İŞLETME ARAŞTIRMALARI DERGİSİ
JOURNAL OF BUSINESS RESEARCH-TURK
2026, 18(3), 1819-1837
https://doi.org/10.20491/isarder.2026.2269

The Impact of Domestic and Global Financial Indicators on the BIST Tourism Index

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ARTICLE INFO

Keywords:
BIST tourism index
Tourism income
Exchange rate
CDS
ARDL bounds test

Received 20 December 2025
Revised 15 July 2026
Accepted 20 July 2026

Article Classification:
Research Article

ABSTRACT

Purpose – This study analyzes the dynamics of the BIST Tourism Index (XTRZM), which represents the tourism sector as a key component of Türkiye's service sector and economy, in Borsa Istanbul. It examines the effects of domestic indicators (tourism income, the exchange rate, and credit default swaps (CDS)) and global indicators (DJUSTT and VIX) on XTRZM using monthly data from May 2019 to June 2025. The study aims to jointly model these five domestic and global drivers within a single ARDL framework over a period encompassing the COVID-19 shock, the 2023 Kahramanmaraş earthquake, and two election episodes, whereas previous studies have largely examined these determinants in isolation.

Design/methodology/approach – The ARDL bounds testing approach is employed to test for long-run cointegration between XTRZM and the selected domestic and global variables. An error correction model (ECM) is then estimated to capture short-run dynamics and the speed of adjustment toward the long-run equilibrium.

Findings – The results indicate that tourism income has a negative long-run effect on XTRZM, whereas the exchange rate, DJUSTT, and CDS have positive long-run effects. The ECM coefficient suggests that approximately 58% of deviations from the long-run equilibrium are corrected within one period.

Discussion – The findings imply that both domestic and global indicators should be considered when evaluating tourism index investments. Although tourism income is generally viewed as a positive signal, the negative association may reflect increased operating costs during peak seasons that reduce valuations of tourism-related stocks. In addition, CDS, through its link with exchange rate dynamics, may be associated with stronger performance of tourism-related stocks. The positive relationship between XTRZM and DJUSTT also points to stronger global integration of the sector. The findings suggest that exchange-rate dynamics, sovereign risk, and firm-level profitability should be considered by investors when evaluating XTRZM, while policymakers should prioritize exchange-rate stability and the management of sovereign risk premia to support the resilience of the tourism sector.

1. Introduction

Tourism in developing countries is a key driver of economic growth because it generates foreign exchange, creates employment, and stimulates related industries (Doğru & Sırakaya-Türk, 2017; Doğru & Bulut, 2018; Adedoyin et al., 2022). In 2024, the travel and tourism sector accounted for about 10% of global Gross Domestic Product, contributed approximately USD 10.9 trillion, and supported 357 million jobs, which is about one in every ten jobs worldwide (World Travel & Tourism Council, 2024). In Türkiye, tourism income increased from USD 56.4 billion in 2023 to USD 61.1 billion in 2024, underscoring the sector's strategic role in financing the current account deficit and strengthening foreign exchange reserves (Turkish Statistical Institute, 2024). These patterns are consistent with the tourism-led growth hypothesis, which emphasizes tourism's contribution to macroeconomic and financial stability (Katırcıoğlu et al., 2018). However, shocks such as COVID-19, geopolitical tensions, the 2023 Kahramanmaraş earthquake, and election-related uncertainties suggest that tourism can both support growth and increase vulnerability (Demirel & Arıca, 2022; Vurur & Özdemir, 2023).

In this context, examining the stock market performance of the tourism sector provides a timely gauge of sectoral conditions, resilience to shocks, and investor confidence. The BIST Tourism Index (XTRZM) tracks the market performance of listed tourism firms and can quickly reflect macroeconomic and sector-specific

ETHICAL APPROVAL: This study used secondary data and does not require ethical committee approval.

Suggested Citation
Kemeç, U., Güryel, A. (2026). The Impact of Domestic and Global Financial Indicators on the BIST Tourism Index, Journal of Business Research-Turk, 18 (3), 1819-1837.

developments (Demir et al., 2017). Identifying the domestic and global determinants of XTRZM is therefore important for understanding market linkages and for drawing implications for investors and policymakers.

Greater global integration allows shocks to spread rapidly from developed markets to developing countries (Diebold & Yılmaz, 2009). The VIX reflects fluctuations in global uncertainty, and declines in risk appetite tend to spill over to markets such as Türkiye (Tuncay, 2021). The DJUSTT summarizes global tourism dynamics and enables the measurement of sectoral co-movement in financially integrated economies (Nazlıoğlu, 2022). Hence, Türkiye's tourism stocks may be influenced by both VIX-related changes in risk appetite and movements in DJUSTT.

Domestic macro-financial conditions are also important for XTRZM. The exchange rate can affect both income and cost channels, so its theoretical effect is ambiguous. A flow-oriented view suggests that depreciation improves price competitiveness and stimulates foreign demand (Phylaktis & Ravazzolo, 2005), whereas a stock-oriented or portfolio-balance view suggests that a stronger currency supports balance-sheet strength and financial soundness (Branson, 1983). In simpler terms, a weaker lira can help tourism firms by making Türkiye cheaper for foreign visitors and by raising the local-currency value of their foreign-currency earnings, whereas a stronger lira can help by strengthening their balance sheets; which of these two effects dominates is therefore ultimately an empirical question. Rising CDS premiums, which proxy country risk, generally depress equity valuations (Yıldırım et al., 2020; Öcal & Ekmen, 2021). Sovereign risk shocks can also transmit through the exchange rate channel because higher CDS levels often coincide with depreciation, which may temporarily improve tourism competitiveness (Della Corte et al., 2022). This transmission can be incomplete, however, because listed firms capture only part of sectoral income and face pronounced seasonality, which helps explain the heterogeneous stock market responses reported in prior studies (Demir et al., 2017; Güdük, 2018).

Empirical evidence on the determinants of XTRZM is mixed. Özçalık and Özçalık (2020) found no long-run relationship between exchange rates and XTRZM, whereas Yılmaz and Menteş (2022) reported a significant negative long-run relationship between the USD exchange rate and XTRZM. Yaman and Korkmaz (2020) showed statistically significant volatility spillovers from major exchange rates to XTRZM returns. Regarding country risk, Yıldırım et al. (2020) identified one-way Granger causality from CDS premiums to XTRZM returns and documented short-run negative responses of XTRZM to both CDS and USD shocks. Akdağ et al. (2019) reported that increases in the VIX reduce tourism index returns. Taken together, however, this body of evidence leaves important gaps unaddressed. Prior studies have largely examined determinants such as the exchange rate (Özçalık & Özçalık, 2020; Yaman & Korkmaz, 2020; Yılmaz & Menteş, 2022), country risk (Yıldırım et al., 2020), and global uncertainty (Akdağ et al., 2019) independently, leaving the joint long-run effects of domestic and global financial determinants within a unified analytical framework insufficiently explored. In the related cross-market tourism-index literature, the relationship between DJUSTT and XTRZM also remains underexamined; to the best of our knowledge, Gökmen and Çömlekçi (2018) is the only study to investigate this relationship directly. Their findings indicate no cointegration between the two indices, leaving the question of Türkiye's co-movement with the global tourism-equity cycle unresolved. Empirical coverage of the period marked by COVID-19, the 2023 Kahramanmaraş earthquake, and election-related uncertainty also remains limited, even though these shocks are the conditions under which domestic and global channels are most likely to interact. The present study addresses these gaps by providing, to the best of our knowledge, the first unified treatment that models tourism income, the exchange rate, and the CDS premium as domestic drivers together with DJUSTT and the VIX as global drivers within a single ARDL framework estimated over the May 2019–June 2025 window. In doing so, it contributes to the tourism finance literature both empirically, by providing new long-run evidence on the DJUSTT–XTRZM linkage and the co-movement of Turkish tourism equities with global tourism-sector conditions, and conceptually, by showing how domestic and global financial channels jointly shape a sectoral equity index during a period of successive macroeconomic shocks.

