to examine the determinants of international tourist inflows. Using regression models and visualisation tools, such as Excel and Power BI, this analysis quantifies the relationships between tourism performance and key economic, environmental, and demographic variables, including GDP per capita, CO_2 emissions, renewable energy use, forest area, urban population, and net migration. This mixed empirical approach provides a transparent framework for linking institutional quality to measurable tourism outcomes.

The contribution of this study lies in its empirical and validated examination of tourism potential through comparative institutional and econometric lenses. In doing so, the paper bridges the gap between qualitative assessments and quantitative evidence, offering insights that are not only academically relevant but also practically

applicable for policymakers and tourism strategists in both countries, the goal being to enable an integrated developmental approach.

The construction of our paper is organised as follows. Section 2 reviews the main strands of literature on tourism and economic development. Section 3 describes the methodological framework and data sources. Section 4 reports and interprets empirical results, while Section 5 concludes with policy implications, study limitations, and prospectives for future research.

2. Literature Review

Tourism has been widely acknowledged in both global and regional academic literature as a dynamic driver of economic growth, particularly in cases of developing and transition economies. According to the UNWTO (2022), the sector contributes approximately 10% of global GDP and plays a pivotal role in achieving the Sustainable Development Goals 2030 by generating employment, investment, and cross-sectoral linkage. Empirical studies confirm its multidimensional impact: Ivanov and Webster (2013) demonstrate that tourism significantly contributes to long-term growth through multiplier effects on income and employment, while Seetanah (2011) highlights tourism's influence on productivity and infrastructure, especially in smaller or developing economies. More recent empirical evidence validates this causal relationship, indicating that tourism development positively affects economic expansion and trade dynamics in emerging markets (Dogru, Isik & Sirakaya-Turk, 2019). Consequently, tourism is not merely an economic activity but a multifaceted engine of regional transformation and institutional modernisation, capable of addressing structural imbalance and promoting international integration (Ardeleanu, 2021).

Based on these global findings, several regional studies in Western Balkans and the broader Southeast European context provide additional insights into the developmental role of tourism. In this context, Petrevska (2012) highlights that tourism offers one of the rare sectors in which transition economies can achieve tangible progress with relatively modest investment, provided there is effective institutional support and a coherent policy design. Nestoroska (2012) stresses that tourism can be an essential factor in achieving balanced regional development, but only when accompanied by long-term planning and capacity building. Likewise, Marku (2013) underscores the strategic role of tourism in enhancing national competitiveness, especially in small and developing economies.

In the case of North Macedonia, relevant academic literature consistently points to the country's underutilised tourism potential and the institutional barriers that limit its realisation. In this context, more recent analyses by Risteski and Nestoroska (2024) indicate that the post-transition period has been characterised by fragmented tourism policies and inconsistent institutional coordination, which have constrained the sector's competitiveness.

Furthermore, Naumov and Petrevska (2019) argue that sustainable tourism in North Macedonia remains largely underdeveloped due to weak destination management and limited stakeholder engagement, highlighting the need for stronger governance and policy consistency. Complementary findings by Stamenkovska, Angeloska-Dichovska and Ilieva (2022) emphasise that the lack of institutional stability and insufficient coordination between national and local authorities continue to hinder strategic tourism planning and investment realisation.

In contrast, Albania has experienced more rapid and structured growth in its tourism sector. The findings of Seetanah (2011) demonstrate that foreign direct investment plays a crucial dual role in enhancing infrastructure and institutional trust in tourism-driven economies. According to Marku (2013), Albania's tourism development has been facilitated not only by natural endowment features but also by more coherent investment policies and targeted reforms aimed at positioning the country among competitive Mediterranean destinations. Therefore, the country's coastal, mountainous, cultural, and historical assets have been successfully leveraged to attract a steady flow of international visitors, particularly from Southern Europe (Ceca, Ladias & Polo, 2016).

Several empirical studies provide robust evidence for a positive and long-term association between tourism activity and economic growth in the European context. Brida, Lanzilotta and Risso (2015) show that increased tourism demand significantly contributes to GDP per capita growth across European countries, even after accounting for structural economic variables, such as capital formation and labour supply. Similarly, Cortés-Jiménez and Pulina (2010) confirm that tourism-led growth is particularly pronounced in Mediterranean and Southern European destinations, where tourism specialisation has become a structural component of economic expansion. These findings reinforce the argument that tourism does not merely generate short-term injection effects but can serve as a strategic driver of sustained economic growth when supported by favourable institutional and macroeconomic conditions.

