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The Impact of Economic Variables on the Travel and Leisure Industry of Japan, the USA, Germany, and the UK*

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Abstract: *After the spread of Covid-19 new concepts like social distance and mobility restrictions have become effective. Leisure activity preferences are changed toward in-home activities. These changes can affect the travel and leisure industry and economic changes owing to the Covid-19 pandemic. The study aims to investigate the travel and leisure industry of Japan, the USA, Germany, and the UK regarding economic linkages and Covid-19 impact. The research data covers the 2011-2020 period. The method of panel data analysis is implemented. The share price index of the industry is analyzed as a dependent variable which can be a benchmark for the industry with selected macro-economic factors. Independent variables are gross domestic product growth, consumer price index growth, consumer confidence index growth, share returns, and interest rates. Results support that the industry is highly dependent on economic factors. The interest rate and consumer confidence index growth have positive effects in the long run. In the short run, the effects of interest rates and gross domestic product growth are positive, while consumer price index growth contributes adverse effects. Results prove that the industry is affected by the Covid-19 pandemic, which is harmful in the long run.*

Keywords: Stock Market, Travel and Leisure, Economic Determinants, Covid-19

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1. Introduction

An unanticipated coronavirus disease called Covid-19 has spread worldwide since the beginning of 2020. Popular articles emphasize that Covid-19 leads impacts on the economies of affected countries (He et al., 2020). The Covid-19 disease has been the first disease that forcefully affects the stock market. Government restrictions that decrease commercial activities and social distancing generate potential effects, primarily on service-oriented businesses and the economy (Baker et al., 2020). The present pandemic outbreak of Covid-19 has caused global economic and health crises with spillover effects on the global industries, including travel and leisure, which are accepted as the primary contributor to the worldwide service industry. The travel and leisure industry has been exposed to the adverse effects of Covid-19 and has taken part among the most damaged global sectors (Abbas et al., 2021).

Public health interventions to cope with Covid-19 can be accepted as an outside shock to economies, especially for sectors like tourism, recreation, and leisure, which are highly dependent on human mobility. Data analysis from 13 countries showed that strict policy interventions lead to an average 9.2 percent drop in leisure and recreation industry participation (Fang, et al., 2021). The Covid-19 pandemic resulted in

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decreasing travel plans. Covid-19 itself has become the leading barrier to leisure intention. Risk perceptions and travel restrictions have a negative connection with leisure intention. However, people are prone to make travel plans when restrictions are canceled (Isaac & Keijzer, 2021). Due to social distancing policies and temporary restrictions, travel leisure activities have been limited. However, leisure activities are increased after covid-19. Home activities such as gardening, painting, art, music, and other creative leisure activities are generally more likely to increase in the Covid-19 period. People focus on activities closer to home rather than accessing popular leisure facilities. According to research findings, watching tv/streaming/movies (20.22%), listening to music (8.38%), and reading (8.31%) were the most increased activities in total during the pandemic. 36.36% of the no socially restricted group, 65.79% of the previously restricted group, and 69.39% of the currently restricted group participants claim to increase their leisure engagement during the pandemic (Morse et al., 2021). People's leisure intentions and leisure activity preferences may impact the travel and leisure industry after the Covid-19 pandemic.

Wang et al. (2021) investigate the effects of Covid-19 related interventions of governments which are social distancing, containment, and health and economic support on travel and leisure stock market returns and volatilities. Their results show that social distancing measures due to Covid-19 positively affect travel and leisure stocks. In the short term, Covid-19 social distancing can harm the travel and leisure industry. However, social distancing government measures can help to diminish the spread of Covid-19 in the long run, and with the elimination of investor panic and investor confidence travel and leisure industry can be positively affected. Altuntas and Gok (2021) state that how tourism companies react to the Covid-19 pandemic and adapt to the new environment is still unknown. Researching the consequences of the Covid-19 pandemic can provide insights for the hospitality sector in order to handle the adverse effects of the pandemic. Liu et al. (2021) forecast the demand recovery of tourism by analyzing tourist arrivals and conclude that the tourism industry can continue to cope with the ongoing crisis in medium and worst-case scenarios, which represents the outcome that Covid-19 spread cannot be mitigated. Firms in the Hospitality industry are experiencing revenue loss that arises from travel reluctance and restrictions and high costs of implementing measures to decrease Covid-19 risk in their facilities. High costs and low demand in the tourism sector result in profitability changes and emerge a need for reevaluation of the sector in order to take appropriate protective decisions, which can be temporary or even persistent (Fotiadis et al., 2021).