To address this gap, the present study examines domestic and global drivers of XTRZM using monthly data from May 2019 to June 2025. The relationships between XTRZM and key domestic indicators (tourism income, exchange rate, CDS premium) and global indicators (VIX, DJUSTT) are analyzed using the Autoregressive Distributed Lag (ARDL) bounds testing approach (Pesaran et al., 2001), which accommodates mixed

integration orders I(0) and I(1). To account for extraordinary events such as COVID-19, the 2023 earthquake, and elections, the Lee and Strazicich (2003) unit-root test with structural breaks is also applied.

The study is grounded in the Efficient Market Hypothesis (Fama, 1970), which holds that asset prices reflect available information and that new information is incorporated into prices without systematic delay. In its semi-strong form, the hypothesis implies that publicly available macro-financial information should be reflected in equity prices once it becomes known. Applied to the tourism sector, this framing suggests that XTRZM should respond to publicly observable signals about tourism income, the exchange rate, Türkiye's CDS premium, the VIX, and DJUSTT. Accordingly, the long-run coefficients estimated below can be interpreted as evidence on how XTRZM is associated with the information content of each indicator over time. This information-efficiency perspective also supports the empirical strategy of relating XTRZM to observable domestic and global indicators, since under semi-strong-form efficiency such public information should be incorporated into prevailing prices.

The spillover and transmission perspective of Diebold and Yılmaz (2009) complements this framing by describing how return and volatility shocks propagate across financially integrated markets. It implies that global developments, captured here by the VIX and DJUSTT, may be reflected in XTRZM both directly and alongside domestic financial channels, particularly the exchange rate and sovereign-risk channels. Rising global risk aversion, for example, may coincide with pressure on the Turkish lira and wider CDS spreads, thereby altering the domestic financial conditions under which tourism equities are priced. This transmission logic motivates the joint inclusion of global and domestic indicators in a single specification: it is the combined long-run behavior of these channels, rather than any single indicator in isolation, that the ARDL framework is used to examine.

By integrating previously fragmented approaches into a unified framework for the 2019–2025 period, this study covers a window marked by COVID-19, the 2023 Kahramanmaraş earthquake, and election-related uncertainty. The results provide evidence on the exposure of Türkiye's tourism equities to both domestic financial conditions and global tourism-equity dynamics. From a policy standpoint, the findings underscore the roles of exchange-rate stability, sovereign-risk premia, and tourism income in sustaining sectoral resilience. From an investment standpoint, they suggest that XTRZM is sensitive to exchange-rate movements and global tourism-equity conditions, making these indicators relevant for portfolio monitoring and risk assessment.

2. Literature Review

Research on the determinants of the Borsa Istanbul Tourism Index (XTRZM) examines both country-specific macro-financial variables, including the exchange rate, the interest rate, energy prices, tourism income, and the CDS premium, and global indicators such as the VIX, DJUSTT, EPU, and GPR. The literature consistently shows that movements in these indicators shape the stock performance of tourism firms and the index level itself.

With respect to exchange rate dynamics, the literature is extensive, though its conclusions are mixed. Özçalık and Özçalık (2020) document short-run Granger causality from USD/TRY and EUR/TRY to XTRZM for the period 2010–2019, while finding no cointegration in the long run. Using monthly data for 2011–2022, Ahmadov et al. (2023) report significant causality links between USD, EUR, and GBP and XTRZM. Yaman and Korkmaz (2020) employ a multivariate VECH-GARCH model and show statistically significant volatility spillovers from USD, EUR, GBP, and RUB to XTRZM returns, with effects that intensify during crisis periods. Applying ARDL bounds testing and Granger analysis for 2003–2022, Yılmaz and Menteş (2022) detect cointegration and estimate that a 1% rise in the exchange rate lowers XTRZM by approximately 0.8%, together with bidirectional causality between the variables. In a complementary VAR study for 2008–2020, Demirkale and Can (2021) show that XTRZM responds positively to dollar shocks in the short run, weakly negatively to the interest rate, and weakly positively to oil prices, underscoring the sensitivity of the index to currency movements and monetary conditions.

Regarding persistence, Soyaslan (2019) and Özçalık and Özçalık (2020) do not find a long-run equilibrium and conclude that exchange rate influences are primarily short-run in nature. This pattern suggests that estimated effects depend on the sample window, the empirical method, and the period under consideration.

Beyond the exchange rate, additional sector-related indicators matter. Demir et al. (2017) show that increases in consumer confidence, the exchange rate, and the number of foreign tourists help explain XTRZM during 2005–2013, whereas oil prices and imports become decisive after the global financial crisis. Within a VAR framework from March 2010 to February 2020, Yıldırım et al. (2020) focus on the CDS premium, the exchange rate, and the VIX. They find unidirectional causality from the CDS premium to XTRZM and show that shocks in the dollar rate and the CDS premium depress the index in the short run, whereas the role of the VIX remains weak. In related work for 2012–2020, Öcal and Ekmen (2021) use VAR and VECM and show that increases in tourism income are associated with a decline in the CDS premium, implying a risk-reducing role for tourism. They do not find direct causality among the CDS premium, the exchange rate, and XTRZM.

From a global integration perspective, Gökmen and Çömlekçi (2018) analyze tourism indices for 25 countries, including DJUSTT, and find that XTRZM is cointegrated with Spain, Taiwan, and Greece in the long run but not with DJUSTT. This result implies co-movement primarily with Mediterranean peers. Nazlıoğlu (2022) shows within a VAR setting for 2006–2022 that exchange rate shocks produce short-run negative effects on both XTRZM and the Global Tourism Index, whereas causality runs from XTRZM to the global index.

The literature on global risk and uncertainty also points to clear patterns. Akdağ and İskenderoğlu (2021) establish long-run relationships between tourism indices and the VIX, EPU, and GPR, and their DOLS and FMOLS estimates highlight a particularly strong negative effect of the VIX. Demirel and Arıca (2022) report that shocks in the VIX during the COVID-19 period generate short-run declines across sectoral indices, including XTRZM, with the effect fading by around the eighth horizon. In a multi-country setting, Akdağ et al. (2019) find that higher VIX significantly reduces tourism index returns in the long run, with persistent effects in several countries. Using daily data for 2013–2020, Tuncay (2021) shows significant and negative volatility transmission from the VIX to XTRZM, indicating that XTRZM reacts distinctively to global risk cycles. More recent evidence reinforces the salience of the VIX for equity markets: Kirci Altinkeski et al. (2024) document significant quantile connectedness between the VIX and global stock markets, with spillovers that intensify at market extremes, consistent with the transmission of global volatility to markets such as Türkiye. In a similar vein, Liu et al. (2022) propose a threshold-based approach and show that incorporating the VIX, and especially its above-threshold values, significantly improves the out-of-sample forecasting of U.S. stock-market volatility, with the gains most pronounced during economic expansions.

Within the EPU strand, Demir and Ersan (2018) show for 2002–2013 that increases in the European EPU index and domestic uncertainty events in Türkiye reduce tourism stock returns, whereas stronger consumer confidence supports them. Using partial wavelet coherence over 1997–2023, Ceylan (2023) finds that the negative relationship between EPU and XTRZM weakens once market conditions are controlled, although European EPU, particularly that originating from France and Germany, continues to exert a negative influence when exchange rate effects are considered. These findings imply indirect transmission through market and currency channels. In line with this channel-based interpretation, the present study models the global risk factor with the VIX and treats EPU as contextual background to avoid overlapping channels and potential multicollinearity.

Evidence from the Fourier–Toda–Yamamoto approach in Soyu Yıldırım (2023) points to unidirectional causality from the VIX to XTRZM and bidirectional causality between the global EPU index and XTRZM, while oil prices and the dollar index also affect the index. Vurur and Özdemir (2023) identify cointegration between global geopolitical risk and XTRZM and estimate that a 1% rise in global GPR reduces XTRZM by approximately 4.45%. Likewise, Şahin (2025) uses an SVAR model with monthly data for 2008–2024 and shows that exchange rate shocks lift XTRZM in the short run but depress it in the medium and long run through the cost channel. The effects of the interest rate and the producer price index are limited, and there is bidirectional causality between USD/TRY and XTRZM.

