

Statistical Processing of Tourism Data in the Republic of North Macedonia with an Empirical Focus on the Period 2019–2024

Goran Karovski ¹
Goran Apostolovski
Sase Kocovski
Elena Tasevska

Abstract

This paper advances a transparent statistical framework for the processing and interpretation of officially reported tourism indicators in the Republic of North Macedonia, with empirical emphasis on the period 2019–2024. The analysis draws on annual data for tourist arrivals and overnight stays, disaggregated by residency, alongside hospitality sector turnover expressed in million denars. All data originate from official releases of the State Statistical Office and are examined through descriptive statistics, annual growth rates, structural proportions, ratio-based indicators, and a limited set of exploratory econometric tools.

The examined period encompasses three analytically distinct phases: a stable pre-pandemic baseline in 2019, a sharp contraction in 2020, and a subsequent phase of recovery and consolidation from 2021 to 2024. Empirical results indicate that the post-crisis rebound has been driven primarily by rising arrival volumes, particularly within the foreign segment, while domestic tourism continues to account for a substantial share of overnight stays due to longer average durations. Hospitality turnover exhibits a strong positive association with overnight stays, as demonstrated by correlation analysis and an illustrative regression specification. Given the short time series and the presence of an exceptional structural disruption, econometric outcomes are interpreted as indicative patterns rather than as stable behavioral parameters.

The paper concludes by highlighting both the analytical value and the inherent constraints of officially available tourism statistics, emphasizing the need for finer spatial and temporal resolution and for consistent use of standardized indicators in tourism policy analysis. By converting basic administrative data into analytically interpretable measures, the study offers a replicable empirical approach suitable for tourism research in data-constrained national settings.

Keywords: tourism statistics; empirical tourism analysis; overnight stays; tourist arrivals; hospitality turnover; post-crisis recovery; statistical indicators; Republic of North Macedonia

JEL Classification:C10, C12, C22, L83, Z32, R11

1. Introduction

Official tourism statistics provide a basis for measuring changes in tourism activity and hospitality turnover in North Macedonia. Tourism can be examined through measurable economic and spatial indicators. Consequently, statistical analysis emerges as an indispensable tool for understanding tourism flows, for comparing different time periods, and for deriving analytically grounded insights relevant to planning and governance.

In the Republic of North Macedonia, tourism statistics are produced within the framework of the official state statistical system and provide continuous data series on the number of tourists, the number of overnight stays, and turnover in the hospitality sector. These indicators constitute the empirical foundation upon which an analytical representation of tourism activity can be constructed, but only when they are subjected

¹Goran Karovski, MSc., Assistant, Goran Apostolovski, MsC., Assistant, Sase Kocovski, MSc., Assistant, University Skopje, Skopje, Republic of North Macedonia and Elena Tasevska, MSc., Assistant, University Skopje, Skopje, Republic of North Macedonia.

to appropriate processing and interpretation. Absolute values alone, without the calculation of derived measures, structural shares, and dynamic rates, have limited explanatory capacity and may lead to superficial conclusions regarding development trajectories.

The period from 2019 to 2024 is particularly suitable for statistical analysis, as it encompasses clearly differentiated phases in tourism development. The year 2019 represents the last fully pre-crisis year characterized by stable tourism flows, while 2020 marked a profound disruption caused by the global health crisis and restrictions on international and domestic travel. The years 2021 and 2022 are characterized by gradual recovery and restructuring of demand, whereas 2023 and 2024 indicate consolidation of tourism volumes and renewed strengthening of the international segment. These shifts create an analytical context in which statistical processing can clearly identify and compare the phases of decline, recovery, and growth.

The objective of this paper is to employ systematic statistical processing of official tourism data in order to derive an analytically grounded interpretation of the volume, structure, and economic correlates of tourism in the Republic of North Macedonia during the period 2019–2024. The paper does not limit itself to a descriptive presentation of trends, but seeks to demonstrate how the calculation of average length of stay, structural shares, rates of change, and ratio-based economic indicators provides deeper insight into the relationships between tourism demand and hospitality turnover. In this sense, statistical processing is treated as a means for analytical interpretation rather than as an end in itself.