The motivation of this study is to provide evidence of economic effects on the travel and leisure industry using a panel data sample of developed countries with the ARDL method, which considers lagged effects. The fact that stationary and nonstationary variables can be used in the same model is advantageous. Many studies in the literature investigate empirical evidence of economic factors in different sectors. However, the studies which investigate the travel and leisure industry are limited. It is expected that the analysis results of this study can provide up-to-date evidence and support the literature which focuses on economic relationships between the travel and leisure industry. Testing the impact of Covid-19 is also added to research aims because all economies are subjected to pandemic effects. In finance theory, there are pricing models which offer to determine stock returns. Capital asset pricing model (CAPM), Fama-French 3-factor model, and arbitrage pricing model (APT) are one of the most widely used pricing models. The results of the study contribute to the literature which aims to research determinants of stock returns. Analysis of the stock market has prime importance in finance. Fundamental analysis is a well-known market assessment method in finance. This assessment method requires economical and sectorial evaluations. The results of our study can provide helpful knowledge about investment assessment in the travel and leisure industry.

This study aims to investigate the economic links between the travel and leisure sector and further analyzes whether Covid-19 affects the travel and leisure sector. The travel and leisure industry is chosen due to potential economic relationships and demand elasticity. Since the demand for this sector is not compulsory in human life, a demand shift can be expected between non-luxury items and travel and leisure services when economic situations are changed. The travel and leisure industry of Japan, the USA, Germany, and the UK is examined. The impact of Covid-19 on industries has become one of the highly investigated topics in recent academic literature. The findings of this study provide evidence of the Covid-19 impact on the travel and leisure industry which is expected to be linked to economic and social changes due to covid-19. Results also

provide stakeholders information regarding the sector's future by exploring economic factors that can forecast future changes.

The remainder of this paper is structured as follows: A brief literature review is provided. Research data and methods are explained. Findings and results are demonstrated. Concluding remarks and implications for future research proposals are presented.

2. Literature Review

The travel and leisure sector with effects of economic factors is one of the crucial topics in the literature. Academic studies test different models and combinations of macro-economic factors. Significant impacts from economic factors on the travel and leisure industry are common evidence in these studies. A seminal study by Barrows and Naka (1994) explains economic factors in the US hospitality sector returns with macroeconomic variables and regression analysis. The study's selected macro-economic variables provide evidence of strong relationships with the hospitality sector compared to the other sector returns. A negative effect from inflation on hospitality stock returns is detected. It is also evidenced that consumption and money supply positively affect hospitality firms. Chen et al. (2005) examine the relationship between shares returns of hotels and changes in the unemployment rate, yield spread, expected inflation, industrial production, and money supply. In the model, only money supply and unemployment rate factors become significant. It is concluded that the effect of the money supply is positive while the effect on the unemployment rate is negative. Chen (2012) investigates FED policy announcements and their impact on the US hospitality stock returns. It is evidenced that the hospitality sector stock returns of the USA react to the monetary policy announcements. Mohanty (2014) studies stock returns of the travel and leisure sector of the USA using the Carhart four factor model with additional oil price risk factors. The findings of this study indicate that oil price risk can have adverse effects on the travel and leisure industry. Lim and Chan (2013) analyze hospitality and tourism stock returns by an empirical model based on arbitrage pricing theory. Money supply and discount rate factors are tested in the model. The money supply is found to be insignificant. It is evidenced that discount rate defined with interest rate term premium has significant positive effects on hospitality- tourism stock returns. Sevil and Polat (2015) study the role of the macro-economic factors in the stock prices of the travel and leisure sector of Borsa Istanbul. It is provided that the term structure of interest rates significantly and negatively impacts the travel and leisure sector since term structures tend to decrease when the business cycle is positive. The inflation rate is also a significant determinant with a negative sign. It is explained that inflation can be a proxy of countercyclical monetary policy changes. In the research, consumption factors become a significant determinant of the travel and leisure sector. In theoretical and empirical studies, broad money (M3) and gross national product (GNP) affect stock prices. However, the results indicate insignificant relationships between M3 and GNP. Hadood and Irani (2020) examine the impacts of economic sentiment and economic policy uncertainty on travel and leisure stock returns. They conclude that economic ideas have a vital positive role in increasing travel and leisure sector returns. In contrast, economic policy uncertainty results in a negative effect on travel and leisure stock returns. Qin et al. (2021) explain that oil price shock negatively impacts travel and leisure sector stock returns while policy uncertainty generates mixed results across sub-industries.