Two international studies reinforce these mechanisms. In the United States, Obi and Ogbeide (2022) show within a nonlinear ARDL framework that including the exchange rate and implied volatility as mediating variables yields long-run cointegration and bidirectional causality between tourism and economic growth. In India, Sharma et al. (2022) document asymmetric responses of tourism demand to exchange rate movements, whereby depreciation stimulates arrivals and appreciation dampens them.

Read as a whole, this body of evidence does not point to a settled consensus but rather to a set of unresolved empirical debates that are instructive for the present design. The most persistent controversy concerns the exchange-rate–XTRZM nexus, where estimates diverge along both the significance and the time-horizon dimensions. In the long run, Yılmaz and Menteş (2022) identify a significant negative cointegrating relationship in which a 1% rise in the exchange rate lowers XTRZM by roughly 0.8%, whereas Soyaslan (2019) and Özçalık and Özçalık (2020) find no long-run equilibrium and interpret currency effects as primarily short-run phenomena. In the short run, the sign itself is contested: Demirkale and Can (2021) report a positive response of XTRZM to dollar shocks, while Yıldırım et al. (2020) and Nazlıoğlu (2022) document negative short-run reactions. Şahin (2025) accounts for part of this tension by showing that the horizon matters within a single sample, with exchange-rate shocks raising the index in the short run but weighing on it over the medium and long run. A parallel disagreement surrounds sovereign risk: Yıldırım et al. (2020) find that CDS shocks depress XTRZM in the short run and detect one-way causality from CDS to the index, whereas Öcal and Ekmen (2021) report no significant direct effect of the CDS premium on XTRZM. Evidence on global volatility is similarly mixed. Akdağ et al. (2019) find that increases in the VIX reduce tourism-index returns, and Tuncay (2021) reports significant volatility interactions between the VIX and BIST sector indices, including XTRZM; by contrast, Yıldırım et al. (2020) find the explanatory role of the VIX to be weak once the exchange rate and the CDS premium are included. These conflicting results appear to reflect differences in sample window, data frequency, variable set, and estimation method, such as cointegration-based designs versus VAR and impulse-response designs, or pre-pandemic samples versus samples that span COVID-19 and the subsequent shocks. This heterogeneity motivates the study's use of a single, internally consistent ARDL bounds-testing framework that jointly accommodates domestic and global determinants over the post-2019 period, separating long-run and short-run channels within one specification and providing a more comparable benchmark for interpreting these divergent findings.

Taken together, the literature for Türkiye indicates that XTRZM is highly sensitive to domestic indicators, including the exchange rate, tourism income, and the CDS premium, as well as to a salient global factor represented by the VIX. To the best of our knowledge, apart from the contribution by Gökmen and Çömlekçi (2018), no study directly examines the linkage between DJUSTT and XTRZM. Because DJUSTT captures global sentiment in the tourism industry, relating DJUSTT to XTRZM can reveal the co-movement of Turkish tourism equities with global tourism cycles. Against this background, the present study investigates the long-run relationship among XTRZM, DJUSTT, the VIX, the CDS premium, USD/TRY, and tourism income through an ARDL framework, thereby providing a holistic assessment of domestic and global drivers. Figure 1 summarizes the resulting conceptual framework, mapping each domestic and global determinant to XTRZM together with its theoretically expected sign. Consistent with the discussion above, the framework also makes explicit the exchange-rate channel through which sovereign risk is hypothesized to transmit to tourism equities, so that the sign expected for the CDS premium is conditioned on this indirect currency mechanism rather than on a direct valuation effect.

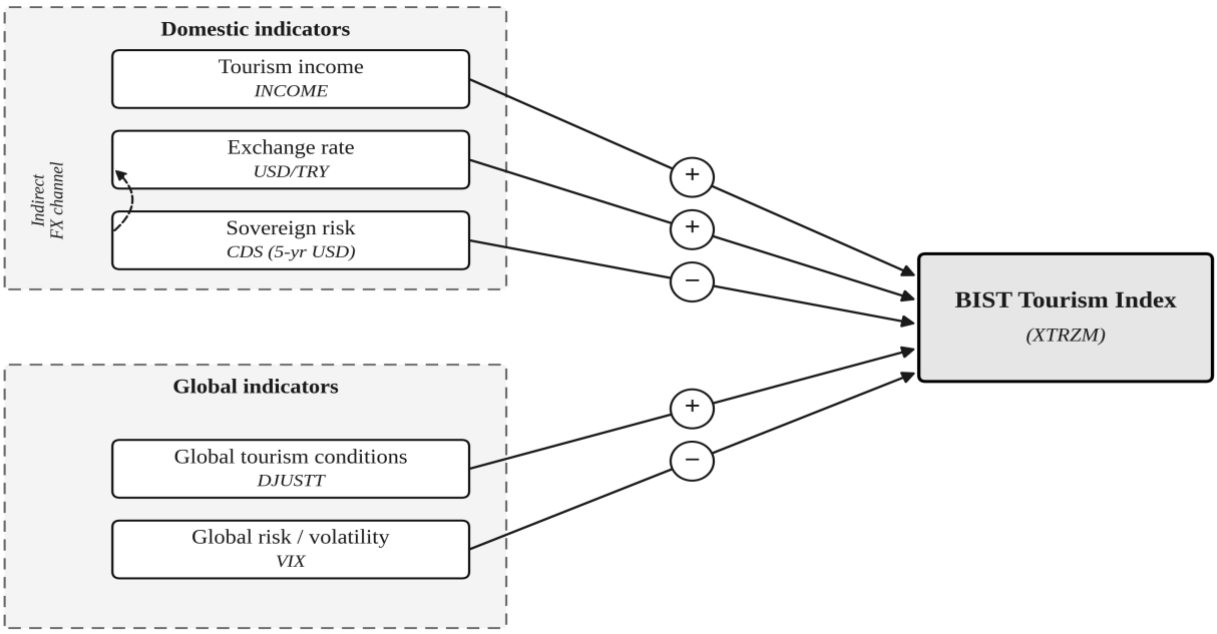

Figure 1. Conceptual framework of expected relationships. Domestic indicators — tourism income (INCOME, expected +), exchange rate (USD/TRY, +), sovereign risk (CDS, −); global indicators — global tourism conditions (DJUSTT, +) and global risk/volatility (VIX, −) — are each mapped to the BIST Tourism Index (XTRZM). The dashed arrow from CDS to USD/TRY represents the indirect exchange-rate channel, reflecting the tendency for higher CDS spreads to be associated with currency depreciation (Della Corte et al., 2022). Signs in parentheses denote the a priori expected direction of the long-run effect on XTRZM, as specified in Table 1.

3. Data and Methodology

This study investigates the long-run relationship between the BIST Tourism Index (XTRZM) and a set of domestic and global indicators, namely the global risk indicator VIX, the Dow Jones U.S. Travel and Tourism Index (DJUSTT), Türkiye's CDS premium, the exchange rate (USD/TRY), and Türkiye's tourism income. Tourism income, the exchange rate, and the CDS premium are country-specific indicators, whereas DJUSTT and VIX are global indicators and are included in the model as factors that may affect XTRZM. Table 1 reports the variables, data sources, and expected signs.