The research approach combines descriptive statistics with elementary econometric procedures, while explicitly acknowledging their analytical potential and limitations. Correlation and regression analyses are employed to examine the degree of association between tourism volumes and the economic indicator, with cautious interpretation due to the short time series and the presence of structural disruptions. In this way, the paper serves a dual purpose: it provides empirical insight into tourism dynamics in the country, and it demonstrates a methodological framework that can be applied and further developed in future research using longer time series, finer spatial disaggregation, and more advanced analytical techniques.

The specific contribution of this paper lies in its systematic transformation of officially published tourism statistics into analytically interpretable indicators that capture structural change, intensity of use, and economic association within a small open economy context. Unlike studies that focus on forecasting or cross-country comparison, this paper emphasizes methodological transparency and indicator construction as a basis for evidence-informed tourism governance. By explicitly linking tourism volume indicators with hospitality turnover during a period of structural disruption and recovery, the study provides a replicable analytical framework applicable to other countries with limited data availability and short statistical series.

2. Theoretical and Methodological Foundations

Statistical processing in tourism represents a procedure through which observed phenomena, commonly perceived in everyday practice as scattered movements of visitors, are transformed into measurable relationships and verifiable conclusions. In the literature, tourism is treated as a complex system of demand and supply, where identical

aggregated values may conceal different structural compositions, different intensities of stay, and different economic implications. Consequently, the selection of indicators and the manner of their processing directly influence the interpretation of development trajectories. Within quantitative research, a clear distinction is required between measures of volume, measures of intensity, and measures of structure. Volume is most often described through the number of tourists and the number of overnight stays, intensity through average length of stay and utilization, and structure through shares by residency, origin, and type of accommodation. In the context of tourism demand modeling, research reviews indicate a wide range of approaches, from classical econometric models to time-series and hybrid techniques, while the core remains the precise operationalization of dependent and independent variables (Song and Li 2008; Lim 1997).

For the purposes of this paper, the focus is placed on the core of official tourism statistics in the country: the number of tourists and the number of overnight stays, disaggregated into domestic and foreign tourists. These indicators are selected because they are comparable across years and consistently present in official series, and because they are suitable for calculating derived measures such as average length of stay, shares, and rates of change. An indicator of turnover in the hospitality sector is added as an approximate economic correlate of tourism volume, with the awareness that turnover is not a purely tourism category, as it also includes local residents and other unobserved consumers. The applied methodological framework combines descriptive statistical measures with a limited set of exploratory econometric techniques.

Descriptive statistics enable clear presentation of levels, variability, and structural composition. Annual change rates provide a measure of inertia and shocks, which is particularly important for periods with abrupt disruptions such as 2020. Correlation analysis offers an initial assessment of the direction and strength of co-movement between tourism volume and the economic indicator, while linear regression serves as a formalized expression of that relationship, with explicit emphasis that causality cannot be inferred automatically from statistical significance. Regarding seasonal processes, tourism typically involves concentrated periods of high pressure; however, in this paper seasonality is considered in a limited manner using available monthly values from late 2024 and the first eight months of 2025, with the aim of demonstrating the calculation method rather than exhausting the entire seasonal structure.

From an analytical perspective, the period under observation allows examination of tourism behavior under three structurally distinct regimes: pre-crisis stability, crisis-induced contraction, and post-crisis recovery. This differentiation enables assessment of whether standard tourism indicators preserve their interpretative value under conditions of systemic shock. In particular, the distinction between arrivals and overnight stays becomes analytically relevant, as crisis conditions may alter average length of stay and thereby decouple volume from intensity. The inclusion of hospitality turnover further permits examination of whether economic activity in the sector responds proportionally to changes in tourism volume or follows a distinct adjustment path.

