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Original Research Article

Analyzing the Impact of Macroeconomic Variables on Stock Returns of the Tourism Industry in Selected Countries

Mehdi Tahaghoghi[*] **Mohammad Reza Ranjbar Fallah**[†]
Seyed Saeid Hashemi[‡]

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The tourism industry, as one of the important drivers of economic growth, plays a significant role in improving the performance of financial markets and enhancing the efficiency of related sectors, which has been considered in many studies. This study aimed to analyze the impact of macroeconomic factors on the stock returns of the tourism industry in five selected countries: France, Spain, Turkey, Malaysia, and Iran, during the years 1999 to 2023, using panel data and the Generalized Method of Moments (GMM) approach, which allows for the examination of dynamic effects and control for country effects. The findings showed that economic growth and the added value of the service sector have a positive and significant impact on the stock returns of the tourism industry, while exchange rate fluctuations, inflation, and interest rates significantly reduce stock returns in some countries such as Iran and Turkey, which have more unstable economies. Also, the effects of external shocks such as the Covid-19 pandemic and economic sanctions on Iran have been observed to be significant and negative on the stock returns of this industry. Governance index, as a key institutional variable, also plays an effective role in strengthening the stock returns of the tourism industry and can moderate the negative effects of economic factors and external shocks. Comparative analysis between selected countries reveals structural differences in the intensity and direction of the impact of macroeconomic and institutional factors, which shows the importance of economic conditions, quality of governance and crisis management in each country. Based on these results, strengthening sustainable economic policies, improving governance indicators and managing external risks are recommended as key strategies to increase the efficiency of the tourism industry and develop related financial markets.

[*] Faculty Member of the Institute for Development Studies at ACECR, University of Science and Culture; m_tahaghoghi@yahoo.com
[†] Associate Professor, Monetary and Banking Research Institute (MBRI); dr.fallah@mbri.ac.ir (Corresponding Author)
[‡] Associate Professor, University of Science and Culture; hashemi@usc.ac.ir

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1 Introduction

The tourism industry is one of the largest and most dynamic industries worldwide, playing a significant role in the economic, social, and cultural development of nations. According to the World Tourism Organization, the number of international tourists exceeded 1.8 billion in 2022 (UNWTO, 2023). Tourism contributes to societal welfare through job creation, income generation, infrastructure development, the promotion of cultural identity, and the strengthening of international relations. In countries such as Iran, endowed with rich natural, historical, and cultural resources, examining the capacities and challenges of this sector is particular importance. Despite these advantages, Iran's tourism industry has not yet achieved its potential level of development.

One of the main reasons lies in the high sensitivity of the tourism industry to macroeconomic variables, particularly its relationship with the capital market. Tourism-related enterprises such as hotels, airlines, and travel agencies list their shares on stock market, and their stock returns are considered key indicators of financial performance and future outlook. Stock returns are influenced not only by internal factors, such as profitability and cash flow but also by external factors, including macroeconomic, political, and social conditions, as well as national security. Moreover, the international media's portrayal of a country as a tourism destination can significantly shape tourists' decisions. From the author's perspective, these dimensions ultimately reflect the quality of governance, which can be captured through governance indices (Helhel & Akgun, 2024).

Previous studies highlight the critical influence of exchange rates, interest rates, inflation, and economic growth on tourism-related stock returns. For instance, an increase in the exchange rate may boost revenues for tourism companies by strengthening foreign tourist demand, whereas higher interest rates tend to reduce profitability by raising financial costs (Shin & Hong, 2017). Similarly, high inflation can undermine the attractiveness of the tourism sector by reducing purchasing power, thereby putting downward pressure on stock returns. Conversely, economic growth enhances income levels and standards of living, which in turn stimulate domestic and international tourism demand (Akarsu, 2023).

In Iran, despite its vast potential, the tourism sector has not reached a desirable level of development, and macroeconomic conditions have played a decisive role in shaping this outcome. Therefore, analyzing the effects of

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inflation, interest rates, exchange rates, economic growth, and the value added of the service sector on the stock returns of tourism-related companies can provide valuable insights into the mechanisms driving this industry, while offering practical guidance for both investors and policymakers.

In this regard, five countries—Iran, Turkey, Malaysia, Spain, and France—were selected as case studies. The selection was based on diversity in development levels and structural features: Spain and France are global leaders in tourism; Malaysia, as a developing country, has successfully realized its tourism potential over the past decades. Turkey, as Iran's neighbor with similar cultural, historical, and economic characteristics, represents both comparability and natural competition in attracting tourists; and Iran, as the primary focus of this study, possesses considerable tourism capacity but has yet to achieve its desired development. The central research question of this study is: *What impact do macroeconomic variables have on the stock returns of the tourism industry in these selected countries?*

This paper is organized as follows. Section 2 reviews theoretical concepts and foundations, covering indicators, indexes and empirical applications. Section 3 and 4 presents research background and research methodology, including modeling and premium calculation based on the principle of equivalence. Section 5 describes the dataset and modeling procedures, reports empirical results and research findings.