The effects of economic factors on general stock market indices are one of the most analyzed topics in finance and economics. A brief review of this literature which includes the ARDL method as the same method in this study will be provided. Akmal (2005) analyzes the Pakistan stock market with the ARDL approach and suggests that stock prices provide a hedge against inflation in the long run but not in the short term. Tripathi and Kumar (2015), using ARDL analysis, present evidence regarding the effect of macroeconomic variables on the stock markets of BRIC economies. GDP is found significant only for India and Russia, while inflation indicates significant coefficients for only Brazil and South Africa. Interest rates are also detected as a significant determinant with a negative sign, as expected in the study. Lima et al. (2016) aim to provide the effects of the quantitative easing monetary policies, which are based on reducing long-term interest rates in the USA, the UK, and Japan. Results of the ARDL analysis explain that quantitative easing policies positively affect stock market indices. Devkota and Dhungana (2019), employing ARDL analysis,

investigate the stock market of Nepal with macro-economic determinants, which are exchange rate, gold prices, interest rates, and money supply. It is stated that interest rates are the most determining variable. Adebayo et al. (2020) examine the relationship between the stock market and GDP in Nigeria. It is documented that there is a positive relationship between the stock market and GDP according to the ARDL model estimation of the study. Hasan et al. (2022) employed an analysis of the Bangladesh stock market using the ARDL method. It is stated that interest rates have a positive impact while inflation is negative on a conventional stock market index in the short and long run.

The academic studies that focus on the travel and leisure sector using stock market data are not ample. There is a limited number of studies. The studies focus on different aspects of finance, such as investments, financial leverage, CEO compensation, and dividend policies. Cave et al. (2009) provide analysis related to travel and leisure sector stock investments. An analysis that comprises different countries reveals the supply side of the travel and leisure sector and risk-return relationships. Data analysis of all the countries in the research indicates that the oversupply of travel and leisure projects can lower prices and negatively affect returns. Van Dellen et al. (2014) investigate financial leverage's role in travel and leisure sector stock returns. It is highlighted that changes in leverage have significant effects only for highly levered firms. The relationship between CEO compensation and corporate governance among travel and leisure sector companies is examined by Al-Najjar (2017). It is concluded that board size, board independence, and CEO age affect CEO pay. Kilincarslan and Demiralay (2021) analyze travel and leisure companies' dividend policies and financial characteristics. Their findings suggest that companies with high profits are likely to make more dividend payments while highly indebted companies pay fewer dividends.

Lee and Chen (2020) implemented an analysis that focuses on the Covid-19 pandemic effects on the travel and leisure sector. Daily cases are employed, and it is confirmed that daily cases have substantial effects on travel and leisure sector returns, especially for low-income countries. The reaction of the travel and leisure sector to the first wave of the Covid-19 pandemic is investigated by Lin and Falk (2021) using three Nordic country data. The travel and leisure sector compositions are essential to understanding the Covid-19 impact. The results show that transportation firms, restaurants, and hotels are negatively affected by travel and leisure businesses. Kaczmarek et al. (2021) studied the resiliency of travel and leisure companies to the Covid-19 pandemic by evaluating the relationships between country and company characteristics and stock reactions. It is evidenced that low debt, intensive investment, and low valuation ratios become protective factors against the Covid-19 outbreak. It is also highlighted that the degree of individualism is vital to coping with the Covid-19 crisis. High individualism in a country results in more risk regarding travel and leisure stocks. Maddock and Suess (2021) examine people's travel and leisure participation behavior in the Covid-19 pandemic. It is suggested that more than half of their research population continue to participate in travel and leisure behaviors which include local leisure behaviors like going to a restaurant and visiting friends or family members by a car, while others prefer not to attend any travel and leisure activities. Wang et al. (2021b) study spillover effects of the news that are related to Covid-19 on travel and leisure shares. Their findings explain that covid-19 news significantly affects travel and leisure share returns and volatilities. It is explained that investors consider Covid-19 news and expect effects on the Travel and leisure industry. The spillover effects of Covid-19 news become stronger in highly unstable economies and fragile financial systems. It is also stated that Covid-19 can result in long-term effects and decrease profits of travel and leisure stock market in the long run, considering both impact and recovery periods.

3. Data and Methodology

The aim of providing macro-economic determinants of travel and leisure index returns is tested with chosen economic factors. This study focuses on developed countries Japan, the USA, Germany, and the UK are chosen by the researchers to create a sample of developed countries. Gross domestic product (GDP) growth, consumer price index (CPI) growth, consumer confidence index (CCI) growth, share returns, and interest rates are chosen as essential determinants of share returns due to their economic importance and availability in the data source in terms of the research period. These variables are chosen after the literature review, which emphasizes the travel and leisure industry. The study aims to investigate whether interest

rates, GDP growth, CPI growth, share returns, and CCI growth are significant factors that affect travel and leisure sector share returns. The studies of Barrows and Naka (1994) and Chen et al. (2005) become a theoretical base of this study. The researchers of these studies claim that the effects of economic factors have crucial importance for travel and leisure-related industries. Travel and Leisure indexes of developed countries Japan, the USA, Germany, and the UK are chosen and aimed to be analyzed in the study. Further analysis is also implemented to explore the effects of the Covid-19 pandemic on travel and leisure sector returns. Data of the study is obtained from Thomson Reuters' DataStream and OECD website. Travel and leisure sector indexes are provided by DataStream.