2. Data Sources and Validity of the Statistical Base

The empirical section relies on official publications of the State Statistical Office, which provide aggregated annual and monthly data on tourism and hospitality turnover.

Monthly statistical bulletins present tables that simultaneously contain hospitality turnover and tourism indicators, disaggregated into domestic and foreign tourists and their overnight stays. For 2019, as the baseline year immediately preceding the pandemic, the table in bulletin code 1.2.25.02 is used, reporting a total of 1,184,963 tourists and 3,262,398 overnight stays, with hospitality turnover of 14,295 million denars. For 2020 to 2024, bulletin code 1.2.25.10 is used, presenting the same categories and ensuring a consistent time series for the shock and recovery period. These sources are selected due to their official nature and the methodological continuity of the series. Nevertheless, the validity of tourism data has well-known limitations. Official statistics are typically based on administrative and survey reporting by accommodation establishments operating as business entities, while a portion of stays, particularly in private accommodation and stays with relatives and friends, may remain unreported. Methodological notes in the bulletins emphasize that some tourists and overnight stays are not covered due to non-reporting in certain forms of private accommodation and due to stays within domestic networks (State Statistical Office 2025a). This limitation must be considered when interpreting the level of tourism volume, but it does not negate the analytical value of the data for dynamics, direction, and relative relationships between categories. Hospitality turnover is reported as the value of realized services and sales in the hospitality sector. This indicator has its own methodological limitations, as it does not distinguish consumption by type of consumer and does not represent a direct measure of tourism expenditure. In the analysis it is used as an approximate indicator of overall activity in a sector closely linked to tourism demand, with awareness that the relationship is mediated by price changes, domestic consumption, and other factors.

4. Operationalization and Calculation Procedures

The basic variables in the analysis are the number of tourists and the number of overnight stays. The number of tourists is interpreted as arrivals and represents a measure of demand volume. The number of overnight stays is a measure of intensity and is linked to length of stay and pressure on capacities. These measures are disaggregated by residency into domestic and foreign categories, enabling assessment of the international component and domestic tourism demand. Based on these variables, several derived indicators are calculated. Average length of stay is computed as the ratio between overnight stays and tourists, stabilizing interpretation by allowing comparison across years with different volumes. Structural shares are calculated as the ratio of foreign tourists to total tourists and as the ratio of foreign overnight stays to total overnight stays, showing the weight of international demand and the sector's sensitivity to external shocks. Annual change rates are calculated as relative changes in total tourists and total overnight stays compared to the previous year, expressed as percentages with one decimal.

In the economic linkage section, turnover per tourist and turnover per overnight stay are calculated. Turnover per tourist is obtained by converting turnover from million denars to denars and dividing by the total number of tourists. Turnover per overnight stay is calculated by the same conversion and division by the total number of overnight stays. These ratios should not be interpreted as exact expenditure per tourist, but as indicative measures of how much hospitality turnover corresponds to a unit of tourism volume. Correlation analysis is conducted using the Pearson coefficient to determine whether

turnover moves in the same direction as tourism measures. The linear regression model uses turnover as the dependent variable and the number of overnight stays expressed in millions as the independent variable. This choice is based on the empirical assumption that overnight stays are more closely related to the immediate use of services in the destination. Given the small number of years, the model is treated as illustrative and accompanied by critical discussion.

5. Tabular Processing, Consistency Checks, and Reproducibility

In practical work with tourism statistics, tabular processing in spreadsheet environments has a dual character. It allows rapid calculation of derived indicators through formulas and controlled transformations, but also entails risks of mechanical errors, misinterpretation of units, and inconsistent series. Therefore, a quality control procedure is established that follows the entire path from source documents to the final analytical table. Verification begins with units, as hospitality turnover is expressed in million denars in the bulletins, while tourists and overnight stays are expressed as counts. Clear labeling of units in column headings and avoidance of mixed scales are essential. Next, identity checks are performed: total tourists must equal the sum of domestic and foreign tourists, and total overnight stays must equal the sum of domestic and foreign overnight stays. This step quickly reveals data entry errors or misaligned separators. Temporal consistency is then checked, as official series may be revised and bulletins may indicate provisional values. In such cases, a status column is introduced to indicate whether a value is final or provisional.