Table 1. Variables and Expected Signs

Variable	Explanation	Source	Expected Sign
XTRZM	Borsa Istanbul Tourism Index monthly data	Investing	Dependent variable
INCOME	Türkiye's tourism income monthly data	TurkStat	+
USD	USD/TRY exchange rate, monthly data	Investing	+
DJUSTT	Dow Jones U.S. Travel & Tourism Index monthly data	Investing	+
CDS	Türkiye 5-year USD CDS spread, monthly data	Investing	-
VIX	VIX index, monthly data (CBOE Volatility Index)	Investing	-

The dataset consists of monthly observations from May 2019 to June 2025 because tourism income for Türkiye is available at a monthly frequency. The sample period is also informative for empirical identification because it covers the pre-COVID-19 period and allows the potential effects of COVID-19 to be assessed. In addition, the occurrence of one local and one general election during the sample provides a basis for evaluating political uncertainty over time. Finally, the period includes the February 6, 2023, Kahramanmaraş earthquake and major exchange rate fluctuations, both of which are relevant for the tourism sector and related financial variables.

The resulting sample comprises 74 monthly observations, and this dimension is acknowledged as a limitation of the study. The sample length is constrained by the monthly frequency of Türkiye's tourism income series,

which is the binding, highest-frequency indicator among the variables and cannot be observed at a higher frequency, while the May 2019 start is retained deliberately so that the pre-COVID-19 period is bracketed and the pandemic, the 2023 Kahramanmaraş earthquake, and two election episodes fall within a single, internally consistent window. Extending the series backward would not resolve the frequency constraint and would risk combining structurally different sub-periods. The ARDL bounds testing approach is nonetheless well suited to this setting, as it was developed to be applicable in relatively small samples and does not require a pre-classification of the regressors as purely I(0) or purely I(1) (Pesaran et al., 2001). The lag order is selected by the Akaike Information Criterion within a maximum lag of eight, and the finite-sample adequacy of the retained specification is supported by the diagnostic tests reported below, which indicate normally distributed residuals, no serial correlation, no heteroskedasticity, and correct functional form, together with the CUSUM and CUSUM of squares statistics, which remain within the 5% critical bounds. These results suggest that, notwithstanding the limited number of observations, the estimated model is statistically well behaved.

Equation (1) is specified to examine the determinants of XTRZM:

$$LOGXTRZMt = \beta_0 + \beta_1 LOGINCOMEt + \beta_2 LOGUSDt + \beta_3 LOGDJUSTTt + \beta_4 LOGCDSt + \beta_5 LOGVIXt + \varepsilon t \quad (1)$$

The expected signs in Table 1 are motivated as follows. Higher tourism income is expected to raise the incomes of tourism firms operating in Türkiye. Because some of these firms are included in XTRZM, tourism income is expected to affect XTRZM positively. Similarly, an increase in the exchange rate is expected to support the index by improving international demand for Türkiye as a destination and raising tourism-related incomes. Increases in DJUSTT, which reflects the international outlook of the tourism industry, are expected to be associated with upward movements in XTRZM by capturing sector-wide global conditions. Conversely, increases in Türkiye's CDS premium (a domestic risk indicator) and VIX (a global risk indicator) are expected to raise risk perceptions and therefore exert negative pressure on XTRZM.

The selection of the explanatory variables reflects a deliberate balance between theoretical relevance, channel coverage, and parsimony. Each variable is included because it captures a distinct channel through which domestic and global conditions may affect XTRZM. Tourism income represents the sector-specific real activity and demand channel; the exchange rate reflects the currency, competitiveness, and cost channel; the CDS premium proxies Türkiye-specific sovereign-risk conditions; the VIX indexes global risk aversion; and DJUSTT stands for global tourism-equity conditions. This structure allows the model to combine domestic real and financial channels with global risk and sectoral equity channels within a single ARDL specification. At the same time, with five regressors and 74 observations, the model already imposes a substantial demand on the available degrees of freedom, so the variable set is intentionally kept parsimonious. Additional variables discussed in the literature, including economic policy uncertainty (Demir & Ersan, 2018; Ceylan, 2023), domestic interest rates and oil prices (Demirkale & Can, 2021; Şahin, 2025), geopolitical risk (Vurur & Özdemir, 2023), and tourist-arrival figures (Demir et al., 2017), are therefore left outside the baseline specification. Some of these channels are partly reflected in the variables already included: domestic monetary and risk conditions are captured through the exchange rate and the CDS premium, while global tourism-sector sentiment is represented by DJUSTT and broader global risk conditions by the VIX. Incorporating additional indicators is left to future research using longer samples or higher-dimensional methods.

Table 2 presents descriptive statistics. Based on Jarque–Bera probabilities, the null hypothesis of normality is rejected for most series at the 10% level, except for CDS and DJUSTT (Gujarati & Porter, 2009; Göksu & Balkı, 2023). This is consistent with the common finding that financial series often deviate from normality (Mandelbrot, 1963; Fama, 1965). At the same time, the proximity of mean and median values suggests that extreme asymmetry is limited for several variables even when normality is rejected.

Table 2. Descriptive Statistics

	LOGXTRZM	LOGINCOME	LOGUSD	LOGDJUSTT	LOGCDS	LOGVIX
Mean	2.656999	6.455849	1.170229	2.891223	2.609159	1.296491
Median	2.679950	6.503602	1.218359	2.881252	2.594965	1.271958
Maximum	3.197716	6.939716	1.600031	3.140524	2.923363	1.728678
Minimum	1.789792	5.247155	0.747054	2.660590	2.379885	1.094820
Std. Dev.	0.415344	0.363987	0.294946	0.114749	0.143516	0.138616
Skewness	-0.558244	-1.279248	-0.027031	0.150541	0.229109	0.654750
Kurtosis	2.241631	4.817419	1.463906	2.223235	2.089029	3.042102
Jarque-Bera	5.616820	30.36748	7.284395	2.139877	3.206147	5.292733
Probability	0.060301	0.000000	0.026195	0.343030	0.201277	0.070908
Observations	74	74	74	74	74	74

Before selecting the econometric framework, the order of integration of the variables is examined. In this context, the Phillips–Perron (PP) test and the Lee–Strazicich (LS) test with structural breaks are applied, and the results are reported in Tables 3 and 4. Although the two tests yield some differences, all series are found to be either I(0) or I(1), and none requires second differencing. Given these properties, the ARDL bounds testing approach is employed because it allows a mixture of I(0) and I(1) regressors provided that no variable is I(2). This implies that the approach remains valid even when some series are stationary in levels while others become stationary only after first differencing, as is the case in this study. The ARDL error-correction representation is specified as follows:

$$\Delta LOGXTRZM_t = \varphi 0 + \Sigma(i=1 \text{ to } 7)\ \varphi 1i\ \Delta LOGXTRZM_{t-i} + \Sigma(j=0 \text{ to } 7)\ \varphi 2j\ \Delta LOGINCOME_{t-j} + \Sigma(k=0 \text{ to } 4)\ \varphi 3k\ \Delta LOGUSD_{t-k} + \Sigma(l=0 \text{ to } 7)\ \varphi 4l\ \Delta LOGDJUSTT_{t-l} + \Sigma(m=0 \text{ to } 7)\ \varphi 5m\ \Delta LOGCDS_{t-m} + \Sigma(n=0 \text{ to } 7)\ \varphi 6n\ \Delta LOGVIX_{t-n} + \beta 1 LOGXTRZM_{t-1} + \beta 2 LOGINCOME_{t-1} + \beta 3 LOGUSD_{t-1} + \beta 4 LOGDJUSTT_{t-1} + \beta 5 LOGCDS_{t-1} + \beta 6 LOGVIX_{t-1} + \varepsilon t \quad (2)$$

In summary, this section has presented the expected effects of the independent variables on the dependent variable in Table 1, the descriptive statistics in Table 2, the long-run model specification in Equation (1), and the ARDL model in Equation (2). The empirical findings are presented in the following section.

4. Empirical Findings

In time-series analysis, stationarity is a fundamental requirement because regressions involving non-stationary variables may yield spurious relationships (Baumöhl & Lyócsa, 2009; Leschke & Finn, 2019; Göksu & Balkı, 2023). Accordingly, the stationarity properties of the variables are first examined using the Phillips–Perron (PP) unit root test (Phillips & Perron, 1988). The PP test results, reported in Table 3, indicate that LOGVIX is stationary at level, I(0), whereas the remaining variables become stationary after first differencing, I(1).