The data of share returns defines the change percentage over the previous period and demonstrates calculation results from share prices of companies traded on national or foreign stock exchanges. GDP, CPI, and CCI are also obtained by the OECD database and defined by the term "growth" which indicates a percentage change over the previous period. GDP growth can be named economic growth, and CPI growth can be named inflation. Interest rates data imply rates of long-term (maturing ten years) government bonds. According to the data OECD data source, the long-term interest rates are generally measured as averages of daily percentage rates. "FTSE USA - Travel & Leisure Price Return Index USD End of Day", "FTSE Japan - Travel & Leisure Price Return Index USD End of Day", "FTSE UK - Travel & Leisure Price Return Index USD End of Day" and "FTSE Germany - Travel & Leisure Price Return Index USD End of Day" datasets are used. Firstly, daily price values are converted to the quarterly and monthly period by considering the last observation of the periods, and percentage changes over the previous period are calculated. Percentage change is calculated by using a formula of (last observation - previous observation) / (previous observation). OECD website helps to acquire other quarterly economic data, which are used to explain economic factors. The data of the economic factor research comprises a period of 2011Q1 and 2020Q2. Economic factors are available for 2020Q2 when the analysis is applied. The data of the study focuses on developed countries, which are Japan, the USA, Germany, and the UK. In the study, panel data analysis of these countries is aimed to be employed.

In order to provide evidence regarding the Covid-19 pandemic crisis, further analysis focuses on weekly travel and leisure returns and the number of Covid-19 cases implemented. This analysis covers weekly data, which starts the first week to the 50th week of 2020 with 50 observations of weekly periods for each country. 2020 can be accepted as the year when significant effects of the Covid-19 pandemic occurred. Thus, this data covers only the Covid-19 global pandemic crisis period. The Covid-19 cases are obtained from the European Centre for Disease Prevention and Control (ECDC) website. Table 1 demonstrates the variables of the study.

Table 1. Variables and Data Sources

Variables	Proxy	Source
Quarterly Travel and Leisure Index Returns	QTLR	DataStream
Quarterly CPI Growth	QCPI	OECD
Quarterly CCI Growth	QCCI	OECD
Quarterly GDP Growth	QGDP	OECD
Quarterly Share Returns	QSR	OECD
Quarterly Interest Rate	QIR	OECD
Weekly Covid-19 Cases Growth	WCOV19	ECDC
Weekly Travel and Leisure Index Returns	WTLR	DataStream

Equation (1) and (2) explain models which are applied in order to achieve study findings.

$$QTLR_{it} = \delta_i + \gamma_{1i} * QTLR_{it-1} + \gamma_{2i} * QTLR_{it-2} + \gamma_{3i} * QTLR_{it-3} + \delta_{0i} * QCPI_{it} + \delta_{1i} * QCPI_{it-1} + \delta_{2i} * QCPI_{it-2} + \delta_{3i} * QCPI_{it-3} + \delta_{0i} * QCCI_{it} + \delta_{1i} * QCCI_{it-1} + \delta_{2i} * QCCI_{it-2} + \delta_{3i} * QCCI_{it-3} + \delta_{0i} * QGDP_{it} + \delta_{1i} * QGDP_{it-1} + \delta_{2i} * QGDP_{it-2} + \delta_{3i} * QGDP_{it-3} + \delta_{0i} * QSR_{it} + \delta_{1i} * QSR_{it-1} + \delta_{2i} * QSR_{it-2} + \delta_{3i} * QSR_{it-3} + \delta_{0i} * QIR_{it} + \delta_{1i} * QIR_{it-1} + \delta_{2i} * QIR_{it-2} + \delta_{3i} * QIR_{it-3} + \vartheta it \quad (1)$$

$$\mathrm{WTLR}_{it} = \delta_i + \gamma_{1i} * \mathrm{WTLR}_{it-1} + \gamma_{2i} * \mathrm{WTLR}_{it-2} + \gamma_{3i} * \mathrm{WTLR}_{it-3} + \delta_{0i} * \mathrm{WCOV19}_{it} + \delta_{1i} * \mathrm{WCOV19}_{it-1} + \delta_{2i} * \mathrm{WCOV19}_{it-2} + \delta_{3i} * \mathrm{WCOV19}_{it-3} + \vartheta it \quad (2)$$

In equations (1) and (2), ϑ is the error term. "t" indicates the time trend identifier, and "i" shows the cross-sectional dimension identifier. This study includes 4 cross-sections with 38-time series for quarterly analysis and 4 cross-sections with 50 time series for weekly analysis, which can be accepted as a small sample comparing most panel studies. The method of estimation is the pooled mean group (PMG) approach since this method allows a mixture of stationarity of factors such as I=0 and I=1 and fits a small sample size (Olayungbo & Qaudri, 2019). Pooled mean group (PMG) panel ARDL approach provides long-run and short-run causality relationships between the response variables and their corresponding independent variables (Mensah et al., 2019). This approach presents individual short-run coefficients and average long-run coefficients by analyzing the pool of sample countries (Matthew et al., 2020). Pooled mean group estimation method is implemented to determine the long-run and short-term effects of the independent variables on the dependent variable. The autoregressive distributive lag model, known as the ARDL model, is the basis of this estimation.