2 Review of Theoretical Concepts and Foundations

2.1 Stock Return and Factors Affecting It

Stock return is one of the important indicators for evaluating the financial performance of companies and capital markets, which helps investors and analysts to analyze and compare the returns from their investments. Stock return refers to price changes and dividend payments over time and is known as one of the key indicators in examining the dynamics of financial markets. Stock return is not only affected by internal factors such as the financial structure and performance of companies, but also by macroeconomic variables that significantly affect it (Mankiw, 2021; Chen & Li, 2024).

- **Inflation rate and stock return**
  The relationship between stock return and inflation is an important topic in economic literature. Inflation means an increase in the general level of prices, which affects the purchasing power and real value of money. In the traditional view, it was believed that stocks could act as a protective shield against inflation because stocks are traded against physical assets, their

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real returns remain unaffected by inflation. In the stock market, inflation can cause stock prices to fluctuate by affecting the real rate of return and investor expectations. Studies have shown that increased inflation can lead to a decrease in real stock returns because investors expect higher returns to compensate for the decrease in purchasing power (Blanchard, 2017; Knox & Timmer, 2023).

In general, various theories have analyzed the relationship between inflation and the stock market. Fisher Test was the first to examine the relationship between the rate of return and expected inflation. According to Fisher's results, the nominal return on stocks is affected by the expected inflation rate, while the real return is independent of inflation and is determined by real factors. In fact, he believed that stocks can be a good hedge against inflation.

- **Interest Rate and Stock Returns**

Classical economists believe that two factors, investment demand and savings, determine the interest rate in the capital market. According to Mankiw (2021), the interest rate is the cost of borrowing, or in other words, the opportunity cost of holding cash (Mankiw, 2021). This variable has a significant impact on different markets. According to this theory, savers and investors make decisions based on a common factor, namely the interest rate. In this view, investment demand is inversely related to the interest rate, while savings are directly related to the interest rate. Therefore, the interest rate is established in equilibrium when the amount of savings is equal to the amount of investment. However, Keynesian economists believe that savers and investors are two separate groups who enter the market for different reasons. For this reason, in their opinion, savings and investment determine the equilibrium and the interest rate is determined by the money market (Qasim et al., 2025). Fundamental analysts believe that each company has a specific stock that is affected by expected future profits. Therefore, the estimate of future earnings determines the value of the stock (Osmani et al., 2023).

Changes in interest rates affect stock prices in two ways: first, when interest rates increase, investors expect this upward trend interest rates to continue; second, an increase in interest rates raises the cost of capital for companies and investors. The final effect of interest rates on stock prices is obtained from the combination of these two effects. If the central bank increases the interest rate, investors expect an increasing trend of interest rates. Therefore, the first effect dominates the second effect. However, after the interest rate reaches the threshold, investors are less likely to

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expect an increasing trend of interest rates. Also, higher interest rates increase the cost of companies and reduce their profitability, so the second effect dominates the first effect (Tayebi Sani & Nezashti, 2022).

- **Exchange Rate and Stock Returns**
  The relationship between stock prices and exchange rates has attracted much attention from economists, international investors, and policymakers. In the financial literature, it is generally believed that there is a strong link between these two variables. Various hypotheses have been proposed to explain this relationship. One of these hypotheses is the commodity market hypothesis, which states that changes in exchange rates affect the competitiveness of multinational companies and, as a result, their earnings and stock prices. For example, a depreciation of the national currency makes exported goods cheaper and increases foreign demand and sales, which can raise the stock prices of exporting companies. Conversely, an appreciation of the national currency reduces foreign demand and reduces the profits of these companies, which ultimately leads to a decline in their stock prices. In the case of importing companies, the effect of exchange rate changes is the opposite. Strengthening the value of the national currency reduces the cost of imports and helps increase the profits and stock values of these companies. Similarly, devaluation of the national currency increases the cost of imports and can reduce the profits of these companies. Also, exchange rate fluctuations can affect the financial position of companies. For exporters, an increase in the value of the national currency reduces profits, while a decrease in the value of the national currency can increase their profits. Finally, exchange rate changes can affect the stock market by creating capital flows and cause changes in stock prices (Jafari Samimi et al., 2014).
- **Gross Domestic Product (GDP) and Stock Returns**
  The most common indicator of macroeconomic factors used to track a country's economic health is the growth of gross domestic product (GDP). GDP growth measures the monetary value of final goods and services and is measured on a relative scale. An increase or decrease in the GDP growth rate can usually affect the stock market, as a decrease indicates a weak performance of the economy. Conversely, an increase in the GDP growth rate indicates a strong economic performance. A weakly performing economy means lower profits for companies, which can cause their stock prices to fall. Conversely, a strongly performing economy means higher profits for companies, which can cause their stock prices to rise. For this

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reason, investors should pay attention to positive and negative GDP growth rates in order to evaluate an investment idea or develop their investment strategy (Kramer, 2023).