More recent empirical evidence validates this causal relationship, indicating that tourism development positively affects economic expansion and trade dynamics in emerging markets. For instance, recent studies of tourism vulnerability demonstrate that aggregate and single-dimension indicators fail to capture structural characteristics, such as informality, seasonality and domestic demand substitution; these factors are particularly relevant for small economies with limited statistical capacity, including North Macedonia and Albania (Duro, Perez-Luis & Teixeira, 2021). Moreover, cross-country comparisons often neglect institutional and governance variables that substantially mediate tourism outcomes, resulting in relative or overall optimistic conclusions.

Principally, although Marku (2013) presents Albania's tourism strategy as a success story, this analysis overlooks external influences, such as regional instability and

global economic shocks, which weaken the robustness of its generalisations. Furthermore, the works of Risteski and Nestoroska (2024) and Petrevska (2012), while offering valuable contextual insights, remain predominantly descriptive and rely less on empirical modelling, limiting their suitability for comparative institutional evaluation. These gaps underscore the need for a data-driven, econometrically grounded framework—an objective that the present study analytically and methodologically seeks to achieve.

Despite growing academic interest in tourism in the Western Balkans, most of the existing research treats each country in isolation, lacking comparative or cross-border perspectives. This study addresses that gap by conducting a structured comparison between North Macedonia and Albania, using business analytics and regression modelling to explore the impact of institutional, economic, and environmental variables on tourism growth. Informed by the literature reviewed and motivated by the gaps identified in comparative analysis, the following hypotheses are proposed:

- H1: Institutional sector quality—including solid governance mechanisms, an efficient degree of policy implementation, and integration within the regulatory environment—has a statistically significant effect on tourism sector performance and future perspectives in both North Macedonia and Albania.
- H2: Structural differences in infrastructure development, predictable environmental processes, and investment-driven development strategies contribute to variations in tourist preferences, behaviour, and overall visitation patterns across the two countries.

The interrelation between the two hypotheses lies in the conceptual premise that institutional quality operates both as a direct determinant of tourism sector outcomes and as an enabling, indirect framework that governs the effectiveness of structural variables, such as infrastructure development, environmental management, and investment strategies, which collectively mediate international tourism flows.

3. Methodology Approach

When composing this article, we chose to collect secondary data from May to July 2024. Data sources included global datasets from the World Bank, The World Data and the UN, as well as governmental portals in Albania and North Macedonia (State Statistical Office of the Republic of North Macedonia, n.d.; Statistical Office of the Republic of Albania, n.d.).

Data in this research refer to the consecutive years from 2000 to 2021. The selection of the 2000–2021 period is based on the availability of consistent, complete, and comparable data for both countries. More recent years contain partially revised or incomplete statistical series, particularly for tourism and environmental indicators, which could introduce instability and reduce model reliability. Therefore, 2021 rep-

resents the last year suitable for robust and methodologically consistent econometric comparison, according to national and international publicly available data.

Although there are data from earlier years, from the 90s to be precise, that period was still quite dynamic and turbulent for this region of the world and, therefore, data associations may not have consistent logical explanation or solid meaning. It is important to note that a certain number of factors that could have an impact on the number of tourists in these countries do not enjoy adequate continuous measurements and there is not a required amount of data available. In the future, it would be recommendable for these countries, and especially their institutions, to pay more attention to a statistical collection of data that would be useful for this type of analytical research.

Key variables used in the analysis include the dependent variable, i.e., the annual number of international tourist arrivals, and a set of independent variables comprising GDP per capita, CO_2 emissions per capita, renewable energy use (as a percentage of total energy consumption), forest area (as a percentage of total land), urban population (percentage), population growth (percentage), road infrastructure, net migration, inflation rate, intentional homicides, birth rate, and death rate.

Initial data exploration was performed using Microsoft Excel and Power BI, facilitating time-series visualisation, pattern recognition, and basic correlation analysis. Trends for each independent variable were graphed and interpreted, emphasising general movements and structural changes over the 21-year period. This phase also included: Checking for missing data and applying imputation methods where necessary; Identifying and treating outliers; Detecting structural breaks (e.g., the impact of COVID-19 starting in 2020); Applying logarithmic transformations to stabilise variance when appropriate.