Table 3. Phillips-Perron (PP) Unit Root Test

PP	**Cons.**		**Cons. and Trend**		**No Cons. and Trend**	
Level	t-stat.	Prob.	t-stat.	Prob.	t-stat.	Prob.
LOGXTRZM	-1.8770	**0.3413**	-2.2599	**0.4499**	2.4959	**0.9968**
LOGINCOME	-1.9772	**0.2961**	-2.4760	**0.3389**	0.0452	**0.6941**
LOGUSD	-0.1547	**0.9386**	-2.4052	**0.3739**	3.7501	**0.9999**
LOGDJUSTT	-0.8342	**0.8032**	-1.8650	**0.6624**	1.0731	**0.9248**
LOGCDS	-1.8970	**0.3320**	-2.0830	**0.5463**	-0.5412	**0.4792**
LOGVIX	-3.5796	**0.0085*** **	-3.9344	**0.0154** **	-0.2863	**0.5795**
Δ LOGXTRZM	-7.5022	**0.0000*** **	-7.5813	**0.0000*** **	-6.9101	**0.0000*** **
Δ LOGINCOME	-4.7372	**0.0002*** **	-4.7060	**0.0016*** **	-4.7797	**0.0000*** **
Δ LOGUSD	-7.3458	**0.0000*** **	-7.2821	**0.0000*** **	-6.1801	**0.0000*** **
Δ LOGDJUSTT	-8.8928	**0.0000*** **	-8.9621	**0.0000*** **	-8.8569	**0.0000*** **
Δ LOGCDS	-7.1281	**0.0000*** **	-7.1113	**0.0000*** **	-7.1854	**0.0000*** **

Note: *** — significant at p <0.01, ** — significant at p <0.05, * — significant at p <0.1.

Because conventional unit root tests may be sensitive to structural changes, the Lee–Strazicich (LS) unit root test, which allows for structural breaks, is also implemented (Lee & Strazicich, 2003). The LS results in Table 4 suggest that LOGINCOME and LOGCDS are stationary at level, I(0), whereas LOGXTRZM, LOGUSD, LOGDJUSTT, and LOGVIX are stationary at first difference, I(1). Although the PP and LS tests differ for some variables, both sets of results confirm that all series are integrated of order zero or one and that none is I(2). This mixed integration order supports the use of the ARDL bounds testing approach for cointegration, which is valid when regressors are a combination of I(0) and I(1) but not I(2) (Pesaran et al., 2001).

Table 4. Lee and Strazicich (LS) Unit Root Test Result

Variables	At Level			First Difference			Decision
	Lag	Break Point	t-stat.	Lag	Break Point	t-stat.	
LOGXTRZM	3	$2021_{M04} – 2023_{M09}$	-5.7610	5	$2020_{M06} – 2024_{M02}$	**-6.8625*** **	I(1)
LOGINCOME	7	$2021_{M01} – 2021_{M09}$	**-6.3299** **				I(0)
LOGUSD	8	$2021_{M09} – 2023_{M05}$	-6.1107	2	$2021_{M09} – 2022_{M02}$	**-7.4483*** **	I(1)
LOGDJUSTT	8	$2020_{M09} – 2022_{M04}$	-5.4392	1	$2020_{M05} – 2022_{M08}$	**-8.4006*** **	I(1)
LOGCDS	8	$2020_{M12} – 2023_{M05}$	**-6.4670** **				I(0)
LOGVIX	7	$2023_{M04} – 2024_{M05}$	-5.2814	1	2021_{M09} - 2023_{M03}	**-8.7476*** **	I(1)

Note: *** — significant at p <0.01, ** — significant at p <0.05, * — significant at p <0.1.

An examination of the structural break dates from the Lee–Strazicich test suggests economically plausible episodes across the variables. For XTRZM, the break around June 2020 (2020M06) coincides with the relaxation of COVID-19 restrictions and the partial reopening of travel, which is in line with stronger tourism activity at the start of the summer season. The subsequent break around February 2024 (2024M02) aligns with heightened domestic political uncertainty in the run-up to the March 31, 2024, local elections. Breaks in tourism income around January 2021 and September 2021 are consistent with distinct phases of the pandemic, including renewed mobility restrictions and uncertainty associated with the global spread of the Delta variant. In the exchange rate series, the break around September 2021 coincides with intensified inflation and currency pressures alongside accommodative monetary conditions, whereas the break around February 2022 is broadly consistent with shifting expectations regarding exports, tourism receipts, and domestic stabilization measures. For DJUSTT, the break around May 2020 corresponds to global repricing during the initial COVID-19 shock and subsequent reopening expectations, while the August 2022 break is consistent with the normalization of travel demand. In the CDS series, the break around December 2020 is broadly consistent with changes in domestic policy expectations, whereas the break around May 2023 coincides with elevated uncertainty around the presidential election period and the macro-fiscal implications of the February 6, 2023, Kahramanmaraş earthquakes, alongside tighter global financial conditions. Finally, break dates in VIX around September 2021 and March 2023 align with major global risk episodes, including renewed pandemic uncertainty and the U.S. banking stress episode, respectively.

Accordingly, the ARDL bounds testing approach is employed to assess whether a long-run (cointegrating) relationship exists among the variables; the bounds test results are reported in Table 5.

Table 5. ARDL Bounds Test Result

$f(LOGXTRZM) = (LOGINCOME, LOGUSD, LOGDJUSTT, LOGCDS, LOGVIX)$							
ARDL (8, 8, 5, 8, 8, 8)							
k	**5**	**Critical values at 1% significance level**		**Critical values at 2.5% significance level**		**Critical values at 5% significance level**	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
F-statistic	6.657865	3.41	4.68	2.96	4.18	2.62	3.79

Given the monthly frequency of the data, the maximum lag length was set to 8. The most appropriate model was identified as (8, 8, 5, 8, 8, 8) based on the Akaike Information Criterion (AIC). The ARDL bounds test indicates cointegration, as the F-statistic (6.6579) exceeds the upper-bound critical value at the 1% level. Long-run coefficients are reported in Table 6.

Table 6. Long-Run Form Coefficients

Variable	Coefficient	t-statistic	Probability
LOGINCOME	**-0.657178**	**-3.638280**	**0.0024*** **
LOGUSD	**1.303442**	**8.180303**	**0.0000*** **
LOGDJUSTT	**1.273475**	**2.683118**	**0.0170** **
LOGCDS	**1.027716**	**2.532851**	**0.0230** **
LOGVIX	-0.458944	-1.460542	0.1648

Note: *** — significant at p <0.01, ** — significant at p <0.05, * — significant at p <0.1.

The long-run results indicate that LOGUSD and LOGDJUSTT are positively and statistically significantly associated with LOGXTRZM. In contrast, LOGINCOME is estimated to have a statistically significant negative association with LOGXTRZM. The coefficient on LOGCDS is positive and statistically significant, while the coefficient on LOGVIX is negative but not statistically significant in the long-run specification. Interpreting the elasticities, a 1% increase in USD/TRY is associated with an approximate 1.30% increase in XTRZM, and a 1% increase in DJUSTT is associated with an approximate 1.27% increase in XTRZM. Meanwhile, a 1% increase in tourism income is associated with an approximate 0.66% decrease in XTRZM. The estimated long-run effect of the CDS premium is positive (about 1.03% for a 1% increase), whereas the long-run effect of VIX is statistically insignificant.