After ensuring consistency of the base figures, indicator calculation proceeds. Average length of stay is calculated with two decimal places to avoid spurious precision. Structural shares are expressed as percentages, and annual change rates are calculated relative to the previous year. In the spreadsheet environment, the use of formulas is recommended, as it preserves transparency and allows rapid revision when adding new years. For economic indicators, turnover per tourist and per overnight stay are sensitive to units, so explicit multiplication by one million is used when converting turnover from million denars to denars. Reproducibility is strengthened through a separate sheet listing sources, including precise links to source documents and the date of retrieval, allowing other researchers to replicate the calculations.

Once the database is established, an analytical phase follows to assess indicator stability and identify structural breaks. The pandemic period creates such a break, making it reasonable to compute indicators that isolate the magnitude of the shock. One approach is index representation with 2019 as the base year, expressing subsequent years relative to 2019. Another approach is logarithmic transformation of tourists and overnight stays, often used in econometric literature to stabilize variance and interpret coefficients as elasticities. In this paper, logarithmic forms are not applied in the main model due to the small number of years, but are highlighted as a natural extension with longer series. Similarly, tourism demand modeling often involves stationarity testing, cointegration, or autoregressive structures when monthly or quarterly data are available. Research reviews indicate the usefulness of such techniques, but their applicability depends on series length and quality (Song and Li 2008; Song, Qiu, and Park 2023). With a short annual series, the priority is to avoid over-modeling and to remain with simple relationships, clearly stating limitations.

In the regression section, sensitivity checks with alternative specifications are recommended, such as using tourists instead of overnight stays or foreign overnight stays as the independent variable. In the present series, tourists and overnight stays are closely related, so including both leads to multicollinearity; therefore, one measure is selected as representative. When turnover is used as the dependent variable, deflation using hospitality price indices should be considered to obtain real turnover, particularly in periods of higher inflation. Finally, each statistical result must be interpreted within an institutional context. The rise in the foreign share in 2024 may be linked to changes in transport connectivity, business travel, regional events, or destination marketing strategies. Statistical processing reveals the form of movement, while explanation requires integration with qualitative sources and more detailed disaggregation by origin and type of stay.

6. Empirical Results and Interpretation

Table 1 presents annual values for hospitality turnover, tourists, and overnight stays in the period 2019–2024, disaggregated into domestic and foreign categories, in accordance with official sources (State Statistical Office 2025a; State Statistical Office 2025b).

Table 1. Hospitality Turnover, Tourists, and Overnight Stays in the Republic of North Macedonia, 2019–2024

Year	Hospitality Turnover (million denars)	Total Tourists	Domestic Tourists	Foreign Tourists	Total Overnight Stays	Domestic Overnight Stays	Foreign Overnight Stays
2019	14,295	1,184,963	427,370	757,593	3,262,398	1,684,627	1,577,771
2020	8,559	467,514	349,308	118,206	1,697,535	1,444,605	252,930
2021	11,208	702,463	408,500	293,963	2,313,543	1,643,083	670,460
2022	16,048	969,277	431,841	537,436	2,848,604	1,703,841	1,144,763
2023	20,627	1,168,730	434,591	734,139	3,135,767	1,728,469	1,407,298
2024	22,386	1,260,425	430,246	830,179	3,297,732	1,765,093	1,532,639