In the following section, we examine key trends of independent variables used in the regression models through a series of comparative graphs for North Macedonia and Albania. These visualisations help identify *structural shifts, correlations, and long-term tendencies concerning the data.* For each of the countries, i.e., North Macedonia and Albania, 8 Graphs are elaborated on within the overall national graph and discussed in detail.
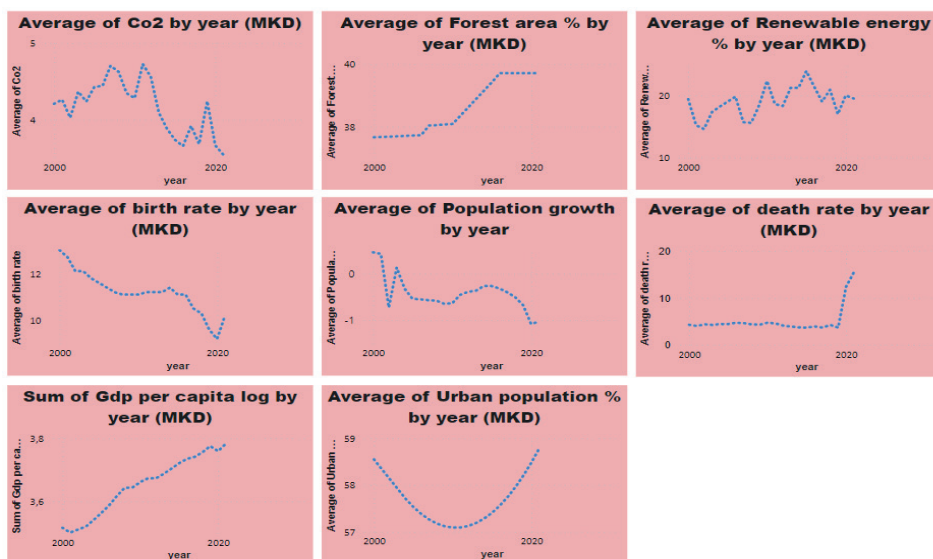
Graph 1 – North Macedonia

Graph 1a (CO_2 emissions) begins with moderate growth, followed by a drop between 2000 and 2003. The upward trend resumes until 2007, after which there is another decline up to 2010. A sharp increase in 2011 is followed by a downward trajectory (2011–2016), and a renewed rise until 2020, interrupted by a dip in 2018. These shifts reflect structural changes in energy use and industrial output, which may indirectly influence environmental perceptions relevant to eco-tourism.

Graph 1b (forest area %) shows stagnation until 2007, followed by gradual increase periods until 2010 and a sharper rise to 2016. The trend is stabilised after this period. This increase reflects afforestation or land reclassification policies, which may positively affect the country's eco-tourism image and landscape preservation efforts.

Graph 1c (renewable energy %) exhibits high variability with no clear long-term direction. This inconsistency suggests institutional uncertainty or fragmented energy strategies, which could affect perceptions of sustainability—a growing concern among modern tourists.

Graphs 1d and 1e both show persistent downward trends, indicating possible demographic or infrastructural constraints. Minor increases do not alter the overall negative direction, suggesting declining attractiveness in some structural indicators

Graph 1. Comparative analysis of The Republic of North Macedonia indicators
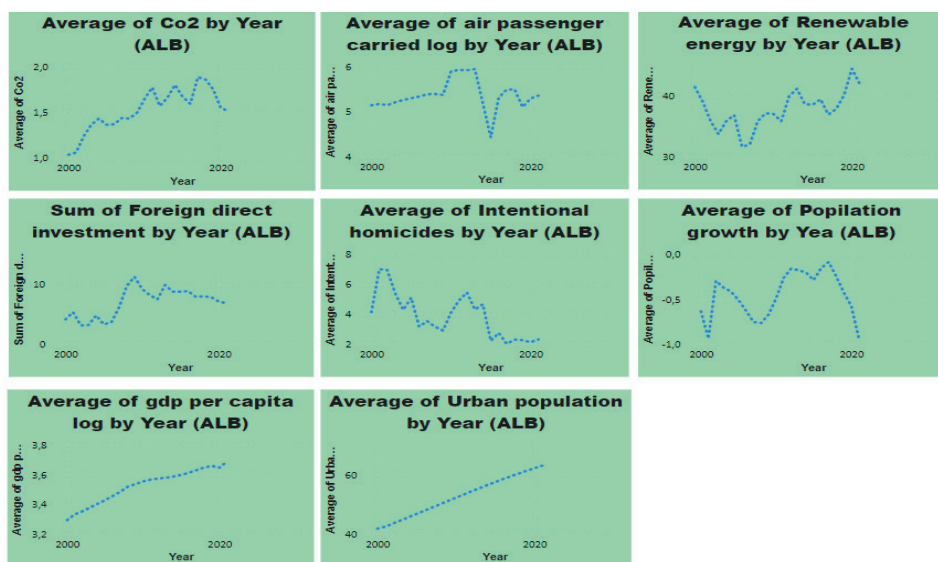Source: Authors' analysis (2000 – 2021)

Graph 1f (death rate) remains largely stable over the two decades, except for a pronounced spike in 2020 due to the COVID-19 pandemic. This disruption aligns with global trends, and it had a short-term negative impact on tourism flows.