These findings include both expected and unexpected patterns. The positive long-run association of USD/TRY with XTRZM is consistent with the view that currency depreciation can strengthen tourism demand by making Türkiye a relatively cheaper destination, while also increasing the local-currency value of foreign-currency earnings. Similarly, the positive association between DJUSTT and XTRZM suggests that Turkish tourism equities co-move with global sector-wide conditions captured by the U.S. travel and tourism index. By contrast, the positive long-run coefficient on CDS is counterintuitive, as higher sovereign risk typically weighs on domestic asset prices. A more formal interpretation is that, in the reduced-form long-run specification, the CDS coefficient does not isolate a pure risk-discount effect but partly proxies an indirect exchange-rate transmission channel. As reported by Della Corte et al. (2022), sovereign risk and the currency co-move, so that increases in Türkiye's CDS premium tend to accompany depreciation of the lira. Because a substantial part of the earnings and competitiveness of the export-oriented tourism sector is effectively foreign-currency denominated, this depreciation raises the local-currency value of foreign tourism receipts and lowers the relative price of Türkiye as a destination, improving both realized competitiveness and the valuation of tourism equities. From an information-efficiency perspective, equity prices are expected to incorporate publicly available information relevant to expected profitability and discounted cash flows, rather than aggregate tourism income alone. From this perspective, a negative tourism-income coefficient is not necessarily inconsistent with rational pricing and may be explained by several complementary mechanisms. First, a divergence may exist between the listed firms represented in XTRZM and the broader tourism sector. XTRZM comprises a relatively small and structurally specific group of listed tourism-related firms, whereas a

large part of the tourism sector lies outside the index. Consequently, aggregate tourism income and the earnings or valuations of listed firms need not move together. This interpretation is consistent with the findings of Güdük (2018), who examines tourism income together with the financial ratios of BIST tourism firms and reports no strong direct correspondence between the two, as well as with the findings of Demir et al. (2017), who show that Turkish tourism stock returns are only partly explained by macroeconomic and tourism-related indicators. Second, reservation-based business models and the associated advance-payment structure, which are pronounced in summer tourism, decouple the timing of recorded aggregate income from the cash-flow timing of listed firms, so that contemporaneous income growth need not map into contemporaneous valuations. Third, a cost-margin channel may operate, as peak-season increases in operating and input costs (labor, energy, and supply-chain expenses) may compress profit margins during high-activity periods, so that periods of buoyant income can coincide with weaker profitability. Taken together, these mechanisms suggest that equity valuations are more closely related to expected profitability than to aggregate tourism income, providing a plausible explanation for the negative coefficient estimated in this study.

Short-run dynamics are assessed through the error correction model (ECM), and the results are presented in Table 7. The error correction term, CointEq(−1), is negative and statistically significant at the 1% level, indicating convergence toward the long-run equilibrium. The estimated coefficient implies that approximately 58% of any deviation from the long-run equilibrium is corrected within one period, suggesting a relatively rapid adjustment process.

Table 7. Error Correction Model Coefficient

Model	Coefficient	t-Statistic	Probability
D(LOGXTRZM(-1))	0.138657	1.238103	0.2347
D(LOGXTRZM(-2))	-0.104804	-0.880905	0.3923
D(LOGXTRZM(-3))	0.125392	1.111666	0.2838
D(LOGXTRZM(-4))	**-0.215995***	**-1.823490**	**0.0882**
D(LOGXTRZM(-5))	-0.177903	-1.361786	0.1934
D(LOGXTRZM(-6))	**-0.269703****	**-2.285435**	**0.0373**
D(LOGXTRZM(-7))	**-0.427458*****	**-3.467908**	**0.0034**
D(LOGINCOME)	**-0.177437*****	**-3.378166**	**0.0041**
D(LOGINCOME(-1))	**0.367275*****	**5.713397**	**0.0000**
D(LOGINCOME(-2))	**0.125561***	**2.102126**	**0.0528**
D(LOGINCOME(-3))	**0.235394*****	**4.224134**	**0.0007**
D(LOGINCOME(-4))	0.083737	1.596375	0.1313
D(LOGINCOME(-5))	**0.103878***	**1.973153**	**0.0672**
D(LOGINCOME(-6))	0.038046	0.688040	0.5019
D(LOGINCOME(-7))	**0.112173***	**2.005691**	**0.0633**
D(LOGUSD)	**-0.589977****	**-2.379822**	**0.0310**
D(LOGUSD(-1))	0.026022	0.099643	0.9219
D(LOGUSD(-2))	-0.311758	-1.324397	0.2052
D(LOGUSD(-3))	**-0.438055***	**-1.871951**	**0.0808**
D(LOGUSD(-4))	0.332395	1.447242	0.1684
D(LOGDJUSTT)	0.007246	0.047340	0.9629
D(LOGDJUSTT(-1))	**-0.775357*****	**-3.732787**	**0.0020**
D(LOGDJUSTT(-2))	**-0.410849****	**-2.305401**	**0.0358**
D(LOGDJUSTT(-3))	**-0.570637*****	**-3.251306**	**0.0054**
D(LOGDJUSTT(-4))	**-0.654527*****	**-3.574876**	**0.0028**
D(LOGDJUSTT(-5))	**-0.717066*****	**-3.773197**	**0.0018**
D(LOGDJUSTT(-6))	**-0.815042*****	**-3.942998**	**0.0013**
D(LOGDJUSTT(-7))	-0.277398	-1.564591	0.1385
D(LOGCDS)	-0.049625	-0.341848	0.7372
D(LOGCDS(-1))	**-0.864446*****	**-5.636867**	**0.0000**
D(LOGCDS(-2))	**-0.425556****	**-2.324189**	**0.0346**
D(LOGCDS(-3))	**-0.840358*****	**-4.993584**	**0.0002**

D(LOGCDS(-4))	**-0.601897*** **	**-3.776673**	**0.0018**
D(LOGCDS(-5))	**-0.398637** **	**-2.537785**	**0.0227**
D(LOGCDS(-6))	**-0.449669*** **	**-3.199919**	**0.0060**
D(LOGCDS(-7))	**-0.457243*** **	**-3.745441**	**0.0019**
D(LOGVIX)	**-0.180602** **	**-2.402716**	**0.0297**
D(LOGVIX(-1))	0.067635	0.865432	0.4004
D(LOGVIX(-2))	-0.122755	-1.453545	0.1667
D(LOGVIX(-3))	0.098850	1.066054	0.3033
D(LOGVIX(-4))	0.018322	0.197771	0.8459
D(LOGVIX(-5))	-0.023711	-0.244349	0.8103
D(LOGVIX(-6))	**-0.221163** **	**-2.531860**	**0.0230**
D(LOGVIX(-7))	**-0.157078** **	**-2.273296**	**0.0381**
CointEq(-1)	**-0.581244*** **	**-7.298145**	**0.0000**

Note: *** — significant at p <0.01, ** — significant at p <0.05, * — significant at p <0.1.

Taken together, the ECM estimates indicate that short-run shocks to CDS, DJUSTT, and VIX can have temporary "risk-off" effects on XTRZM. By contrast, the long-run coefficients capture the more persistent valuation channels operating through exchange-rate competitiveness and Türkiye's integration with global tourism-sector conditions.

To assess the adequacy of the estimated ARDL–ECM specification, standard diagnostic tests are performed and reported in Table 8 (Pesaran et al., 2001; Gujarati & Porter, 2009; Göksu & Balkı, 2023). The Jarque–Bera statistic indicates that the residuals are consistent with normality. The Breusch–Godfrey test suggests no residual serial correlation, and both the Breusch–Pagan–Godfrey and ARCH tests indicate no evidence of heteroskedasticity. The Ramsey RESET test does not reject correct functional form.

The evidence reported above also provides a coherent robustness assessment of the reported relationships. First, the consistency of the two unit-root procedures is reassuring: although the Phillips-Perron and Lee-Strazicich tests disagree on the classification of individual series, both agree that every variable is integrated of order zero or one and that none is I(2), which is the precise condition required for the validity of the ARDL bounds testing approach (Pesaran et al., 2001). Second, the diagnostic tests reported in Table 8 indicate that the estimated specification is statistically adequate, with residuals consistent with normality, no serial correlation, no heteroskedasticity, and no evidence of functional-form misspecification. Third, the CUSUM and CUSUMQ statistics reported in Figure 2 indicate that the estimated coefficients are structurally stable within the 5% bounds despite the pronounced shocks of the sample period. Taken together, these results provide additional support for the reliability and stability of the estimated ARDL model. The stability of the long-run estimates is examined further through three supplementary procedures, the results of which are reported in Table 9.