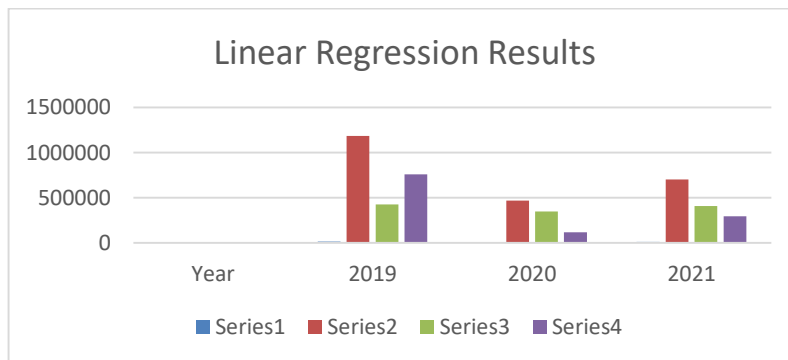


Figure 1. Derived Tourism Indicators in North Macedonia (2019–2024)

Hospitality turnover is expressed in million denars. Tourist arrivals and overnight stays represent officially registered values reported by accommodation establishments. Total values equal the sum of domestic and foreign categories. Tourism indicators recorded a pronounced contraction in 2020, reflecting the disruptive effects of pandemic-related restrictions on mobility and travel activity.

Table 2. Derived Tourism Indicators, 2019–2024

Year	Average Length of Stay (nights)	Share of Foreign Tourists (%)	Share of Foreign Overnight Stays (%)	Turnover per Tourist (denars)	Turnover per Overnight Stay (denars)
2019	2.75	63.9	48.4	12,064	4,382
2020	3.63	25.3	14.9	18,307	5,042
2021	3.29	41.8	29.0	15,955	4,845
2022	2.94	55.4	40.2	16,557	5,634
2023	2.68	62.8	44.9	17,649	6,578
2024	2.62	65.9	46.5	17,761	6,788

Average length of stay is calculated as the ratio between total overnight stays and total tourists. Shares of foreign tourists and foreign overnight stays are expressed as percentages of total values. Turnover per tourist and turnover per overnight stay are derived by converting hospitality turnover from million denars to denars and dividing by the corresponding tourism volume. These indicators represent approximate ratios and should not be interpreted as exact tourist expenditure.

The combined reading of average length of stay and foreign shares reveals an important compositional mechanism. Years with a higher share of domestic tourists exhibit longer average stays, while years dominated by foreign arrivals are associated with shorter, more intensive visit patterns. This interaction explains why recovery in arrival numbers does not necessarily translate into proportional growth in overnight stays. The indicators therefore suggest that post-crisis tourism expansion in North Macedonia has been driven more by increased frequency of visits than by extension of stay duration.

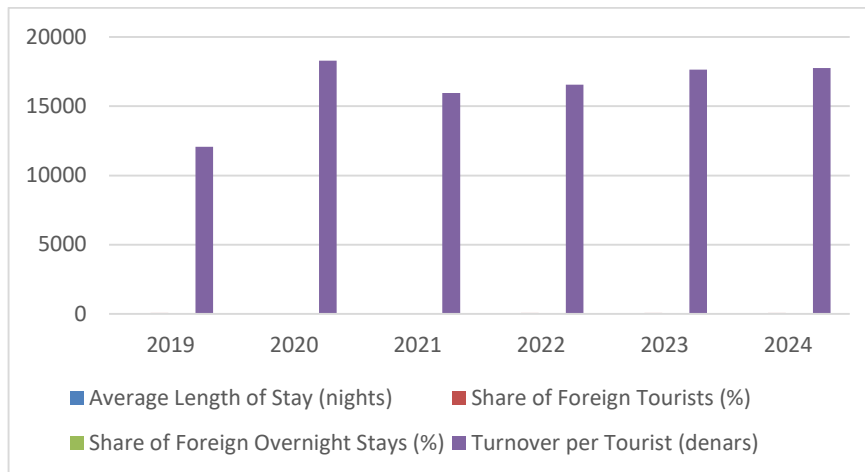


Figure 2. Regression Relationship Between Overnight Stays and Hospitality Turnover

6.1. Econometric Assessment of the Tourism–Turnover Relationship

The regression model examines associations between overnight stays and hospitality turnover within a limited annual series. Given the short annual time series and the presence of a pronounced structural disruption in 2020, the model is specified to indicate the direction and approximate magnitude of association between overnight stays and aggregate hospitality turnover. Correlation estimates point to a strong co-movement between tourism volume, measured through overnight stays, and realized turnover in the hospitality sector, suggesting that changes in tourism intensity are closely mirrored by sectoral economic activity.