Graph 1g (GDP per capita) displays a steady and continuous upward trend, signalling long-term economic improvement. This is a key macroeconomic driver of tourism, associated with increased investment capacity and better infrastructure.

Graph 1h presents a continuous upward trend from 2000 to 2020, suggesting steady progress in respective indicators (e.g., urban population or digital infrastructure). This sustained growth reflects long-term structural improvements that enhance North Macedonia's capacity to support tourism, such as better accessibility, connectivity, or living standards. The absence of major declines implies stable policy implementation and resilience against external shocks.

Graph 2 – Albania

Graph 2a, illustrating average annual CO_2 emissions in Albania, demonstrates a significant increase from 2000 to 2004—likely driven by post-transition industrial activity and rising energy demands. The dip in 2005 may reflect temporary policy adjustments or data irregularities. Over the next decade and a half, emissions continued to rise, albeit intermittently interrupted by short-term declines in 2012, 2015, and from 2017 to 2020. Overall, the trend suggests that Albania's economic expansion during this period was accompanied by increased environmental pressures.

Graph 2. Comparative analysis of Albanian indicators
Source: Authors' analysis (2000 – 2021)

Graph 2b (logarithmic air passenger numbers) highlights a strong upward trajectory until 2010/2011, reflecting increased connectivity and Albania's growing attractiveness as a tourist destination. The subsequent decline could be associated with

temporary infrastructural or regional constraints, while the sharp post-2015 recovery aligns with targeted promotional campaigns and airport expansion projects. This trend is particularly significant as air travel is a key facilitator of international tourism growth.

Graph 2c focused on renewable energy consumption and reveals an overall increasing tendency despite several fluctuations. This reflects Albania's hydroelectric potential and gradual efforts to diversify its energy portfolio. The sustained growth of this variable is crucial, not only for environmental sustainability but also as an indirect signal of institutional modernisation—particularly relevant for eco-conscious tourist segments.

Graph 2d (foreign direct investment) shows modest levels in the early 2000s, followed by a surge in mid-decade. This surge aligns with liberalisation reforms and infrastructure projects—critical enablers of tourism sector growth. The moderate decline in recent years may indicate investors' caution or market saturation, but earlier gains likely laid the groundwork for improved hospitality capacity and service quality.

Graph 2e reflects inconsistent movement/changes of the respective variable, with notable drops around 2009 and 2015. These years correspond to wider regional financial instability and political uncertainty, both of which are known to influence travel decisions. The low levels sustained between 2015 and 2020 underscore structural weaknesses that require policy attention.

Graph 2f shows a sharp decline in 2002 followed by immediate recovery. The period between 2002 and 2009 is characterised by volatility, likely influenced by institutional transitions. The steady growth trend observed from 2010 to 2020, despite minor interruptions, signals increasing stability and gradual socio-economic improvement—factors that often correlate positively with tourism growth.

Graphs 2g and 2h representing GDP per capita (log-transformed) and urban population, display continuous upward trends. The steady rise in GDP per capita confirms Albania's sustained economic growth, while urbanisation indicates improving infrastructure and service availability in city centres—both core determinants of tourism competitiveness. These two variables, jointly, are among the strongest predictors of tourist inflows in the regression analysis, confirming their central role in destination appeal and accessibility.

4. Methodology

To investigate the determinants of international tourist arrivals in the Republic of North Macedonia and the Republic of Albania, this study adopts a quantitative approach utilising regression analysis based on secondary data. The methodological framework consists of two sequential stages: simple linear regression and multiple

linear regression, conducted using Microsoft Excel's Data Analysis Toolpak. The simple model captures the bivariate relationships between tourism performance and individual explanatory variables, while the multiple regression model controls for the joint effects of economic, environmental, and demographic factors, allowing for a more robust identification of underlying drivers.

In the first stage, a series of simple linear regressions were performed to identify which independent variables may individually influence the number of international tourist arrivals. Each potentially explanatory variable—such as GDP per capita, CO_2 emissions, renewable energy use, urban population, and others—is regressed independently against the dependent variable. The primary statistical measure used for variable evaluation is the coefficient of determination (R^2), which reflects the proportion of variance in the dependent variable explained by each independent variable. The estimation technique employed is the Ordinary Least Squares (OLS) method, which minimises the sum of squared residuals to produce unbiased and efficient estimates. The basic form of the simple linear regression is expressed as follows:

$$Y = \beta 0 + \beta 1 X + \varepsilon$$

where Y is the dependent variable, i.e., the number of international tourist arrivals in our case, X is the independent variable, while $\beta 0$ and $\beta 1$ are intercept and slope parameters to be estimated and ε denotes the residual variability within the model.