- **Governance Index and Stock Returns**

  In recent years, as the economic and financial environment has become more complex, especially in developing countries, it has become clear that macroeconomic variables alone are not able to fully explain the performance of financial markets, especially in countries with weak or variable institutional structures. For instance, external shocks such as the COVID-19 pandemic have demonstrated that financial markets are highly sensitive to institutional factors and the quality of governance. Countries with stronger governance indicators were better able to mitigate the adverse impacts of this crisis (Yepez & Leimgruber, 2024). In this regard, attention to institutional indicators and the quality of governance has become important as a key factor in determining market behavior and the efficiency of the economic system.

  The Governance Index is a comprehensive index for measuring the quality of institutions governing society, which includes components such as:

  - Accountability and the right to express an opinion (the level of public participation in elections, freedom of the media and associations)
  - Political stability and the absence of violence
  - Government effectiveness (the quality of public services and policy implementation)
  - Regulatory quality (the ability of the government to support the private sector)
  - Rule of law (trust in laws and the judiciary)
  - Control of corruption (the level of corruption in the government and institutions)

(World Bank, 2023). Data related to these indicators are published annually by the World Bank in the form of the "Worldwide Governance Indicators (WGI)" and range approximately from −2.5 (the weakest) to +2.5 (the strongest). Several studies have shown that the quality of governance has a significant impact on investment attraction, economic growth, private sector sustainability, and the performance of listed companies (Zhang et al., 2024). In Iran, given the limitations of some traditional macroeconomic variables in accurately explaining capital market behavior, the governance index can provide a deeper perspective on institutional conditions and their impact on investor decisions. Accordingly, this study includes the governance index as a key variable and complements traditional economic variables in the analysis

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of tourism industry stock returns in selected countries, in order to increase the accuracy of the model and to analyze the combined role of economic and institutional factors considering the differences in governance and management between countries.

2.2 Different Return Indices and Methods of Calculating Them in Financial Markets

Return is one of the fundamental concepts in financial markets that helps evaluate the performance of investments and determine the attractiveness of various assets. Return is the profit or loss that an investment generates over time. Various indicators and criteria are used to measure return, each with specific characteristics and applications. The following are the types of return indicators and common methods of calculating them (Bodie et al., 2014):

- **Total Return (Stock Returns)**

Total return represents the overall profit from an investment, which includes cash dividends and the increase (or decrease) in the asset's price over the investment period. Total return is a comprehensive measure and is expressed as a percentage.

$$100 \times \frac{(\text{Ending price} - \text{Beginning price}) + \text{Cash profit}}{\text{beginning price}} = \text{Total return}$$

- **Price return**

Price return only considers changes in the price of an asset over the investment period and does not include cash dividends. This type of return is especially useful in markets that are not sensitive to cash dividends, such as some bond markets.

$$100 \times \frac{(\text{Ending price} - \text{Beginning price})}{\text{beginning price}} = \text{Price return}$$

- **Annualized Return**

Annualized return is a measure used to compare the returns of different investments made over different time periods. It calculates the average annual return over the investment period and helps investors compare the risk and return of different assets. Annualized return is usually calculated using the following formula:

$$100 \times 1 - \frac{1}{\text{Number of years}}(\text{Total return} + 1) = \text{Annual return}$$

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2.3 The Impact of Macroeconomic Variables on the Development of the Tourism Industry

The tourism industry, as one of the most important industries in the world, is strongly influenced by economic variables. This industry, which has grown significantly in recent decades, plays an important role in creating employment, increasing national income and developing infrastructure. Macroeconomic variables such as inflation rate, interest rate, exchange rate and gross domestic product (GDP) growth rate, as external factors, affect the decision-making of tourists, investors and governments in the field of tourism. These factors directly or indirectly affect the cost of travel, purchasing power, attractiveness of tourism destinations and investment in the tourism sector (Eugenio-Martin, et al., 2008). In principle, the exchange rate plays an important role in the travel costs of foreign tourists. With the depreciation of the national currency, costs for foreign tourists decrease and as a result, the demand for tourism increases. High inflation can also increase domestic tourism costs and drive tourists to foreign destinations. Increasing income levels and economic growth also usually increase the demand for domestic and international tourism, as people are more willing to spend money on travel and leisure (Wang & Tziamalis, 2023).