Table 3. Linear Regression Results: Hospitality Turnover as Dependent Variable and Overnight Stays as Independent Variable (2019–2024)

Parameter	Estimate	Unit	Note
Coefficient for Overnight Stays	7,114.949	million denars per million overnight stays	Linear model based on six annual observations
Intercept	-4,111.517	million denars	
R-squared	0.719		Explained variance

The regression results indicate a positive and statistically meaningful association between overnight stays and hospitality turnover. However, the estimated parameters should be interpreted with caution, as they reflect indicative relationships within a constrained empirical setting shaped by limited observations and exceptional external shocks.

It is important to emphasize that increases in turnover per tourist and per overnight stay cannot be interpreted as direct evidence of higher individual tourist expenditure. These ratio-based indicators are affected by price dynamics, inflationary pressures, and domestic consumption within the hospitality sector. Their analytical relevance lies

primarily in comparative interpretation across years rather than in absolute monetary valuation of tourism demand.

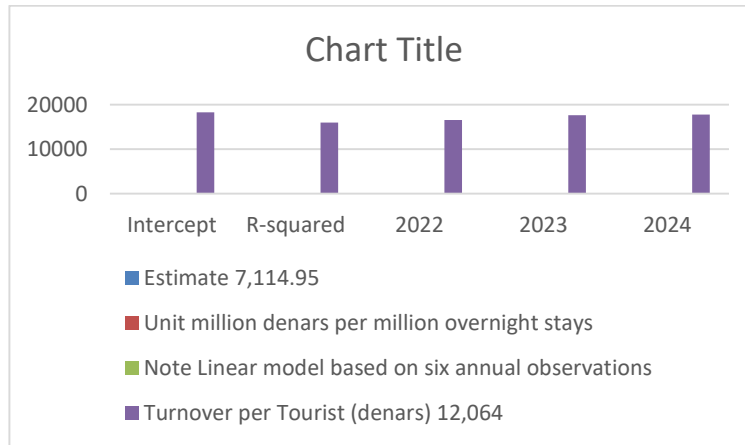


Figure 3. Monthly Tourism Indicators and Seasonal Variation (2024–2025)

The dependent variable is hospitality turnover expressed in million denars. The independent variable is the total number of overnight stays expressed in millions. The regression is estimated using ordinary least squares with six annual observations. Results should be interpreted with caution due to the short time series and the presence of structural disruption during the pandemic period.

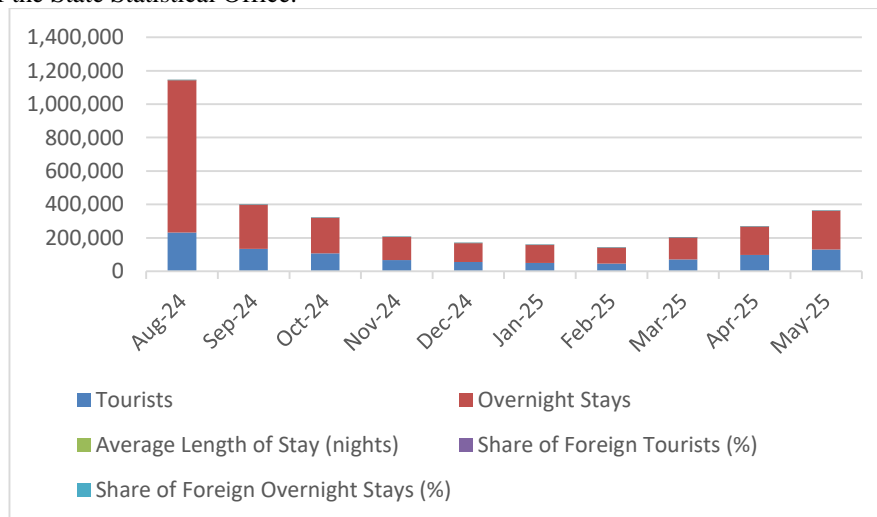
Monthly data are introduced to illustrate the analytical potential of seasonal decomposition rather than to provide a complete seasonal model. Even within a limited monthly subset, the concentration of overnight stays during summer months highlights structural pressure points relevant for capacity management, labor allocation, and infrastructure planning. The observed seasonal amplitude suggests that annual aggregates may mask substantial intra-year variability with direct implications for tourism governance.