The method makes a reparametrization into an error correction model, which can be employable in cases where response and exploratory variables are a mixture of (I=1) and (I=0) processes (Jaidane-Mazigh et al., 2022). A specification of the ARDL equation can be developed by using the PMG approach. The estimation requires the selection of lag lengths. Thus, panel unit root tests that help to check stationarity should be used. Pooled Mean Group estimator restricts the same long-run coefficients across countries while short-run coefficients vary (Mehmood & Rehman, 2018). In the analysis, the lag length is determined according to the arbitrary approach. The arbitrary approach indicates lag specification by employing a "rule of thumb". Commonly employed arbitrary lags are 4 and 8 (Thornton & Batten, 1985). There are several information criteria that help to determine the lag order in econometric literature. Akaike information criterion, Schwarz-Bayesian criterion, and Hannan-Quinn criterion are widely used in the literature. However, the choice between these information criteria is also arbitrary. Inconsistent results can emerge by using different lag selection criteria (Liew & Chong, 2005). The lag structure in this study is maintained by arbitrarily using 4 lags for each variable to provide a consistent analysis.

4. Empirical Findings

The first model of the study is based on quarterly data and accepts travel and leisure sector index returns as a dependent variable. Changes in general share market prices of Japan, the USA, Germany, and the UK, become a crucial explanatory variable of the model, based on the stock market pricing theory of the capital asset pricing model. Asset pricing is one of the most popular topics in economic studies. Many theoretical models have been proposed and updated in the past. These models explain the relationship between expected returns and the risk of stock returns. A fundamental model called the mean-variance model was developed in the literature. This model indicates that risk-averse and rational investors should prefer the most efficient mean and variance portfolios.

The mean-variance model leads to the development of the CAPM. CAPM is a single factor model that explains the relationship between the expected returns in the securities market and determines the equilibrium price considering non-systematic risk as the main factor that impacts a stock return. It is proposed that stock returns are linear and dependent on the overall systematic risk of the general stock market and

defines as proportions of the general market's systematic risk. CAPM uses the beta coefficient, which calculates a stock's sensitivity to systematic risk and hypothetical risk-free security return to determine an asset price (Xiao, 2022). In line with the aim of the study, other economic variables: interest rates, inflation (CPI growth), GDP growth, and CCI, remains the factors that can explain travel and leisure sector index returns. The second model of the study includes weekly Covid-19 cases independent variable and travel and leisure index returns as the dependent variables. Table 2 shows descriptive statistics of the variables.

Table 2. Descriptive Statistics

Descriptive Statistics	Quarterly Travel and Leisure Index Returns	Quarterly CPI Growth	Quarterly CCI Growth	Quarterly GDP Growth	Quarterly Share Returns	Quarterly Interest Rate	Weekly Covid-19 Cases Growth	Weekly Travel and Leisure Index Returns
Mean	0.0128	1.4140	-0.0005	0.0255	0.0102	1.3030	0.8797	-0.0014
Median	0.0195	1.5	2.59E-05	0.4005	0.0127	1.3447	0.0320	0.0045
Maximum	0.397	4	0.0159	2.4399	0.2516	3.7819	57	0.2496
Minimum	-0.4899	-0.6565	-0.0258	-19.039	-0.1475	-0.5440	-1	-0.4286
Std. Dev.	0.1254	1.0230	0.0062	2.1373	0.058	1.0257	4.4839	0.0691
Observations	152	152	152	152	152	152	200	200

Results of the unit root tests are demonstrated in Table 3. Research models aim to be estimated by the ARDL approach because this approach allows mixed stationarity of factors. Unit root results explain that some of the factors in the research can be assumed as I=0, and others might be I=1. It is concluded that the stationarity of the variable can be assumed as suitable for the ARDL approach.