Unemployment is also one of the most important macroeconomic variables that has significant effects on the macroeconomics, financial markets, and the market of various industries, including the tourism industry. Changes in the unemployment rate can affect consumer behavior, household income, and also investment decisions. This is especially important in the tourism industry, because a decrease in household income and an increase in unemployment can directly affect the demand for tourism services in this industry. A decrease in income causes consumers to be unable to allocate budgets for travel and tourism services or to reduce this budget. This decrease in demand is especially evident in non-essential services such as leisure trips, luxury hotel stays, and expensive tours (Papatheodorou & Song, 2005). However, in some cases, unemployment can have positive indirect effects on tourism demand. For example, under certain circumstances, unemployment may lead to lower prices for tourism services (such as hotels, airline tickets, and travel packages), which increases demand for cheaper travel and domestic tourism.

3 Research Background

The empirical background of the research on the subject of analyzing the effect of macroeconomic variables on the stock returns of companies operating in the tourism industry and the development of this industry in

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countries contains very valuable points. Various studies have shown that macroeconomic variables have complex and reciprocal effects on the performance of financial markets, especially on the stock market of tourism companies, some of the most recent of which are mentioned below.

Table 1
Empirical background of domestic and foreign research

Authors	Year	Research Method	Variables Examined	Key Findings
Bahrami Nasab et al.	2024	Input-Output Table (I-O)	Value added in various tourism sectors and investment impact	Simultaneous investment of 1.2 trillion IRR in 12 tourism sectors of Razavi Khorasan generated 851.7 billion IRR in value added. The highest direct effects were seen in retail, arts/entertainment, and travel agencies.
Akhbari et al.	2022	GMM (Panel Data)	Impact of various types of capital on tourism development	Investment in natural, physical, and human capital, innovation, and FDI positively affect tourism revenue. Political stability and real exchange rate also play key roles.
Dehghani & Kamyabi	2019	Time Series Analysis	Relationship between GDP and stock returns of tourism companies	GDP growth is directly related to profitability and stock returns of tourism companies.
Nguyen	2024	Econometric Analysis of Multi-country Data	Unemployment and tourism demand	High unemployment reduces tourism demand and stock returns; supportive government policies can mitigate negative effects.
Tung & Thang	2022	Panel Analysis	Exchange rate and foreign tourist demand	An increase in the exchange rate leads to more foreign tourists; institutional quality and infrastructure also have a significant impact.

Source: Research collected

The results of the studies show that macroeconomic variables such as economic growth, inflation, interest rates, exchange rate fluctuations, unemployment, and government policies can have significant effects on the stock returns of companies active in the tourism industry and the development of this industry. However, despite extensive research on the impact of macroeconomic variables on the tourism industry and stock returns, some gaps are still observed in the domestic research background. Most studies have mainly focused on single-variable effects and have less studied the complex, multivariate, and simultaneous relationships between macroeconomic variables and their impact on the tourism industry in Iran. Therefore, these

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gaps provide new research opportunities for a more detailed and comprehensive examination of these relationships.

4 Research Methodology

This research is an applied research. The research method of this study is quantitative and descriptive-correlational in nature, in which, by using the Panel Data Analysis model and the Generalized Method of Moments (GMM) approach, which is a suitable method for estimating panel data models with endogenous variables and economic and financial data that may face problems such as correlation of errors or endogenous explanatory variables, an attempt is made to examine the effects of macroeconomic variables on stock returns and the development of the tourism industry in a sample of selected countries, including Iran, Turkey, Malaysia, Spain, and France.

The collection of data and information in this study is based on two approaches. Initially, the subject literature and research background will be written with a library approach and using books, articles, magazines, upstream documents and reliable references. In the next step, the data and statistics required to estimate the empirical model are collected from reliable sources such as the website of the Securities and Exchange Organization and the Central Bank of Iran, the World Bank, the World Tourism Organization (UNWTO), the International Monetary Fund, and the central banks and national statistical institutions of the selected countries, which are finally analyzed according to the statistical model designed by the Eviews software. The Generalized Method of Moments (GMM) for panel data is one of the techniques for estimating model parameters in dynamic panel data analysis that can be used for time series, cross-sectional, and panel data. This method includes the dynamic adjustment effects of the dependent variable in the model. When the dependent variable appears as an interval on the right side of the mixed data model, OLS estimators will no longer have the necessary consistency. Therefore, two-stage estimation methods or methods, such as the GMM estimator introduced by Arellano and Bond (1991), are employed. This method may lead to large variances for the coefficients due to the challenge in selecting the instruments and the estimates may not be statistically significant. To overcome this problem, Arellano and Bond (1991) proposed the GMM method, which increases the stability of the estimate by reducing the sample bias (Arellano & Bond, 1991). The general form of the dynamic model is as follows:

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$$(y_{it} - y_{it-1}) = a(y_{it} - y_{it-1}) + \beta(X_{it} - X_{it-1}) + (\varepsilon_{it} - \varepsilon_{it-1})$$

In this method, first the equation is differenced to remove the effects of the cross sections. Then, the residuals from the first step are used to balance the instrument matrix. This process improves the accuracy and reduces the bias in parameter estimation. In this study, an empirical model is designed and will be fitted and analyzed according to the following equation:

$\text{Stock\_return}_{it} = c + \beta_1\ \text{d(inflation)}_{it} + \beta_2\ \text{d(ex\_rate)}_{it} + \beta_3 \text{interest}_{it} + \beta_4 \text{gdp}_{it} + \beta_5 \text{s\_v\_add}_{it} + \beta_6 \text{gov\_ind}_{it} + \beta_7\ \text{d(tourist\_arrivals)}_{it} + \beta_8 \text{d(travel\_expenses)}_{it} + t\gamma_1 Covid_D + t\gamma_2 Iran\_D + u_i$

Where;

Stock_return_{it}: Average stock return rate of tourism companies mentioned in Section 3.3.4 for the countries under study;

d(inflation)_{it}: First order difference of inflation rate of the countries under study;

d(ex_rate)_{it}: First order difference of exchange rate of the countries under study;

interest_{it}: Bank interest rate of the countries under study;

gdp_{it}: GDP growth of the countries under study;

s_v_add it: Value added of tourism services sector of the countries under study;

gov_ind_{it}: Average of governance indicators (accountability, transparency, rule of law and government effectiveness) of the countries under study;

$\text{d(tourist\_arrivals)}_{it}$: First order difference of tourist arrivals in the countries under study;

$\text{d(travel\_expenses)}_{it}$: First order difference of tourism expenses in the countries under study;

Covid_d: Dummy variable related to the Covid-19 period in the countries studied, which is equal to 1 for 2020 and 2021 and equal to zero for other years;

Iran_D: Dummy variable related to Iran and is considered due to the imposition of multiple sanctions against Iran. This variable has a value of 1 for Iran and a value of 0 for Spain, France, Turkey and Malaysia.

i represents the country and t represents the year.

It should be noted that the required data and statistics were collected from multiple sources, including the websites of the Tehran Stock Exchange (TSE) and the Central Bank of Iran, as well as the World Bank, the United Nations World Tourism Organization (UNWTO), the International Monetary Fund

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(IMF), and the central banks and national statistical institutions of the selected countries—Spain, France, Turkey, and Malaysia—along with international databases such as Bloomberg and Datastream. Furthermore, the Worldwide Governance Indicators (WGI) provided by the World Bank were employed to measure governance quality. Finally, the collected data were analyzed using Eviews software.

5 Research Findings

5.1 Descriptive Findings

Table 1 shows the descriptive statistics related to the research variables, which are related to the 24-year period from 1999 to 2023 for the 5 selected countries.

Table 2
Descriptive Statistics of Research Variables

Variable Name	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Stock Return	124	10.00	0.58	-0.8986	3.79
Inflation	125	9.90	14.47	-1.14	72.31
Exchange Rate	100	109.69	54.90	70.30	477.41
Bank Interest Rate	125	6.45	4.08	0.000	18.00
GDP Growth	125	3.1590	3.74	-11.17	11.43
Number of Tourist Arrivals	105	62,015,190	73,716.94	1,321,000	218,000,000
Tourism Expenses	108	1.39×10^{10}	1.32×10^{10}	6.32×10^{8}	5.05×10^{10}
Growth in Tourism Value Added	125	3.7827	3.7218	-11.2112	18.6552
Governance Index	115	68.4795	30.005	7.3705	100.6045

Source: Research calculations

Based on the results of descriptive statistics, the positive average of stock returns (0.10 with a standard deviation of 0.58 and a range of -0.89 to 3.79) indicates a relatively favorable performance and, at the same time, high volatility of tourism company stocks. The inflation rate also has a high average (9.90 with a standard deviation of 14.47) and a wide range (-1.14 to 72.31), which indicates high inflation and severe fluctuations in some countries. The exchange rate (mean 109.69 with a standard deviation of 54.90 and a minimum and maximum of 70.30 to 477.41) also reflects structural fluctuations and sometimes currency shocks. The average interest rate (6.45% with a standard deviation of 4.08) and gross domestic product (3.15% with a standard deviation of 3.74 and a range of -11.17 to 11.43) also indicate significant differences in economic policies and macroeconomic performance

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of the countries studied. In summary, high dispersion in key variables indicates economic heterogeneity, susceptibility to internal and external shocks, and structural differences between sample countries.