Table 4. Selected Monthly Tourism Indicators, August–December 2024 and January–August 2025

Period	Tourists	Overnight Stays	Average Length of Stay (nights)	Share of Foreign Tourists (%)	Share of Foreign Overnight Stays (%)
August 2024	232,576	911,478	3.92	51.4	25.7
September 2024	134,829	262,632	1.95	75.4	68.1
October 2024	107,672	211,611	1.97	74.2	67.5
November 2024	66,701	138,226	2.07	68.4	61.4

Period	Tourists	Overnight Stays	Average Length of Stay (nights)	Share of Foreign Tourists (%)	Share of Foreign Overnight Stays (%)
December 2024	55,371	113,490	2.05	61.5	58.8
January 2025	49,870	106,894	2.14	63.2	57.5
February 2025	45,992	94,981	2.07	65.3	60.0
March 2025	70,902	132,015	1.86	78.0	72.0
April 2025	96,943	171,886	1.77	78.6	73.5
May 2025	130,739	231,313	1.77	77.6	71.2
June 2025	126,415	243,157	1.92	79.9	73.3
July 2025	209,932	770,733	3.67	57.9	30.8
August 2025	226,179	846,221	3.74	52.0	26.6

Monthly data are presented to illustrate seasonal variation in tourism activity. Average length of stay is calculated as the ratio between monthly overnight stays and monthly tourist arrivals. Shares of foreign tourists and foreign overnight stays are expressed as percentages of total monthly values. Data are based on official monthly tourism releases of the State Statistical Office.



7. Correlation and Regression Analysis

7.1. Monthly Indicators and Seasonal Interpretation

Monthly tourism indicators provide an essential complementary perspective to annual aggregates by revealing intra-annual concentration patterns that shape the operational and economic dynamics of tourism activity. While annual data capture overall volume

and structural change across years, they inevitably mask the temporal clustering of demand that characterizes tourism systems. In this study, selected monthly observations from late 2024 and from January to August 2025 are employed to illustrate seasonal variation in tourism activity in the Republic of North Macedonia and to demonstrate the analytical value of disaggregated temporal data.

The monthly figures summarized in Table 4 indicate a pronounced concentration of tourism activity during the summer months, reflected in both the absolute number of overnight stays and the marked increase in average length of stay. This pattern suggests that seasonal peaks are driven not only by higher arrival volumes but also by extended stays, which intensify pressure on accommodation capacity and hospitality services. In contrast, spring and early autumn months are characterized by shorter average stays and a higher relative share of foreign tourists, pointing to a different demand profile associated with business travel, transit tourism, and short-term city visits.

Tourism demand varies substantially across seasons. During the spring months, foreign tourists account for a dominant share of arrivals and overnight stays, indicating strong international mobility outside the main holiday season. Conversely, the summer peak is accompanied by a noticeable increase in the domestic segment, which contributes substantially to overnight stays through longer durations of stay. This seasonal rebalancing between domestic and foreign demand highlights the dual role of tourism in the national context: as an internationally oriented sector during off-peak periods and as a domestically driven stabilizing activity during peak vacation months.