All regression models were estimated using the Ordinary Least Squares (OLS) method, which represents the most widely applied estimation technique in empirical economics. OLS identifies the best-fitting linear relationship by minimising the sum of squared residuals. Prior to interpreting the results, standard diagnostic checks were performed, confirming that most models satisfy key OLS assumptions regarding homoscedasticity, normality of residuals, and absence of serial correlation. This ensures that the estimated coefficients are statistically consistent and suitable for cross-country comparison.

In the second stage, a multiple linear regression model was conducted to identify the strongest relationships between a combination of factors and the number of tourist rates. Simple transformations of variables were applied to the most significant regression models to meet the theoretical assumptions for regression of cross-sectional data. The models were selected by comparing several statistical indicators: the statistical significance of each coefficient separately, the statistical significance of the model (F-statistic), the coefficient of determination ($R2$ and adjusted $R2$ for comparison between models with different number of variables). The general form of the models that showed the best compromise between their fit and complexity is

$$Y=\beta0+\beta1X+\beta2X2+\cdots+\beta iXi+\varepsilon$$

Or

$$Y =\beta0+\sum\beta iXi\ i=1 +$$

The slope coefficients indicate a linear relationship at a marginal change in the corresponding independent variable, all else being equal. By transforming all variables in each model into their logarithm form, we explored a relationship in which the effect of each variable on the outcome is proportional to its natural logarithm.

1. Analysis Of Results

5.1 Tourism Determinants: Single Regression Results

In the initial phase, separate regression analyses were conducted for Albania and North Macedonia to assess the assumptions for modelling cross-sectional data and the explanatory strength of each variable, as indicated by the $R2$ values in the models. Our findings revealed that most associations between independent and dependent variables exhibit homoscedasticity. Specifically, eleven out of thirteen samples demonstrated homoscedasticity.

Instances of heteroscedasticity were observed in analyses involving the independent variables Agricultural land % and Intentional homicides in Albania. Notably, North Macedonia did not exhibit any variables with heteroscedasticity.

Table 1. Results of the Simple linear regression analysis for The Republic of North Macedonia

Macedonia single regressions (number of tourists, the dependent variable – Y)	Intercept	Coefficient	R-square	Heteroskedasticity	Significance F	P-value
Birth rate	6.9269	-0.1323	0.2204	Homoscedastic	0.0274	0.0274
Road infrastructure	5.2973	0.0463	0.1763	Homoscedastic	0.0051	0.0051
Internet users %	5.1026	0.0068	0.5157	Homoscedastic	0.0000	0.0000
Intentional homicides	5.8607	-0.2216	0.3294	Homoscedastic	0.0051	0.0051
Forest area	-2.4605	0.2049	0.4945	Homoscedastic	0.0002	0.0002
GDP per capita	-1.7507	1.9713	0.5402	Homoscedastic	0.0000	0.0000

Source: Authors' analysis (2000 – 2021)

Hence, the medium/high correlations between two independent variables in North Macedonia that we should consider are the correlation between the number of tourists and Internet users, which is 0.52, and the correlation of 0.54 between the number of tourists and GDP per capita

In our analysis there were more independent variables, but we selected the pairs shown above because they indicate the highest variability.

Table 2. Results of the Simple linear regression analysis for Albania

Albania single regressions (number of tourists, the dependent variable – Y)	Intercept	Coefficient	R-square	Heteroskedasticity	Significance F	P-value
CO_2	3.7605	1.6486	0.8084	Homoscedastic	0.0000	0.0000
Net migration	11.6693	-1.2316	0.8814	Homoscedastic	0.0000	0.0000
Urban population	3.1041	0.0601	0.9123	Homoscedastic	0.0000	0.0000
Intentional homicides	6.9867	-0.1874	0.4363	Heteroscedastic	0.0013	0.0013
GDP per capita	-6.3721	3.5870	0.9564	Homoscedastic	0.0000	0.0000

Source: Authors' analysis (2000 – 2021)

Furthermore, we obtained the coefficient of determination ($R2$) for each regression, i.e. we found out which of the independent variables explain our dependent variable the best. We found that birth rate with 22%, road infrastructure with 17%, Intentional homicides with 32% and Forest area with 49%. On the other hand, the correlations between the independents in Albania that we analysed, shown through the coefficient of determination ($R2$) for each regression, will help to find out which of the independent variables best explain our dependent variable. Independents with a significantly high R2 for this country are Co2 with 80%, Net migration with 88%, Urban population with 91%, Intentional homicides with 43% and GDP per capita 95%.