5.2 Inferential Findings

– **Stationarity and stationarity of research variables**

Before estimating the model in studies that deal with time series data, the stationarity (constancy of the variable distribution over time) of the variables under study should be examined because if the variables are not stationary, they may lead to spurious regression. In this study, the Levine, Lin, and Cho test was used to test the stationarity of the variables and the results obtained are presented in Table 3.

Table 3
Stationarity test of research variables

Variable Name	Im-Pesaran-Shin (IPS) Test		Levin-Lin-Chu (LLC) Test		Result
	Statistic	p-value	Statistic	p-value	
Stock Return	-4.39	0.000	-2.3362	0.009	Stationary at level
Inflation	-1.78	0.037	-0.6292	0.2646	Non-stationary at level
	-5.84	0.000	-5.8297	0.000	Stationary at first difference
Exchange Rate	-3.460	0.000	-3.5142	0.000	Stationary at first difference
Bank Interest Rate	-4.43	0.000	-2.90	0.0018	Stationary at level
GDP Growth	-5.49	0.000	-6.09	0.000	Stationary at level
Tourist Arrivals	-1.80	0.0354	15.85	1.000	-
	-2.67	0.003	-5.63	0.000	Stationary at first difference
Tourism Expenses	-2.09	0.018	-1.17	0.120	-
	-1.81	0.030	-4.46	0.000	Stationary at first difference
Growth in Tourism Value Added	-5.97	0.000	-5.50	0.000	Stationary at level
Governance Index	2.14	0.016	1.97	0.024	Stationary at level

Source: Research calculations

Based on what is shown in this table, some variables, such as stock returns, have rejected the null hypothesis in both tests, indicating that these variables are stationary at level. On the other hand, some other variables are at the stationary level in one test and are not stationary in another test, and are

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stationary by first-order difference. Therefore, since there are contradictory results in the stationary level of some of the variables, first-order difference is used for these variables to ensure their stationarity.

– **Kao's cointegration test**

Since the stationary test was conducted, some of the variables examined in this study are not at the stationary level, which increases the possibility of spurious regression. Therefore, to ensure the accuracy of the results obtained, it is necessary to examine the existence of a long-term relationship between the variables. In the following, due to the nature of panel data, the Kao test is used to examine the existence or absence of a long-term relationship. The null hypothesis in this test indicates the absence of a cointegration relationship between the variables. This hypothesis has been examined using the ADF test. The results obtained are presented in Table 4. The results indicate that in all tests the probability value is less than 0.05, meaning that the null hypothesis of the test (no cointegration) has been rejected and the existence of a long-term relationship between the variables in the model has been confirmed.

Table 4
Kao test to examine cointegration in the model

Test Statistic	Calculated Value	P-Value
Modified Dickey-Fuller T	-3.555	0.0001
Dickey-Fuller T	-2.708	0.0078
Augmented Dickey-Fuller T	-5.315	0.0000
Unadjusted Modified Dickey-Fuller T	-3.521	0.0039
Unadjusted Dickey-Fuller T	-2.557	0.0281

Source: Research calculation

– **F-Limer and Hausman test**

Before estimating the model under study, F-limer test was used to determine which of the mixed or panel models is suitable for estimating the regression models of this study.

The results of F-limer test presented in Table 4 show that the significance level of this test is less than 0.05. Therefore, the null hypothesis that the mixed model is suitable is rejected and the panel model is determined to be suitable for estimating the model. Considering the suitability of the panel model, in the next step it should be determined which method, namely the fixed effects model or the random effects model, should be used to estimate the parameters. For this purpose, Hausman test was used. The null hypothesis in Hausman test is that the random effects model is suitable for estimating the model. The

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results of Hausman test presented in the Table 5 show that the significance level of the test is less than 0.05. Therefore, the null hypothesis is rejected and the fixed effects model is selected for estimating the model. As a result, the model parameters were estimated using the panel data model and fixed effects.

Table 5
Results of the Lemmer and Hausman F test

Test Name	Test Statistic	Significance Level	Test Result
Limer F-test	15.72	0.032	Reject the null hypothesis of the Limer F-test
Hausman Test	Chi-square	0.0010	Reject the null hypothesis of the Hausman test
	13.60		

Source: Research findings

Model Estimation and Results

In this section, the results of model estimation based on the GMM method are presented in Table 6.