Monthly indicators clarify trends observed in annual statistics. The decline in average length of stay observed in annual data during the recovery period can be understood as the net result of opposing seasonal forces: shorter international visits during much of the year combined with longer domestic stays concentrated in a limited number of peak months. Without monthly disaggregation, these offsetting effects would remain obscured within annual averages.

Seasonal concentration strongly influences hospitality turnover. Concentration of overnight stays in a narrow seasonal window implies that a substantial portion of annual turnover is generated during a limited number of months, increasing sensitivity to short-term shocks and capacity constraints. This observation underscores the importance of integrating temporal disaggregation into economic analyses of tourism, particularly when turnover is used as a proxy for tourism-related economic activity.

It is important to emphasize that the monthly analysis presented here is illustrative rather than exhaustive. The selected period does not constitute a sufficiently long or uninterrupted time series to support formal seasonal adjustment or forecasting models. Nevertheless, the inclusion of monthly indicators demonstrates how temporal disaggregation enhances analytical interpretation by linking structural composition, average length of stay, and seasonal concentration within a coherent statistical framework.

Overall, the monthly evidence complements the annual analysis by providing a clearer understanding of intra-year dynamics and by reinforcing the methodological argument that tourism statistics gain explanatory power when volume, structure, and timing are jointly considered. Future research based on longer monthly series could extend this approach through formal seasonal modeling and deeper integration of price and capacity indicators.

8. Critical Assessment and Policy Implications

The empirical results provide a clear overview of tourism in the Republic of North Macedonia, but raise questions regarding coverage and analytical depth of official series. The statistical base focuses on registered accommodation establishments, potentially underestimating total volume when private or informal accommodation is significant. Hospitality turnover is an aggregate indicator rather than a strictly tourism-specific measure, making deflation and complementary indicators desirable. Interpretation becomes more convincing with spatial disaggregation, as national aggregates conceal concentration in a limited number of centers. Seasonal analysis requires complete monthly series and formal correction methods. Causality remains unresolved, as correlation and simple regression indicate strong statistical relationships but do not isolate channels of influence. From a policy perspective, the 2020 series highlights the stabilizing effect of domestic demand, while the growth in 2024 underscores the importance of foreign arrivals and the need for market diversification and longer-stay products.

9. Conclusion

The results demonstrate clear changes in tourism activity during the pre-crisis, crisis, and recovery periods. The annual time series clearly reflect the impact of the 2020 crisis, followed by a phase of gradual recovery in 2021 and 2022 and a subsequent consolidation of tourism volumes in 2023 and 2024. The empirical evidence confirms that the recovery process has been characterized by a renewed dominance of foreign arrivals, while domestic tourism has retained a significant role in the overall volume of overnight stays due to longer average durations of stay.

The analysis highlights the importance of distinguishing between arrivals and overnight stays as complementary indicators of tourism demand. Changes in arrival volumes do not translate mechanically into changes in overnight stays, as shifts in the structural composition of demand and in average length of stay alter the relationship between volume and intensity. Ratio-based indicators such as turnover per tourist and turnover per overnight stay further illustrate how economic outcomes in the hospitality sector evolve in relation to tourism activity, while also underscoring the influence of price dynamics and non-tourism consumption embedded in aggregate turnover measures.

Correlation analysis and a deliberately limited regression model provide additional insight into the association between tourism intensity and hospitality sector turnover. While these results confirm a strong positive relationship, the analysis explicitly avoids causal claims, recognizing the constraints imposed by a short annual time series and the presence of an exceptional structural disruption. In this context, the econometric component serves as an analytical complement to descriptive and structural indicators rather than as a definitive explanatory model.

The applied framework may support future tourism analysis using longer and spatially disaggregated series. The results underscore the analytical potential of descriptive and ratio-based measures in data-constrained environments, while pointing to clear directions for future research, including the use of deflated economic indicators, longer and fully disaggregated monthly series, and spatially differentiated analysis. In this sense,

statistical processing is positioned not as a purely technical exercise, but as a foundational element of evidence-informed tourism analysis and policy deliberation.

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