Table 3. Unit Root Tests

Unit Root Test	Quarterly Travel and Leisure Returns	Quarterly CPI Growth	Quarterly CCI Growth	Quarterly GDP Growth	Quarterly Share Returns	Quarterly Interest Rate	Weekly Covid Cases	Weekly Travel and Leisure Returns
Levin, Lin & Chu t*	1.1493 (Prob.:0.8748)	-0.8305 (Prob.: 0.2031)	-1.4421 (Prob.: 0.9254)	35.1274 (Prob.: 1.0000)	-2.5048 (Prob.: 0.0061***)	-21.843 (Prob.: 0.0145**)	4.3510 Prob: 0.0000***)	-1.4935 (Prob: 0.0677*)
Im, Pesaran and Shin W-stat	-60.099 (Prob.: 0.0000***)	-1.4141 (Prob.: 0.0787*)	-3.8190 (Prob.: 0.0001***)	8.8757 (Prob.: 1.0000)	-4.9250 (Prob.: 0.0000)	-1.4414 (Prob.: 0.0747*)	-4.6100 Prob: 0.0000***)	-5.8586 (Prob: 0.0000***)
ADF - Fisher Chi-square	50.1037 (Prob.: 0.0000***)	12.4008 (Prob.: 0.1342)	30.7626 (Prob.: 0.0001***)	0.1693 (Prob.: 1.0000)	39.5198 (Prob.: 0.0000***)	12.5050 (Prob.: 0.1301)	37.9141 Prob: 0.0000***)	49.5146 (Prob: 0.0000***)
PP - Fisher Chi-square	106.401 (Prob.: 0.0000***)	9.3119 (Prob.: 0.3167)	55.8861 (Prob.: 0.0000***)	4.5618 (Prob.: 0.8032)	57.6798 (Prob.: 0.0000***)	14.5798 (Prob.: 0.0679*)	102.3870 Prob: 0.0000***)	108.786 (Prob: 0.0000***)

***, **, * represent 1%, 5%, 10% significance level respectively.

The data is tested in order to determine homogeneity in panel data. A test of homogeneity in panel data is implemented by the Hsaio Test. The null hypothesis of the implemented test is “panel is homogeneous” and the alternative hypothesis of the test is “panel is partially homogeneous”. In our research, the two-panel dataset is analyzed. Table 4 demonstrates the results. Results show acceptance of the null hypothesis for datasets. It can be stated that the data of the study is homogeneous.

Table 4. Hsaio Test of Panel Homogeneity

Variable	F-stat	P-value
Weekly Dataset	0.162177	0.921701
Quarterly Dataset	0.014043	0.997718

Cross-section dependency is also tested to determine which unit root test is accurate. Table 5 provides the results of implemented cross-sectional dependence test. Significant results show that cross-sectional dependence exists in the data. Therefore, the CIPS test, a unit root test that considers cross-sectional dependence, is applied.

Table 5. Cross-Sectional Dependence Test and CIPS Test

	Quarterly Travel and Leisure Returns	Quarterly CPI Growth	Quarterly CCI Growth	Quarterly GDP Growth	Quarterly Share Returns	Quarterly Interest Rate	Weekly Covid Cases	Weekly Travel and Leisure Returns
Breusch Pagan LM	65,75(prob:0.00***)	86,96(prob:0.00***)	46,21(prob:0.00***)	180,62(prob:0.00***)	115,96(prob:0.00***)	121,7(prob:0.000***)	15,21(prob=0.0187**)	126,24(prob:0.000***)
Peseran Scaled LM	17,53(prob:0.00***)	23,37(prob:0.00***)	11,6(prob:0.000***)	50,4(prob:0.00***)	31,74(prob:0.000***)	33,4(prob:0.00***)	2,65(prob:0.0078***)	34,71(prob:0.000***)
Bias Corrected Scaled LM	17,48(prob:0.00***)	23,31(prob:0.00***)	11,55(prob:0.00***)	50,35(prob:0.000***)	31,69(prob:0.000***)	33,34(prob:0.000***)	2,61(prob:0.0088***)	34,67(prob:0.000***)
Peseran CD	7,01(prob:0.00***)	4,59(prob:0.000***)	6,71(prob:0.000***)	13,4(prob:0.00***)	10,65(prob:0.000***)	10,39(prob:0.000***)	2,78(prob:0.0053***)	11,04(prob:0.000***)
CIPS Test	-4.43 (p<0.01)	-1.74 (p>=0.1)	-3.39 (p<0.01)	-4,59 (p<0.01)	-4.54 (p<0.01)	-0.23 (p>=0.1)	-5,31 (p<0.01	-6.95 (p<0.01)

***, **, * represent 1%, 5%, 10% significance level respectively.

Table 6 presents the baseline results of the long-run coefficient analysis. The error correction term of the model is calculated with a negative coefficient and high prob. value. This evidences a long-run relationship since the coefficient is negative and significant. The analysis demonstrates that the growth of CCI positively and significantly affects travel and leisure sector returns. The role of interest rates is also positive and highly significant. The results of data analysis also show that general share market index returns have an insignificant impact on travel and leisure sector returns of Japan, the USA, Germany, and the UK. The effects of GDP growth and CPI inflation on travel and leisure sector returns are insignificant. This finding is not expected according to the theoretical importance of the GDP and inflation on the whole economy. However, in short-run analysis, these variables can provide significant coefficients.