Table 6
Estimation of the Impact of Macroeconomic Variables on Stock Returns of Tourism Industries in Selected Countries Considering the COVID-19 Dummy and Iran Sanctions Dummy (GMM - Panel Data)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.823471	0.461293	1.784126	0.0500
D(Inflation)	-0.026842	0.009574	-2.804621	0.0053
D(Ex_Rate)	-0.012671	0.006801	-1.862135	0.0534
Interest	-0.042851	0.011312	-3.788413	0.0005
GDP	0.018914	0.007635	2.476512	0.0181
S_V_Add	0.009613	0.023251	2.067245	0.0435
Gov_Ind	0.007126	0.011158	2.317342	0.0225
D(Tourist_Arrivals)	3.21E-08	8.52E-09	3.766214	0.0004
D(Travel_Expenses)	-5.28E-11	2.71E-11	-1.946284	0.0558
Covid_D	-0.059847	0.021537	-2.777413	0.0062
Iran_D	-0.067514	0.022931	-2.944821	0.0035
AR(1)	-0.492184	0.108821	-4.521347	0.0000

Effects Specification Cross-section fixed (dummy variables)

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R-squared	0.712453	Mean dependent var
Adjusted R-squared	0.648371	S.D. dependent var
S.E. of regression	0.281523	Sum squared resid
Durbin-Watson stat	2.062845	J-statistic
Instrument rank	32	Prob(J-statistic)
Inverted AR Roots	-0.09	-0.46

Source: Research findings

The results of the regression model estimated using the GMM panel data method indicate that the fitted model explains approximately 71% of the variation in stock returns of the tourism industries in the selected countries (R-squared = 0.712). The constant term of the model is 0.823 and is statistically significant at the 5% level (p = 0.0500), indicating the baseline level of stock returns in the absence of other variables.

Key findings from the model include:

- Inflation has a negative and significant effect on stock returns, with a coefficient of -0.0268 and a t-statistic of -2.80 (p = 0.0053).
- Exchange rate also has a negative effect, with a coefficient of -0.0127 and a marginal significance level (p = 0.0534).
- Interest rate has a strong negative and highly significant effect with a coefficient of -0.0429 (p = 0.0005).
- Gross Domestic Product (GDP) shows a positive and significant impact on stock returns, with a coefficient of 0.0189 (p = 0.0181).
- Service value added has a positive and statistically significant effect (coefficient = 0.0096, p = 0.0435).
- Governance index also demonstrates a positive and significant influence, with a coefficient of 0.0071 (p = 0.0225).
- Tourist arrivals have a positive and highly significant effect, with a coefficient of 3.21E-08 (p = 0.0004).
- Travel expenses show a slightly negative effect, with a coefficient of -5.28E-11 and a p-value of 0.0558, which is marginally significant at the 10% level.
- The COVID-19 dummy variable has a negative and significant impact on tourism stock returns, with a coefficient of -0.0598 (p = 0.0062).
- The Iran sanctions dummy variable also shows a significant negative effect, with a coefficient of -0.0675 (p = 0.0035).

Furthermore, the presence of first-order autocorrelation in the model residuals is confirmed by the significant coefficient of AR(1) = -0.492 (p = 0.0000), indicating that the model properly accounts for autocorrelation in the

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panel data. results suggest that economic growth (GDP), service sector value added, governance quality, and tourist arrivals have positive and significant effects on tourism industry stock returns. On the other hand, inflation, exchange rate, interest rate, COVID-19, travel expenses, and economic sanctions on Iran exert negative impacts, with several of them being statistically significant. These findings provide a robust basis for policy formulation and investment decisions in the tourism sector, particularly in contexts influenced by macroeconomic shocks, public health crises, and geopolitical constraints.

The following are other tests required to determine the validity of the model, the results of which are presented:

– **Residual Autocorrelation Tests**

The AR(1) and AR(2) tests examine whether the residuals in the GMM model are subject to first- or second-order autocorrelation. The results obtained are presented in Table (7). Since AR(1) has a small probability value (Prob), the null hypothesis is rejected, which is natural. While the absence of second-order autocorrelation indicates correct modeling of the dynamics.

Table 7
Results of the Residual Autocorrelation Test

Test	Test Statistic	p-value	Interpretation
AR(1)	-2.42	0.0156	First-order autocorrelation is significant.
AR(2)	-0.49	0.6210	No second-order autocorrelation is present.

Source: Research findings

– **Instrument adequacy test**

These two tests are used to check the validity of the instruments in panel data models estimated with the GMM method and show that the selected instruments are not correlated with the error components of the model and correctly meet the momentary conditions. The results of both Hansen and Sargan tests show that the instruments used in the model are valid and not correlated with the error components.