Table 8. Diagnostic Test Results

Diagnostic Tests	Test Value	Prob.
Jarque-Bera Normality	2.931757	0.230875
Breusch-Godfrey Serial Correlation	1.871794	0.1930
Breusch-Pagan-Godfrey	0.539105	0.9476
ARCH	0.206900	0.6508
Ramsey RESET	2.205337	0.1497

Finally, parameter stability is evaluated using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) tests. The results, presented in Figure 2, indicate that both statistics remain within the 5% critical bounds throughout the sample period. This evidence supports the structural stability of the estimated coefficients, and the null hypothesis that all coefficients in the error correction model are constant cannot be rejected.

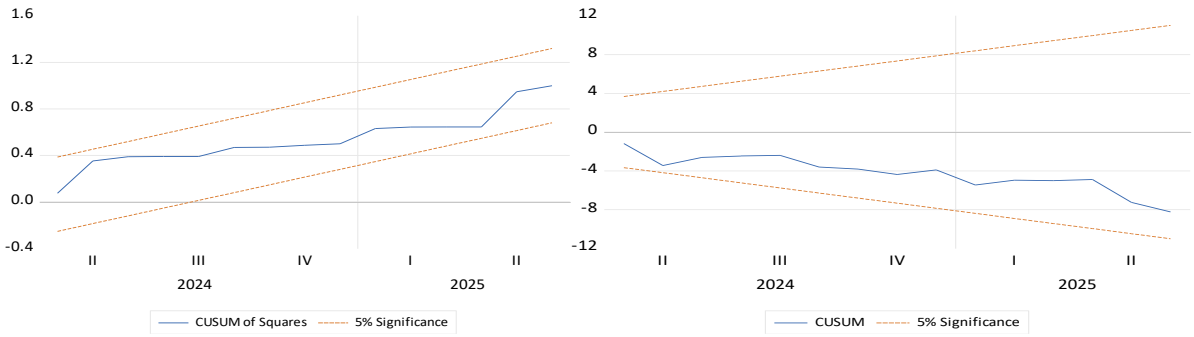

Figure 2: CUSUM and CUSUMQ Graphs

Table 9 reports the long-run coefficients obtained under three alternative procedures alongside the baseline ARDL estimates. The first column reproduces the Akaike-selected specification of Table 6. The remaining columns present, in turn, the Stock-Watson dynamic OLS estimator, the error-correction model augmented with structural-break dummies at the June 2020 and February 2024 break dates identified by the Lee-Strazicich test, and an ARDL specification whose lag order is chosen by the Schwarz rather than the Akaike criterion. The estimates are consistent with the baseline. The sign of every long-run coefficient is preserved across the four specifications: tourism income is negative, while the exchange rate, DJUSTT, and the CDS premium are positive and the VIX is negative. The exchange-rate effect is the most stable, remaining positive and strongly significant throughout, from 0.99 under the Schwarz criterion to 1.35 under dynamic OLS. The two counterintuitive results survive under dynamic OLS, where the negative tourism-income coefficient and the positive CDS coefficient are both significant. The error-correction term stays negative and significant in every case, between -0.28 and -0.68, and the bounds F-statistic rejects the absence of a long-run relationship at least at the 5% level under both the break-dummy specification and the Schwarz criterion. The significance of the smaller channels weakens in the more parsimonious specifications, in which the richer short-run dynamics retained by the Akaike criterion are absent; the direction of each effect, together with the exchange-rate and error-correction results, is nonetheless stable across estimators and lag criteria.

Table 9. Robustness of the Long-Run Estimates

Variable	ARDL (AIC)	DOLS	ARDL with breaks	ARDL (BIC)
LOGINCOME	-0.657***	-0.537***	-0.422*	-0.088
LOGUSD	1.303***	1.346***	1.110***	0.988***
LOGDJUSTT	1.273**	1.946***	0.769	0.626
LOGCDS	1.028**	1.580***	0.682	0.481
LOGVIX	-0.459	-0.568*	-0.338	-0.252
CointEq(-1)	-0.581***	—	-0.681***	-0.276***
Bounds F-statistic	6.658	—	5.599	4.136

Note: *** p<0.01, ** p<0.05, * p<0.1. DOLS denotes the Stock-Watson dynamic OLS estimator with two leads and lags and Newey-West standard errors; the break dummies are defined at 2020M06 and 2024M02; and the ARDL (BIC) column selects the lag order by the Schwarz rather than the Akaike criterion. The 1% (5%) upper-bound critical value for k = 5 is 4.68 (3.79).

5. Conclusion and Discussion

Tourism plays a particularly vital role for developing countries such as Türkiye, not only through its contribution to foreign exchange earnings but also by supporting employment, making it a key component of macroeconomic stability. XTRZM is an important indicator that reflects developments in Türkiye's tourism sector and transmits its economic dynamics to the capital markets. Given the strategic importance of tourism to Türkiye's economy, identifying the factors that shape XTRZM is crucial for both investors and policymakers. Although the literature includes studies examining the effects of tourism income, exchange rates, CDS premiums, and VIX on XTRZM, research that simultaneously considers both domestic and global determinants remains limited. Accordingly, this study addresses this gap by investigating the effects of

tourism income, the exchange rate (USD/TRY), and the CDS premium as domestic indicators, together with VIX and DJUSTT as global indicators, on XTRZM using the ARDL bounds testing approach.

The empirical results indicate that XTRZM is statistically significantly affected by tourism income, the exchange rate (USD/TRY), the CDS premium, and DJUSTT, whereas VIX has no statistically significant long-run effect in the baseline ARDL specification. Specifically, increases in tourism income are associated with a decline in XTRZM, while increases in the exchange rate, the CDS premium, and DJUSTT are associated with higher values of the index. The error correction model (ECM) results further suggest that approximately 58% of any deviation from the long-run equilibrium is corrected within one period, indicating a relatively rapid adjustment process. Diagnostic tests confirm that the model satisfies the key regression assumptions and exhibits an appropriate functional form. In addition, the CUSUM and CUSUMQ tests support the structural stability of the estimated specification.

The negative impact of tourism income on XTRZM does not support the initial expectation of a positive association. While Öcal and Ekmen (2021) report no significant relationship between tourism income and XTRZM, the findings of the current study indicate a statistically significant negative relationship, which contradicts the expected positive effect. A plausible explanation is that tourism income in Türkiye is not generated solely by the listed firms represented in XTRZM. Rather, a substantial portion of sectoral activity is produced by small and medium-sized enterprises. Moreover, the widespread use of advance payments under reservation-based business models, particularly in summer tourism, may weaken the contemporaneous link between aggregate income and listed-firm cash flows. In addition, periods of high tourism activity can coincide with rising operating expenses (e.g., labor, energy, and input costs), which may compress profit margins and exert downward pressure on tourism equity valuations.

The relationship between the exchange rate and XTRZM has been widely discussed in the literature (Özçalık & Özçalık, 2020; Yaman & Korkmaz, 2020; Ahmadov et al., 2023; Soyu Yıldırım, 2023). The positive effect of exchange-rate increases on XTRZM is consistent with the expected direction. Depreciation of the Turkish lira can make Türkiye a more attractive destination for foreign tourists and, at the same time, increase demand for tourism-sector stocks by making domestic assets appear relatively cheaper to foreign investors. Evidence on the short-run exchange-rate effect, however, is mixed: Demirkale and Can (2021) and Şahin (2025) report a positive short-run effect on XTRZM, whereas Yıldırım et al. (2020) and Nazlıoğlu (2022) find that exchange-rate shocks negatively affect XTRZM in the short run. In contrast, the long-run findings in the present study differ from those of Yılmaz and Menteş (2022) and Şahin (2025), who document a negative long-run effect of exchange rates on XTRZM, and from Soyaslan (2019) and Özçalık and Özçalık (2020), who report no long-run relationship.