Table 6. Long Run Coefficients of Economic Determinants of Travel and Leisure Sector

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Share Returns	0.065137	0.047304	1.376994	0.175
Interest rate	0.017667	0.0043	4.10844	0.0002***
Growth of GDP	-0.007447	0.004868	-1.529735	0.1328
Growth of CPI	0.00078	0.00226	0.345001	0.7316
Growth of CCI	1.932112	0.734877	2.629165	0.0115***

The error correction term of the model -1.572925 coefficient and 0.0013*** prob.
***, **, * represent 1%, 5%, 10% significance level respectively.

Short-run relationships are demonstrated in Table 7. The growth of GDP has a significant relationship with travel and leisure sector returns in the short run. The growth of CPI, which explains inflation, is also

found to be significant in the short run. These findings imply that the growth of GDP and CPI factors which are not significant in the long run provides a significant relationship in the short run.

Table 7. Short Run Coefficients of Economic Determinants of Travel and Leisure Sector

Variable	Coefficient and Significance	Coefficient and Significance (Lag 1)	Coefficient and Significance (Lag 2)	Coefficient and Significance (Lag 3)
Share Returns	0.134962(Prob: 0.6156)	0.460893(Prob: 0.2698)	0.034953(Prob: 0.8782)	0.430741(Prob: 0.3579)
Interest Rate	0.103371 (Prob: 0.0298)**	0.068712(Prob: 0.4680)	-0.112185(Prob: 0.3543)	0.167491(Prob: 0.4336)
Growth of GDP	0.031283 (Prob:0.0136)**	-0.046492(Prob: 0.1602)	0.009366 (Prob: 0.0365)**	0.044308 (Prob: 0.0987)*
Growth of CPI	-0.055261 (Prob:0.0002)***	0.053406(Prob: 0.1348)	0.051532(Prob: 0.3360)	0.030025(Prob: 0.6086)
Growth of CCI	6.066394(Prob: 0.1517)	-2.318837(Prob: 0.5116)	0.238407(Prob: 0.9238)	1.384581(Prob: 0.7170)

***, **, * represent 1%, 5%, 10% significance level respectively.

Table 8 shows the findings of the model, which investigates the effects of weekly Covid-19 Cases on the dependent variable of travel and leisure sector index returns. The error correction term of the model has the coefficient of -1.400606 and 0.0000 prob. Value. This explains long-term relationships. Long term coefficient of Covid-19 cases is negative and highly significant. This finding indicates that the Covid-19 pandemic negatively impacts travel and leisure sector index returns. In the short run, the effect is positive. However, it becomes insignificant after the first lag. This result explains the negative impacts of the Covid-19 pandemic on travel and leisure sector index returns in the long run rather than in the short run. Coefficient diagnostics are also provided in Table 9.

Table 8. Long Run and Short Run Coefficients of Covid-19 Cases in the Travel and Leisure Sector

Long Run Coefficient				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Weekly Covid Cases	-0.008770	0.000849	-10.32796	0.0000***
Short Run Coefficient				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Weekly Covid Cases	0.0074	0.0015	4.8639	0.0000***
Weekly Covid Cases (Lag 1)	0.0045	0.0008	5.7362	0.0000***
Weekly Covid Cases (Lag 2)	0.0054	0.0033	1.6196	0.1073
Weekly Covid Cases (Lag 3)	0.0001	0.0022	0.0313	0.9751

The error correction term of the model -1.400606 coefficient and 0.0000*** prob.
***, **, * represent 1%, 5%, 10% significance level respectively.

Table 9. Coefficient Diagnostics: Scaled Coefficients

Variables	Quarterly Share Returns	Quarterly Interest Rate	Quarterly GDP Growth	Quarterly CPI Growth	Quarterly CCI Growth	Covid Cases
Coefficient	0.065137	0.017667	-0.007447	0.000780	1.932.112	-0.008770
Standardized Coefficient	0.030381	0.144504	-0.126915	0.006362	0.095982	-0.568815
Elasticity at Means	0.052118	1.792.773	-0.014832	0.085882	-0.077621	5.491.428

5. Conclusion and Discussion

Covid-19 negatively impacted various macroeconomic indicators. The travel and leisure sector can be seen as potentially vulnerable to negative pandemic impacts due to new social preferences and restrictions preferred to prevent Covid-19. Since travel and leisure intentions are changing after the Covid-19, companies' future in the travel and leisure sector should be carefully examined. The results of this study provide economic relationships regarding the travel and leisure industry represented by share market indexes. Share market prices include relevant information which can affect firm value. In the study, share market price indexes of the travel and leisure sector are analyzed with potential macro-economic determinants and Covid-19 cases. The results of the study are beneficial to managers and decision-makers regarding the issues related to the travel and leisure sector to formulate industrial changes due to the Covid-19 pandemic. Economic fluctuations have been one of the prime concerns of business management. Firms encounter increasing risk and uncertainty with an outburst of the Covid-19 pandemic. Managers of firms need data and information about the course of business. Insights provided by this study can be necessary for the decisions, plans, and actions of firm management.