5.2 Tourism Determinants: Multiple Regression Results

After conducting the multiple linear analysis, about 50% of the variability of the number of tourists in North Macedonia is explained by birth rate and death rate.

Table 3. Results of the multiple linear regression analysis for The Republic of North Macedonia

	Model 1	Model 2	Model 3	Model 4
Intercept	8.0959*** (0.6241)	-7.7880*** (2.6094)	-4.0276** (1.5534)	7.5599* (3.7466)
Birth rate	-0.2133*** (0.0518)			
Death rate	-0.0516*** (0.0157)			
CO2		0.4084*** (0.1405)		
Forest area		0.2831*** (0.0575)		
Renewable energy %		0.0321* (0.0169)		
GDP per capita			2.6284*** (0.4324)	
Population growth			0.2860** (0.1070)	-0.1893*** (0.0646)
Urban population %				0.2283*** (0.0402)
Forest area %				
Included Obs.	22	22	20	22
R-squired	0.5021	0.6718	0.6658	0.6516
Adjusted R-squired	0.4497	0.6172	0.6306	0.6149
S.E. of regression	0.1860	0.1551	0.1524	0.1556

*** Significant at 0.01; **Significant at 0.05, *Significant at 0.1
Source: Authors' analysis (2000 – 2021)

The linear association is represented by the coefficients of the corresponding (explanatory) variables ceteris paribus: for each point increase in Birth rate, number of tourists decrease by -0.2133% and for every point of increase in Death rate number of tourist decrease by -0.0516. Model number 2 shows us multiple linear regression with variability of 67% of the number of tourists in country mention above and this model is explained by CO_2, Forest area and renewable energy%. For each point increase in CO_2, number of tourists increase by 0,4084%, for every point of increase in Forest area (%) number of tourists increase by 0.2831% and for every point increase in Renewable energy number of tourists increase by 0.0321 %.

Model number 3 show us multiple linear regression with variability of 66% of the number of tourists in country mention above and this model is explained by GDP per capita and population growth. For each % point increase in GDP per capita, number of tourists increase by 2.6284 and for every point of increase in Population growth number of tourists increase by 0.2860%.

Table 4. Results of the multiple linear regression analysis for
The Republic of Albania

	Model 1	Model 2	Model 3	Model 4
Intercept	3.2744*** (0.1969)	2.0160*** (0.4683)	-5.6648*** (0.4760)	4.8910*** (1.0510)
Urban population	0.0520*** (0.0045)			
Foreign direct investment	0.0369*** (0.0126)			
CO_2		1.8080*** (0.1725)		
Population growth		-0.3135* (0.1570)		
Renewable energy		0.0360*** (0.0100)		
GDP per capita			3.4193*** (0.1325)	
Population growth			0.2549*** (0.0605)	
Air passenger carried log				0.4013* (0.1981)
Intentional homicides				-0.2018*** (0.0448)
Included Obs.	22	22	22	22
R-squired	0.9395	0.9023	0.9774	0.8772
Adjusted R-squired	0.9331	0.8860	0.9750	0.8567
S.E. of regression	0.1099	0.1435	0.0671	2.4574

*** Significant at 0.01; **Significant at 0.05, *Significant at 0.1
Source: Authors' analysis (2000 – 2021)

The last model, that also presents a high percentage of variability, can be seen and analysed by readers in the table above. In this part of the analysis of results, multiple

regressions for Albania are presented, one of the regressions concerns 3 independent variables while there are three with 2 independent variables.

Triple model will be explained in more detail, and ~~the~~ two variable models can be seen in the table showing the significant regression items. The first model with two independents in it shows a multiple regression analysis with a high variability of 94%, which involves urban population and foreign direct investment. For each point increase in Urban population, Number of tourists increases by 0.0520% and for every point of increase in Foreign direct investment, Number of tourists increases by 0.0369%.

The second model with three independent variables presents a multiple regression analysis with a high variability of 90%, which involves Co_2, Population growth, and Renewable energy. For each point Co_2 increase, Number of tourists increases by 1.8080%, for every point Population growth increase, Number of tourists decreases by -0.3135% and for each point Renewable energy increase, Number of tourists decreases by 0.57477. The other two models that also present a high percentage of variability can be seen and analysed by readers in the table on the previous page.

6. Disscusion And Recommendations

The empirical results of this study provide robust support for the hypotheses proposed, particularly regarding the role of institutional quality and structural economic factors in shaping tourism dynamics. These findings confirm both H1 and H2, demonstrating that institutional quality and structural variables jointly determine tourism performance in cases of transition economies.