The positive impact of the CDS premium on XTRZM is counterintuitive because higher sovereign risk is typically expected to weigh on domestic asset prices. By contrast, Öcal and Ekmen (2021) report that movements in CDS premiums and exchange rates have no significant effect on XTRZM. More broadly, the literature generally suggests that increases in a country's CDS premium are associated with adverse effects on capital-market indices (Coronado et al., 2011; Ceylan et al., 2018; Topaloğlu & Ege, 2020; Yıldırım et al., 2020; İlhan & Bayır, 2021). Likewise, Demir and Ersan (2018) find that the Economic Policy Uncertainty (EPU) index, another proxy for country-specific risk, negatively influences XTRZM. Nevertheless, because increases in the CDS premium frequently coincide with currency depreciation (Della Corte et al., 2022), the positive coefficient on CDS may reflect an indirect channel operating through exchange-rate dynamics. Higher perceived sovereign risk may be accompanied by a weaker currency, which can support tourism-related incomes and valuations and partially offset the adverse risk effect.

The positive effect of DJUSTT on XTRZM is consistent with expectations and suggests meaningful co-movement between Türkiye's tourism equities and global tourism-sector conditions. Empirical evidence jointly examining DJUSTT and XTRZM remains limited. Gökmen and Çömlekçi (2018), for example, investigate cointegration between DJUSTT and XTRZM but report no significant relationship for Türkiye, although cointegration is found for tourism indices in countries such as Spain, Taiwan, and Greece. By contrast, the results of the present study support a cointegrating relationship and indicate that Türkiye's tourism sector is integrated with global tourism markets. Accordingly, favorable conditions and expectations in international tourism activity appear to be reflected in Turkish tourism equities.

Several policy and investment implications emerge from these findings. First, the negative relationship between tourism income and XTRZM suggests that income growth may not translate into higher profitability for listed tourism firms, potentially because operational costs, such as labor, energy, and supply chain expenses, rise sharply during peak activity periods. Investors may therefore benefit from focusing on firm-level profitability indicators rather than aggregate sectoral income. Second, the positive long-run association between CDS and XTRZM implies that investors may interpret increases in sovereign risk not primarily as a direct threat to tourism equities but as a signal of currency depreciation, which can improve the competitiveness of Türkiye's tourism sector and strengthen foreign-currency earnings. In this sense, tourism-sector equities may display partial resilience to exchange-rate volatility during periods of macroeconomic instability. Third, the positive role of DJUSTT highlights the relevance of global tourism conditions: improvements in international tourism sentiment and sectoral performance can be reflected in domestic tourism equities. Finally, the absence of a statistically significant long-run effect of VIX in the baseline ARDL specification suggests that short-run global volatility shocks do not have a persistent impact on the long-run pricing of Türkiye's tourism-sector equities, even though VIX may still matter over shorter horizons.

Beyond these firm- and investor-level implications, the findings can be situated within broader tourism-policy and financial-market-development strategies. Because the long-run pricing of XTRZM is dominated by exchange-rate and sovereign-risk dynamics rather than by realized tourism income, the sector's equity performance appears tightly bound to Türkiye's overall macro-financial credibility. A policy framework aimed at exchange-rate stability and credible disinflation could therefore reduce the sovereign-risk and currency volatility that currently drive tourism-index valuations, allowing sectoral fundamentals to play a larger role in price formation over time. At the same time, the weak transmission from aggregate tourism income to listed-firm valuations points to a capital-market-development agenda. Deepening and broadening tourism-sector listings, and encouraging small and medium-sized tourism enterprises to access public equity markets, would help XTRZM represent sectoral income more fully and strengthen the link between tourism-income growth and equity values. Developing sector-relevant hedging instruments could likewise help listed firms and investors manage the exchange-rate and sovereign-risk exposures that this study finds to be central to XTRZM. Finally, enhancing firm-level disclosure on profitability and cost structures, together with investor education emphasizing profitability indicators over aggregate sectoral income, would support more accurate valuation of tourism equities and reinforce the informational efficiency of the market in the sense of the Efficient Market Hypothesis (Fama, 1970).

Several limitations should be acknowledged when interpreting these results. First, the analysis is subject to data constraints. The sample comprises 74 monthly observations, a length dictated by the availability of Türkiye's tourism income at a monthly frequency, and although this is adequate for the ARDL bounds testing procedure, it limits the degrees of freedom available in a specification with several lagged regressors and constrains the power of the diagnostic and stability tests. The analysis is also conducted at the index level rather than the firm level, so it captures the aggregate behavior of listed tourism firms but not heterogeneity in their exposures. Second, certain model assumptions warrant caution. The ARDL specification imposes a linear and symmetric adjustment structure, so it cannot capture potential asymmetries in the responses of XTRZM to positive versus negative shocks in the exchange rate, the CDS premium, or global conditions; a nonlinear ARDL (NARDL) framework, as employed by Obi and Ogbeide (2022) and discussed by Göksu and Balkı (2023), represents a natural extension for addressing this issue. In addition, the results may be sensitive to the choice of maximum lag and information criterion, and the single-equation bounds testing approach treats XTRZM as the dependent variable rather than modeling potential feedback among the variables. Third, the model deliberately excludes several potentially relevant determinants, such as the interest rate, energy and oil prices, geopolitical risk, economic policy uncertainty, and tourist arrivals, in the interest of parsimony and to limit multicollinearity among closely related risk and channel variables; their omission may nonetheless leave part of the variation in XTRZM unexplained. Finally, although the CUSUM and CUSUMQ tests indicate that the estimated coefficients remain stable within the 5% bounds, the sample spans an unusually turbulent period marked by the COVID-19 pandemic, the 2023 Kahramanmaraş earthquake, and repeated election-related uncertainty, so the possibility of residual structural instability cannot be entirely ruled out.

These limitations point directly to several avenues for future research. In particular, the omitted-variable and model-assumption concerns noted above could be addressed by incorporating additional determinants such

as tourism demand indicators, energy prices, geopolitical risk, or economic policy uncertainty, by adopting nonlinear or asymmetric specifications such as NARDL to test for threshold and sign-dependent effects, and by examining post-pandemic structural changes in greater detail. Expanding the framework to multi-country samples using panel data could also provide a more comprehensive assessment of the tourism sector's global integration. In addition, given the monthly frequency of the data used in this study, future studies may benefit from exploring alternative data frequencies and time horizons to further test the robustness of the reported relationships.

Declarations

Generative Artificial Intelligence Statement: Generative artificial intelligence tools were used solely to support language editing and improve the clarity and readability of the manuscript. These tools were not used to generate research data, conduct statistical analyses, interpret the findings, or develop the scientific conclusions. The authors critically reviewed and revised all AI-assisted content and take full responsibility for the accuracy, integrity, and originality of the published work.

CRediT Authorship Contribution Statement: Umut Kemeç: Conceptualization, Data Curation, Methodology, Investigation, Writing – Original Draft, Writing – Review & Editing. **Aykut Güryel**: Conceptualization, Literature Review, Formal Analysis, Software, Validation, Writing – Original Draft, Writing – Review & Editing. Both authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Conflict of Interest Statement: The authors declare that they have no financial, commercial, personal, or professional conflicts of interest that could have influenced the research, analysis, interpretation, or publication of this study.

Data Availability Statement: The data used in this study were obtained from publicly available sources, including the Turkish Statistical Institute (TurkStat) and Investing.com, as specified in the Data and Methodology section. The dataset compiled and processed for the analysis, together with the relevant analysis files, is available from the corresponding author upon reasonable request, subject to the terms and conditions of the original data providers.

Funding Statement: The authors received no financial support for the research, authorship, or publication of this article.

Ethics Committee Approval: This study is based exclusively on publicly available secondary macroeconomic and financial time-series data. It does not involve human participants, animals, personal data, surveys, interviews, or experimental procedures. Therefore, ethics committee approval and informed consent were not required.

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