In conclusion, the effects of five macro-economic determinants on the share price index of the travel and leisure sector of Japan, the USA, Germany, and the UK and the impact of Covid-19 cases are explored. The study aims to analyze developed countries' share market and economic factors to provide evidence regarding the economic link between the travel and leisure sectors. Covid-19 has strongly endangered economies around the world. The travel and leisure sector, which is assumed to become a susceptible sector, is analyzed with Covid-19 cases and the index returns relationship, which helps to understand the effect of Covid-19. Academic studies (Isaac & Keijzer, 2021; Morse et al., 2021; Wang et al., 2021a) provide the view that changes in government measures, leisure intentions, social life, and activity preferences owing to Covid-19 can impact the travel and leisure industry. Results show that the travel and leisure sectors have significant economic linkages and generate adverse reactions to Covid-19 cases in the long run. In the short run, this effect is positive. However, it is insignificant after the first lag. Results show that negative impacts of Covid-19 on travel and leisure sector index return were observed in the long run rather than the short term. This is supported by a view of Wang et al. (2021b) which suggests that negative effects of Covid-19 on the travel and leisure sector are likely to occur in the long run. Lin and Falk (2021) also evidence negative impacts on travel and leisure companies due to the Covid-19 pandemic. The research has limitations. Four countries sample of developed countries can be increased, and developing countries can be included in future studies. The model of study employs independent factors, which are suggested in the literature. However, other variables which have potential impacts remain out of the scope of this research. The research period of this study covers the initial time of the Covid-19 pandemic. Thus, the prolonged effects of the pandemic cannot be tested. Decision-makers from the real sector and government related to the travel and leisure industry could benefit from the findings of this study. Governments provide subventions for the recovery of the real sector. These subventions can be reformed by considering the performance of the real sector and changing economic factors, which are analyzed by this study.

In the short run, it can be noted that the economy's growth rate becomes an explanatory factor of travel and leisure sector returns. The study provides an insignificant impact on GDP growth in the long run. Interest rates have long-run and short-run significant positive coefficients. This finding shows that investments in the travel and leisure sector provide returns dependent on monetary conditions and supports the findings of Chen (2012), which evidences the significant impact of monetary policy announcements on hospitality stock returns. The growth rate of CPI that demonstrates inflation is insignificant in the long run. This indicates that travel and leisure sector portfolios cannot generate returns consistent with inflation. Chen et al. (2005) also found significant inflation factors in their research. However, this variable can provide a short-run significant negative relationship in our analysis. It can be implied that inflation is a signal of monetary policy changes that have negative effects. The significant negative impact of inflation is also evidenced by Barrows and Naka (1994), and Sevil and Polat (2015). Share price growth becomes an insignificant determinant. This explains that travel and leisure index returns have not parallel line with general share market returns. Since well-known pricing theories in finance are based on arbitrage pricing

model, capital asset pricing model, and Fama-French 3-factors model fundamentally employ the general share market return variable as an explanatory factor. APT can be defined as a substitute for the CAPM.

APT and CAPM suggest a linear relationship between securities' expected returns and their covariance with other variables. CAPM uses only one variable, which indicates the covariance of market portfolio returns. In the models, the variables' covariance can be interpreted as a risk premium that investors cannot mitigate by diversification. Fama and French 3-factor model employs variables calculated from the spread between stock returns of constructed portfolios. This model sorts portfolios on firm size and book to market ratio and calculates return spreads to serve as one of their factors (Huberman & Wang, 2005). The findings of our study show that travel and leisure share returns are mainly related to economic factors than the share market growth rate, which is suggested by finance theories. The consumer confidence index also sustained significant findings in the study. Sevil and Polat (2015) state that consumer spending is crucial for travel and leisure sector companies and impacts share prices. In line with this statement, our study presents the growth of the consumer confidence index highly significant long-run determinant that generates a positive relationship. Investors of the travel and leisure sector should trace the consumer confidence index to estimate the sector's return in financial decisions. Consumer confidence index growth is found to be statistically significant. Descriptive statistics demonstrate that consumer confidence index growth decreased in the research period. Recovering from the negative impacts of the Covid-19 pandemic can follow developments in consumer confidence. Interest rates are found to be significant positive determinants long and short run. Monetary conditions will be necessary to recover the travel and leisure industry. Future studies can investigate developing countries and compare the results of developed economies with expanding determinant factors. The travel and leisure industry can be analyzed with financial statement data and sector-specific factors like leisure intention, activity preferences, and social changes in human life. Future studies can test new economic models and factors that explain the travel and leisure industry since studies in the literature prefer to employ different models than accepting one economic model. Industrial comparisons can be made to define specific economic determinants for the travel and leisure industry. The travel and leisure industry is vital for a country and its citizens. People may need hospitality services for their life satisfaction. Firms may also require high-quality and continuous travel and leisure services due to their business activities. Detecting industrial problems and providing development offers for the sector can be an aim for future studies.

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