Overall results reveal that, in both North Macedonia and Albania, multivariate models that incorporate governance-related indicators, such as foreign direct investment, GDP per capita, and renewable energy usage, exhibit significantly higher explanatory power than bivariate models. This suggests that tourism development is not driven by isolated variables but by complex intercorrelations of economic capacity, institutional efficiency, and environmental sustainability.

Albania's stronger empirical performance, reflected in the higher explanatory power of its models, indicates a more coherent institutional and investment environment. Consistent focus on transport infrastructure, coastal branding, and targeted foreign investment has enabled the country to position itself among competitive Mediterranean destinations. On the other hand, North Macedonia's tourism sector remains constrained by fragmented institutional coordination, limited inter-ministerial collaboration, and absence of a unified long-term strategy, while certain initiatives, such as the short-term gains generated in tourist inflows, their sustainability and alignment with broader development goals, remain questionable.

Based on empirical findings, these results underscore the necessity of adopting an integrated policy approach that aligns tourism development with broader economic

and environmental strategies. Variables such as urban population growth, renewable energy expansion, and environmental preservation should be recognised as central components of tourism planning rather than as peripheral considerations. Policymakers should, therefore, pursue cross-sectoral collaboration and establish continuous monitoring mechanisms to evaluate the effectiveness and long-term sustainability of tourism-related policies.

Despite its robustness, this study faces several limitations primarily related to data availability and quality, which may influence the precision of certain estimates. Reliable and continuous data were unavailable for several potentially influential indicators, such as average tourist expenditure, tourism satisfaction indices, and digital engagement metrics. Moreover, inconsistencies in statistical reporting across national institutions constrained the analytical scope and comparability of results. A key recommendation is for national statistical agencies to prioritise the systematic collection and standardisation of tourism-related data, especially the ones capturing institutional performance and environmental impact.

Although more recent statistical releases exist for certain tourism indicators after 2021, an extensive review of international and national databases showed that the full set of variables required for a comparative econometric framework is not consistently available or harmonised for either of the countries studied beyond 2021. Several environmental, demographic and institutional indicators remain incomplete, subject to revision, or published with significant delay. As a result, the period 2000–2021 represents the last fully reliable and methodologically consistent time frame that allows for cross-country comparability and robust regression modelling.

An additional limitation arises from the use of annual data, which may obscure important seasonal patterns that are particularly relevant for tourism-dependent economies. Monthly or quarterly datasets could provide richer insights into short-term fluctuations, high-season dynamics, and the effects of policy interventions. Furthermore, reliance on secondary sources restricts the inclusion of qualitative indicators, such as tourist satisfaction, service quality, or destination image, which are increasingly recognised as important determinants of tourism performance. Future studies integrating mixed-method approaches or higher-frequency data could, therefore, capture a more nuanced and comprehensive picture of tourism dynamics.

Future research should build upon the current analytical framework by incorporating spatial econometrics, stakeholder analysis, or dynamic panel models to address time-lagged relationships and spatial interdependencies that static regression models cannot fully capture. Complementing the quantitative analysis with qualitative approaches, such as expert interviews or policy evaluation studies, would provide valuable contextual insights and enhance the interpretability of empirical findings. Together, these extensions could yield a more comprehensive and policy-relevant understanding of tourism systems in transition economies.

7. Conclusion

This research conducted a comparative, data-driven analysis of tourism development in the Republic of North Macedonia and the Republic of Albania for the period 2000–2021, applying a business analytics framework grounded in descriptive, diagnostic, and predictive methods. By integrating regression analysis with visualisation tools, the study revealed that economic, institutional, and environmental factors significantly influence international tourist arrivals.

Results highlight Albania's advantage in policy coherence, investment continuity, and institutional effectiveness, resulting in stronger model-explanatory power. North Macedonia's performance, while constantly improving, is hindered by fragmented governance and underdeveloped infrastructure. These contrasts underscore the strategic importance of aligning tourism development with broader economic and sustainability objectives.

Methodologically, the paper illustrates the utility of combining accessible software tools, such as Excel and Power BI, with formal regression techniques for policy-relevant insights. While limitations related to data availability were noted, the study lays a foundation for future research to explore more advanced econometric methods and incorporate qualitative aspects, such as tourist behaviour and satisfaction, as well as future tourist expectations and tourist service quality.

Overall, findings affirm that sustainable tourism growth in the Western Balkans depends not only on natural appeal but also on robust institutions, harmonised national policy measures, coordinated planning, and long-term commitment to integrated development strategies.