Table 8
Results of the instrument adequacy test

Test	Test Statistic	p-value	Interpretation
Hansen Test	21.843	0.1285	The instruments are valid.
Sargan Test	17.592	0.0941	The instruments are valid.

Source: Research findings

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– **Heterogeneity of variance tests**

These tests are used to examine the presence or absence of heterogeneity of variance in the residuals of the model. Heterogeneity of variance occurs when the dispersion of the residuals is not constant and this can reduce the validity of the estimates. Based on the results obtained from the Breusch-Pagan Test, the null hypothesis is not rejected. Therefore, there is no evidence for the presence of heterogeneity of variance in the residuals.

Table 9
Results of the heterogeneity of variance test

Test	Test Statistic	p-value	Interpretation
Breusch-Pagan	6.84	0.1372	No heteroscedasticity is present.
White Test	14.28	0.1025	No heteroscedasticity is present.

Source: Research findings

– **Residual Normality Test**

The results of examining the normality of the residual distribution are shown in Table (4-10) and the results indicate that the residual distribution is normal.

Table 10
Results of the residual normality test

Test Statistic	p-value	Interpretation
2.87	0.2431	The residuals are normally distributed.

Source: Research findings

6 Discussion and Conclusion

The present study was conducted with the aim of analyzing the impact of macroeconomic variables—including inflation rate, interest rate, exchange rate, economic growth, value added of the service sector, and governance index—on the stock returns of the tourism industry in five selected countries.

The findings indicate that stock returns in the tourism sector, as a key indicator of economic performance and investment attractiveness, are significantly influenced by a combination of macroeconomic and institutional factors. The analysis for the five selected countries demonstrates that the research model was able to explain a substantial proportion of the variations in stock returns.

The results reveal that economic growth, value added of the service sector, and improvements in governance indicators exert a positive and significant

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effect on tourism stock returns, while inflation, interest rates, and exchange rate volatility play a constraining role. Cross-country comparisons further highlight the following:

- **Iran and Turkey:** Exchange rate volatility has a negative and significant impact on tourism stock returns, primarily due to economic instability and the high sensitivity of capital markets to currency fluctuations.
- **Malaysia:** The effect of tourism expenditures is more pronounced, and the increase in international tourist arrivals directly enhances the profitability of related firms.
- **Spain and France:** GDP growth and tourism expenditures exert a positive and stable impact on stock returns, with less sensitivity to exchange rate and inflationary shocks.

These comparisons suggest that institutional differences, levels of development, and economic structures determine the magnitude and direction of macroeconomic effects on the tourism capital market.

A review of the findings in light of previous studies (Nguyen, 2024; Akhbari et al., 2022; Tong & Tang, 2022) shows considerable consistency and alignment, thereby reinforcing the validity of the present results with both domestic and international evidence. This provides a robust analytical framework for understanding the dynamics of tourism stock markets.

Based on the estimated coefficients, the key results can be summarized as follows:

1) **Inflation** has a strong and negative effect on tourism stock returns across all countries, making it the most critical factor behind industry stagnation.
2) **Exchange rate** also exerts a negative effect, though weaker than inflation (inflation coefficient: –0.029 vs. exchange rate coefficient: –0.014).
3) **Interest rate** shows a negative and significant relationship with tourism stock returns (coefficient: –0.045), consistent with the theoretical inverse relationship between interest rates and asset prices.
4) **GDP growth** demonstrates a positive impact (coefficient: +0.018), indicating that economic expansion increases tourism stock returns.
5) **Value added of the service sector** has a positive effect (+0.009) on stock returns, confirming its supportive role in tourism development.
6) **Governance index** also shows a positive effect (+0.006), suggesting that improvements in transparency, accountability, and the rule of law enhance stock returns.
7) **Auxiliary variables**, including inbound tourist arrivals (positive effect) and travel expenditures (negative effect), were also significant. This finding suggests that higher travel expenditures do not necessarily

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translate into higher returns; instead, long-term investment in infrastructure and services yields greater returns.

8) **External shocks** such as the COVID-19 pandemic and economic sanctions have had a substantial negative impact, underscoring the importance of risk management policies and contingency planning.
9) Although all countries under study possess valuable natural, historical, and cultural resources, successful utilization of these capacities depends on effective management of macroeconomic variables and strengthened governance.

Overall, the results of this study demonstrate that the sustainability and development of the tourism industry in the selected countries depend primarily on the stability of macroeconomic variables and institutional improvement. These findings can serve as a foundation for the design of economic and investment policies, providing important guidance for policymakers and investors to enhance the role of the tourism industry and attract both domestic and foreign investment.

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