Finally, this comparative approach offers valuable lessons for other transition economies in the Western Balkans and beyond. By highlighting the nuanced interplay between policy, infrastructure, and environmental stewardship, the study emphasises the importance of context-sensitive tourism strategies in relation to their potential for sustained implementation. Rather than applying one-size-fits-all solutions, countries should tailor their development plans based on institutional capacity, resource availability, customer needs, and societal needs. Ultimately, sustainable tourism should be understood not merely as an economic objective but as a multidimensional pathway toward inclusive growth, regional cooperation, transparent tourist service provision, as well as an economy's inclination towards global integration.

REFERENCES

Ardeleanu, D. (2021). *What are the factors that influence the level of tourism development? Research based on 130 countries* (Master's thesis, Uppsala University). https://www.diva-portal.org/smash/get/diva2:1564594/FULLTEXT01.pdf (Accessed: June–August 2024 (Summer Period))

Caca, O., Ladias, C., & Polo, A. (2016). *The development of tourism in Albania and the importance of cultural tourism.* https://www.researchgate.net/publication/315529795 (Accessed: June–August 2024 (Summer Period))

Eugenio-Martin, J. L., Morales, N. M., & Scarpa, R. (2004). *Tourism and economic growth in Latin American countries: A panel data approach* (OECD Development Centre Working Paper No. 2004/17). https://doi.org/10.1787/508867357414

Eurostat. (2024). *European statistics portal.* https://ec.europa.eu/eurostat (Accessed: June–August 2024 (Summer Period))

Gooroochurn, N., & Sugiyarto, G. (2005). Competitiveness indicators in the travel and tourism industry. *Tourism Economics,* 11(1), 25–43. https://doi.org/10.5367/0000000053297130

Institute of Statistics of the Republic of Albania. (n.d.). *Official statistics portal.* https://instat.gov.al (Accessed: June–August 2024 (Summer Period))

Kohl & Partner. (2016). *Tourism Development Strategy for North Macedonia* (Unpublished report).

Kruja, D., & Lufi, M. (2012). The role of tourism in developing countries: The case of Albania. *European Scientific Journal*, 8(19), 1–10. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=c8d62906356742b345f88a9183123558005af9b7 (Accessed: June–August 2024 (Summer Period))

Marku, A. (2013). Tourism strategy in Albania. In *Proceedings of the International Scientific Forum ISF 2013* (Vol. 2, pp. 57–67).

Naumov, N., & Petrevska, B. (2019). Sustainable tourism development under institutional challenges: Evidence from North Macedonia.

Nestoroska, I. (2012). Identifying tourism potentials in the Republic of Macedonia through regional approach. *Procedia – Social and Behavioral Sciences, 44*, 95–103. https://doi.org/10.1016/j.sbspro.2012.05.009

Petrevska, B. (n.d.). *Exploring tourism dynamics: North Macedonia in regional context.* https://eprints.ugd.edu.mk/34038/1/Exploring%20tourism%20dynamics_North%20Macedonia%20in%20regional%20context.pdf (Accessed: June–August 2024 (Summer Period))

Risteski, M., & Nestoroska, I. (2024). *Tourism development in the Republic of North Macedonia in the period 1991–2021.* https://www.researchgate.net/publication/381855321_Tourism_Development_in_the_Republic_of_North_Macedonia_in_the_Period_1991-2021 (Accessed: June–August 2024 (Summer Period))

Roser, M. (2023). *Our World in Data.* https://ourworldindata.org (Accessed: June–August 2024 (Summer Period))

Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research, 38*(1), 291–308. https://doi.org/10.1016/j.annals.2010.08.009

State Statistical Office of the Republic of North Macedonia (MakStat). (2024). *MakStat database.* https://makstat.stat.gov.mk (Accessed: June–August 2024 (Summer Period))

United Nations World Tourism Organization (UNWTO). (2022). *Tourism and sustainable development goals: Journey to 2030.* https://www.unwto.org/sustainable-development (Accessed: June–August 2024 (Summer Period))

World Bank. (2024). *World Bank Open Data.* https://data.worldbank.org (Accessed: June–August 2024 (Summer Period))

World Economics. (2019). *The global authority on economic data.* https://www.worldeconomics.com (Accessed: June–August 2024 (Summer Period))

World Health Organization (WHO). (2024). *Global health observatory.* https://www.who.int (Accessed: June–August 2024 (Summer Period))

World Population Review. (2022). *World population by country.* https://worldpopulationreview.com (Accessed: June–August 2024 (Summer Period))

WorldData.info. (2024). *World data: The world in numbers.* https://www.worlddata.info (Accessed: June–August 2024 (Summer Period))